

TOWARDS A POLICY FOR RIVERINE ISLANDS IN THE GANGA RIVER

A POSITION PAPER



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Towards A Policy For Riverine Islands In The Ganga River

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EXECUTIVE SUMMARY

The issue of river conservation is gaining urgency in recent times in India. However, despite considerable efforts in this field, riverine islands and sandbars have, until now, received negligible attention from subject experts and policymakers. This is evident from the gross lack of studies on this topic and the absence of any significant policy/regulation addressing pressing issues faced by these vital components of the riverine ecosystem.

In recent years riverine islands have begun to face anthropogenic pressures to the extent that some are hosting major built settlements. Most major rivers in India including River Ganga not only support numerous habitats and exemplary biodiversity but also serve as sources of several key ecosystem services. However, the increasing human colonization within and around the riverine ecosystems has overwhelmed the islands and led to the loss of their native biodiversity vis-à-vis increasing concretization and agricultural activities.

The lack of studies regarding these islands as well as the absence of a policy framework to address their usage, conservation and protection, prompted this study. INTACH proposed a comprehensive and pioneering study to examine various issues pertaining to riverine islands of the Ganga [other than the deltaic region of Sundarbans where the islands are subject to tidal influences] and lay out the contours of a position paper for riverine island governance with the prime objective of enabling islands to play a healthy role in the river eco-system, possibly enabling other environmentally compatible uses [on select islands] and certainly preventing misuse of the islands for inappropriate activities.

Typically, a fluvial riverine island can be defined as **‘a land mass within a river channel that is separated from the floodplain by water on all sides, exhibits some stability, and remains exposed during bankfull flow’** (whereas a sandbar may be submerged). Most international studies have considered the riparian vegetation to be playing an important role in the formation and stabilization of riverine islands along with being an important distinguishing factor between an island and a sandbar. Broadly, the riverine islands formation is in two ways – those which are newly formed mostly by initiation on

gravel bars within the rivers and second that are formed due to dissection of a floodplain region. In India, riverine islands and sandbars occur in most major rivers with some important examples being – Majuli Island in the Brahmaputra River (considered to be one of the world’s biggest riverine islands and the first island district in India), Raghapur Diara in the Ganga River, Srirangapatna and Srirangam Islands in the Cauvery River, Kabirvad Island and Omkareshwar Mandhata Island in Narmada River, Divar Island in Mandovi River and islands of Godavari River. These islands are known by different names regionally such as – ‘*Taapu*’, ‘*Diara*’, ‘*Lanka*’, ‘*Kudru*’, ‘*Bet*’ and ‘*Char*’. Despite these examples, studies in India have, hitherto, been concentrated on Majuli Island while scanty information is available for others including islands in the Ganga River.

The riverine islands in the Ganga River are known to form in various shapes which are dependent on factors such as discharge, velocity, gradient and sediment load. The **GIS-based mapping of riverine islands and sandbars** yielded the presence of 2397 islands of which 1198 islands have an area of more than 5 hectares. Among these 1198 islands, 790 are barren lands/sand bars without any defined land use, 132 islands are under agriculture and human settlements while 250 islands are under forest or vegetation cover.

For the current study, 13 islands were selected for **survey** in the Ganga River main stem and Hooghly River stretch. The field studies involving biodiversity surveys and stakeholder interactions underscored various issues that varied from island to island. Overall, it was recorded that the increasing land pressures played a pivotal role in shifting the focus of local communities (especially from riparian villages, towns and cities) towards exploiting the riverine islands and sandbars. Mostly this was done for agricultural and horticultural purposes with vegetables and fruits being chief products on islands closer to towns and cities. This, however, led to the clearing of native vegetation which adversely impacted biodiversity and threatened habitats of turtles, otters and several birds on the islands. Upon interactions, several cultivators reiterated that they had the necessary ownership or permissions to undertake cultivation on islands but often failed to back their claims with any documents.

The islands in the upper reaches of the Ganga River such as those in Haridwar Distt. supported a rich biodiversity and served as crucial migratory corridors for Elephants, Deer and other wildlife. In the middle and lower stretches of the Ganga River, wildlife such as Wild Boars, Golden Jackals, Nilgai, smooth-coated otters, and several bird species found their abode on the islands. *Saccharum* sps. grasses were found to be growing luxuriantly on islands and were often collected by local communities for thatching hut roofs, making brooms, baskets and granaries. Cattle grazing by riparian communities was also recorded to be a common activity on the riverine islands.

In certain islands such as Raghapur Diara (Vaishali) and Ramchandipur Diara (Varanasi), people have owned lands for years and with the passage of time are developing these places into full-fledged towns with all necessary amenities including multi-storey constructions but without any regulations. While the former is being connected by a new bridge, the latter is already well connected with the mainland through a proper bridge. Similar connectivity demands are resonating among island dwellers in Jharkhand and West Bengal as reported during the survey. In several islands, unauthorized activities and other criminal activities often go unnoticed due to jurisdictional ambiguities between districts on opposing banks or in some cases two different states on opposite river banks.

The following categories of **land uses**, deliberate or natural, were observed, although not uniformly applicable to each island :

- ❖ Woodlands, wildscapes, habitats
- ❖ Cultivation
- ❖ Settlements
- ❖ Cottage industry [fisheries hub on one island]
- ❖ Sand mining

Survey of literature and workshop inputs suggest the possibility that islands in urban stretches could be used for eco-tourism and light commercial development.

In order to analyze various **issues** recorded during the surveys and address the same, a thorough **legal analysis** was also carried out pertaining to existing laws and regulations in India dealing with riverine islands. The earliest and most prominent known regulation in this regard is the Bengal Alluvion & Diluvion Regulation, 1825 developed by the erstwhile British administration which deals with ownership of lands either gained by river action or cut-off from the mainland due to course changes. Although this Act was modified and discarded later, its different provisions were adopted in land regulations of States such as Bihar, West Bengal, Odisha and even Punjab. While it was clear that land within the river was the property of the state governments, several state-level Acts/regulations complicate the picture of ownership and tenures. Among recent national Acts/Notifications some contradictions or grey areas were noted between the River Ganga (Rejuvenation, Protection and Management) Authorities Order [2016], National Waterways Act [1982] and Wildlife Protection Act [1972] which have been addressed in the recommendations.

The national level legislation such as the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016, EIA Notification [to the extent applicable], and the Water Act – are oriented towards conserving the health of the river system. The Wildlife Protection Act comes into play where river sanctuaries are involved and would therefore have a bearing on islands within the sanctuary zone as well as on the riparian buffer zone.

The 1985 National Waterways Act's provisions enabling the removal of any obstruction in the navigational channel seem to belong to an era where the river systems were little understood and, in fact, taken for granted. Such a provision would allow unhindered modification of islands and bank profiles. Where islands are concerned the LARR Act would then come into play as LARR ACT not only mandates compensation against land acquisition but also loss of occupations.

As no extant law/regulation permits construction on islands the islands on which construction has come up in violation, both by government and by private individuals, are on the wrong side of the law. The River Ganga (Rejuvenation, Protection and Management) Authorities Order, in fact, bars any construction on the 100-year floodplain of the river.

There clearly appears to be a need to simplify and consolidate the state-level laws to bring about internal consistency and align them with the objectives of the national-level laws. An overriding national legislation which balances the tenurial issues, need to accommodate the existing genuine cultivators while attaining and sustaining the robust health of the river ecosystem seems to be required.

The study proceeded to identify various **stakeholders** as follows :

- ❖ Settlers with built residential establishments
- ❖ Cultivators with ownership documents
- ❖ Cultivators without ownership documents
- ❖ District Administration for administrative jurisdiction
- ❖ District Forest & Wildlife Dept. [for corridors, river sanctuaries, wildscapes and habitats, ecotourism]
- ❖ Basin Manager [NMCG] for resolution of complex issues arising out of actions or inactions of various stakeholders and as the human representative of the river systems
- ❖ IWAI [Inland Waterways Authority of India] as navigational routes can require island modification [horizontally]
- ❖ Urban local bodies & town planning departments in whose jurisdiction islands in urban stretches fall
- ❖ Wildlife having actual and potential habitats represented by DFO, CWW, relevant civil society organization[s]

Other **key issues** pertaining to Ganga riverine islands include definitional issues and complexities in ownership and tenures on islands. Thus, for e.g.

- i. The case of fordable islands where tenurial rights but not ownership may exist.
- ii. The case of non-fordable islands which belong to the State Governments in their entirety. Here again, the district authorities can give tenurial rights for cultivation but only for limited periods.

With increasing human settlements, there is a spurt in the **construction** of multistoried houses, schools, panchayat offices, water tanks, markets, roads, permanent bridges and many other city-like facilities on some islands. In the absence of any regulations, the residents owning lands on these islands are freely undertaking construction and an urban land market is beginning to emerge in a couple of cases. Despite the threat of damage during flooding, some islands, particularly those close to large cities, are now seeing changes in land use with urban colonization. Construction of buildings and residential settlements is not recommended on the grounds that these are against extant law, vulnerable to floods, erode already shrinking wildlife habitats, can generate pollution affecting surface and groundwater regime, affect aquatic life through increased traffic, noise and light pollution. Such settlements will also create demands for road and bridge connectivity thereby opening the island to further undesired exploitation.

Modification Issues – it needs to be considered as to the circumstances under which modification of islands, in the horizontal and vertical plane, can be permitted.

- i. For eg. an island keeps on expanding to narrow down its containing channels and thereby choke navigation. In such a situation the island may require horizontal modification of one of its containing channels to maintain navigation. The extent of modification should be minimal based on the requirements of large vessels.
- ii. Bridges for connectivity are also undesirable as they increase accessibility, rob the island of its isolated, undisturbed and natural status, driving up land costs which then attract construction demands by real estate lobbies.

Other **issues** pertain to opposing concerns of the several stakeholders, jurisdictional ambiguities [often the result of shifting river course], increasing human footprint, agriculture expansion, encroachments, biodiversity and ecosystem services loss, use of chemicals in agriculture, pressure for bridge /road access which in turn leads to land price spikes and unauthorized construction, lack of sound legal framework and inability to identify the islands as most of them have no nomenclature.

Business as Usual Scenario : What would happen if the present situation is allowed to develop unhindered? Hardin's 'Tragedy of the Commons' model predicts the eventual

overexploitation or degradation of all resources used in common. A situation can be visualized wherein more islands would be colonized, more habitats and woodlands cleared, more areas brought under cultivation, new sources of pollution would develop mid-river and growing populations would exert political pressures for flood protection measures, thereby completely destroying the natural character of the river.

Policy Based Regulated Scenario : Under a policy-regulated scenario consistency would be achieved amongst state-level and national laws, the interests of cultivators accommodated, while river conservation and wildlife refuges would be the drivers of interventions or prevention of interventions. A very limited number of islands in the urban stretch can be permitted to have recreational activities and other select islands can have controlled eco-tourism activity, all in the non-monsoon season.

Policy Objectives : This policy position paper aims to ensure the following objectives:

- i. Settling the ownership issues of the river islands
- ii. Settling the usage issues of the river islands
- iii. Promoting inventory and mapping of all river islands
- iv. Resolving legal anomalies

The position paper **recommends** a balance between environmental, administrative and settlement challenges. Towards this end, it advocates reconciliation between the objectives of national-level law and state-level legislation. The paper retains the interests of existing cultivators while preventing destructive and flood-vulnerable construction on islands.

The position paper defines a river island as – **“A piece of land definitely surrounded by water during the monsoons and is fairly stabilized with natural vegetation”**.

Ownership : The State Government is/will be the owner of the islands in existence as of the date of the policy, those which may emerge later and those sandbars which evolve as islands. Where private property exists on certain islands, the gross footprint of the same will not be expanded and the remaining unregistered lands will remain in the ownership of the State.

The paper also advocates amendments to the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016 to explicitly cover islands. It further addresses the potential contestation between the National Waterways Act and the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016. It also advocates the need for amendment in state-level legislation for internal consistency and consistency across the Ganga Basin. Further, the paper recommends amendments to state-level legislation to regularize and freeze residential and related construction where it has occurred on a large scale.

A nomenclature system has also been proposed to name the islands thereby raising their visibility in the minds of stakeholders. Lastly, the position paper bats for the interest of wildlife and ecology which finds refuge on these islands.

The issue of **permissible landuse** is dealt with in detail. The landuse of islands falling in non- urban stretches of the rivers will be completely rural. Thus, no construction activity will be allowed here as is the law.

- i. Where cultivation is being carried out cultivated area as of the date of policy notification may be established by satellite imagery supported by ground truthing surveys. No further expansion of cultivable area is to be permitted and the remaining area is to be maintained wild or rewilded
- ii. In case cultivation is being carried out legitimately the agronomic practices will be completely organic and without a trace of chemical inputs and gradually transformed into permaculture with appropriate steps by the authorities.
- iii. Further, sandmining will not be allowed on the defined islands.
- iv. Eco-tourism, observing eco-tourism code of conduct, may be allowed on the islands.
- v. Islands falling in the urban stretches may be allowed for eco-tourism use such as trails and camping and some forms of recreation and extremely strictly defined temporary construction with all pollution-preventing measures.

Construction on Islands - With regards to construction the following policy injunctions will be followed :

- i. Existing construction on privately held lands within large settlements, as existing on the date of the policy, can remain. However, the expansion of footprint and vertical growth will be frozen as of the date of the policy notification. Even this will be an exception to state laws which will require an amendment
- ii. Construction on empty private plots is not to be allowed from the date of policy notification.

Accessibility : Construction of bridges to the islands from the banks is not to be permitted except in the case of islands with major existing settlements.

Island erosion : Erosion of riverine islands is a major issue as observed on Raghapur *Diara* along with other islands. The most environment-friendly approach to this challenge is stabilizing the island banks with riparian grass, specially *Saccharum* sps. and other native riparian vegetation. Not only do these provide long-term bank stability but also support native biodiversity and enhance climate resilience.

Specific **recommendations** include promoting organic agriculture, safeguarding native vegetation and wildlife in newly formed islands and islands which are not privately owned, chalking out sustainable development plans for bigger islands with significant human footprints, avoiding permanent connectivity as far as possible, increasing research studies in this subject, resolving jurisdictional issues, prevention of island erosion.

It is suggested that the National Mission for Clean Ganga (NMCG) can be the nodal body for developing and implementing a sound riverine islands policy which can be effectively monitored in conjunction with State Ganga Committees and various District Administrations concerned. The policy emanating out of this position paper would be applicable to the main stem of the Ganga River along with its tributaries and tributaries of those tributaries.

Monitoring and Implementation : National Mission for Clean Ganga (NMCG) can be the nodal body for developing and implementing riverine island policy. Any activity concerning the riverine islands and sandbars would need prior approval from them. The State Ganga Committees in conjunction with the concerned District Administration can effectively monitor the implementation of guidelines from time to time and apprise about the same to NMCG.

CHAPTER 1 – INTRODUCTION

- 1.1 Riverine islands are a common and important feature in most major rivers across the world and in India, particularly those flowing through alluvial terrain, transporting plenty of sediment, and having seasonal flood pulses which result in changing courses and braiding. They are particularly common [although not exclusively so] to the middle stretch, lower reaches and estuarine areas of rivers flowing through alluvial strata particularly in areas of gentle gradients with resultant gentle flows which allow sediment deposition and island formation. Such is the case with River Ganga which originates in a mountainous stretch, thereafter coursing through alluvial plains and subsequently carving out the deltaic zone at the Bay of Bengal. The alluvial stretch is a zone of island formation which has several islands formed by sediment deposition and channel braiding. “Islands may not be permanent on the geologic time scale owing to the river meandering, climate change, etc. but can remain in place over decadal or century time scales and hence exhibit stability” [Wyrick & Klingeman, 2011]. The several islands recorded in the Ganga River have a dynamic relationship with fluvial processes and are integral parts of the river channel sedimentary dynamics and offer extant and potential ecosystem services.
- 1.2 These riverine islands have rarely been considered consciously, in either administrative and revenue processes, nor have been addressed from the perspective of river conservation or the larger biodiversity aspect even though they are integral to river ecology and are components of larger ecosystems. This is also true with most other major rivers of India as barring Majuli Island in Assam, there are no other significant studies. Of late, with the identification of rivers as waterways, these islands are also seen as hurdles in the navigation process.
- 1.3 The vegetated riverine islands in the river, have a dynamic relationship with fluvial processes, are integral parts of the river channel sedimentary dynamics

and offer extant and potential ecosystem services. Furthermore, as they are separated from the mainland, there is a potential of harboring unique biodiversity and also of providing a safe haven for several other species. However, while some riverine islands in the Ganga River system, especially in secluded areas and sites away from human settlements continue to provide ecological benefits, most others are being increasingly subjected to human intervention and even colonization, which is reducing the natural wildscapes of these islands thereby destroying biodiversity and habitats intrinsic to the river system. The increasing vulnerability of riverine islands to exploitation is a result of an absence of robust and farsighted policy on the issues of jurisdiction, land ownership, permissible land use, wild flora and fauna refuges, colonization pressure in the middle of the river and destruction of islands on account of sand mining.

Objectives

- 1.4 It is thus surprising that riverine islands, staring river experts in the face, have elicited such little attention and thus attracted very little research. Despite growing efforts for river conservation in recent years, there have been limited studies that contribute to a better understanding of these ecologically significant areas. Thus, a comprehensive and pioneering study was proposed by INTACH to examine various issues pertaining to riverine islands of the Ganga [other than the deltaic region of Sunderbans where the islands are subject to tidal influences] and lay out the contours of a well-defined policy position paper for riverine island governance with the prime objective of enabling islands to play a healthy role in the river ecosystem, possibly enabling other environmentally compatible uses [on select islands] and certainly preventing misuse of the islands for inappropriate activities. The following important **objectives** are envisaged for the study:

- a) **Understanding the present situation at the ground level – typology of islands, location and formation of islands, the effect of meandering**

course and braided formations, the effect of islands on river flow, and ways of usage will be examined.

- b) Identify issues – clarify administrative – revenue – legal jurisdictions, existing regulations [if any], inputs from the international literature on the subject, identify stakeholders and their interests and motivations [for example: Forest and Wildlife Dept., NMCG, Mining Dept, National Waterways, Tourism Dept., Mining Dept., Basin Manager’s perspective via CWC, riparian communities].**
- c) Elaborate on ecosystem services of riverine islands – here existing status of islands for biodiversity and habitats, potential as wildlife refuges, as part of wildlife corridors along with native flora [particularly riparian grasses] would be examined especially in the context of river banks becoming inhospitable and bald.**
- d) Develop policy options for conservation and management through stakeholder consultation resulting in an analysis of current status, potential, governance issues, stakeholder interests’ articulation and the way forward through a position paper.**

CHAPTER 2 – LITERATURE SURVEY: INTERNATIONAL CONTEXT

The international literature survey highlights some work on riverine islands in major rivers of the world such as St. Lawrence, Tagliamento, Yangtze, Amazon, Nile and Padma. The riverine islands can be broadly divided into two categories – ones that are newly formed mostly by initiation on gravel bars within the rivers and second that are formed due to the dissection of a floodplain region. In both these cases, the islands are referred to as those land masses within a river channel that are separated from the floodplain and surrounded by water on all sides. Through several papers, it has come to light that riparian vegetation has an important role in the formation and stabilization of riverine islands. It can also be considered as an important distinguishing factor between an island and a sandbar. The riverine islands provide shelter to various people as observed in Bangladesh, serve as crucial wildlife habitats as observed in the Amazon River and have also been developed for their immense tourism potential as observed in the case of Thousand Islands. Along with this, the riverine islands provide several important ecosystem services for mankind which often go unnoticed. This section surveys the various international papers on riverine islands vis-à-vis gaining insights from some crucial examples worldwide.

2.1 For surveying the literature on riverine islands in international rivers, an extensive search was made online using appropriate keywords on various platforms such as Wiley Online Library, Springer Link Publications, Taylor & Francis Journals, ResearchGate & Academia.edu platforms among several others. Available research papers were downloaded for reference and in some cases, the authors were also contacted for sharing their literature. All the references surveyed have been duly cited in this chapter and their details are provided in the Bibliography section.

2.2 **Definition of Islands** : Fluvial islands exist in almost all the major rivers of the world whether they are regulated or unregulated. A fluvial island can be defined as ‘**a land mass within a river channel that is separated from the floodplain by water on all sides, exhibits some stability (Osterkamp, 1998), and remains exposed during bankfull flow**’ (whereas a sandbar may be submerged).

2.3 **Morphological Characteristics** : Although islands may generally be unstable and not permanent in the geological time scale, some of them can remain in place over decades or centuries, thereby exhibiting stability. Islands provide morphological and biological complexity to river environments (Ward *et al.*, 2002, Gurnell *et al.*, 2005) and are an important element of river morphodynamics (Huppand Osterkamp, 1996; Schnauder & Moggridge, 2009). They are crucial in both hydrologic and biotic capacities, and can therefore be indicators of the general health and energy of the river ecosystem (Beechie *et al.*, 2006). Some recent histories of magnitudes, frequencies and durations of water and sediment fluxes can also be recorded in the sediment and biota of fluvial islands (Wyrick & Klingeman, 2011). Despite such usefulness, the discussions on riverine islands have been conspicuously sparse in several geomorphology texts (e.g. Chorley, 1971; Schumm, 1972; Richards, 1987; Hickin, 1995; Rodriguez-Iturbe & Rinaldo, 1997; Knighton, 1998; Bridge, 2003).

2.4 **Formation Of Riverine Islands** : The formation of riverine islands has been minimally understood through the research and literature available so far. In most cases, the researchers have described island formations pertaining to their local study sites. For example:

- Tooth & Nanson (2000) described the formation of islands in an ephemeral Australian river Marshall due to the deposition of sediment behind tea trees. This river is characterized by ridge-form anabranching, where water and sediment are routed through subparallel, multiple channels of variable size which occur within a typically straight channel-train. Ridges and islands represent a continuum of forms, and their

formation and development can be divided into a three-stage sequence involving teatree growth and alluvial sedimentation [Image 1]:

- Teatrees colonize a flat, sandy channel bed, initiating the formation of ridges by lee-side accretion. Individual ridges grow laterally, vertically and longitudinally and maintain a geometrically similar streamlined (lemniscate) form that presents minimum drag.
- Individual ridges grow in size, and interact with neighboring ridges, causing the lemniscate forms to become distorted. Ridges in the lee of other ridges tend to be protected from the erosive effects of floods and survive, whereas individual teatrees or small ridges exposed to flow concentrated between larger ridges, tend to be removed.
- Ridges lengthen, and coalesce with downstream ridges, eventually subdividing the channel-train into well-defined anabranches.

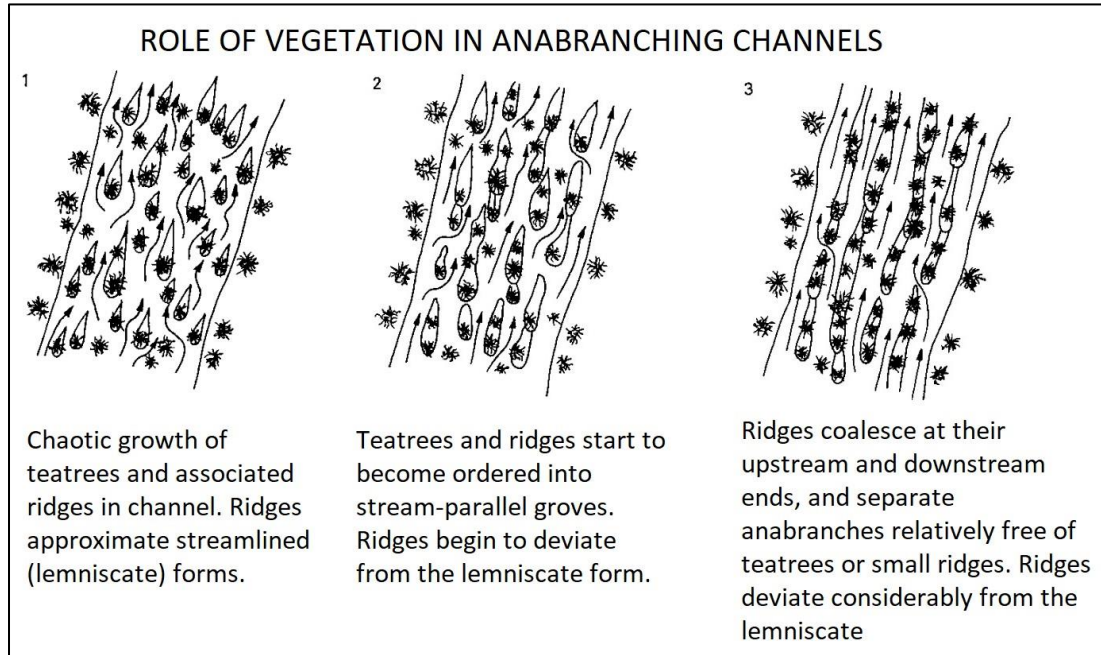


Image 1 : Illustration Of The Three Stages Of Ridge And Anabranching Formation (Source - Tooth & Nanson, 2000)

- Edwards *et al.* (1999) proposed a mechanism for island initiation on gravel bars in which it was noted how some uprooted trees, particularly *Populus nigra*, remained alive after erosion, transport and deposition on gravel bar surfaces during flood events. Under suitable environmental conditions, which included part-burial by fine sediment, the uprooted trees sprouted to form 'pioneer islands'. It was suggested that further accumulation and growth of vegetation, wood debris and sediment around these pioneer islands supported their enlargement and coalescence, culminating in the formation of larger established islands.

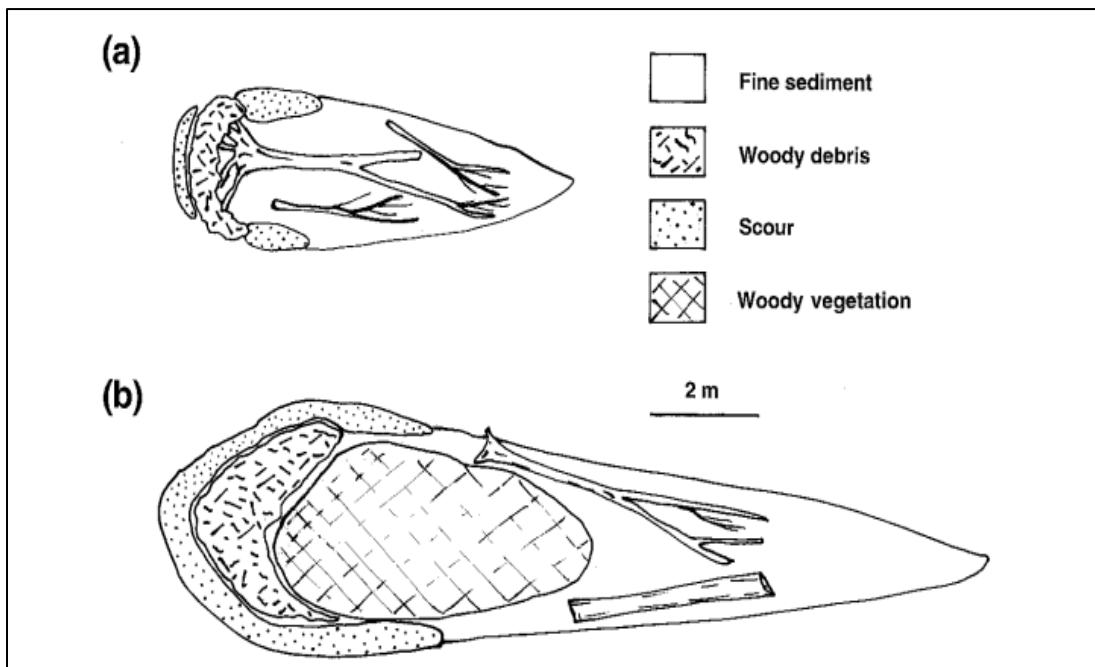


Image 2 : Sketches Based On Field Observations In 1997 Showing The Early Stages Of Development Of Vegetated Islands: (A) A 'LWD Island' Formed Around A Large Uprooted Tree Stranded On A Gravel Bar Following A Flood Event In November 1996; And (B) A 'Pioneer Island' Which Was Established Probably In 1990, And Which Accumulated More Debris And Sediment During The Flood Event In 1996. (Source - Edwards *et al.*, 1999)

Note: Solid Arrows Represent The Most Commonly Occurring Phenomenon

- 2.5 In one of the earliest studies, Leopold and Wolman (1957) explained the pattern of island formation and subsequent braiding of the main river channel through a case study in Horse Creek and Green River of the USA. They suggested a sequence of events with the initiation being the deposition of a submerged central gravel bar in an originally single/undivided river channel. The head of the gravel bar is composed of the coarse fraction of the bed load that is moving down the center of the river channel. Because of some local conditions, not all coarse particles are transported through this particular reach and some get deposited in the center of the channel. Most of the smaller materials pass over the bar but part of the finer fraction is trapped and deposited. Though the depth is gradually reduced, velocity over the bar remains undiminished leading to the rolling of some central bar particles and getting deposited beyond the lower end of the bar where a marked increase in depth is associated with a decrease in velocity. Thus, the bar grows by successive additions along its downstream end presumably by some additions along its margin.
- 2.6 The growth of the gravel bar at first does not affect the width of the stream, but when the bar gets large enough, the channels along its sides are insufficient in width to remain stable. Widening then occurs by trimming the edges of the central bar and by cutting laterally against the original sides of the channel until a stable width has been attained. At the same time, some deepening of the flanking channels may occur and the bar emerges as an island. The bar gradually becomes stabilized by vegetation. After the island has been formed, the new channels in the divided reach may become subdivided in the same manner. As successive division occurs, the amount of water carried by an individual channel tends to diminish so that in some of these, vegetation prevents further erosion and, by screening action, promotes deposition.

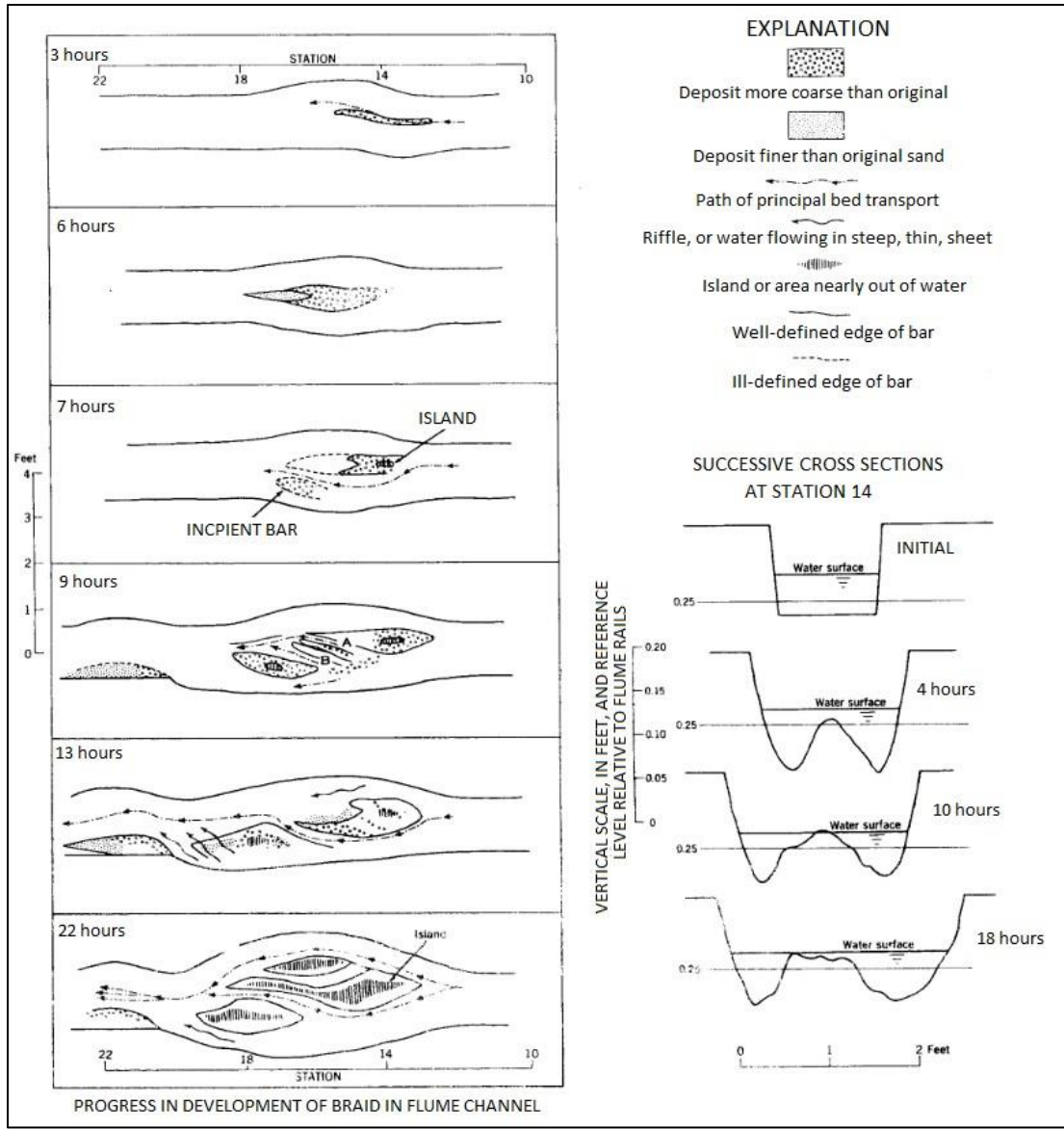


Image 4 : Sketches and cross sections showing developing of braids in river (Leopold & Wolman, 1957)

2.7 In another study, Ham & Church (2002) investigated the bar growth and island development during the twentieth century in a gravel reach of Fraser River in the Province of British Columbia in Canada where they found that below-average floods between 1977 and 2002 caused vegetation growth that got matured on elevated bar surfaces, thus, creating new island area. In addition, bed material influx to the reach was being increasingly deposited along or adjacent to high bar

or island surfaces rather than within the main flow channel. As a result, islands had grown in size and narrowing and deepening of channels took place.

2.8 Stanford *et al.* (1996) summarized the fluvial system of a river as a sequence, a continuum, of eight biophysical environments: (1) headwater streams, (2) headwater transition, (3) montane flood plain, (4) montane transition, (5) piedmont valley flood plain, (6) piedmont transition, (7) coastal flood plain, and (8) estuary [Image 5].

2.9 **Osterkamp (1998) gave a detailed understanding of the fluvial islands and their different formation processes.** According to him, natural islands in the biophysical continuum occur through at least eight different processes that are as follows:

- Avulsion typically occurs by incision and channel straightening into coarse alluvium during an erosive flood.
- Gradual degradation of channel branches bounding a higher, within channel surface. This results from the steady evacuation, over years to centuries, of sand and gravel deposited during flood events or debris flow, as glacial outwash, or by other processes of accelerated upland erosion, bank failure, or an abundant supply of stored bed sediment.
- Lateral shifts in channel positions during normal discharges that isolate a central surface topographically higher than the channel branches bounding it.
- Stabilization of a riffle, sand or gravel bar, or other positive channel element by accretion and establishment of persistent vegetation during a period of non-erosive peak discharges. This occurs usually in small rivers of the headwater-transition zone, and in larger, flood-widened sand channels.
- Steady degradation of channel branches along preferred paths of bedrock fractures or around structural features such as a reef-anticline (Liberty, 1981), or through permeable zones in glacial deposits, leaving a medial

feature of relative resistance to erosion between the channel branches. This case is typical of non-alluvial channels (often bedrock) of slow base-level lowering, such as stream systems of karstic, glacial, and volcanic ash geology.

- Rapid incision of channel branches during the recession of a flood or a ponding event, leaving a surface higher than the anabranches bounding it. This case requires rapid evacuation of sediment deposited during a flood, by mass movement, or following general landscape instability.
- Lee deposition at a channel obstruction, generally in a braided or anabranching reach. This case is common in widened, braided channels of various sizes, where steady evacuation, principally as bedload, of flood or glacial debris occurs.
- Deposition of various positive features by mass movement, such as hummocks of debris avalanche and possibly rare drumlin-like bars preserved as protuberances from basal-flow deposits of debris flow (Scott, 1988). Rare examples of islands in the eighth category are restricted to lowlands catastrophically altered by extreme events such as debris avalanche of a volcanic eruption or subsequent debris flow. Other possible causes of islands of this sort are rockfall, soil slump, and bank failure.

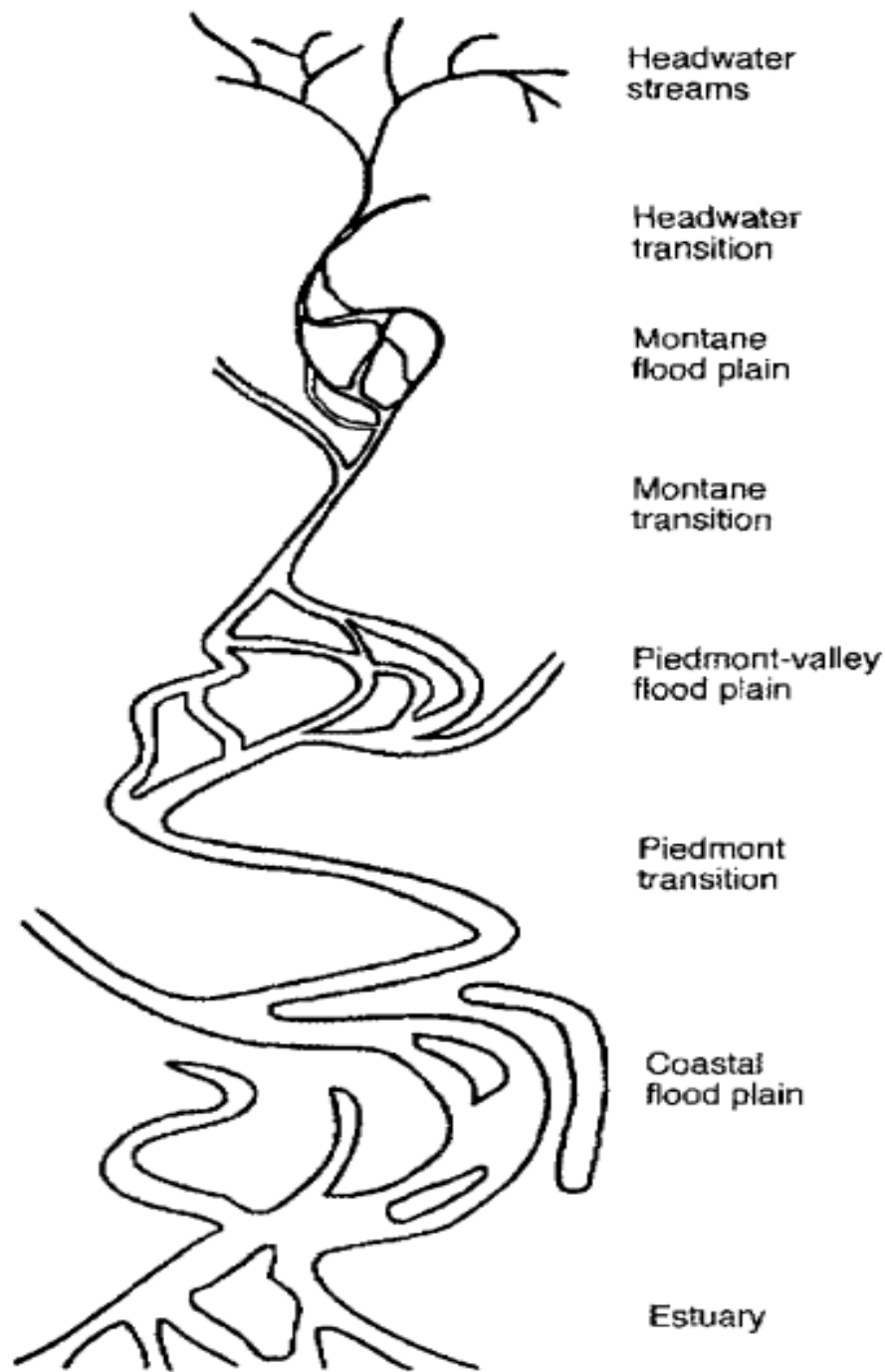


Figure 1. Schematic drawing of the biophysical continuum for a large river system, progressing from headwater streams of an alpine area, through the montane, piedmont-valley, and coastal flood plains, to an estuary (modified from Stanford et al. 1996).

Image 5 : Source - Osterkamp, 1998

2.10 **Role of Vegetation and Island Evolution** : Among the various criteria, natural vegetation has been considered to be an important indicator of island stability (Kollmann *et al.*, 1999). **Vegetation can also provide a good distinction between an island and a sandbar.** However, it may not be always so, as many islands might be composed of material too coarse to allow the establishment of vegetation or such islands might be located in regions with naturally sparse vegetation cover. However, since riverine islands are separated from the floodplains, they can offer undisturbed growth for natural vegetation and safe havens for wildlife from their predators or hunters. Flow conditions near an island, such as river width, depth and velocity, can minimize predation and increase species productivity (e.g. Ham & Church, 2002). For this reason, many large rivers have wildlife refuges that include islands. **Arscott *et al.* (2000) found that on the Fiume Tagliamento [Image 6], aquatic habitat complexity was greater in the island-braided section as compared to the section devoid of islands. In the same river, van der Nat *et al.* (2003) showed that aquatic habitats were more stable in regions of vegetated islands than in bar-braided regions.**



Image 6 : Fiume Tagliamento River After Leaving The Alps Mountains (Source – K. Tockner *et al.*, 2003)

2.10 Another outstanding example of this theory is the riverine islands of the Amazon River that are covered by early successional vegetation. They constitute a large proportion of the total riverine habitat in Amazonia. After formation, these islands travel downstream, in a sense, by constant erosion of the older, upstream portions, and the constant increase in size by the deposition of sand and silt on the downstream ends. This constant change creates an array of early successional habitats on the islands. **Exploratory visits to islands in the Napo River in northeastern Peru in 1982 by the Louisiana State University Museum of Natural Science (LSUMNS) revealed that the assemblage of land bird species on these islands was almost completely different from that found in *terra firme* forest on the “mainland” only 1-2 km away.** Some species encountered on these islands were river-edge and second-growth species that were common on the mainland but several appeared unique to the islands (Rosenberg, 1990).

- 2.11 In one of the detailed studies, Gurnell *et al.*, (2018) investigated the morphological and ecological evolution of riverine islands in Tagliamento River, Italy with a special focus on islands initiated by deposited trees that sprout to form vegetated patches. The results highlighted that at a decadal time scale, pioneer islands aggrade rapidly to the elevation of the mean annual flood, showing a steady increase in vegetation canopy height, and fining of surface sediments from predominantly gravel to silty-sand with a notable clay and organic fraction. As islands age, standing vegetation becomes comprised mainly of competitor species with transient seed banks and typical of woodland, scrub, pasture and wetland habitats. However, at shorter time scales, the biogeomorphological trajectory of pioneer islands is initiated by large flood events that control the elevation of deposited trees, and subsequent flows that control tree survival and establishment. Island morphological evolution depends on the frequency-magnitude of sediment and seed delivery and redistribution by flood and possibly wind events, whereas islands' ability to retain sediments reflects the degree of vegetation establishment, which in the short-term may vary with seasonal to annual moisture supply, substrate *characteristics* and climatic growth conditions.
- 2.12 The islands and floodplain regions in the lower and middle stretches of the Tagliamento River in Italy are dominated by plant species of the family – Saliaceae, especially *Populus nigra* L. (black poplar). After more than two decades of research, researchers developed a conceptual model based on the theory that species from Saliaceae plant family drive island development in this region (Gurnell *et al.*, 2001; Gurnell & Petts, 2002; Gurnell *et al.*, 2005). The proposed model incorporated three pathways along which Salicaceae species may colonize the surfaces of river bars and initiate island development: (1) germination and growth of widely dispersed seeds when they are deposited at suitable germination sites; (2) germination and growth of seeds that accumulate in sheltered locations such as in the lee of wood piles and (3) sprouting of shoots and roots from deposited wood pieces or entire uprooted trees. However, in the

high-energy context of the Tagliamento, Pathway (3) has been identified as the most likely to initiate island development with the rapid rooting and sprouting of flood-deposited trees and large wood playing a crucial role in stabilizing bar surfaces and trapping fluvial sediments, wood and plant propagules to construct small “pioneer” islands (Edwards *et al.*, 1999). In another study, Bertoldi & Gurnell (2020) reported on the potential contribution of *Alnus incana* (L.) Moench. (Grey alder), a member of the Betulaceae plant family that produces seeds with a longer period of viability than the riparian Salicaceae, for riverbed landform development in the middle reaches of the Tagliamento.

2.13 Erosion and Sedimentation of Riverine Islands : River islands exhibit various shapes and different surface areas. They are molded river sediment formed by continuous scouring and silting. Among various factors, river floods are considered to be the dominant force in shaping island morphology, as their power and kinetic energy is very high (Grove *et al.*, 2013). This case is especially observed in the monsoon-affected Yangtze River in China where fluvial geomorphic work is largely carried out during monsoon floods (Zhang & Qian, 2004). Affected by long-term river erosion and sediment deposition, the rapidly evolving riverine islands can significantly affect the waterway; and flood control safety and threaten the production and life of people on both sides of the Yangtze River. Hence, a study was carried out by Sun *et al.* (2018) which focused on temporal changes of three river islands - Fenghuangzhou, Changshazhou, and one uninhabited island in the Yangtze River in 2016 [Image 7] along with estimating the relationship between the area of river islands and measured water levels using four different remote sensing-based models. The results highlighted that there was a correlation between the land area of the river islands and the water level in the Yangtze River and that the temporal variation of the river island was mainly controlled by the variation of the water level during the year. Moreover, the abrupt change in river islands was induced by flooding-driven water level variations.

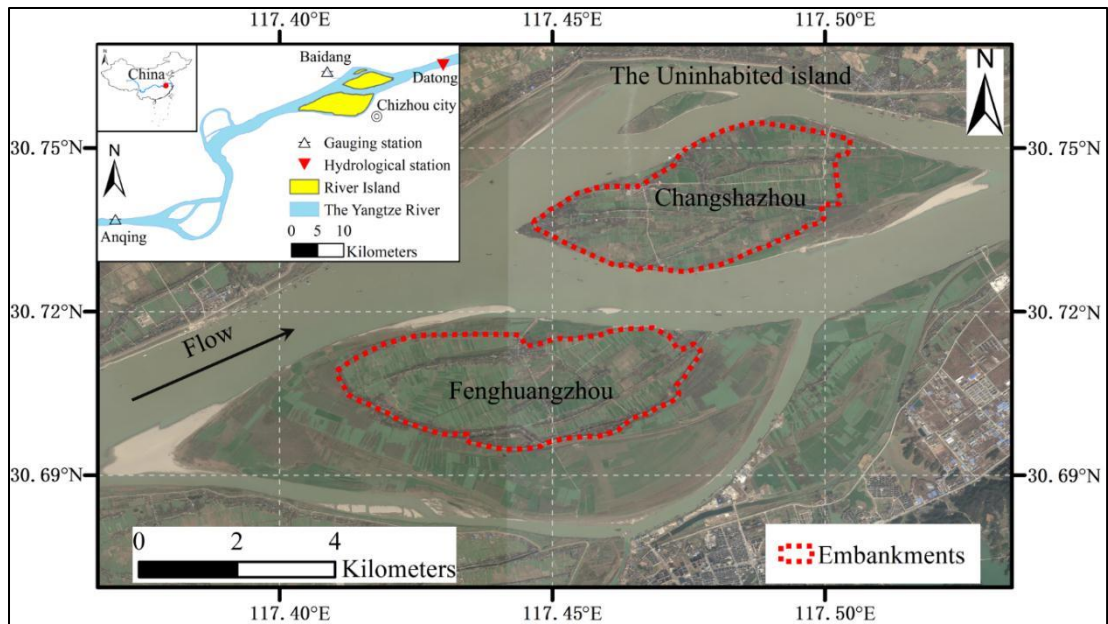


Image 7 : River Islands In Yangtze River (Source – Sun *et al.*, 2018)

- 2.14 The erosion and sedimentation processes in riverine islands are often affected by changes in hydraulic *characteristics* and human interventions. In the Greater Cairo region of Egypt, the construction of Aswan High Dam (AHD) has caused major changes in hydrological *characteristics* downstream of the dam consequently affecting the river morphology including island formation and type. A study by Sadek *et al.* (1999) evaluated the effect of AHD on the morphology of the Rosetta branch of the Nile River Delta based on the analysis of aerial photos. **Three different types of islands along the branch were reported – permanent islands which have permanent vegetation and are distinct from the sand bars; the attachment islands which joined the main banks and work as part of the floodplain; and the under-forming islands which have begun to form due to heavy sedimentation resulting from weak water current.**
- 2.15 **Examples of Riverine Islands Worldwide :** Some important examples of riverine islands along with their relevant information and research are discussed further in this section.

2.16 **Islands in St. Lawrence River [USA & Canada]** : The St. Lawrence River-Great Lakes system is the second largest river network in North America in terms of annual discharge and is crucial for this region as its basin holds about 23000 km³ of water (accounting for roughly 18% of the world's freshwater; Fuller *et al.*, 1995). The St. Lawrence River-Great Lakes system forms part of the boundary between Canada and the United States and has played an important role in the lives of many native Americans. The St. Lawrence River's main stem originates at the outlet of Lake Ontario and flows through four sections before reaching the Gulf of St. Lawrence (Thorp *et al.*, 2005). In the eastern part of Lake Ontario where this river originates, there lies an **archipelago of 1864 islands** between The United States and Canada. These are popularly known as '**Thousand Islands**' [Images 8-9] which mainly comprise smaller islands many of which just barely have emergent land and few major islands covering an area of several sq.km. Many islands are rocky and covered with thick vegetation divided along the international border. The Canadian islands belong to the province of Ontario and the U.S. islands are part of the State of New York (Kumar, 2018). While the smaller islands are more or less uninhabited, the larger islands in this region have turned into tourist spots which feature rustic cottages, mansions and a couple of castles [Image 10] for touristic leisure.

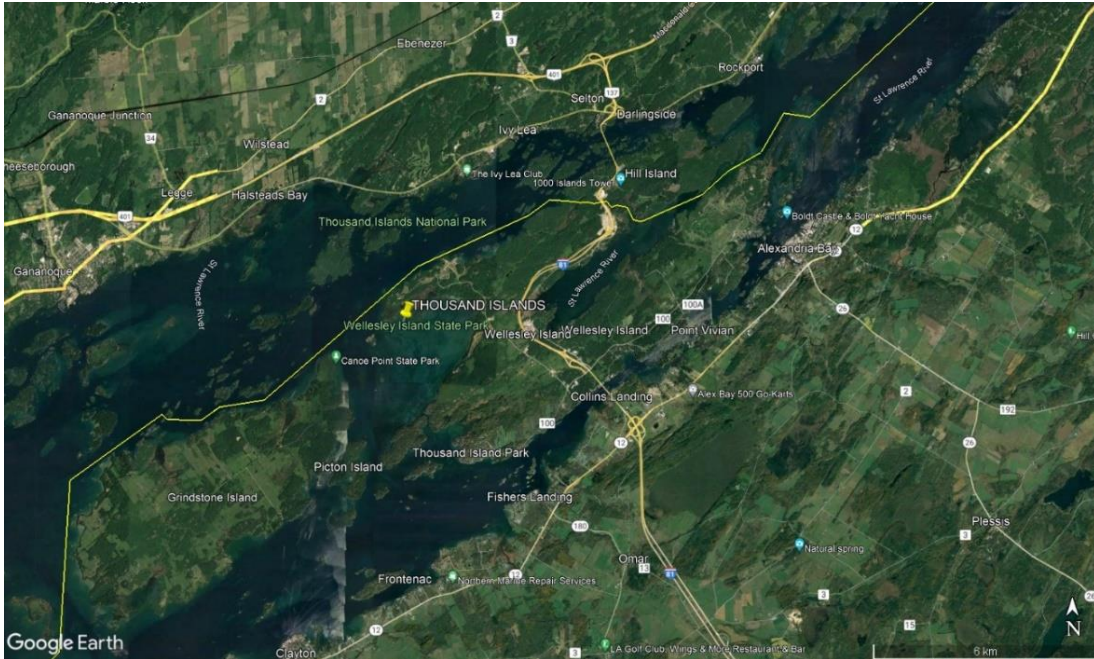


Image 8 : Google Earth Imagery Showing Thousand Islands In St. Lawrence River



Image 9 : Aerial view of Thousand Island (Source: <https://www.dailymail.co.uk/travel/escape/article-8785861/Pictured-amazing-Thousand-Islands-archipelago-Canada-border.html>)



Image 10 : Singer Castle on Dark Island which is a part of Thousand Islands
(Source: <https://www.dailymail.co.uk/travel/escape/article-8785861/Pictured-amazing-Thousand-Islands-archipelago-Canada-border.html>)

2.17 Apart from immense tourism importance, the Thousand Islands are well known for their biodiversity resources which also form an important attraction. Some islands in this archipelago form a part of the Thousand Island National Park of Canada which was established as the first Canadian National Park east of the Rockies. This area was also officially designated as a 'Biosphere Reserve' by the United Nations in 2002. This National Park consists of several ecologically important mainland properties and over 20 islands between Kingston and Brockville, Ontario. Being located in a transition zone, the park, for its size, is rich in biodiversity and provides habitat for many species that are at the northern or southern limits of their range. Some endangered and threatened species in this national park include – American Ginseng, American Water-Willow, Blanding's Turtle, Canadian Warbler, Golden-Winged Warbler, Gray Ratsnake, Western Chorus Frog and American Eel to name a few (Parks Canada Agency, 2016).

2.18 **Riverine Islands in Bangladesh** : Bangladesh is one of the world's most densely populated countries with a large number of people dependent on the riverine islands found in most major river systems in the country such as Brahmaputra, Ganga, Padma, Upper Meghna and Lower Meghna rivers. The riverine islands are locally known as '*Chars*' which are generally sandy and infertile also being extremely vulnerable to flooding during monsoon season (Ashraf *et al.*, 2013) [Image 11]. It is estimated that about 600,000 people find shelter on various *chars* in Bangladesh. Although the riverine *chars* in Bangladesh offer, on a continuous basis, significant areas of new land for settlement and cultivation, living and working conditions on these newly emerging lands are harsh. The *chars* are poorly connected to the mainland and are prone to acute erosion and flooding which makes the inhabitants vulnerable. The typical patterns of physical development and human use of land and other resources in the *chars* differ among the different river systems in Bangladesh and also among the different reaches of the same river (Sarker *et al.*, 2003). **Though most *char* lands are de jure State-owned, in reality, most *char* lands have a de facto claimant who is economically and politically powerful, acting as 'Feudal Lord' to the people residing on the *char*, to the extent that they are at times beyond the reach of the judiciary (Barkat *et al.*, 2007).**



Image 11 : Houses on *Char* Islands in Brahmaputra River Submerged During Monsoon
(Source: <https://www.ipsnews.net/2014/10/bangladeshi-char-dwellers-in-search-of-higher-ground/>)

- 2.19 In a detailed study on *char* islands of Bangladesh by Sarker *et al.* (2003), it was highlighted that the formation processes and *characteristics* of *char* islands are different in braided and meandering rivers and also, within a river, the *char characteristics* may generally vary in the longitudinal direction. When a *char* emerges, it consists of sand of approximately the same coarseness as the bed material of the river reach. However, at the lee side of a medial or point bar, fine materials would deposit. When the bar elevation reaches close to average flood levels, a layer of silt and clay is deposited over the sand layer, facilitating the development of vegetated islands named *chars*.
- 2.20 Among the various rivers of Bangladesh, Jamuna River (another name for Brahmaputra) is one of the largest braided rivers in the world which provides vital water resources and affects the socio-economic developments in major parts of Bangladesh. The *char* islands in this river stretch are mainly colonized by the riparian grass species – *Saccharum spontaneum*. Although relatively new *chars*

have very few trees, some older *chars* have a variety of fruit trees, including mango, jackfruit, guava, bamboo, *shimul*, and *jiga*. A study by Baki and Gan (2012) highlighted that the islands having an area of more than 150 ha were fairly stable in the Jamuna River channel while islands with an area of less than 50 ha tended to be very unstable and were subjected to fairly major changes.

- 2.21 On certain occasions, the residents of *char* lands get opportunities to practice agriculture, but the infertility of sandy land makes it more difficult and at times almost impossible to raise any crop. In the absence of this and any other possible source of income, many families on the *char* lands in Bangladesh are living in extreme poverty conditions. Although wherever possible, agriculture is the chief source of livelihood for *char* dwellers in Bangladesh with most inhabitants involved directly or indirectly (World Bank, 2013). Cropping systems in *char* islands are quite different from the other land areas because of sandy soil texture and environmental variability (Kabir, 2006). Only a few specific crops are grown in the *char* area such as maize, groundnut, seasonal paddy, and some vegetables. Most of the *char* farmers keep their lands fallow during the main cropping season - Kharif (May to October) - because of high evaporation which renders cultivation impossible without irrigation. Instead, the Rabi season (November to April) is the main cropping season in the *char* area, when temperatures are lower which is best for vegetable cultivation (Lahiri-Dutt and Samanta, 2007). Furthermore, climatic risks such as droughts, erosion and floods are key challenges for agriculture as perceived by *char* dwellers in Bangladesh. A study by Ahmed *et al.*, (2021) has highlighted that *char* dwellers in Bangladesh have adopted several adaptation strategies such as implementing new or alternative farming practices, water-intensive irrigation, changing planting times, and cultivating short-duration varieties, among others to improve their livelihood. The study also emphasizes that supporting such alternatives by concerned government authorities and other stakeholders will aid in reducing agricultural vulnerability and result in increased food productivity for the *char* dwelling families in the country.

2.22 **Islands in River Neris** : This River is situated in the Baltic Sea basin with a total length of 509.5 km and a total basin area of 13849.6 sq. km. (Gailiūšis *et al.*, 2001). Neris is the largest tributary of Nemunas (the direct channel flowing into the Baltic Sea). It flows in Lithuania for about 234.5 km during which it crosses a few hills and plain terrains of different genesis. According to Baubiniene *et al.*, (2015), riverine islands occur in the almost entire stretch of this river in Lithuania barring a few segments. Islands are few or absent at all in the segments where the channel erodes through the moraine chains as the material eroded from the morainic formations is deposited in the downstream segments. The number of islands increases in the meandering river segments where sharp bends of the channel cut off parts of flood plains. **Two different types of islands are formed in this river – Channel Islands (which are accumulations of bottom and particulate sediments formed during the dry periods) and floodplain islands (which are land masses cut off from floodplain regions by rising water)**. The majority of the islands in this river are of low heights (up to 1 m above average river water level) and remain submerged almost every year during floods. Such islands are permanently transformed by floods because water-borne sediments remain on the islands making them higher after the fall of the flood (Gautier *et al.*, 2007). The higher river islands are concentrated in the lower reach of Neris River which is one of the most urbanized river segments.

2.23 Channel Islands have been mentioned in the journals of many earlier explorers and travelers. Several 19th-century Army officers, such as Lieutenant J. Henry Carleton (1845) and Captain John C. Fremont (1845), commented on channel conditions and islands in the Platte River and other streams of the American West. Channel filling, narrowing by island growth, and coalescence with the flood plain were described for the Platte River by Williams (1978) and Eschner *et al.* (1983), for the Loup River system of Nebraska by Brice (1964), for the Cimarron River in Kansas by Schumm and Lichty (1963), and for the South Platte and Arkansas Rivers by Nadler (1978). Shull (1922) was early to recognize the

rapidity with which a channel island can form and become vegetated in documenting the development of an island in the Mississippi River.

2.24 **Marajó Island Brazil** : Marajó is **the world's largest delta island** located at the mouth of the Amazon River at its interface with the Atlantic Ocean in Brazil (Goulding *et al.*, 2003) [Image 12]. It encompasses a total area of approximately 50,000 sq. km. In addition to the Amazon, the island is also influenced by the Tocantins River and other small rivers of the south (Barthem & Schwassmann, 1994). The island is surrounded by sandy-clayey beaches and encompasses a hydrographic system (rivers, channels, and creeks) that both drains and floods the *terra firme* forest and *várzeas* (swamps) (Marques-Aguiar *et al.*, 2002). In addition to these forest ecosystems, the island's lakes, lagoons, beaches, rivers, and mangroves contribute to its diversity of habitats and organisms (Marques-Aguiar *et al.*, 2002; Montag *et al.*, 2009; Almeida *et al.*, 2009). This diversity of habitats influences the richness of the region's fauna, including its fish, and plays an important role in habitat preferences and use (Lowe-McConnell, 1999; Carrier *et al.*, 2004). Humans have occupied Marajó Island for at least the past five to seven thousand years [Image 13] (Simões, 1981; Roosevelt *et al.*, 1991). These residents have indulged in various socio-economic activities without considering the conservation aspects that have led to the progressive degradation of the island's ecosystem (Montag *et al.*, 2011). Despite the unique features and ecological importance of Marajó Island in the local context, it has not been included in the environmental and hydrological management programs that have been developed for the Amazon region (Lima *et al.*, 2005). Though the whole of Marajó Island is located within a single State conservation unit, the Marajós Archipelago Environmental Protection Area, or Marajó EPA which is the largest State EPA in Brazil (MMA, 2007), this category of protected area is highly flexible in terms of the exploitation of natural resources and definitely does not guarantee the maintenance of the ecological functions of the local ecosystems over the long term.

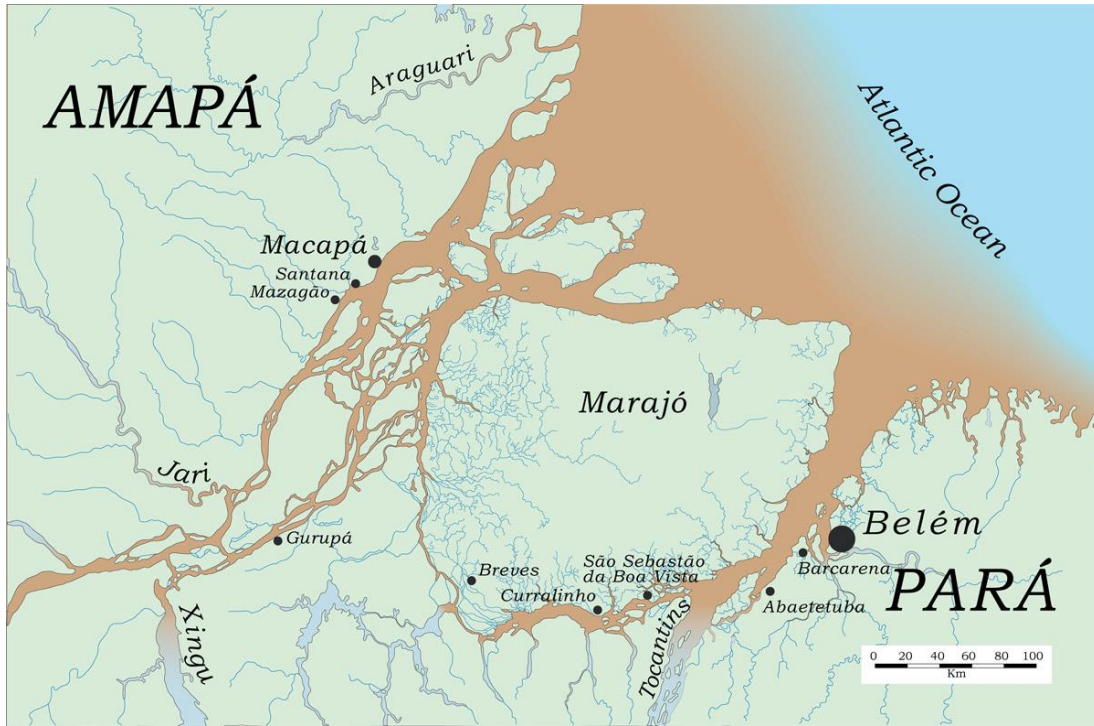


Image 12 : Location Of Marajó Island In Brazil

(Source: <http://amazonwaters.org/basins/estuary-coast/marajo-island/>)



Image 13 : Human Settlement On Marajó Island

(Source: <http://amazonwaters.org/basins/estuary-coast/marajo-island/>)

2.25 **Ecosystem Services from Riverine Islands** : Riverine Ecosystem Services can be defined as those services provided by rivers and the broader landscapes that are hydrologically connected to the rivers (including associated watershed areas). This definition for riverine ecosystem services incorporates both services that are provided directly within rivers, such as the production of hydroelectricity, as well as services that are not strictly provided within rivers, but related to them, such as flood mitigation, irrigation of agricultural fields, and recreational activities such as hiking or camping alongside rivers (Hanna *et al.*, 2017). Out of the various typologies and classifications of ecosystem services, the most widely adopted one is the **classification provided by Millennium Ecosystem Assessment (2005) which classifies the services into four broad categories – cultural ecosystem services (nonmaterial benefits such as recreational activities including swimming or canoeing, the aesthetic beauty of rivers, or their spiritual significance among many communities); provisioning ecosystem services (products obtained from ecosystems, including the supply of fresh water for drinking, and fish); regulating ecosystem services (the benefits obtained from the regulation of ecosystem processes, such as erosion prevention or water purification); and supporting ecosystem services (processes that are necessary for the production of other ecosystem services, such as nutrient cycling and habitat provision)**. Plenty of research and documentation-based literature are available for several riverine ecosystem services around the globe. Hanna *et al.*, (2017) analyzed a large number of such papers and publications and highlighted that the most frequently quantified ecosystem services from riverine habitats included – erosion control/prevention, habitat provision, water supply, water quality and recreation/tourism. They further pointed out that ambiguities in quantification techniques, lack of standardized methods and absence of assigning monetary values to the ecosystem services were a challenge in this sector. However, wide variation in methods reflected the flexible nature of the concept of ecosystem services, which is one of its strengths. Based on their analysis they put forward five recommendations for strengthening riverine ecosystem services :

- Assess multiple diverse ecosystem services.
- Use validated and reproducible data, methods and indicators, and clearly communicate sources of data and methods.
- Evaluate the interactions between the ecosystem services assessed, including those that are spatially distant and result from upstream–downstream connectivity.
- Select the spatial extent and resolution of ecosystem service quantification based on the question of interest while considering directionality, lateral connectivity, and narrow extent of riverine features.
- Evaluate the implications of using this extent over others. Engage with local and relevant communities/stakeholders to identify and quantify ecosystem services.

From the literature survey in this aspect, it can also be concluded that while much attention has been addressed to the numerous riverine ecosystem services across the world, there is a huge gap in specific studies of these services from riverine island habitats. Hence, taking into account the various riverine ecosystem services and their valuation approaches as available from existing literature, the proposed study would be the first of its nature to document ecosystem services of riverine island habitats which would add further value for developing conservation strategies. It may also be mentioned that studies focused on riparian conditions, which may have some kinship with islandic conditions, may have lessons for this study.

2.26 Socio-Cultural and Archaeological significance of Riverine Islands : Some studies on floodplain evolution in North-Western Europe have highlighted that braiding of rivers and formation of islands were far more common in past times than today. Evidence of this also comes from towns and cities on floodplains many of which have retained riverine islands which can be shown to be at least 2000 years old (e.g. Paris, Budapest, Rome, St. Petersburg and Cairo). Several examples of riverine islands have been discussed in a study by Brown (2003) that

highlights their socio-cultural significance and archaeological linkages, some of which are as follows:

- In the Irthling Borough stretch of River Nene in the United Kingdom, several bronze-age barrows were constructed in the floodplains of this highly anastomosing river. One of these is a triple-ditched barrow which is particularly important being associated with 184 cattle skulls and high-status grave goods believed to have been constructed between 2140 and 1800 B.C. Pollen studies on the floodplain islands in this area have also led to findings about grasses which particularly thrive when grazing is absent and their dominance during earlier periods and during the clearing phase clearly indicate that livestock was kept away from the riverine islands.
- Another example is of the riverine islands from Thames River which has a history of forming small islands or islets, several of which exist even today. Haughey (2000) has shown that in the area of the junction of the tributary - the Colne Brook with the Thames was a group of eight islands during the mid-later Mesolithic and this channel pattern would be expected to have persisted into the Neolithic. In the middle Thames at Yarnton extensive excavations have revealed numerous palaeochannels surrounding areas of Neolithic and early Bronze Age domestic activity, burnt mounds and a beaker grave. Given the location and density of the palaeochannels, some of this activity at least was probably located on floodplain islands.
- The Seine River in Paris has several islands which have been connected by aesthetic bridges and are completely urbanized. The western island in the image below hosts the renowned architectural marvel - 'Chapel of Notre Dame' [Image 14].

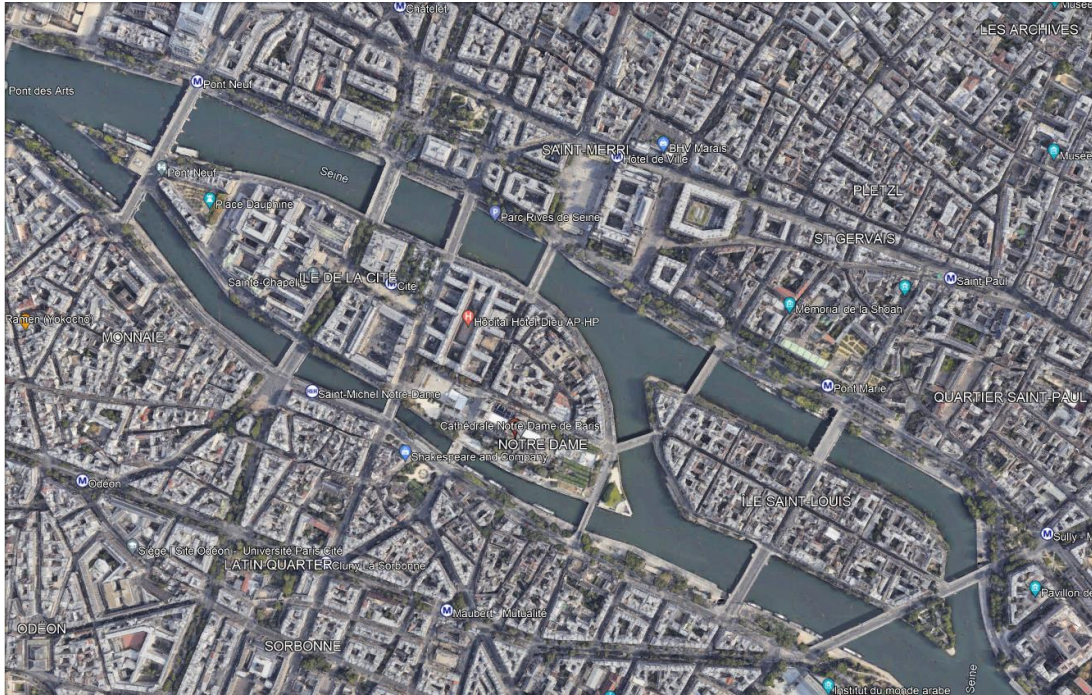


Image 14 : Islands In Seine River Of Paris

2.27 Sustainable Tourism Challenges : The concept of sustainable tourism, as developed by the World Tourism Organization (WTO, 2014) in the context of the United Nations sustainable development process, refers to tourist activities “leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems”. UNWTO and World Travel & Tourism Council (WTTTC) adopted the concept of sustainable development for travel and tourism in the publication Agenda 21 for the Travel and Tourism Industry “Towards an Environmentally Sustainable Development”. The three pillars of sustainable tourism are :

- i. Environmentally friendly practices
- ii. Support for the protection of cultural and natural heritage
- iii. Tangible economic and social benefits to local people in host destinations (WTO, WTTCEC, 2014)

- 2.28 In recent decades, significant focus has shifted towards sustainable tourism-based studies and analysis for different ecosystems including riverine habitats. In a recent significant study, Collado (2019) carried out a study to determine the impacts of river-based tourism destinations' sustainability of Panay Island in terms of economic viability, socio-cultural equity, and environmental conservation. A questionnaire-based response was initiated in the study region incorporating various stakeholders such as tourists, residents, business sector, concerned officials and so on. When ranked in terms of the sustainability indicators, data showed that the most favored response in the economic viability revealed to "create income opportunity" while "increase in self-esteem and pride of host community" as the highest rating on socio-cultural equity, and "promotes reduce, reuse and recycle mentality" as the topmost priority in the environmental conservation. Based on a complete analysis of the results, a sustainability framework was also formulated for river-based tourism in Panay Island which is presented in Image 15.
- 2.29 Excessive tourism impacts land and water alike and creates waste that goes beyond the capacity of the islands to manage. Most ecosystems, habitats and species are threatened due to pressures created by tourists visiting islands. However, while there are lessons from elsewhere, the Ganga situation is distinct with changing island morphology, the need to avoid pollution and waste from economic activity if permitted, and the need to give priority to ecosystem services from islands in view of rapidly balding banks. This last is particularly so as *Saccharum* grasses, a valuable renewable biomass is now found more on riverine islands than on banks. In the rare cases where archaeological sites or artifacts are located and tourism permitted the challenges of excessive footfall would have to be controlled. The size of the island would also be a significant determinant for permitting tourism activity so that sustainability and development can be harmonized.

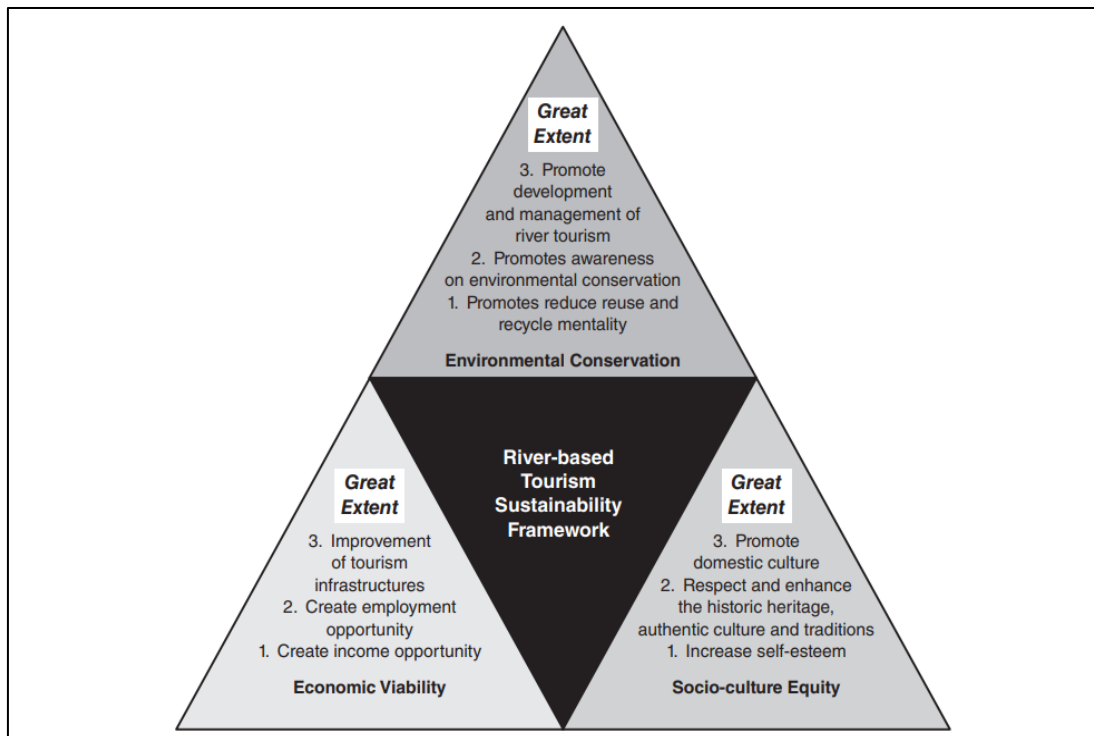


Image 15 : Sustainability Framework Of River-Based Tourism In Panay Island [Phillipines]

2.30 **Island Policy Literature** : As earlier pointed out, riverine islands are an under-researched domain. There are some studies which are based on islands in the sea or concerned with island States/nations. The situation of these islands either in terms of governance or ecology is significantly different from the riverine islands of the Ganga. However, in terms of principles, they may have something to offer. Here, three papers have been referred to as follows :

- I. The Finland government came out with an island policy and proposed an action plan for its 76,000 islands with an area of 0.5 ha or more in its neighboring sea area. Finland being a country largely comprising of islands and hence proper governance for the municipalities required enunciating an island policy which was proposed in 2012-15. The action plan largely revolved around the aim to utilize the *characteristics* of the islands and watercourses in particular. A major emphasis was on transport, data connection, security, recreational centers and environment, nature and

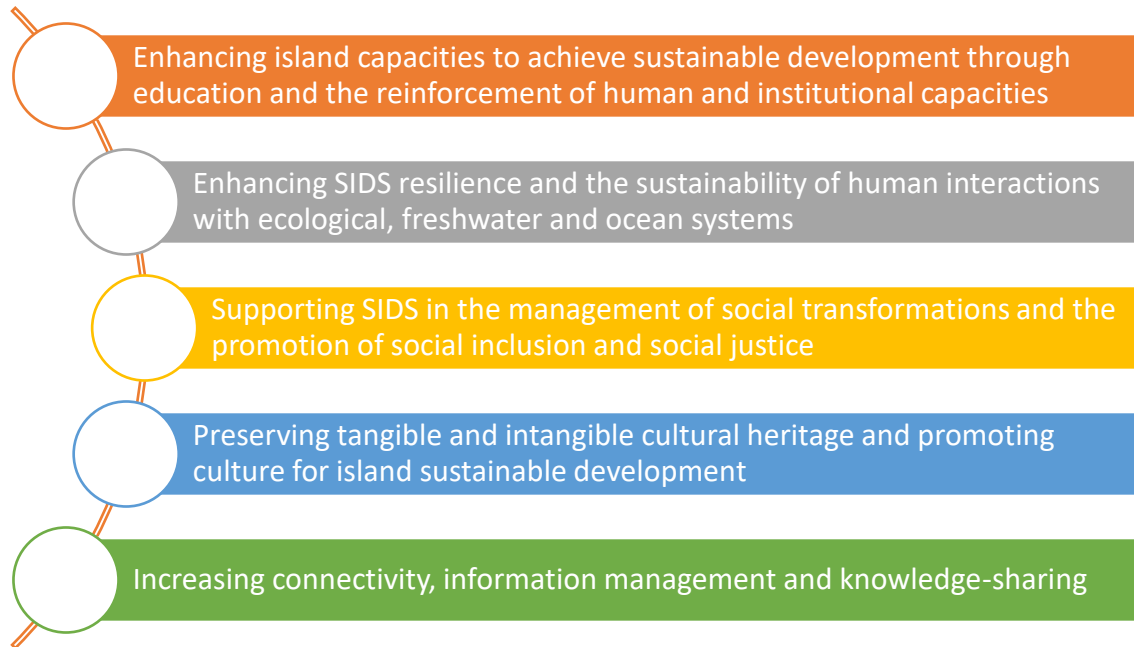
culture. Measures recommended included the development of water tourism, professional fishing, and increasing time spent in the holiday homes. Measures to treat and restrict sewage disposal were also formulated as an environmental concern. The policy also takes into consideration the landscape protection and management of cultural heritage through the conservation and restoration of natural meadows and moors. Since there are inhabitants practising livestock farming pastoralist management of the landscape for grazing purposes is also highlighted.

[Ref: 'Ministry of Employment and the Economy Regional Development (2012). National Action Plan for Island Policy' 2012-15, 37/2012, 106 pp.]

II. **UNESCO Small Island Developing States (SIDS) Action Plan** for 2016–2021 embodies and guides UNESCO in its efforts to build capacities through education and training in order to :

- promote scientific research and conservation of the environment, in particular, the oceans
- to safeguard cultural heritage to uphold the cultural diversity of SIDS as an engine for innovation and sustainable development
- to improve information management and knowledge sharing
- to ensure the fullest participation of youth and social inclusion.

This Plan also encompasses UNESCO's response to combat climate change through the strengthening of capacities in SIDS to deal with emergencies triggered by natural disasters. The SIDS addressed the following five priority areas within UNESCO's mandate:



[Ref: 'UNESCO (2016). Small Island Developing States – UNESCO's Action Plan', UNESCO, Paris. 32pp.]

III. **Tristan da Cunha** usually refers to all the islands in the Tristan-Gough archipelago, belonging to the UK, located in the southern Atlantic. The islands have an area of 201 sq. km. with the inhabited island having an area of 98 sq. km. The Biodiversity Action Plan for the Tristan da Cunha islands was developed with objectives like conservation integrated into Government programs to strengthen biodiversity conservation, eliminate invasive species, and to a great extent promote sustainable use and management of the marine environment through various steps and increase the knowledge of Tristan's key habitats and species. The overall goal is to conserve the native biological diversity of Tristan da Cunha so that the people of Tristan da Cunha continue to benefit from it and the entire world community is enriched by it. There is provision for partnership with organizations from around the world particularly in the UK and South Africa, to conserve their globally important and unique biodiversity for the benefit of current and future generations.

[Ref: 'Tristan da Cunha Government and RSPB (2012). Biodiversity Action Plan for the Tristan da Cunha Islands (2012-2016)'. Tristan Conservation Department, Edinburgh of the Seven Seas, Tristan da Cunha, South Atlantic, 79pp.]

2.31 Some other studies focusing on related aspects of sustainable tourism and riverine ecosystems including riverine islands are presented in Table 1.

Table 1 : Excerpts From Few Significant Studies On Islands Tourism, Ecosystem Services & Jurisdictional Challenges

Sr. No.	Title of paper	Author & Affiliation	Objective	Significant findings
1.	Tourism in River Island Majuli: Prospects and Problems	Dibya Jyoti Kalita, Research scholar (M. Phil) Department of Economics Dibrugarh University, Assam	The study was carried out to explore the Tourism potential in Majuli Island by assessing the reason tourists visit the island and by taking tourists' opinions on various aspects of the island.	<ul style="list-style-type: none"> • Reason to visit Majuli was mainly due to its religious and cultural significance and to see the Sattras. • For its rich biodiversity of flora and fauna and bird watching. • Factors that affect tourism activity on the island • Tourism infrastructure, local guides, better connectivity, recurrent floods and promotion of the island
2.	Planning for Sustainable Ecotourism: The Case for Research Ecotourism in Developing Country Destinations	Julian Clifton , Department of Geography, University of Portsmouth, UK Angela Benson , Centre for Tourism Policy Studies, University of Brighton, UK	The study explores the possibility of proposing "Research Ecotourism" as a model in Indonesia.	<ul style="list-style-type: none"> • The paper discusses the concept of Ecotourism and its impact on the society • Discusses the economic benefit of 'Research Ecotourism' on the host communities of this region • Emphasizes developing ecotourism proposals based on individual potentials of a particular place and keeping in mind the impacts that have on host communities

Sr. No.	Title of paper	Author & Affiliation	Objective	Significant findings
3.	Sustainable Competitive Advantages for Eco-tourism Development of Phu Quoc Island: Background and Literature Reviews	<p>Hoang Pham Huy, Management and Science University (MSU), Malaysia.</p> <p>Aye Aye Khin, Management and Science University (MSU), Malaysia</p>	<p>The study gives an overview of Ecotourism and Sustainable Tourism Development in the context of developing tourism strategies in Vietnam.</p>	<ul style="list-style-type: none"> • Discusses the relationship and concepts of ecotourism and sustainable tourism development • Emphasizes the need for economy, environment and society to be accounted together for developing a sustainable future
4.	Exploring Sustainable Eco-Tourism Potential Along the River Islands of Coastal Karnataka: A Case Study of Mudukudru	<p>Satyaprakash Das, Manipal School of Architecture and Planning, Manipal Academy of Higher Education, Karnataka</p> <p>Shanta Pragyan Dash, Manipal School of Architecture and Planning, Manipal Academy of Higher Education, Karnataka</p>	<p>The study explores the feasibility of sustainable options for implementing eco-tourism concept for revenue generation that sustains livelihood of the natives as well as the ecosystem by understanding the</p>	<ul style="list-style-type: none"> • The riverine island has a rich biodiversity, wetlands and sacred groves as the natural elements • The island provides a good escape from city hustle-bustle and the native residents are welcoming in nature • Challenges for developing tourism here include – flooding during rainy season, salinity in drinking water resources, migration of younger population and

Sr. No.	Title of paper	Author & Affiliation	Objective	Significant findings
	Island.		issues and involving community participation and indigenous approach for economic sustainability	lack of tourism-based infrastructure
5.	The Regime of Islands in International Law	Hiran W. Jaywardane, 1990	Focus on international law pertaining to sea islands but has a section on riverine islands	<ul style="list-style-type: none"> • Rule of thalweg or navigable median is provided in detail • The ownership and jurisdiction of river islands in interState rivers is provided in Chapter 6 and may be relevant regarding jurisdictional aspects. The Chapter also addresses appearing and disappearing islands
6.	Paradox of the Moving Boundary: Legal Heredity of River Accretion and Avulsion	John W. Donaldson Department of Geography, Durham University, Durham, UK; w.donaldson@durham.ac.uk	Partial Case study of jurisdictional issues on islands between Myanmar and Thailand on Mae Sai river	<ul style="list-style-type: none"> • The issues of interState rivers with changing courses in a monsoonal climate can have relevance to a parallel situation of inter-district jurisdiction

Sr. No.	Title of paper	Author & Affiliation	Objective	Significant findings
7.	Paper -The importance of deliberation in valuing ecosystem services in developing countries— Evidence from the Solomon Islands	Jasper O. Kenter a,1, Tony Hyde a, Michael Christie a, Ioan Fazey b. 2011	The paper discussed value placed by resident users on ecosystem services in coastal islands in the Pacific	The research aimed to determine the value people placed on ecosystem services and whether participatory interventions to elicit deeper-held values influenced the preferences expressed. Results found that the initial willingness to pay for a number of tropical forest ecosystem services amounted to 30% of household income
8.	Maurea Islands: A Restoration Journey	Cheri Van Schravendijk, Jaedyn Falwasser & John Brown	This paper explores different options to restore the Waikato River by restoring the small islands in the river.	<ul style="list-style-type: none"> • The island was dominated by exotic vegetation and the local species were sparse • Curb the spread of pest grass like yellow flag iris, without using herbicides • Help from the local tribes was taken to understand traditional methods used to control the spread of weed grass. • The local tribes were involved to know

Sr. No.	Title of paper	Author & Affiliation	Objective	Significant findings
				their aspirations about the island in order to set the objectives for the tourism development project

CHAPTER 3 – A GLANCE AT RIVERINE ISLANDS IN INDIA

Most major rivers of India have different types of sandbars and islands in their courses which are referred to locally as 'taapu', '*Diara*', '*chars*', 'kudrus' or 'lankas'. The biggest and most popular riverine island in India is Majuli located in the Brahmaputra River in Assam State. It is designated as an independent island district, has old cultural attractions known as 'Satras' and has emerged to be a popular tourist destination in recent years. Although this island has been reeling under pressures of floods and erosion coupled with other hazards affecting the local communities. Another major island is Raghopur *Diara* in the Ganga River stretch of Bihar State which is a designated block under Vaishali Distt. having its own administrative Block Office on the island. While riverine islands and sandbars have been mostly exploited for agriculture, there are some examples such as Srirangapatnam Island, Divar Island and Mudukudru Island which are rich in heritage and have immense tourism potential. Despite such well-known sites, it was observed through a literature survey that not many studies have been focused on various aspects of riverine islands in India barring Majuli.

- 3.1 Based on extensive search using appropriate keywords online on various platforms including several international and Indian journals, the literature pertaining to riverine islands in India was collected and surveyed which has been discussed in this chapter. Wherever necessary, telephonic and e-mail-based interactions were undertaken with different experts and researchers to discuss this topic and gather relevant information. The details of all the references in this chapter have been provided in the Bibliography section.
- 3.2 Rivers in India flow through diverse terrains – mountains and hills, alluvial terrain, and peninsular Deccan rock substrata. They also flow through a variety of climatic zones – temperate, tropical, sub-tropical, arid and semi-arid. These conditions lead to the existence or emergence of islands differentiated by size, shape, stability and

usage. The following section puts the spotlight on various types of islands found in Indian rivers to demonstrate existing typology and usage.

3.3 Majuli River Island : Most major rivers in India but chiefly Ganga and Brahmaputra harbor numerous irregularly shaped and different-sized riverine islands in their course. Among all these, Majuli River Island in Brahmaputra River is perhaps the most explored in India which is evident from the numerous studies carried out in the last couple of years. Majuli is one of the world's largest riverine islands situated in the middle course of the Brahmaputra River in the State of Assam. It is also one of the world's largest inhabited riverine islands covering a total area of about 487.55 sq. km. and having a population of 1,67,304 (Census of India, 2011). The island consists of three Mauzas viz. Ahatguri, Kamalabari and Salmora, 20 Gaon Panchayats (village councils) and 248 cadastral villages. A distinct *characteristic* of the island is the presence of numerous mid-channel bars or islets (locally known as Chapori) resulting from the braided nature of the river Brahmaputra. Apart from these, there are numerous beels (wetlands), oxbow lakes, and rivers on the island, which cover 14% of the total geographical area of the island (Roy *et al.*, 2020).

Majuli Island is currently the first riverine island in India to be designated as a district that was carved out from Jorhat district via Assam Govt notification no. GAG (B) 27/2005/Pt.NI/59 in the north east State of Assam. Majuli is not a single island but it is a combination of clusters of islets formed and developed in the mid-river stream of the mighty Brahmaputra and its tributaries - the Luit and Kherkatia to the north and north-east and north-west extremity. The island today is separated from the shoreline by a 2.5 km wide channel and can be approached from Nimati Ghat in Jorhat district to the south of the island by ferry reaching Kamalabari in Majuli. The other mainland towns in proximity to the island on the north bank are North Lakhimpur and Dhakuwakhana.

(Source: <https://majuli.gov.in/information-services/geography>)

3.4 Apart from being the largest, Majuli Island is also the oldest inhabited riverine island in the world. It is very difficult to ascertain the year or the period of the inhabitation of Majuli as sufficient and convincing records are not available to support the views in regard to its history. However, on the basis of certain geographical evidence and literary accounts, it may be presumed that Majuli took its island's shape at least before the 13th century A.D. before Sukhapha's arrival at the Brahmaputra valley in the year 1228. It was formerly known as "Majali" which was situated between the "Dihing" and the Brahmaputra. Another chronicle upholds that Koch-king Naranarayana sent his brother Chilarai to extend his kingdom towards the upper Assam region. Dr. D. Nath in his book "The Majuli Island - Society, Economy and Culture" described that Koch king Naranarayana had made his camp at "Mojali" (Majuli) and it was there at the camp, that he had received the tributes and present from the Ahom king Sukhampha alias Khora Raja (1548-1563), who was defeated in the war. Pre-historic references mentioned that the original name of the present Majuli was known both as "Majali" or "Mojali" and later in 1562, it was also called "Luitor Majuli" indicating the same area of Majuli prior to taking its present shape. Another reference regarding the early existence of Majuli is found in "Yogini Tranta" that Chutiya king Ramchandra founded his capital in Ratanpur, Majuli which was perhaps washed away by the Brahmaputra. Apart from such legendary beliefs and chronicler evidence, there are early historical references of Majuli and its land area mentioned by historians and other biographers. A. J. Mafat Mills recorded in "Report on Province of Assam" Stated that Majuli island extended to a land area of 2,82,165 acres [1130 sq. km. approximately] in 1853. British writer B. C. Allen in his "Provincial Gazetteer of India" published in 1901, mentioned that Majuli's total land area was around 185 sq. miles [474 sq. km. approximately] and its population was 35000. According to British doctor John Peter Wede, the island was 160 Miles long and 60 Miles broad (1927). (Source: <https://majuli.gov.in/information-services/history-of-majuli>)

3.5 Majuli Island is severely affected by erosion caused by the Brahmaputra and Subansiri Rivers in the region. The extreme braided nature of the Brahmaputra coupled with the silt and sand strata of the banks is the main cause of erosion (Dutta *et al.*, 2010).

Significant erosion of the island began after 1950. However, after the great earthquake of 1950, the island witnessed tremendous changes in its morphology due to continuous changes in river channels. The great earthquake swelled up the river bed of Brahmaputra by 3–4 m due to the deposition of massive silt layers, which resulted in bank line erosion and floods in the island year after year (Goswami, 1985). Several studies have been carried out in the last few decades to document the extent and impacts of bank erosion on this island. In one of the earlier studies, Kotoky *et al.*, (2003) analyzed erosion impacts on Majuli Riverine Island from 1996-1998 based on Survey of India toposheets and remote sensing satellite imagery. The results highlighted that this island suffered from significant erosion on its southern and northern sides owing to Subansiri and Brahmaputra rivers respectively. When compared with historical records, it was found that a reduction of 667.35 sq. km. with an average rate of about 2 sq. km./year was observed till 1998. An increase in sediment load in excess of the competency of the river caused significant channel widening which resulted in an increase in the differential rate of bank erosion on both sides of the island. Sarma and Phukan (2004) gave a comprehensive account of the origin and geomorphological changes including erosion and deposition in Majuli Island. The loss of landmass on Majuli Island due to erosion was also reiterated in another study (Sarma, 2014) which provided important details presented in Table 2:

Table 2 : Loss of Landmass (in Sq.Km.) of Majuli Island by Erosion (Source: Sarma, 2014)

Year	Land Area (Sq. Km.)	Area Eroded (Sq. Km.)	Average Area Annually Lost Or Gained (Sq. Km.)	Data Source
1914	733.79	-	-	Survey of India Map
1949	708.91	- 24.88	- 0.71	Survey of India Map
1963	588.79	- 120.12	- 8.58	Survey of India Map
1988	513.89	- 74.90	- 3.00	IRS LISS III
1998	510.79	- 3.10	- 0.31	INSAT IC LISS III
2004	502.21	- 8.58	- 1.43	IRS P6 LISS III
2008	506.37	+ 4.16	+ 1.04	IRS P6 LISS IV
2013	522.73	+ 16.36	+ 3.27	IRS P6 LISS IV

- 3.6 Lahri & Sinha (2014) highlighted through geomorphological studies that Majuli Island did not result from pure fluvial processes but was born resultant of the great earthquake in 1750 during which a much smaller palaeo-Brahmaputra developed an anabranch and captured the Burhi Dihing River. The intermediate land-locked area thereby became Majuli Island that is constituted primarily of the older floodplain deposits.
- 3.7 **Umananda Island** : Umananda is reputed to be the world's smallest inhabited riverine island lying between 91° 45' to 91° 50' E Longitude and 26° 07' to 26°10' N Latitude with an area of about 4.7 hectares [Images 16-17]. It is located in the Brahmaputra River stretch adjoining Guwahati city in Assam. The temple of Umananda is located on the Island and was built in 1694 A.D. The original temple structure was immensely damaged by a devastating earthquake in 1897 and hence, the current temple structure was constructed subsequently (Anonymous, 2006; Kar *et al.*, 2008). The island is on a rocky outcrop in the river and vegetation has established in the sediment deposits.

According to legends, Lord Shiva is believed to have resided here in the form of Bhayananda. According to the Kalika Purana, at the beginning of the creation, Shiva sprinkled ashes (bhasma) at this place and imparted knowledge to Parvati (his consort). It is said that, when Siva was in meditation on this hillock, Kamadeva interrupted his yoga and was therefore burnt to ashes with the fire of Shiva's anger and hence the hillock also got the name Bhasmacala (Anonymous 2007). The Umananda temple dedicated to Lord Shiva on this island witnesses an extensive footfall of enthusiasts during religious celebrations and auspicious occasions.

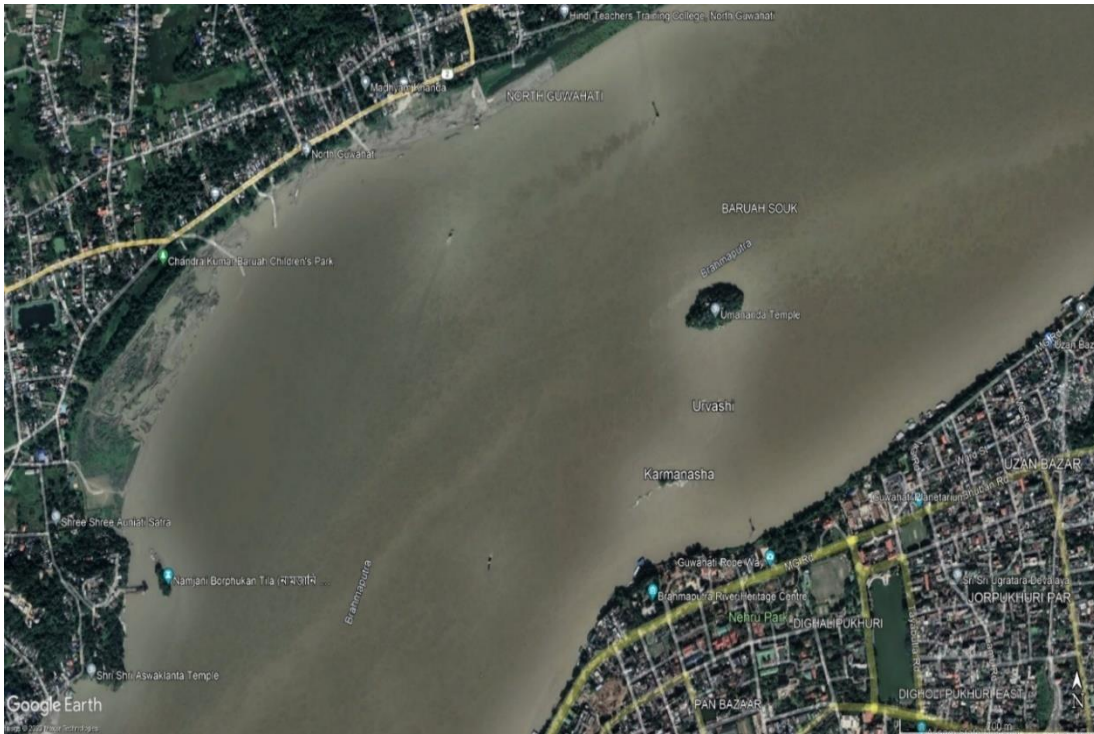


Image 16 : Umananda Island [Peacock Island] In Brahmaputra River
Note: Borphukan Tila, a smaller island on the western edge of the frame



Image 17 : Umananda Island During Field Survey [Image Credit : Sumesh N. Dudani]

3.8 Apart from its historical and religious significance, the island serves as a very important habitat for one of the most endangered species of primates – the Golden Langur (*Trachypithe cusgeei*). This species is an Old-World monkey (a common English name for primates belonging to the taxonomic family of *Cercopithecidae*) found in a small region of western Assam, India (Choudhury, 1988 a & b) and the neighboring foothills of the Black Mountains of Bhutan (Choudhury, 2008). The existence of the species on the island is connected with a popular folklore which says that two youths left a pair of these langurs here some 35 years ago and they have since survived. The species, otherwise hostile, has adapted to human beings especially the tourists and pilgrims who frequent the island. They are social animals and live in groups. Golden langur populations in Assam are isolated and restricted to pockets of suitable habitat as in Umananda islands (Dutta *et al.*, 2019).

3.9 In one of the significant studies, Kar *et al.*, (2008) highlighted the vegetation type and enumerated the floral diversity of Umananda Island. According to the study, the island chiefly comprises tropical dry deciduous forests harboring 146 different plant species representing 127 genera and 67 families. These include flowering plants, gymnosperms, pteridophytes, bryophytes and fungi. Some of the common trees on this island include – *Azadirachta indica* (Neem), *Aegle marmelos* (Indian Bel), *Cocos nucifera* (Coconut), *Areca catechu* (Betelnut Palm), *Tamarindus indica* (Imli) and *Streblus asper* (Sand Paper Tree). Based on the plant species diversity, Bujarbarua (2018) analyzed that phanerophyte and theophyte life forms were dominant on this island. A high percentage of phanerophytes is characteristic of tropical humid bioclimate and the predominance of therophytes is attributed to various factors like the prevalent microclimate of the area coupled with anthropogenic activities (Sharma, 2003; Khan *et al.* 2011). Therefore, the bioclimate of Umananda River Island can be termed as therophanerophytic and the vegetation is a relic of tropical evergreen/semi-evergreen forest.

3.10 **Riverine Islands/Diaras in Bihar :** The Ganga River and its tributaries (mainly Sone, Kosi, Gandak and Ghaghra) in Bihar State harbor numerous irregularly shaped and varied-sized riverine islands. Most of these islands in this region are referred to

locally as '*Diyara/Diara*'. The term *Diara* derives from the word '*diya*', which means an earthen oil lamp. *Diara* is a word coined for a land where a *diya* is never lit. In local parlance in parts of Bihar, it symbolizes a village located inside the embankments of the floodplains of the River Gandak in Bihar. In a wider sense, the term indicates people living in abject poverty and who face multiple vulnerabilities, due to frequent flooding of the Gandak. The river meanders and people are never sure when it would change course (Udas *et al.*, 2018).

- 3.11 Perhaps the biggest and one of the oldest riverine islands in the Ganga River's main stretch is *Raghopur Diara* situated between the districts of Vaishali and Patna [Images 18-19]. This riverine island measures about 30 km long and 8-10 km wide with a population of about 232,909 people (Census of India, 2011) inhabiting various villages such as Birpur, Paharpur, Fatehpur, Rampur, Jurawanpur and Shiv Nagar to name a few. Parts of this island are connected with the Vaishali and Patna districts by pontoon bridges and boats that navigate throughout the year. A permanent bridge is also being constructed in this region to provide road connectivity to this island in all seasons. ***Raghopur Diara* has been officially recognized as a Community Development Block having its own Block Development Office for administrative purposes.**



Image 18 : Settlements On Raghopur *Diara* (Image Credit : Sumesh N. Dudani)



Image 19 : Raghopur Block Office Building On Island (Image Credit : Sumesh N. Dudani)

An important highlight of this *Diara* was the accidental discovery of Harappan bricks by a local resident which was confirmed by the State Archaeology Department [Image 20]. According to an article by Verma (2017), a resident landowner on this *Diara* stumbled upon thousands of large bricks during construction-related work. A team from the State Archaeology Department led by the then Director, Dr. Atul Verma, visited this *Diara* and got the brick samples tested. The results showed that out of the two bricks that were tested, one was 7.5cm thick, 15cm wide and 30cm long, and the other was 8cm thick, 16cm wide and 32cm long. Both these bricks had thickness, width and length in the ratio 1:2:4 and they were fire-burnt similar to the bricks known from other Harappan civilization sites in the country.



Image 20 : One Of The Harappan Bricks Collected From RaghopurDiara
(Source: [https://www.telegraphindia.com/bihar/harappa-signs-in-bricks-of-
raghopur/cid/1375856](https://www.telegraphindia.com/bihar/harappa-signs-in-bricks-of-raghopur/cid/1375856))

3.12 **Islands in Gujarat:** A significant island in Gujarat State is Aaliya *bet* officially believed as “No Man’s Land”, located about 25 km west of Bharuch in the estuary of the Narmada River [Image 21]. This delta earlier was treated as an island or *bet* and derived the name after “AAL”, a grass species scientifically known as *Porteresia corctata* which grows abundantly in the area. Geologically, the delta came into existence due to the silt deposition by the Narmada River, prior to debouching its water into the Gulf of Khambhat of the Arabian Sea (Modi *et al.*, 2018). Presently, it has joined the mainland because of the silt deposition in the Narmada River. After the construction of the Sardar Sarovar Dam, water from the Narmada River was diverted to the northern areas of Gujarat leading to a drop in the water levels at the Narmada estuary region. The drop in water levels led to the emergence of previously submerged areas. There was a considerable amount of silt deposition also in the subsequent years owing to low flow velocities. The result of all these changes was that the southern and south eastern edges of Aliya Bet have joined the mainland of Hansot *taluka*. Aliya Bet has today become a peninsula (MacDonald, 2009).



Image 21 : Aaliya Bet Island In Narmada River

3.13 The present mouth of the Narmada River has roughly retained the original funnel shape of the estuary formed i.e., during the Mid-Late Holocene. However, the size of the estuary is now considerably reduced. The present estuarine reach contains several islands, which are well above the present tidal range. Hence, they are the products of the estuarine processes of the Mid-Late Holocene and not those of the present day (Chamyal & Maurya, 2017).

3.14 **Mahi River** is another important river of Western and Central India which arises in the Malwa plateau near Moripara in Madhya Pradesh. It flows through the uplands and alluvial plain in Gujarat before debouching into the Gulf of Cambay. In the alluvial plain, it shows typical meandering river morphology and is characterized by the presence of extensive point-bars along its convex meander bends. In one study, Sridhar and Patidar (2005) investigated a point bar deposit in the Mahi River using the Ground Penetrating Radar (GPR) system. The basal part of this point-bar indicated deposition under a near-continuous flow with minor changes in velocity and direction giving rise to fining upward planar cross-stratified sand facies typical of a point-bar sequence. However, the sediments in the upper part show a high degree of lateral and vertical heterogeneity and are inferred to have resulted from deposition

by high-stage flood events associated with cyclonic storms and the gradually waning flow.



Image 22 : Islands And Sandbars In Mahi River [Google Earth Imagery]

3.15 **Godavari** is an east-flowing river of the Deccan originating in Maharashtra and flowing through Telangana and Andhra States successively. The East Godavari District of Andhra is a coastal district. As the river flows through Dowleshwaram Barrage the resultant low flow has enabled sediment deposition in its course to the coast over a very gentle gradient. At Konaseema, where a major tributary joins from the north, there is a prominent group of deltaic islands duly named and including :

- Ainavilli
- Antarvedi
- Ryali
- Gudapalli
- Mandapalli
- Vadapalli
- Appanapalli
- Muramalla

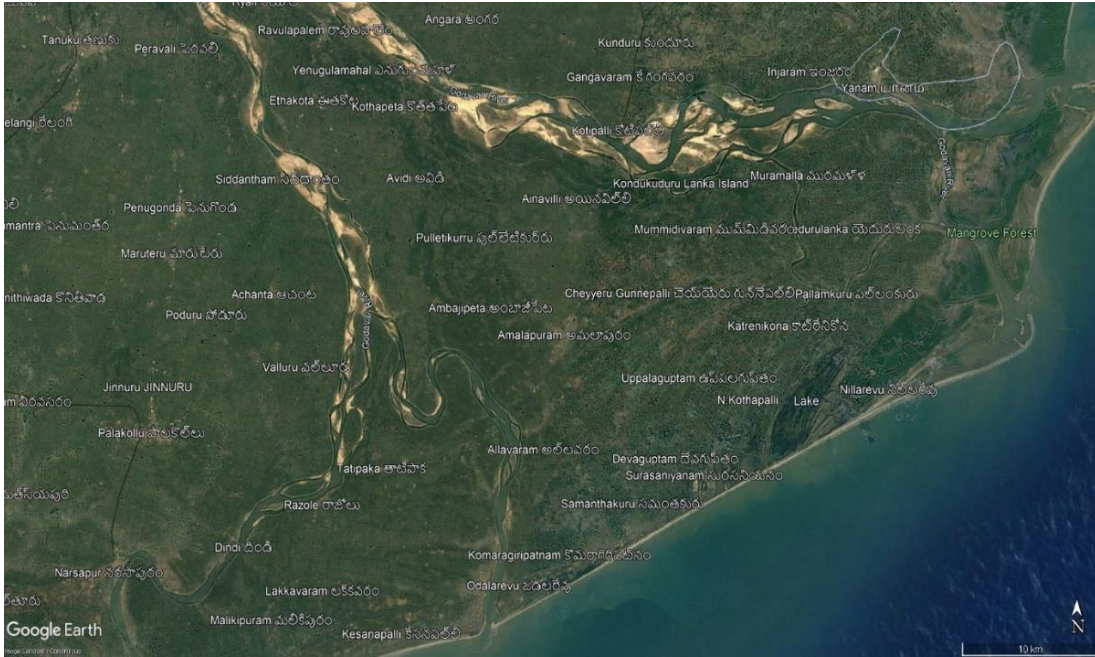


Image 23 : Deltaic Islands on Northern Course of Godavari River, Andhra Pradesh



Image 24 : Smaller Islands Known As 'Lankas' Submerging During Monsoon In Godavari River [Image Credit : Sumesh N. Dudani]

3.16 A study carried out by Patel (2010) highlighted that the number of mid-channel Islands in the Godavari River stretch of Rajahmundry in East Godavari District almost doubled as observed from satellite image analysis from 1977 to 1990. Furthermore from 1990 to 2006, the analysis did not show any increase in the number of islands but their attributes such as total area, maximum area, total perimeter and maximum perimeter did show a marked steady increase. The study also highlighted that these islands are known as '*Char* lands' in this region and are mostly inhabited by fishermen and other local populations. However, issues such as stability and constant shifting of *char* lands, fragmentation of islands and sand bars and flood events have significant effects on the overall life of local communities here. Furthermore, the islands in the Godavari Delta are also popular tourist places with development measures executed by local authorities.

3.17 **Mandhata Island** : It is an island in the Narmada River situated on the northern fringe of the present Khandwa District in the State of Madhya Pradesh. This island, including some villages on it and on the opposite bank, is referred to as Omkareshwar-Mandhata which is a popular Hindu pilgrimage site in this region [Images 25-26]. This island houses one of the twelve *dyotirlingas* in India – Omkareshwar, which is worshipped by several thousand pilgrims especially those who come to visit Mahakaleshwar in Ujjain which is approximately 80 km from here. Despite extensive archaeological remains on this island and its vicinity, this place remained neglected by scholars until a detailed study carried out by Neuss Jürgen which was published as a book in 2018. According to this study, Mandhata island and its surroundings flourished during the 'early-medieval' phase (about 600-1300 CE) of the South Asian historiography. The remains on this island represent the only preserved fortified city of the Paramaras of Dhara known to us. However, the remains of built heritage that are still extant on this island face threat from local construction activities even though many areas are either under the protection of the Archaeological Survey of India or the Directorate of Archaeology, Archives and Museums.



Image 25 : Google Earth Imagery Showing Location Of Mandhata Island In Narmada River, Madhya Pradesh



Image 26 : Mandhata Island With Temple And Runaway Unplanned Construction [2023]

3.18 Riverine Islands in Coastal Karnataka : Some west-flowing rivers such as Panchgangavali, Sita and Suvarna have several small and big sized riverine islands especially close to their confluence with the Arabian Sea. Some of these islands have been developed as recreational tourism sites by the Karnataka State Tourism Department and private owners in the region. One such island known locally as Madukudru island in the estuarine region of Suvarna River [Image 27] was highlighted by Das & Dash (2020) in their study. This island is the largest in this estuary having a total area of 156.3 acres and a perimeter of 4.75 km. It falls under the jurisdiction of Kallianpur panchayat of Udupi District and is covered under the Coastal Regulation Zone-III. The island houses some settlements which are involved in coconut plantations and fishing activities. It is connected with the mainland by permanent bridges.

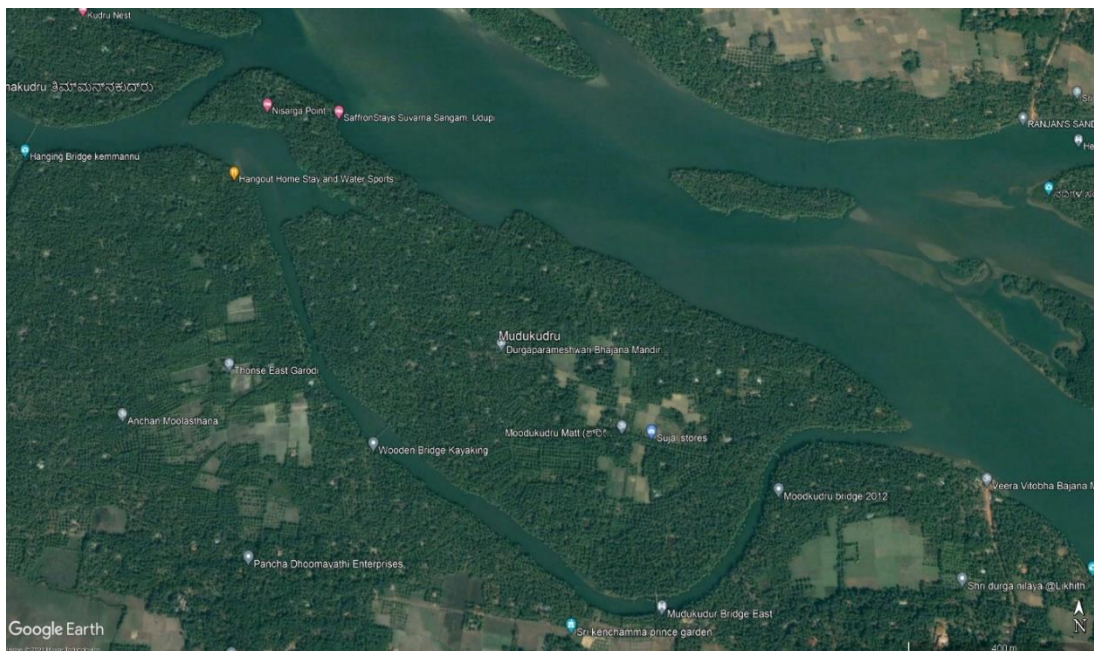


Image 27 : Location Of Mudukudru Island In Coastal Karnataka

3.20 River Islands of West Bengal : Major Colebrooke, in his paper 'On the Courses of the Ganges through Bengal' (1801), noted: "The quantity of land, which has been destroyed by the river in course of a few years, will amount, upon most moderate calculation, to 40 square miles, or 25,600 acres; but this is counter-balanced, in a

great measure, by alluviation which has taken place on the opposite shore." In the late 19th century, Hunter (1876) observed that an acre of land was engulfed by the gnawing Padma within half an hour. Captain Sherwul (1858) witnessed the emergence of 'Char lands which became inhabited, cleared and cultivated, the population increased, large villages established, land revenue collected for ten or twelve years, and then the whole fabric disappeared within one rainy season'. *Chars* are sandy shoals that emerge as an aftermath of river bank erosion that engulfs one part of the land and gives rise to another territory on the opposite bank. *Diaras* and *Chars* often first appear as thin slivers of sand. On this is deposited layers of silt till a low bank is consolidated. Tamarisk bushes, a spiny grass, establish a foot-hold and accretion as soon as the river recedes in winter; the river flows varying considerably seasonally. For several years the *Diaras* and *Chars* may be cultivable only in winter, until, with a fresh flood, either the level is raised above the normal flood level or the accretion is diluvated completely (Rashid, 1977). It is important to understand the different types of *chars* which are named dead, mature and running. The dead *char* is one which has not faced any significant change due to fluvial action for the last few decades. Mature *chars* have not faced any change due to fluvial action for the last 10 - 15 years and running *chars* are those land patches which face regular changes due to the action of the river and continuously emerge and submerge, this process being known as *sikasti* and *payasti* (Chakrabartty, 2016).

3.21 Historical Records : When the British took over India, the rivers (and the marshy lands) of Bengal appeared strange to them because of their frequently shifting courses, the property ownership complicated, and ancient Hindu laws quite incomprehensible. European practices oriented them to splitting soils and fluids into discrete domains (Cosgrove & Petts, 1990). The first priority in establishing an absolute and irrefutable authority on the land was to prove beyond doubt that the State owned all the land according to ancient Indian systems. The Permanent Settlement of 1793 gave land away to zamindars in perpetuity to reduce the complexities of revenue collection and to prevent default in the payments of rent. A series of actions and measures followed the permanent settlement of land, the most

significant being the initiation of surveys of rivers and lands. The East India Company assigned its surveyor and engineer, Major James Renell, to conduct a survey of the river systems in Bengal and to prepare detailed maps of these rivers. From 1763 to 1773, Renell compiled a set of maps of Bengal for the British Government, published in 1779 as the Bengal Atlas, which became the most authentic and legitimate source of information on the rivers of Bengal and was regarded as vitally important for commercial, military, and administrative purposes (O'Malley, 1914). In 1811, the collector of Comilla district, for instance, reminded the Board of Revenue of the existence of fine rice-producing *chars* that were being formed in the district frequently, as being fit for immediate cultivation. He advised the Board to take control of all unclaimed *char* lands with a view to putting them up for farm lease immediately (Hunter, 1876).

3.22 Islands of Murshidabad and Malda, West Bengal : The commissioning of Farakka barrage played a large role in the rise of the new running *chars* in the two districts (Islam & Guichait, 2017). Many *chars* have come up in Malda district in the last few decades such as the Gadai and Dakatia *chars* along with opening up deep channels which have in turn affected the course of the river. The Hamidpur *char*, Nirmal *char*, and Jalangi *char* lands have emerged in Malda and Murshidabad districts as a result of river bank erosion (De Micheaux *et al.*, 2018). The appearance, disappearance and reappearance of *char* lands in Panchanandapur in Malda district has become a regular phenomenon. In Murshidabad, too, the same process has been active leading to the Nirmal *char* and Jalangi *char* lands. People have moved between 4 to 16 times in the last 15 years. Thus, human vulnerability takes an added dimension in the existing *char* lands. The people who migrate and settle in the newly emerged *char* lands lead a life under the shadow of poverty and insecurity. The erosion and resultant homelessness cause an oversupply of agricultural labor in the fertile *chars* engaging the laborer at a wage lower than the minimum fixed by the government. In the Malda *chars*, the average daily wage of adults working in the Malda *chars* is even less than Rs. 60 (Basu, 2014).

3.23 There are boundary problems in the *char* lands in the two districts of Malda and Murshidabad which have developed towards Bangladesh. As per official estimates, till 1992-94 more than 10,000 hectares of *chars* have come up at places which have become inaccessible from the Indian side but can be reached easily from Bangladesh. Akheriganj which literally means the last settlement virtually disappeared from the map when the 1989 – 1990 monsoon-driven erosion overtook it (Chakrabartty, 1977). In 1947, the course of the Ganga was accepted as the international boundary between the Rajshahi District of East Pakistan (Now Bangladesh) and the Murshidabad District of West Bengal (India). Subsequently, more than 35,000 hectares of land have been wiped out from Murshidabad and *char* lands of an almost equal areal extent emerged along the opposite bank. These *char* lands, being attached to the mainland of Bangladesh, are difficult to approach from India. Erosion wiped away boundary posts at many places, where the border is now merely on the map. Despite repeated assurances by govt officials and ministers in Parliament, the infiltration and illegal occupancy on *Char* lands by Bangladeshi nationals have often been experienced. In April 1993, a joint survey was conducted to ascertain the boundary on the *Char* lands. but Bangladesh subsequently declined to accept this newly identified boundary. Certainly, Bangladesh has better access to the *Char* lands and also it is often difficult for the district authorities of Murshidabad to provide proper security to the new settlers there (Rudra, 1996). In Malda, *chars* have created problems with the adjoining State of Bihar. *Mouzas* in the *char* lands like Piarpore, Pranpur, Plashghata, Kanchi, Jadpur, Srighar, Begamganj, Dogachi, Daskthia, Nityanandapur, Hosenabad, Hakimbad, Jituagar are inhabited by more than one lakh people each. These *char* lands can be accessed from Paglar Ghat by boat. No health or education facilities of any kind exist here and for registration of land one has to come to Malda since the land falls in the Malda District jurisdiction which is also depicted in the District Census Handbook (Rudra, 2011).

3.24 **Piarpur islands of Malda** : These group of islands fall under Kaliachack C.D. Block of Malda district in West Bengal and comprise 20 revenue villages (*mouzas*), popularly known as PPP (Piarpur, Paranpur and Palashgachhi or simply Piarpur) river islands.

These islands have emerged during the last couple of decades and have presence of human habitation. There are three *mouzas* i.e. Rezakpur, Kamaluddinpur and Daridiar Jhaubona which are completely under water and another six *mouzas* namely Mahadevpur, Jot Kasturi, Sukrullapur, Birodhi and Panchanandapur are majorly under water. However, this region is under immense conflict owing to the shifting course of the Ganga River and the presence of an interstate boundary between Jharkhand and West Bengal States which has been further aggravated owing to the shifting of the river towards the left bank. During British rule, the course of Ganga was accepted as a boundary between the districts of Santhal Parganas of Bihar and Malda of Bengal. It was noted in Survey of India topographical sheet No. 72 P/13 surveyed in the year 1922-23 and published in 1924 (reprinted in 1946) that, "*the province and district boundaries in the Ganges river follow the main deep water channel and will vary as the course of deep water channel changes*". The Survey of India map published in 1975 based on a 1970-71 survey of the area footnoted, "*Owing to changes in the course of Ganga river, the State boundary between Bihar and West Bengal and the district boundary between Malda and Murshidabad should not be accepted as authoritative.*" The problem was raised in the Ganga Erosion Committee (Singh *et al.*, 1980). The representative of Bihar in the Committee opposed the proposal of constructing two long spurs near Manikchak Ghat of Malda to deflect the fast-flowing current to the opposite bank. The rationale behind the opposition was that the measure was likely to deflect current on the west bank and thus aggravate erosion along the said bank. The problem then was referred to Survey of India and the then Director (Survey of India), Eastern Circle opined, "*The boundary in this portion of the Ganga follows the deep-water channel and varies as the course of the deep-water channel changes.*" It is interesting to note that the footnote is in contravention with the earlier note of the Survey of India expressed in the map 72P/13 published in 1975. One of the representatives of the West Bengal Government in the commission declined to accept the opinion of the Survey of India and intimated the Committee that, "*The boundary between Bihar and West Bengal in this reach is under dispute.*" Even after the lapse of two decades since the Pritam Singh Committee submitted its report, the problem remains unresolved. Interestingly the district map of Malda

published in 1994 by SoI depicted the boundary as unauthenticated (Anwaruzzaman & Khatoon, 2012).

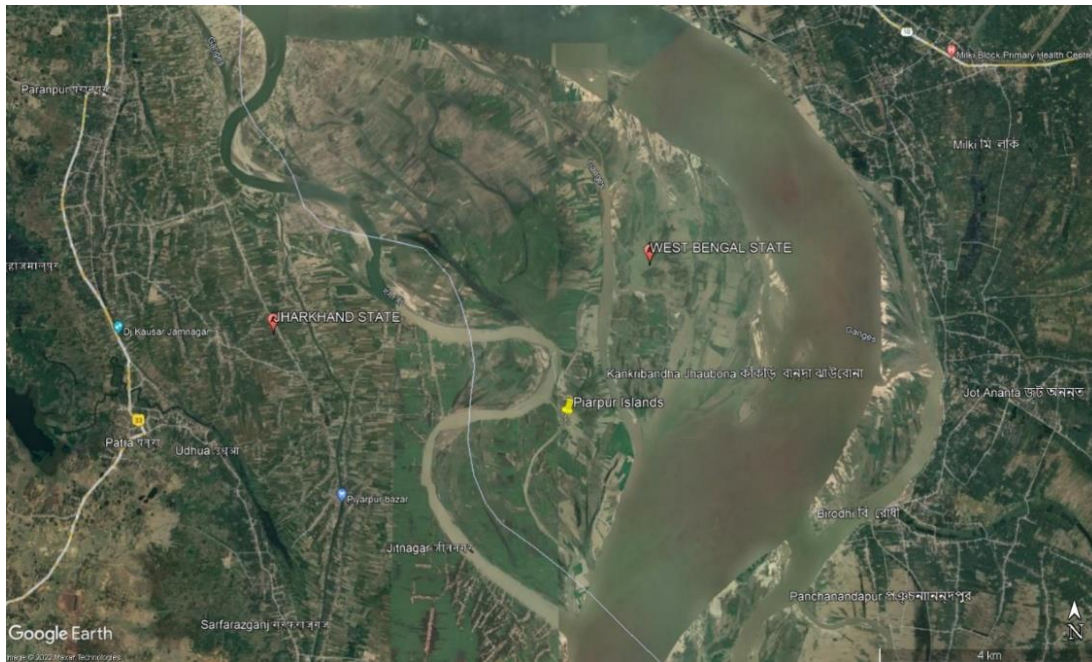


Image 28 : Location Of Piarpur Islands

3.25 Damodar River Char Lands : Damodar is an important river of the Bengal Delta. It flows across the States of Bihar and West Bengal eventually joining the Hugli River near Falta in Howrah District. The clearing of extensive natural forests in the upper catchment areas of this river for the construction of reservoirs has resulted in increased siltation rates and the formation of more stable *chars* on the riverbed. Also, the behavior of the river has become more unpredictable: large chunks of fertile agricultural land are eroded by its currents every year. The current physical *character* of the Damodar *chars*, therefore, is somewhat different from other *chars* located in the active delta areas of the Ganga–Padma and other rivers in deltaic Bengal. Being more permanent in nature, Damodar *chars* do not experience the regular and annual flooding *characteristic* of the active delta *chars* of Bangladesh. Most of these *char* lands comprise natural vegetation including plum trees and tall *Bena* grass planted during the late 19th century when fishermen from Bihar started migrating and occupying these riverine locations. After partition, Bangladeshi (then East Pakistan)

Hindus started to trickle into this part of India in search of livelihoods and social security. Lacking any legal owners, these *char* lands were designated by the Govt. as 'Khas lands' and deemed available for the resettlement of refugees. However, the shifting river courses made *char* lands highly insecure; considerable stretches of *char* lands have since reverted to riverbeds, whereas some new lands have emerged from the riverbed, and again considerable stretches of the river channel have been converted into seasonal croplands by the *char* people. Presently, Bangladeshi migrants form the dominant group in all *char* lands; the earlier Bihari settlers are gradually being marginalized. Agriculture is the main occupation on these *char* lands where large pieces of sandy lands have been reclaimed for crop cultivation by *char* dwellers. However, the Damodar *char* lands too face vulnerabilities from erosion and shifts in the river course. Some stabilized *char* lands closer to the south bank were under the administration of the Bankura District of West Bengal but as the river shifted towards the north bank the physical distance of these *char* lands have increased from Bankura and is now closer to Burdwan District. The local residents of Damodar *char* lands view floods as natural elements and have flourished owing to their maneuvering skills for land and water-based livelihoods (Lahiri-Dutt & Samanta, 2007).

3.26 Riverine Islands as Wildlife Corridors : The Brahmaputra River Valley in Assam is considered to be an important habitat for tigers in India (Jha *et al.*, 2008). This region is a very important landscape for tigers in its best habitats that include Kaziranga National Park on the east and Orang National Park on the west with Lakhowa and Burhachapori Wildlife Sanctuaries in between these two protected areas. This area is known to hold the highest density of tigers in the world with 32 tigers/100 sq. km. in the Kaziranga National Park (Ahmed *et al.*, 2010). The floodplains of Brahmaputra River support high prey biomass which forms an important source of food for these tigers. Hence, a detailed scientific study was carried out by Borah *et al.*, (2010) to assess the potentiality of Brahmaputra riverine islands in this region to support dispersing tigers and act as potential corridors for their movement. The results highlighted the presence of tiger population on 11 out of 52 riverine islands studied

which was positively correlated with the presence of livestock on these islands. Furthermore, it was established that the islands and river banks in this region served as a crucial corridor for the movement of tigers from one island to another or from one protected area to another. These islands also served as movement corridors for other important fauna in the region such as rhinos, elephants and various ungulates. In Haridwar District, a group of riverine islands serve as important habitat and movement corridors for deer species such as – Swamp Deer or ‘Barasingha’, Hog Deer and Chital [Image 29].

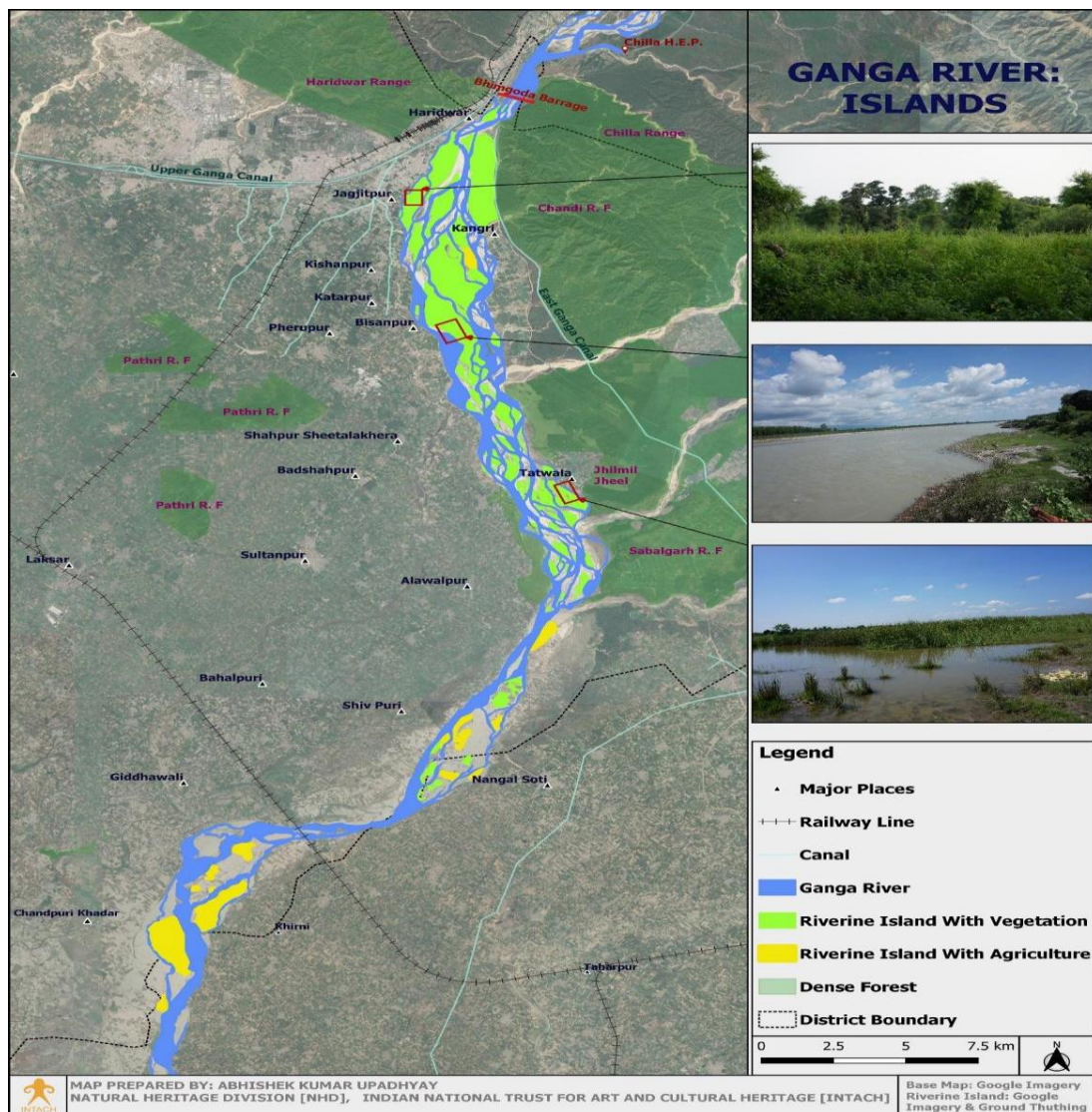


Image 29 : Riverine Islands Forming Part of Movement Corridors for Deer Species In Ganga River Stretch Of Haridwar District

Pankaj Sekhsaria's insightful book "Islands in a Flux" [2019] is about the Andaman and Nicobar Islands and the issues and challenges of when mainstream development is sought to be foisted on these environmentally sensitive and biodiversity-rich islands which have a limited carrying capacity.

The principal learnings from the discussions have relevance to riverine islands to some extent and to a variable extent to the different classes of riverine islands.

The issues raised are :

- a) The destructive impact of mainstream development on island ecology*
- b) The need for Biodiversity Strategy and Action Plans for large islands and island clusters*
- c) The need to phase out sand mining from islands as being destructive of habitats*
- d) The complete ban by the Supreme Court on cutting of natural forests*

3.27 River Island With Built Heritage

3.27.1 Gagron Fort : This fort is a hill and water fort situated approximately 10 km north-east of Jhalawar [Rajasthan] at the confluence of Ahu and Kali Sindh rivers in Rajasthan State [Images 30-31]. This fort was built by Bijaldev Singh Dod (a Rajput King) in the twelfth century and is surrounded by water on three sides and a moat on the fourth site, thereby earning the name of '*Jaladurg*'. In addition to its uniqueness of river protection, this fort was built in a strategic location in a pass in the hills such that it helped control the trade routes in this region. It is currently designated as State Protected Monument of Rajasthan under the Rajasthan Monuments, Archaeological Sites and Antiquities Act of 1968 (<https://whc.unesco.org/en/list/247>)



Image 30 : Gagron Fort In Rajasthan – a 'Jaldurg'



Image 31 : Gagron Fort In Jhalawar, Rajasthan

(Source: <https://www.tripinives.com/places/jhalawar/gagron-fort/photos-of-gagron-fort/>)

3.27.2 **Ajgaivinath Temple** : It is an ancient temple dedicated to Lord Shiva built solidly on rocks which are emerging out of the Ganga River in the Sultanganj area of Bhagalpur [Images 32-33]. The temple premises also contain a series of marvelous rock sculptures and some inscriptions. This is an important and revered spot in this District which is visited by thousands of pilgrims and tourists from different parts of the country, especially on auspicious occasions. It is well known that these rocks remained surrounded by the Ganga River on both sides and could be accessed only by boats or a bridge which was constructed to connect it with the mainland. However, currently, due to a shift in the course, the Ganga River flows only on one side of this temple while in monsoon season it regains its original island position.



Image 32 : Location Of Ajgaivinath Temple, Bhagalpur



Image 33 : Ajaivinath Temple, Bhagalpur (Image Credit: Sumesh N. Dudani)

3.27.3 **Srirangam Island** : This river island lies between the latitude $10^{\circ}51'0''$ - $10^{\circ}48'0''$ N and longitude $78^{\circ}39'0''$ - $78^{\circ}45'0''$ E covering an area of approximately 27.03 sq. km. and falling within a part of Tiruchirapalli District of Tamil Nadu State [Images 34-35]. It is bounded by the Upper Anicut to the west, the Grand Anicut to the east, the Coleroon River to the north and the the Cauvery River to the south. According to census data of 2011, the population of this island is 2,10,361 (Muthamilselvan *et al.*, 2016). This land was known as '*Vellithirumutha Gramam*' in ancient times and is currently known as 'Srirangam' or 'Thiruvarangam' in Tamil. Numerous architectural heritage sites such as Srirangam temple shrines and *Mandapas* are found here and carry inscriptions pertaining to the rule of different dynasties. The oldest inscription pertains to the period of Aditya-I, who was also popularly known as *Rajakesarivarman* (Sivasamy, 2018).

Sri Ranganathaswamy temple at Srirangam Island is dedicated to the reclining form of Lord Vishnu, known as Ranganatha. The temple has one of the tallest temple towers in south India and one of the largest Hindu temples in the world. The temple is considered the first among 108 prominent Vishnu temples and is also one of the popular Tamil Nadu tourist places. This place is also one of the eight svayam-vyaktakshetras (self-manifested temples) of Lord Vishnu.



Image 34 : Location Of Srirangam Island

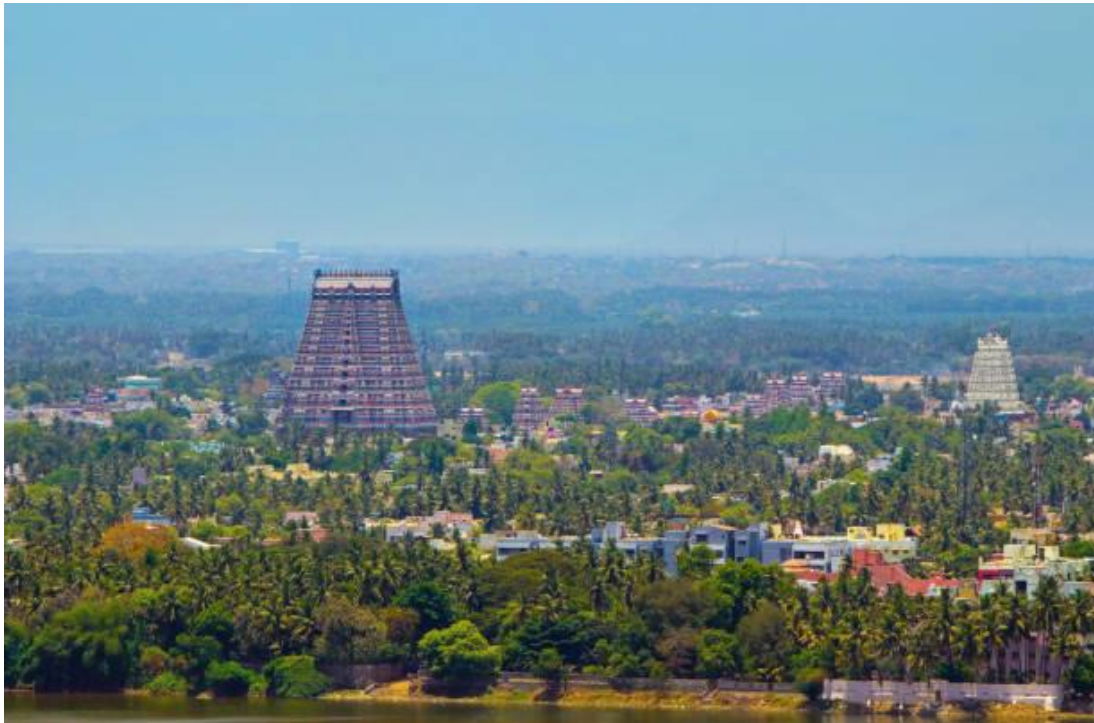


Image 35 : Srirangam Island With The Sriranganathaswamy Temple
(Source: <https://www.istockphoto.com/photos/tiruchirapalli>)

3.27.4 **Srirangapatna Island Town** : Srirangapatna is a small municipal town which serves as taluk headquarters in Mandya District on the way from Bengaluru to Mysuru. This town is of immense historical and religious significance and used to be the erstwhile capital of the Mysore Kingdom. The presiding deity of this temple town is Lord Ranganathaswamy who is also known as Adiranga. According to legends, Lord Vishnu appeared here to Rishi Gautama in the form of Ranganatha and established himself on this island attended by the consort, river Goddess Cauvery. Several inscriptions and monuments found in Srirangapatna trace the influence of the rule of various kingdoms such as Hoysala, Vijaynagara, Mysore Wodeyars, Hyder Ali and Tippu Sultan. Towards the north-western part of this island, the Cauvery River divides into eastern and western branches enclosing this central mass as an island and protecting it on all sides [Image 36]. In the western part of this island, the Srirangapatna fort is present that exhibits defensive fortifications like bastions and turrets (Ramakrishna & Gayathri, 2010).

About 1.3 km upstream of this island town, the Ranganathittu Bird Sanctuary has been notified, which comprises 6 islands and 6 islets in the Cauvery River [Image 37]. The islets are the main breeding ground for several species of local and migratory birds. The comparative isolation of the islets during the monsoons and the abundance of aquatic insects make Ranganathittu a favorite place for birds. The islets are surrounded by water from a reservoir formed by the construction of a weir across River Cauvery between 1645 & 1648. Ranganathittu island and the islets surrounded by backwater of the weir have been developed and managed as a tourist place.

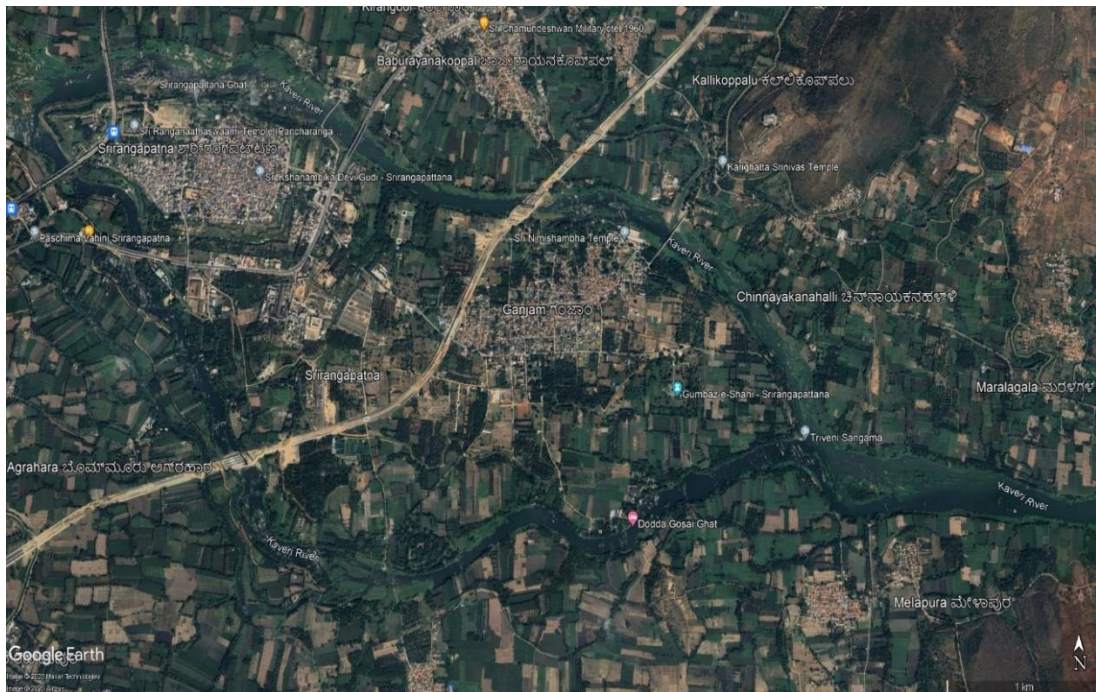


Image 36 : Location Of Srirangapatna Island Town



Image 37 : Location Of Ranganathittu Bird Sanctuary

3.27.5 **Divar Island, Goa :** Goa State is one of the most popular tourist destinations for Indian and foreign travelers alike. While the focus has always been on its beautiful beaches and the coastal tourist attractions, less is known about the riverine islands in Mandovi River – one of the major rivers of the State. Several small islands and islets are known to be present in the lower stretch of the river and its tributaries among which Divar Island [Images 38-39] occupies a privileged position. Located about 10 km from Panjim, this island is surrounded by water from the Mandovi River on all sides and is connected with the mainland only through ferry services. The island is basically a rocky projection of basalt rock but the land surface has been peripherally extended now by heavy siltation. The island is covered with dense vegetation, is less developed as compared to mainland Goa and serves as a transition from the hustle-bustle of the city to peaceful natural surroundings. Divar Island is divided into four villages – Navelim, Goltim, Malar and Naroa. The island is well known for its rich architectural heritage comprising churches, temples and houses reflecting Portuguese culture.

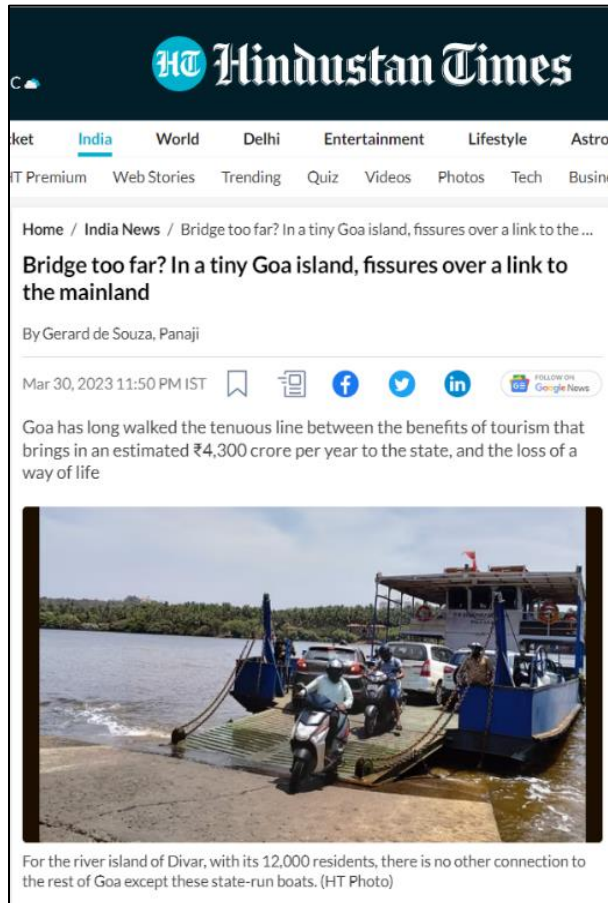


Image 38 : Google Earth Imagery Showing Location Of Divar Island



Image 39 : Divar Island In Goa

(Source: <https://www.thegoavilla.com/goa/distanation/divar-island.html>)



THE CONFLICT

In one corner of Divar, right next to the banks of the Mandovi, is a decade old foundation stone, damaged and forlorn, standing testimony to the island's dilemma. In 2011, the then Digambar Kamat government proposed constructing two four-lane bridges between Ribandar (Panjim) and Divar, and Divar to Chorao, costing an estimated ₹600 crore. The plan set off protests in the island; the foundation stone was vandalized; and land for the bridge was never acquired, Goa government officials said.

Even as the demand for a bridge continued bubbling under the surface, and in the corridors of power in Goa, the Divar panchayat staunchly stood against the construction of the bridge, something they communicated officially to Goa Governor PS Sreedharan Pillai when he visited the island in November 2022. "The sarpanch of Divar came with a proposal that they do not want a bridge. It was the first time I had heard of a village saying this. When I asked why, they said that people from the mainland will arrive in the island, create a nuisance, and ruin their happiness. Officially, they requested for a bridge not to be sanctioned," Pillai said to reporters then.

Faldessai, the Cumbarjua MLA however said that the project would not be carried forward unless there is consensus. "I had taken up the matter with the chief minister three months back and he told me that unless there is a consensus we should not needlessly 'spoil' the island. If there is a decision, he said, the government would have no problem taking the project forward," Faldessai said.

THE ARGUMENTS AGAINST

59-year-old Effie Silveira-de-Melo says she has travelled nearly every day from her home in Divar to Panjim, where she works as an accountant, for close to four decades. That journey, she says, takes her not more than half an hour each day, even accounting for the ferry trip that includes a charge only if she's travelling by car. "I have been doing this for the past 40 years, and have not faced any major issue. To this day, I have not come across anyone that has been adversely affected by the ferry. Importantly, where will the bridge be built? Nobody wants to lose their land or their home for a bridge that will not really bring any benefit," she says.

A recent news article highlighted the issues of connectivity for Divar island which is an important riverine island in Goa that is rich in heritage and has immense tourism potential.

3.27.6 Kadamakkudy Islands, Kerala : Kadamakkudy Islands are a cluster of fourteen islands: Valiya Kadamakkudy (the main island), Murikkal, Palyam Thuruth, Pizhala, Cheriya Kadamakkudy, Pulikkapuram, Moolampilly, Puthussery, Chariyam Thuruth, Chennur, Kothad, Korambadam, Kandanad and Karikkad Thuruthu situated near the city of Ernakulam (Kochi) in Kerala State. These islands are rich in natural beauty and are a popular spot for bird watchers, nature enthusiasts and local explorers [Image 40].



**Image 40 : Kadamakkudy Island In Kochi, Kerala
(Source: <https://kadamakkudy.net/gallery.php>)**

3.28 Sinha *et al.* in a study carried out for the Govt. of Bihar, published in Earth Surface Process Landforms [2022], titled “Channel morphodynamics and sediment budget of the Lower Ganga River using a hydrogeomorphological approach” compute sediment volumes accumulated in the channel belt along the Lower Ganga River between Buxar and Farakka based on historical remote sensing data and UAV surveys to reconstruct channel morphodynamics. The paper States “The Ganga River is one of the largest river systems in the world that has built extensive alluvial plains in northern India. The stretch of the Lower Ganga River is vulnerable to siltation because of: (a) the naturally low slope in the alluvial stretch; (b) the confluence of several highly sediment-*charged* rivers such as the Ghaghra, Gandak, and Kosi; and (c) the reduction in non-monsoon flows because of upstream abstractions of both surface and groundwater --- Continued siltation in several stretches of the Lower Ganga River has stabilized the major alluvial islands and large bars. The perception that the high

monsoonal flows may be sufficient to remove them may not be correct, as these high flows also bring additional sediments and there has been an incremental effect over the years in terms of excessive siltation in several reaches. Exceptionally large alluvial islands such as Raghopur *Diara*, Shankerpur *Diara*, Gopalpur *Diara* and so on require special attention as many of these are vegetated, inhabited, and ecologically sensitive. The dredging of these islands is not advisable. Instead, it may be more beneficial to maintain both channels around these islands and design a pilot channel through the island, wherever possible, to improve channel efficiency. Not surprisingly, the confluence of major tributaries with the Ganga seems to influence sediment dynamics in a major way. All major tributaries such as the Ghaghra, Gandak, and Kosi are highly sediment-*charged*, and major hotspots of siltation (stabilized alluvial islands) have developed downstream of these confluences.”

3.29 **Riverine island Typology** : A river system can be divided into three subsystems – 1) a collection system (bank and bed erosion), 2) a transport system, and iii) a dispersing or deposition system. These three subsystems are collectively referred to as cut-and-fill alluviation and are dependent on *discharge*, velocity, gradient, sediment load, and base level. Based on such dependent factors a river may have a different typology i.e. straight, braided, wandering, and meandering. The river erodes [vertically (river bed) or laterally (bank)] & collects and transports the sediments downstream. During this process, a time comes when the capacity of the flow to carry the sediments is exceeded by the volume of sediment being transported as bed-load. This results in rapid deposition of the sediments and forces the single channel to split into multiple separate channels called **braided channels**. The depositions between such channels are referred to as **Braided Islands** [Image 41]. The construction of dams/barrages may act as a catalyst for early deposition or elimination of deposited material.

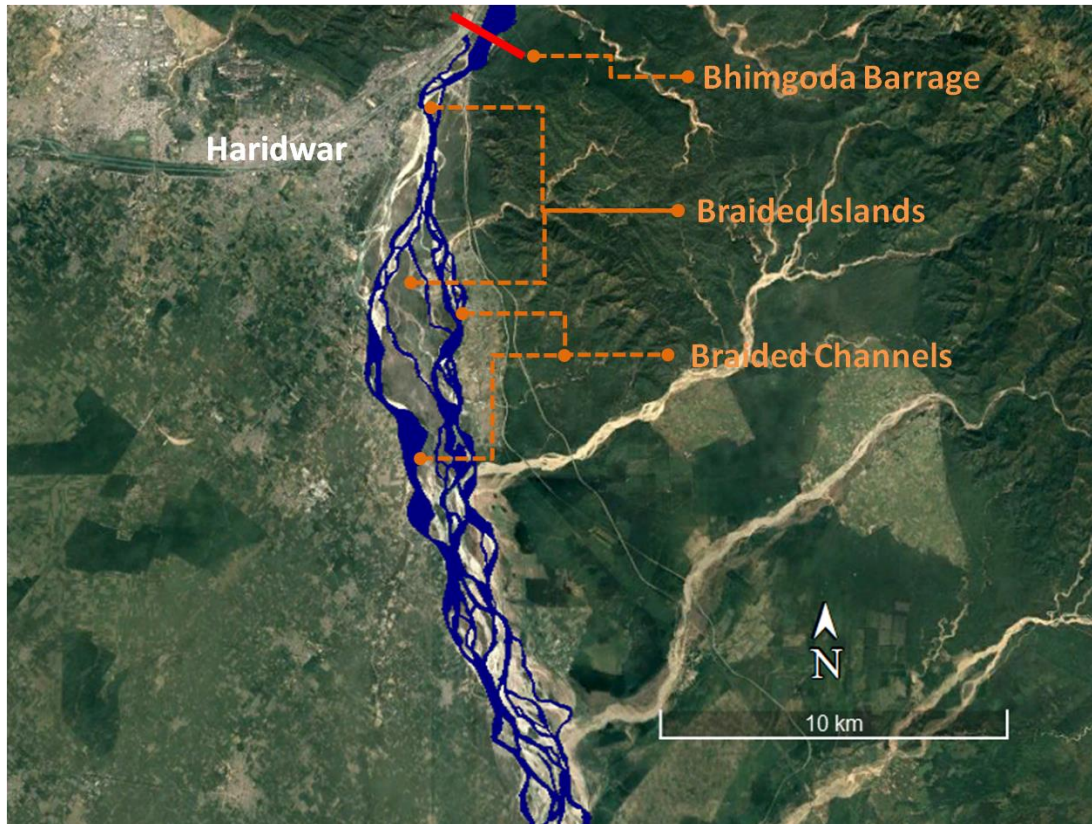


Image 41 : Braided Channels And Islands In Ganga River Stretch Of Haridwar & Bijnor

3.30 Similar to the braiding of a river, the channel widening process may also lead to the formation of **Mid-Channel Islands**. Channel widening occurs when the supply of sediment relative to the capacity of the stream or river to transport the sediment decreases and a new channel emerges. These channels become more stable and high-frequency avulsion activity becomes a less dominant fluvial process. Channel widening triggers lateral erosion along the outside bend of a channel due to increased flow velocities along the inside of the bend. The eroded material usually gets deposited at the mouth of the island [Image 42]. Such kinds of mid-channels are present in the middle Ganga Region [Image 43].

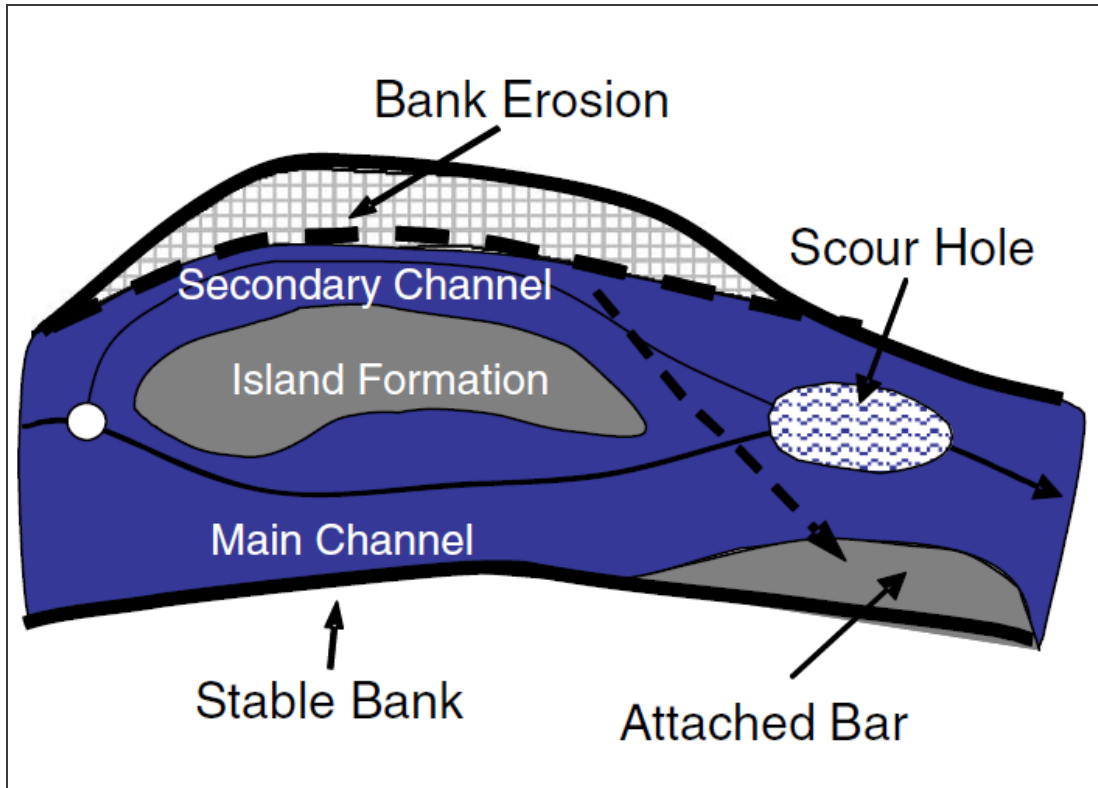


Image 42 : Channel Widening Process And Formation Of Mid-Channel Islands
 [Source: Lorang, M. S., & Hauer, F. R. (2017)]

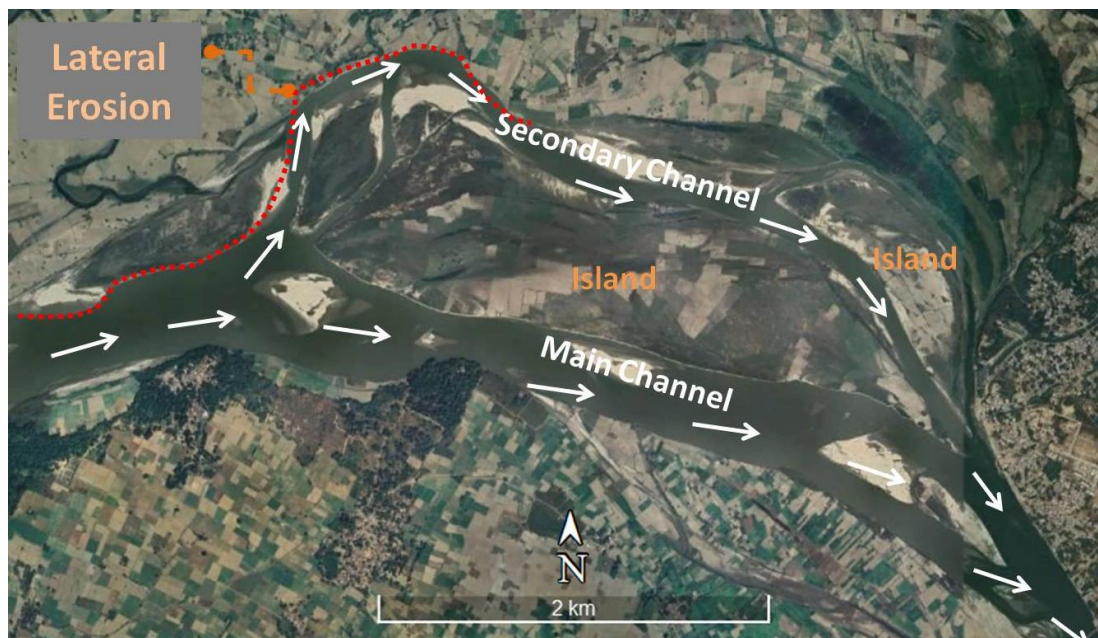


Image 43 : Mid-Channel Island In Ganga River Developed Due To Channel Widening

3.31 Channel widening process coupled with avulsion results in a more complex environment. When the avulsion is on a large scale it is called **Anastomosing** and results in the formation of a new channel or secondary channel (Schumm, 1977). Here, the primary channel becomes less active and gets flooded in monsoons or during high inflow from upstream. During this process, a riverine island emerges between the channels and is mostly accessible in the lean season. Such islands are found in eastern Uttar Pradesh and Bihar. These islands usually act as wildlife refuges [Image 44].



Image 44 : Riverine Island In Ganga River Formed Due To Anastomosing

3.32 The above-mentioned river typology i.e. Braided, Channel Widening and Anastomosing results in the formation of the different types of islands. Apart from this, there are some attempts made to establish the river typology based on the different fluvial processes. Kellerhals *et al.* (1976) has classified the different type of rivers and especially incorporates the riverine islands in its classification system. In the classification, the authors have codified islands for their proximity to other

islands [Table 3]. Further Osterkamp (1998) has classified and provided the types of fluvial islands [Table 4].

Table 3 : Codification Of Fluvial Islands In Relation To Their Proximity To Other Islands
 [Source: Kellerhals et al. (1976)]


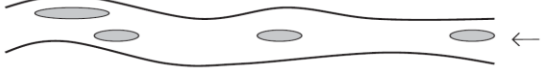
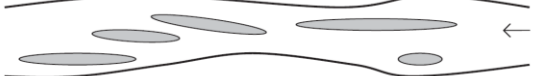

<p>Occasional <i>[no overlapping of islands (i.e. not on the same cross-section) with an average spacing greater than ten river widths]</i></p>	
<p>Frequent <i>[infrequent overlapping with average spacing less than ten river widths]</i></p>	
<p>Split <i>[frequent or continuous overlapping, creating two or three flow paths]</i></p>	
<p>Braided <i>[many channels divided by islands and bars, which may be washed out in high flows]</i></p>	

Table 4 : Riverine Island Typology Based On Fluvial Processes
 [Sources: Osterkamp (1998); Wyrick & Klingeman (2011)]

SR. NO.	ISLAND TYPE	FLUVIAL PROCESS
1.	Avulsive type of islands	<p>Avulsion <i>[During a high flow event, a river may excavate a shorter path, particularly across a bend, thereby leaving two flow channels after the river stage has receded.]</i></p>
2.	Gradual-erosion type of island	<p>Gradual degradation of channel branches <i>[Divided flow in the mainstem, around coarse material, may result in the formation of islands through deposition on the coarse material and/or incision of the flanking channels.]</i></p>
3.	Non-avulsive Islands [meander cutoffs and braided]	<p>Lateral shifts in channel position <i>[As a river channel preferentially migrates within its meander belt, lateral-shift islands can result. A non-avulsive meander cutoff will also create this</i></p>

SR. NO.	ISLAND TYPE	FLUVIAL PROCESS
		<i>type of island]</i>
4.	Emergent island	Stabilization of a bar or riffle <i>[This type of island is formed when a previously transient bar or riffle stabilizes through either vegetation or sediment coarsening.]</i>
5.	Structural-feature type of islands	Structural features <i>[Forms almost exclusively in high-gradient, bedrock channels.]</i>
6.	Flood deposited islands	Rapid incision of deposited sediments during flood Recession <i>[Flood-deposit islands are formed by erosion of newly-deposited sediments. It differs from Avulsive island as they formed by older-deposited sediments]</i>
7.	Lee Deposited islands	Lee deposition <i>[formed when a channel obstruction creates a downstream zone of shallow depth and reduced velocity]</i>
8.	Mass movement islands	Mass movement <i>[Mass-movement islands are the result of a mass of allochthonous material being deposited within the channel. Typical mechanisms include debris avalanches and bank failures.]</i>
9.	Island formed due to river structures	Reservoir installation <i>[When a dam is emplaced, it ponds water upstream. If there is a sufficient water level rise, high riparian topography may become isolated as the valleys are flooded. These islands may or may not be composed of bedrock. Because the erosive power of rivers is reduced drastically within a reservoir, these types of islands are highly stable and may only cease to be islands if the dam is removed or the water surface elevation is dropped]</i>

3.33 **Based on flood inundation fluvial island may be classified into –**

- i. **Seasonal Island** : Seasonal islands are temporary islands that form mainly during the rainy season and are within the active parafluvial zone. These islands are no more when summer comes because the water in these rivers usually dries down in the summer.
- ii. **Permanent Island** : Perennial rivers have a number of permanent islets. In monsoonal rivers, these islands can experience different degrees of submergence seasonally.

3.34 **Based on Land Use & Land Cover fluvial island may be classified into –**

- i. **Habitable River Islands** : Islands which have a substantial area spread above high flood levels can house human inhabitants.
- ii. **Wooded/Vegetated Island** : Continuous deposition of bed load on an emergent island provides substratum to herbage cover and further provides ground to shrubs and trees. Such islands have a unique assemblage of biota and may act as a wildlife refuge.

Single River island: *Single river islands create a solid foundation in the middle of the river. Water flows around the islands. These types of islets are formed at a sharp bend of the river.*

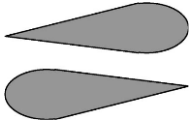




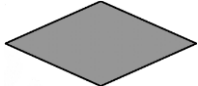

Parallel River Island: *When two parallel rivers flow together and a solid place naturally forms between these rivers, they are called parallel river islands. There are very few naturally formed parallel river islands available. The maximum available river islands are single river islands.*

Coastline River Island: *Most of the rivers end up on oceanic coastlines. River islets that naturally form the coastline on the other side are called coastal river islands.*

3.35 **Shape of the islands** : The riverine islands are known to have various shapes and are dependent on the discharge, velocity, gradient, and sediment load. The human-induced factors such as – river structures [Dams, Barrages, and reservoirs], sand

mining, large-scale navigation, dredging, construction, and agriculture may also have an impact on the shape of the islands. Activities like sand mining and dredging alter the river bed, and agriculture and construction make the ground susceptible to erosion. River structures change the river's natural flow, so occasionally a stabilized island may be washed out by a high reservoir discharge. The island's shape can be classified as a) irregular, b) angular, or c) streamlined. Age may have an impact on an island's design because older, more eroded islands tend to have more streamlined shapes (Wyrick & Klingeman, 2011). The common shapes of the fluvial island provided by Wyrick & Klingeman (2011) are presented in the table below –

Table 5 : Different Shapes Of Fluvial Riverine Islands

Sr. No.	Shape Category	Shape Name	Planform Shape
1	Streamlined	Lemniscate (upstream or downstream)	
		Elliptical	
		Lenticular	
		Semi-circular or Hemispherical	
2	Angular	Triangular	
		Rhombic	
3	Irregular		

CHAPTER 4 – MAPPING OF RIVERINE ISLANDS IN GANGA RIVER

The GIS-based mapping analysis of the Ganga River highlighted the presence of a total of 2397 islands of which 1198 islands have an area of more than 5 hectares. Among these 1198 islands, 790 are barren lands/sand bars without any kind of land use, 132 islands are under agriculture and human settlements while 250 islands are under forest or vegetation cover. Around 21 of these 1198 islands have sand mining activities while the remaining 5 have mixed landscapes of vegetation, agriculture and settlements. The detailed spatio-temporal analysis of selected islands in this study did not reveal any significant changes in the size or shape of these islands from 2000 – 2022. Based on varied river actions, their areas may increase or decrease with marginal differences each year.

4.1 The spatio-temporal analysis of selected sites was carried out by utilizing the Sentinel-2 Satellite Imagery (of 2020–2022) and Google Earth Imagery (of 2020–2022) in order to identify and digitize each riverine island. Following this, the Survey of India (SOI) Open Series Maps (OSM) was used for validation of the data. The acquired Sentinel-2 satellite Imagery was processed using different image processing techniques like Layer Staking, Mosaicking and Image Enhancement. Further classification of the imageries was performed by using unsupervised classification along with manual editing. For an accurate image classification, data collected from the field (ground truthing/field surveys) was also linked to image data. A procedure of semi-manual cleaning was applied for achieving the above-stated objectives and thereby, a map depicting various land cover types of the study site was created. Image 44 depicts the flowchart of this entire mapping exercise.

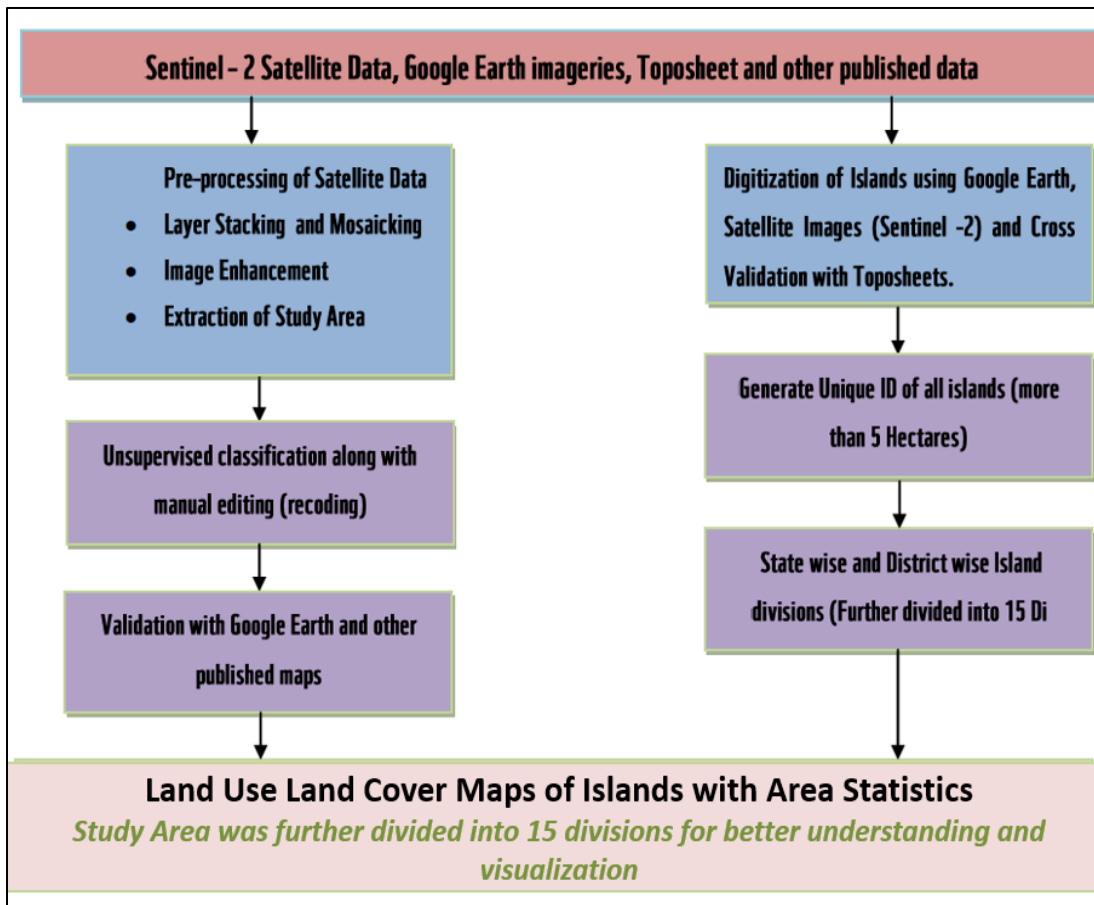


Image 45 : Flowchart Depicting The Method Involved In Mapping Of Riverine Islands

- 4.2 After identification, digitization and LULC classification, the study area has been divided into 15 grids of which one is in Uttarakhand, seven are in Uttar Pradesh, three are in Bihar and four are in West Bengal as depicted in Map 1. These grids were divided taking into consideration the length of Ganga River and administrative jurisdictions. Each grid in the study region is further depicted in Maps 2-16.
- 4.3 Based on the mapping analysis, a total of 2397 islands were identified in the entire stretch of Ganga River (including Hooghly) of which 1198 islands have an area of more than 5 hectares. Furthermore, out of these 1198 islands, 790 islands are barren lands/sand bars without any kind of land use while 21 barren islands/sandbars are such that are being exploited for sand mining activities. 132 of the 1198 islands are under agriculture and human settlements while 250 islands are under forest or vegetation cover. The remaining 5 islands have mixed landscapes

comprising vegetation, agriculture and human settlements. These details are provided in Table 6 whereas the details of each riverine island/sand bar as recorded in the mapping exercise are provided in Annexure I.

Table 6 : Broad Classification & Land Use Pattern Of Ganga Riverine Islands

Class Name [Current Uses]	No. of Islands	Area [Hectares]	Island More than 5 Hectare	Island Less than 5 Hectare
Agriculture	141	130908.4235	127	14
Agriculture, Settlements	5	55341.8519	5	0
Barren Land/Sand Bar	1941	38406.1347	790	1151
Barren Land/Sand Bar, Sand Mining	21	7358.0638	21	
Vegetation/Forest	284	70355.0642	250	34
Vegetation/Forest, Agriculture	4	3424.4281	4	0
Vegetation/Forest, Settlements	1	16.6756	1	0
Total	2397	305810.6418	1198	1199

4.4 A detailed spatio-temporal analysis using available satellite and Google imagery was also performed for the selected islands in this study namely – islands group of Haridwar District, unnamed islands in Fatehpur and Rae Bareilly Districts, unnamed island in Prayagraj District, Majhara *Diara* in Mirzapur District, Ramchandipur *Diara* in Varanasi District, Raghapur *Diara* in Vaishali District, Unnamed island in Munger District, Gopalpur *Diara* group in Sahibganj District, Piarpur *Diara* group in Malda District, *Char* Mahammadpur in Murshidabad District, Island near Chinsurah Municipality and *Nayachar* Island in Hooghly estuary. The images from 2000-2002, 2010-2012 and 2020-2022 were compared for analyzing the changes in these islands

during the last two decades. Other details such as shape, size and current land use of these selected islands are presented in Table 7 while the comparative Google Earth imagery over the last two decades for each island is presented in Images 46-60.

Table 7 : Comparative Statistics For Study Sites Based On Mapping Exercise

Sr. No	Island Name & Location	Island Size [Hectares]			Island Shape	Island Uses	
		2000-2002	2010-2012	2020-2022			
1	Island Group of Haridwar District	Bairagi Camp [29°55'39.71"N, 78° 9'24.52"E]	2.0 Sq.Km	2.11 Sq.Km	2.16 Sq.Km	Irregular	Some settlements, sparse riparian vegetation and scattered trees, no sand mining
		Dakshadweep [29°54'32.97"N, 78° 8'36.92"E]	1.10 Sq.Km	1.15 Sq.Km	1.17 Sq.Km	Streamlined [Elliptical]	Sparse vegetation mainly grasses and trees, no sand mining.
		Unnamed [29°53'36.63"N, 78° 8'42.90"E]	0.56 Sq.Km	0.95 Sq.Km	1.0 Sq.Km	Lemniscate [in downstream]	Dense vegetation, no sand mining.
		Jaspur Ranjeetpur Ka Jungle [29°40'41.07"N, 78° 9'43.03"E]	----	----	6.33 Sq.Km	Streamlined [Elliptical]	Temporary settlemenets, sparse vegetation and agriculture.
		Unnamed [29°37'31.38"N, 78° 4'47.64"E]	1.57 Sq.Km	Island Eroded completely [A sand bar	2.84 Sq.Km	Irregular	Agriculture

Sr. No	Island Name & Location	Island Size [Hectares]			Island Shape	Island Uses
		2000-2002	2010-2012	2020-2022		
			emerged after 2012]			
2	Island in Raebareli & Fatehpur District [80°47'25.02"E, 26°3'56.44"N], Uttar Pradesh	6.33 sq.km.	6.56 Sq.Km	6.12 Sq.Km	Streamlined [Semi-circular or Hemispherical]	Dense vegetation & agriculture
3	Island In Prayagraj District [25°20'27.76"N, 81°58'25.03"E], Uttar Pradesh	32.9 Sq.Km	32.7 Sq.Km	33.6 Sq.Km	Streamlined [Semi-circular or Hemispherical]	Dense vegetation, scattered agriculture and sand mining
4	Majhara [82°29'21.98"E, 25°12'10.24"N], Mirzapur District, Uttar Pradesh	7.42 Sq.Km	8.22 Sq.Km	7.88 Sq.Km	Streamlined [Semi-circular or Hemispherical]	Dense vegetation and sparse agriculture
5	Island in Varanasi District [25°21'3.28"N, 83° 9'18.63"E], Uttar Pradesh	13.2 Sq.Km	15.4 Sq.Km	14.4 Sq.Km	Streamlined [Elliptical]	Permanent settlements with all city like facilities & agriculture

Sr. No	Island Name & Location	Island Size [Hectares]			Island Shape	Island Uses
		2000-2002	2010-2012	2020-2022		
6	Raghopur <i>Diara</i> /Diyara, Bihar [25°32'7.27"N, 85°25'46.31"E]	261 Sq.Km	252 Sq.Km	235 Sq.Km	Irregular	Largest <i>Diara</i> in Ganga river with settlements, large scale agriculture and sand mining in some parts
7	Island In Munger/ Khagaria District [25°24'36.88"N, 86°30'5.84"E], Bihar	-----	-----	15.9 Sq.Km [Emergent Island]	Streamlined [Semi-circular or Hemispherical]	Dense vegetation with sparse agriculture and settlements
8	Island of Sahibganj District [87°46'21.20"E, 25°13'56.75"N], Jharkhand	33.2 Sq.Km	33.6 Sq.Km	63.3 Sq.Km	Streamlined [Semi-circular or Hemispherical]	Permanent settlements and large-scale agriculture, sparse vegetation
9	Island Group of Malda District [Piarpur <i>Diara</i>], West Bengal [25° 0'56.25"N, 87°54'20.77"E]	12.8 Sq.Km	47.9 Sq.Km	50.3 Sq.Km	Irregular	Settlements and large-scale agriculture, sparse vegetation

Sr. No	Island Name & Location		Island Size [Hectares]			Island Shape	Island Uses
			2000-2002	2010-2012	2020-2022		
	[Refer Figure No. 11]						
10	Island in Hooghly River, West Bengal	Mahammadpur Char [88°14'38.73"E, 23°49'33.40"N]	0.35 Sq.Km	0.41 Sq.Km	0.62 Sq.Km	Streamlined [Lenticular]	No settlements, only agriculture and vegetation
		Island in Chinsura [22°52'34.64"N, 88°24'6.79"E]	----	0.10 Sq.Km	0.11 Sq.Km	Streamlined [Lenticular]	Dense vegetation
		Balari Bar [22° 2'18.76"N, 88° 9'6.37"E]	0.63 Sq.Km	3.60 Sq.Km	5.54 Sq.Km	Lemniscate [downstream] before 2014, currently shape has changed and in Irregular	Aquaculture farms
		Nayachar	51.0	44.6 Sq.Km	49.0Sq.Km	Streamlined	Dominant aquaculture farms,

Sr. No	Island Name & Location	Island Size [Hectares]			Island Shape	Island Uses
		2000-2002	2010-2012	2020-2022		
	[21°59'53.96"N, 88° 5'58.06"E]	Sq.Km			[Elliptical]	sparse vegetation



Image 46 : A Group Of Riverine Islands In Haridwar District

Note: No significant change in shape or size of these islands; Seasonal agriculture is noted in one of these islands which was not there in 2002

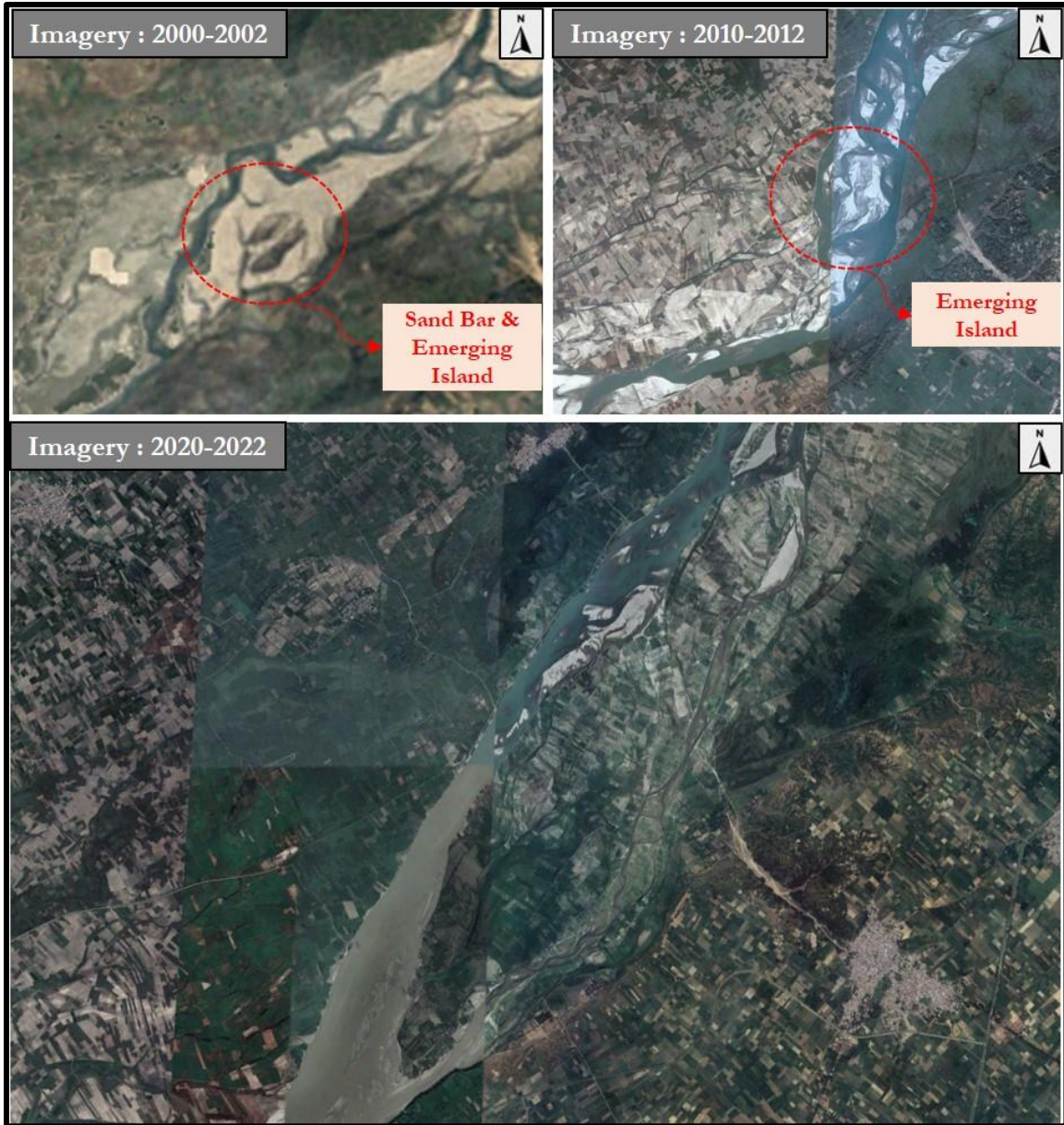


Image 47 : Jaspur Ranjeetpur Ka Jungle, Haridwar, Uttarakhand

Note: It was a sandbar which stabilized with natural vegetation by 2012 & utilized for seasonal cultivation by 2022; Shape of this island is elongated due to consolidation of isolated sandbars

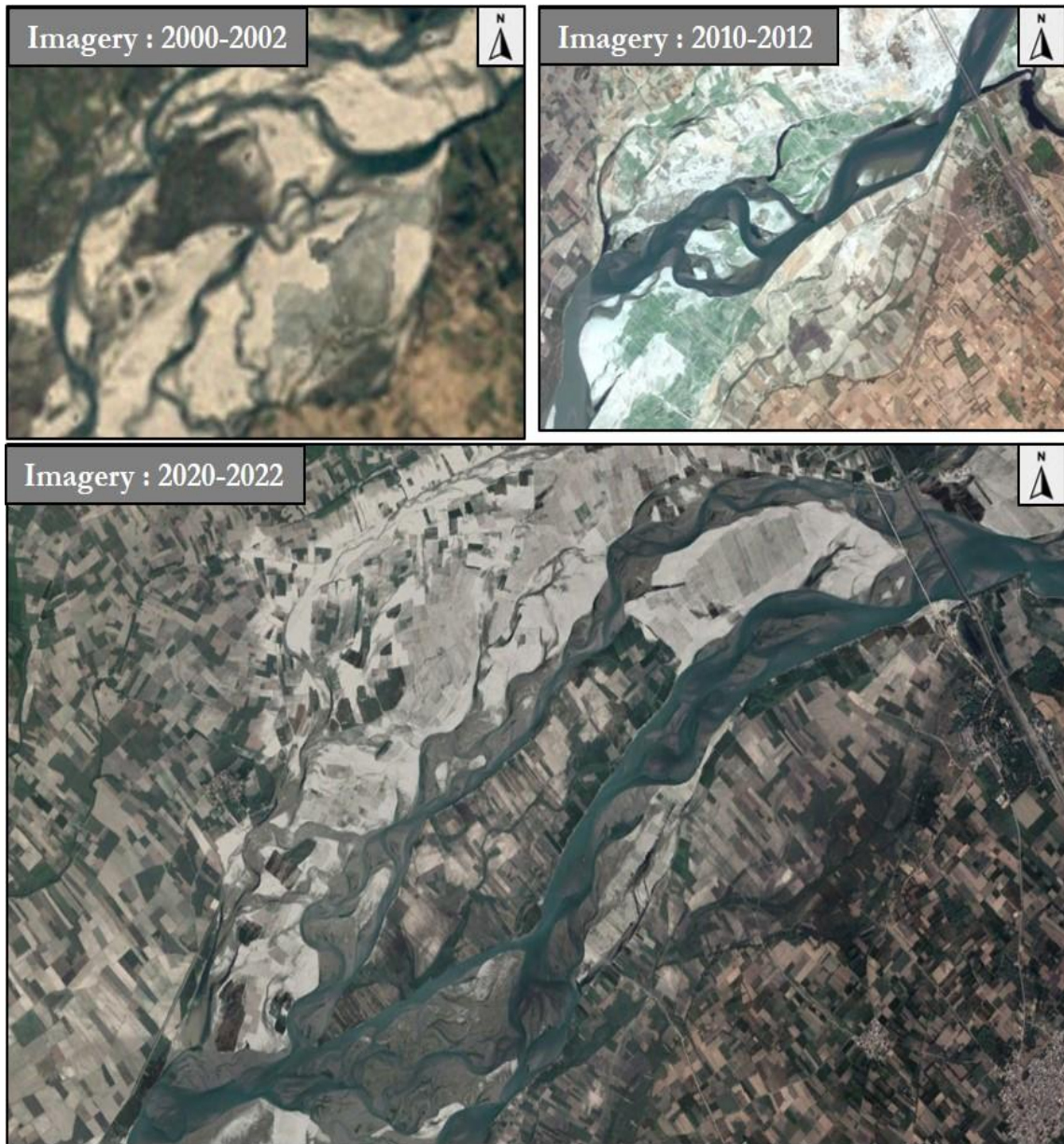


Image 48 : Unnamed Island 2 In Haridwar District

Note: It was a sandbar which stabilized with natural vegetation by 2012 & utilized for seasonal cultivation by 2022; Shape of this island is elongated due to consolidation of isolated sandbars



Image 49: Unnamed Riverine Island Between Fatehpur & Rae Bareilly Districts

Note: Sandbar stabilizes with vegetation by 2012; seasonal cultivation note in some parts & shape elongated owing to consolidation of isolated sandbars

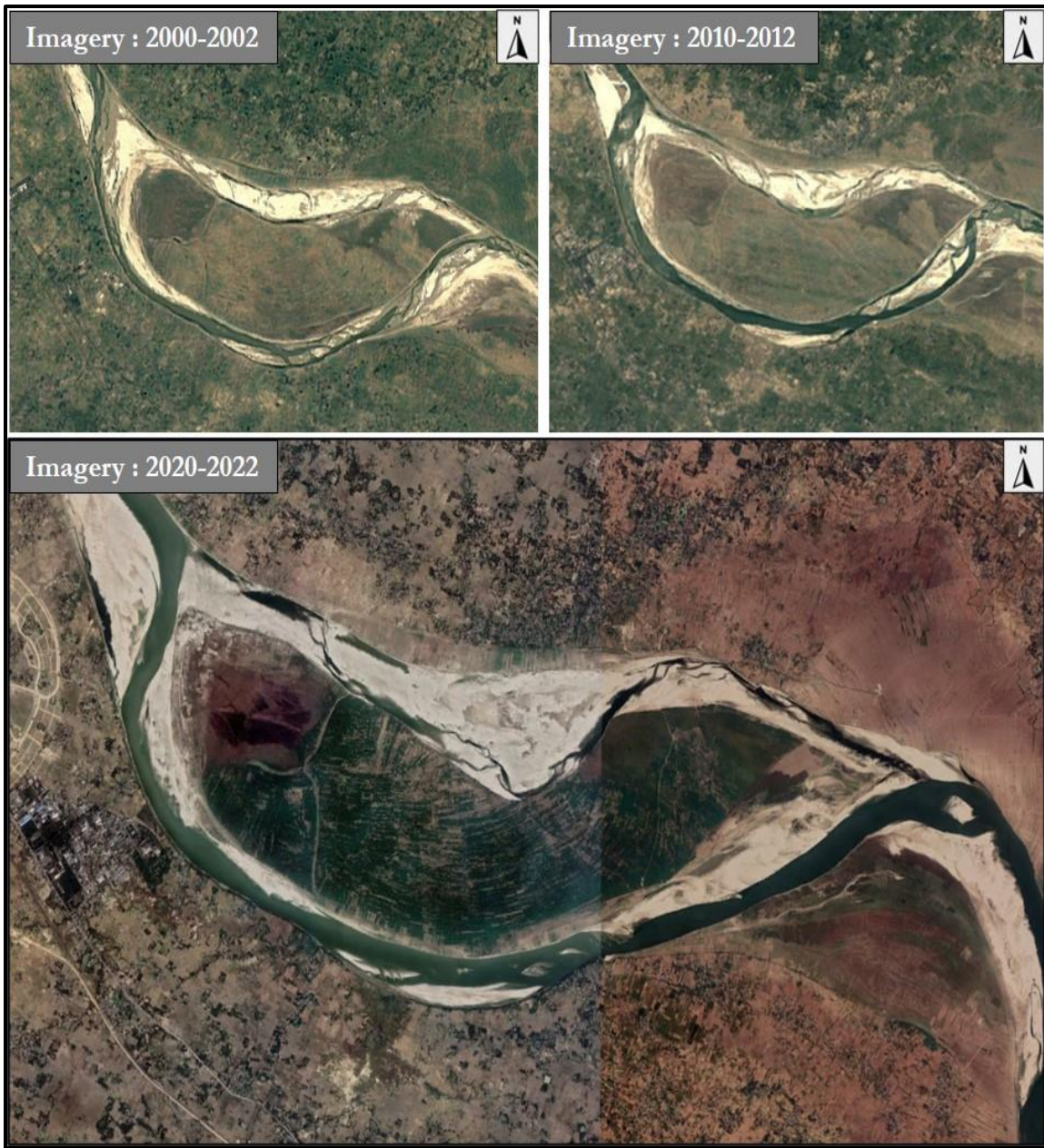


Image 50 : Unnamed Island In Prayagraj District

Note: Loss in area of island noted in northern part but shape mostly retained; Dense wild vegetation stabilizing the island with sparse agriculture



Image 51 : Majhara *Diara* in Mirzapur District

Note: Stabilized island with dense vegetation and no significant changes in shape or size



Image 52 : Ramchandipur *Diara* In Varanasi District

Note: Stable Island With No Significant Changes In Shape Or Size; Observed To Be Under Agriculture Throughout 2000 - 2022



Image 53 : Raghopur *Diara* In Vaishali District

Note: Stabilized island with no significant changes in shape or size; Growing human colonization and agriculture observed between 2000-2022

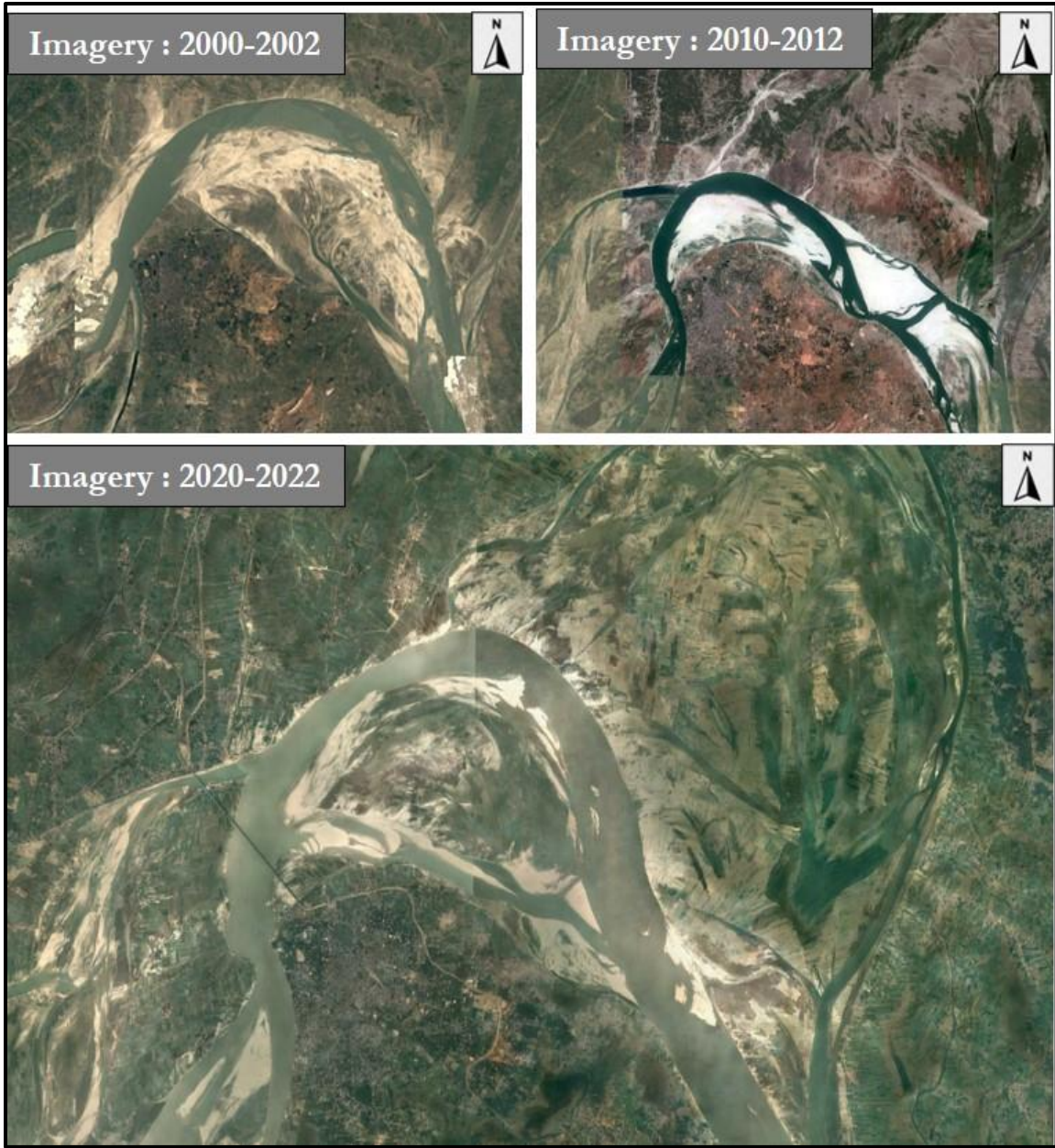


Image 54 : Riverine Island In Munger District

Note: Island morphology fluid as it is located in a meandering section; Gradual land accretion observed and wild vegetation leading to stabilization

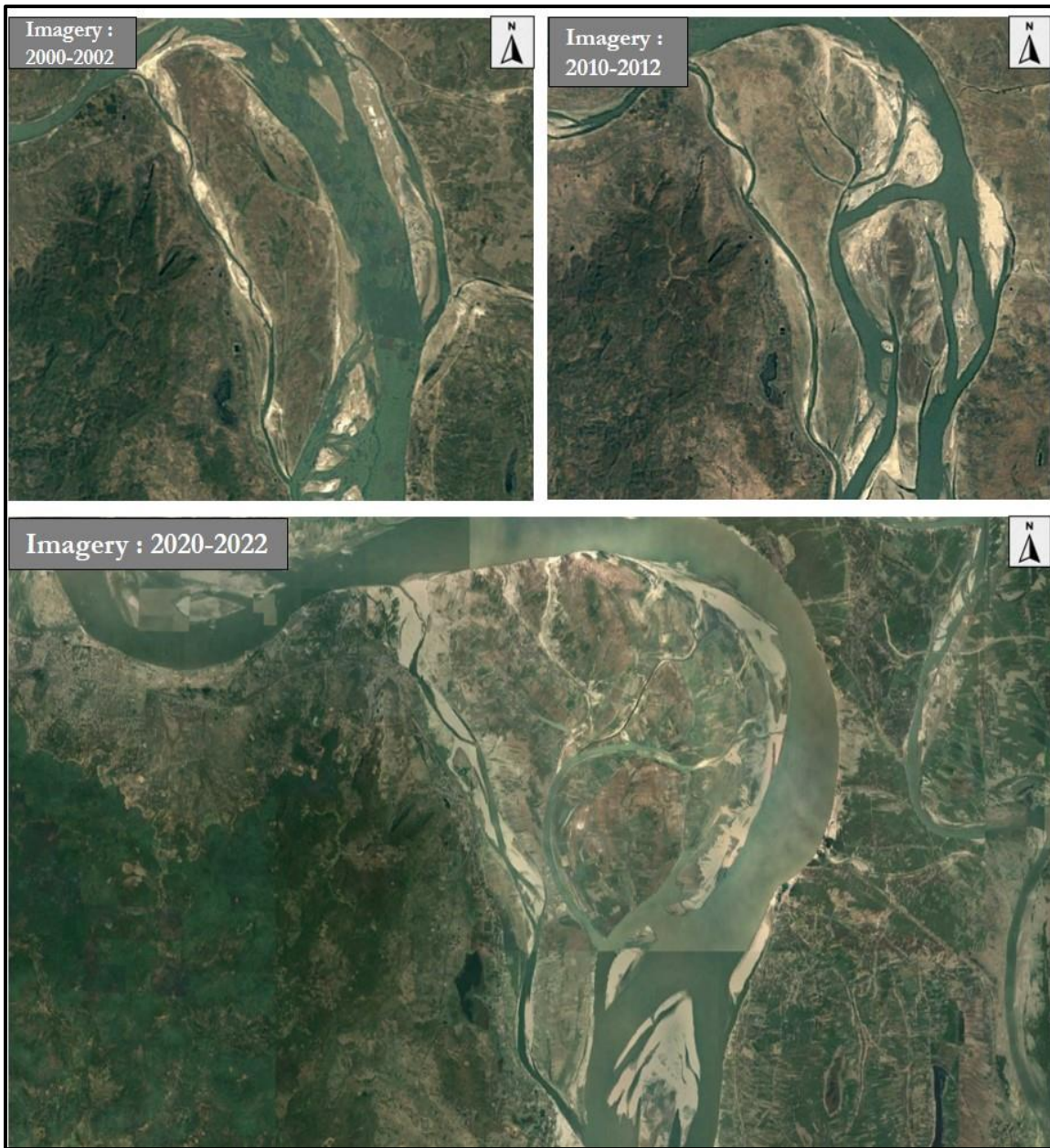


Image 55 : Riverine Island In Sahibganj District

Note: Island morphology fluid as it is located in a meandering section; Gradual land accretion observed and agriculture present throughout the observation period



Image 56 : Piarpur *Diara* In Malda District

Note: Island morphology fluid as it is located in a meandering section; Gradual land accretion observed and agriculture present throughout the observation period



Image 57 : *Char* Mohammadpur In Murshidabad District

Note: Island observed to be broadening eastwards along with accretion of land towards that side; Island is mostly under cultivation barring a vegetated part in its north-western side



Image 58 : Riverine Island Near Chinsurah Municipality

Note: Island in a formative stage with elongated shape; Land accretion taking place leading to broadening and elongation of the island and it also appears to be stabilizing through natural vegetation



Image 59 : Balari Bar Near Hooghly Estuary

Note: Island in a formative stage and currently joined with *Nayachar* island; Its northern half under cultivation and southern half under natural vegetation



Image 60 : Nayachar Island In Hooghly Estuary

Note: Stable island with no significant changes in size or shape, Balari bar now part of this island; Island under agriculture and aquaculture farms

Pattern in Island Location

So far there is no discernible pattern to island location or eventual size. An examination of the Ganga map of 1786 [Renell's], when the river had virgin flow highlights that:

- There were far fewer islands than presently.
- The island locations were at bends, at confluences where there was a pushback to the tributary flow when the main stem was in spate.
- In stretches where the river bed was wide resulting in braiding tendency post monsoon.
- In upper reach the island could form with an immovable rocky outcrop or heavy boulder as a core.
- Barrage interventions have an impact on island location and formation. Thus, barrages slow down the water velocity immediately after the monsoon thereby enabling higher deposition of sediment downstream of the barrage while at the same time the barrage holds back or diverts [into canals] much sediment which would have otherwise added to island formation.
- Images 61-63 depict three major islands that were visible even during that time in the Renell's Map of Ganga River. These were much smaller than presently.
- Furthermore, Annexure II provides a list of islands that were present during that time in the Renell's Map of Ganga River



Source : The Map Of Bengal, Bahar, Oude & Allahabad [James Rennell], 1786. (Re-engraved By William Faden)

Image 61 : Renell's Map Showing Raghopur Diara During 1786

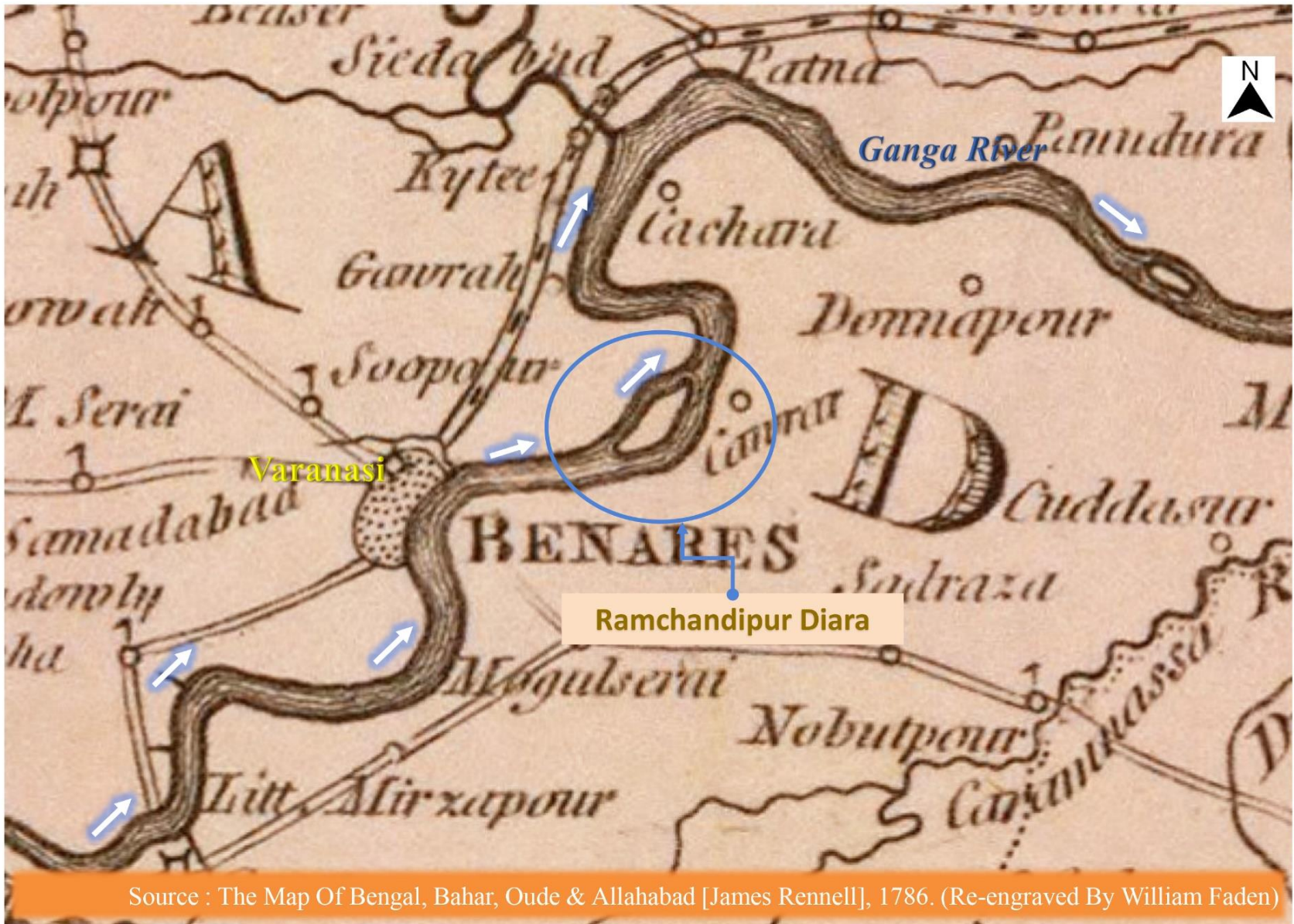
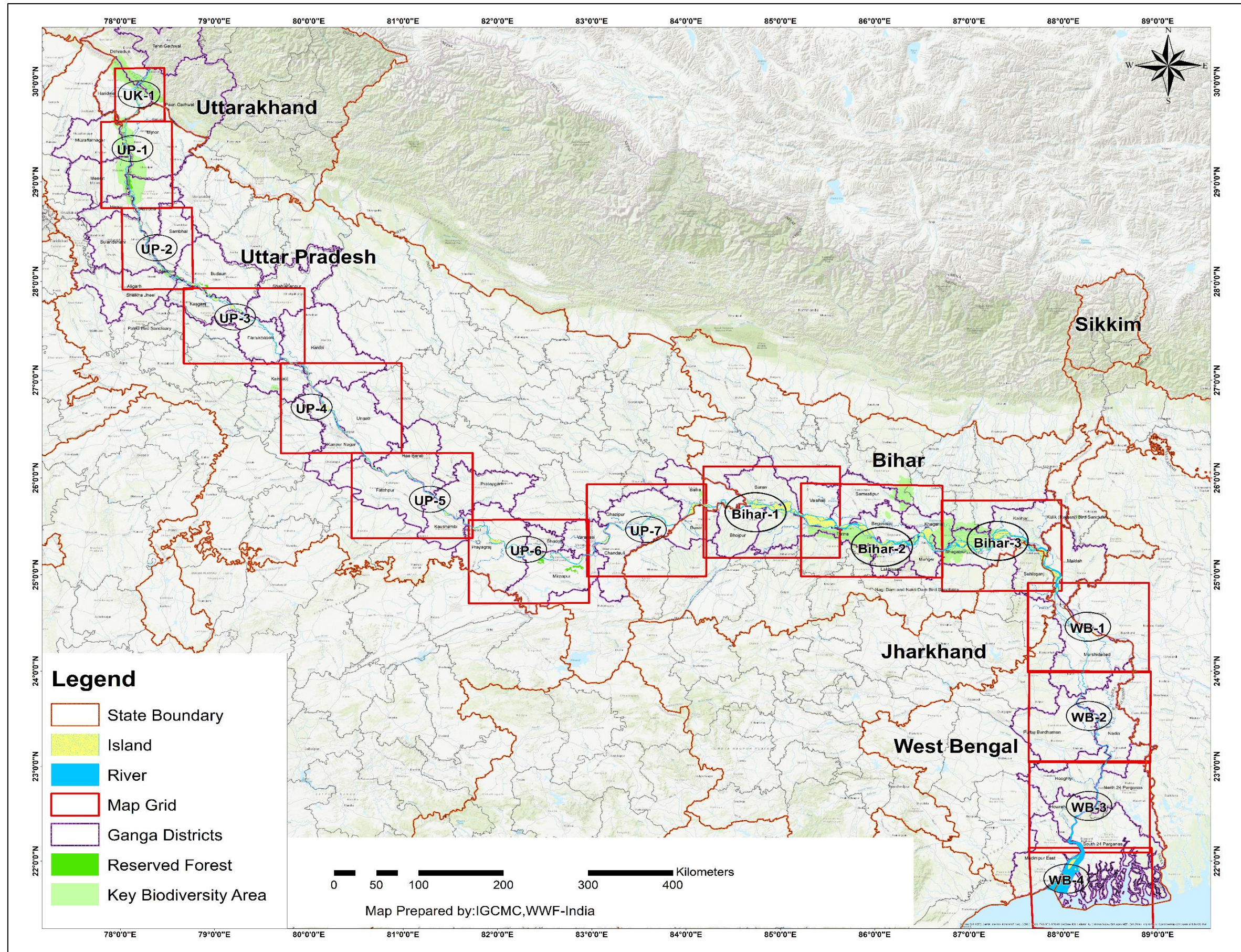
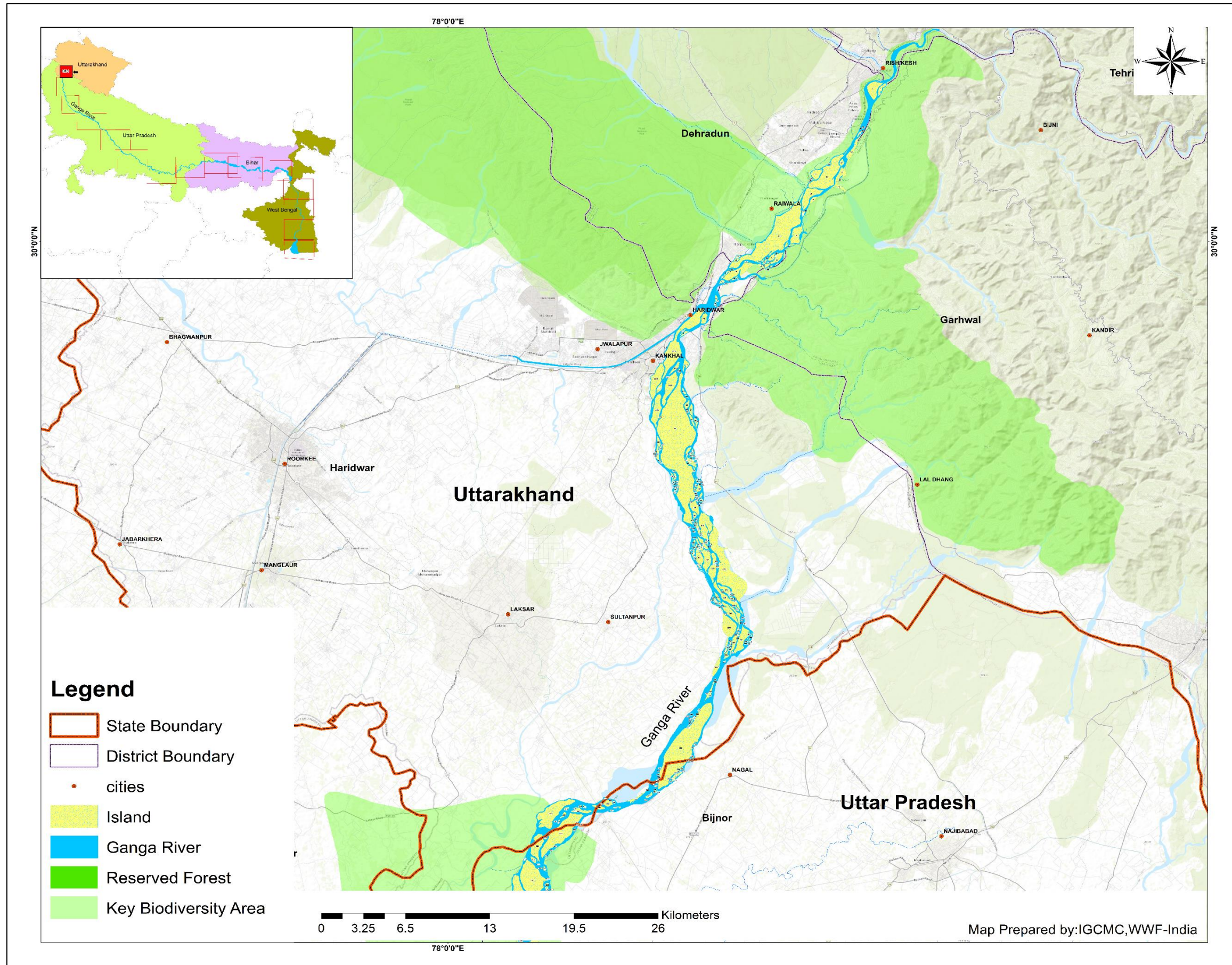


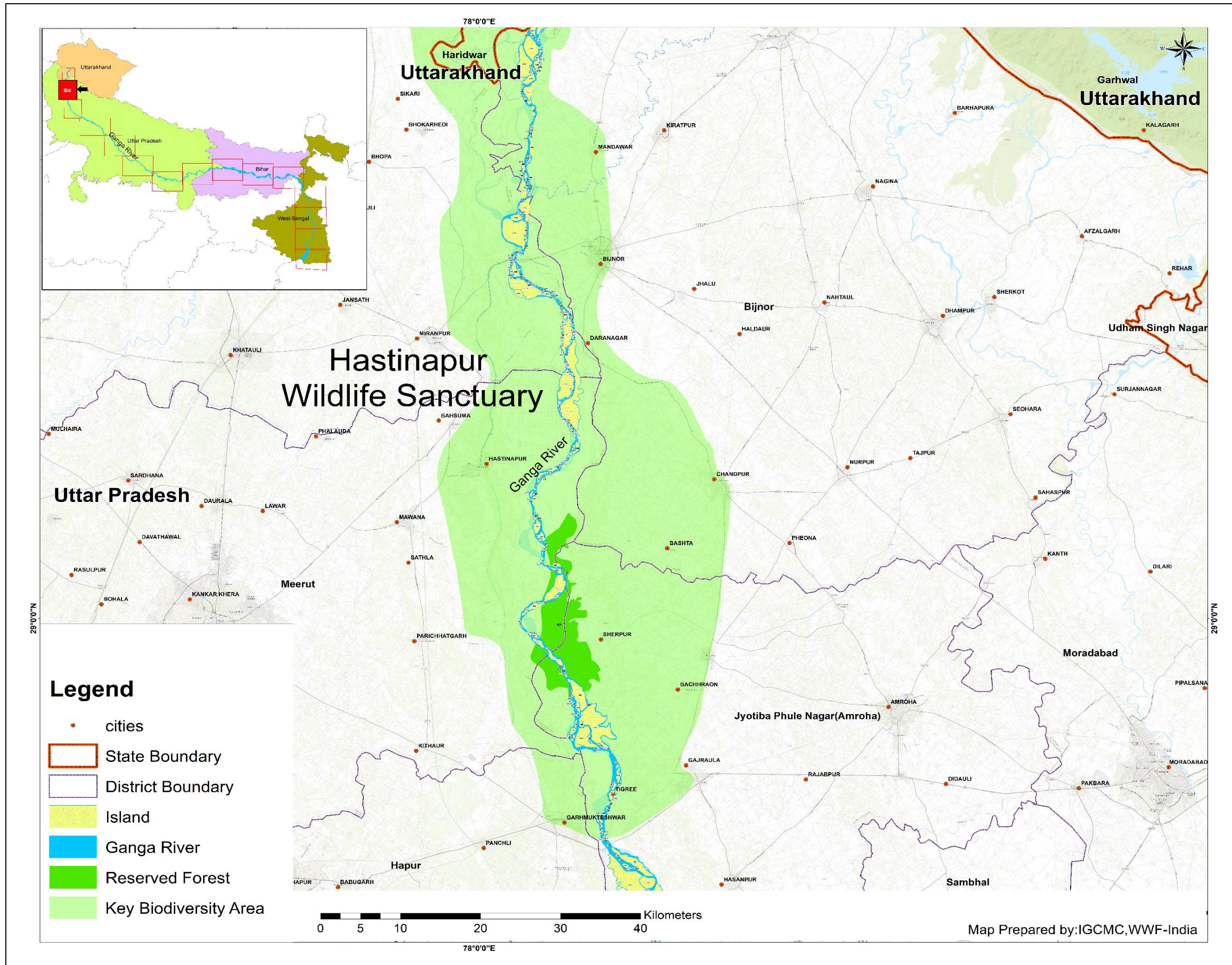
Image 62 : Renell's Map Showing Ramchandipur Diara During 1786



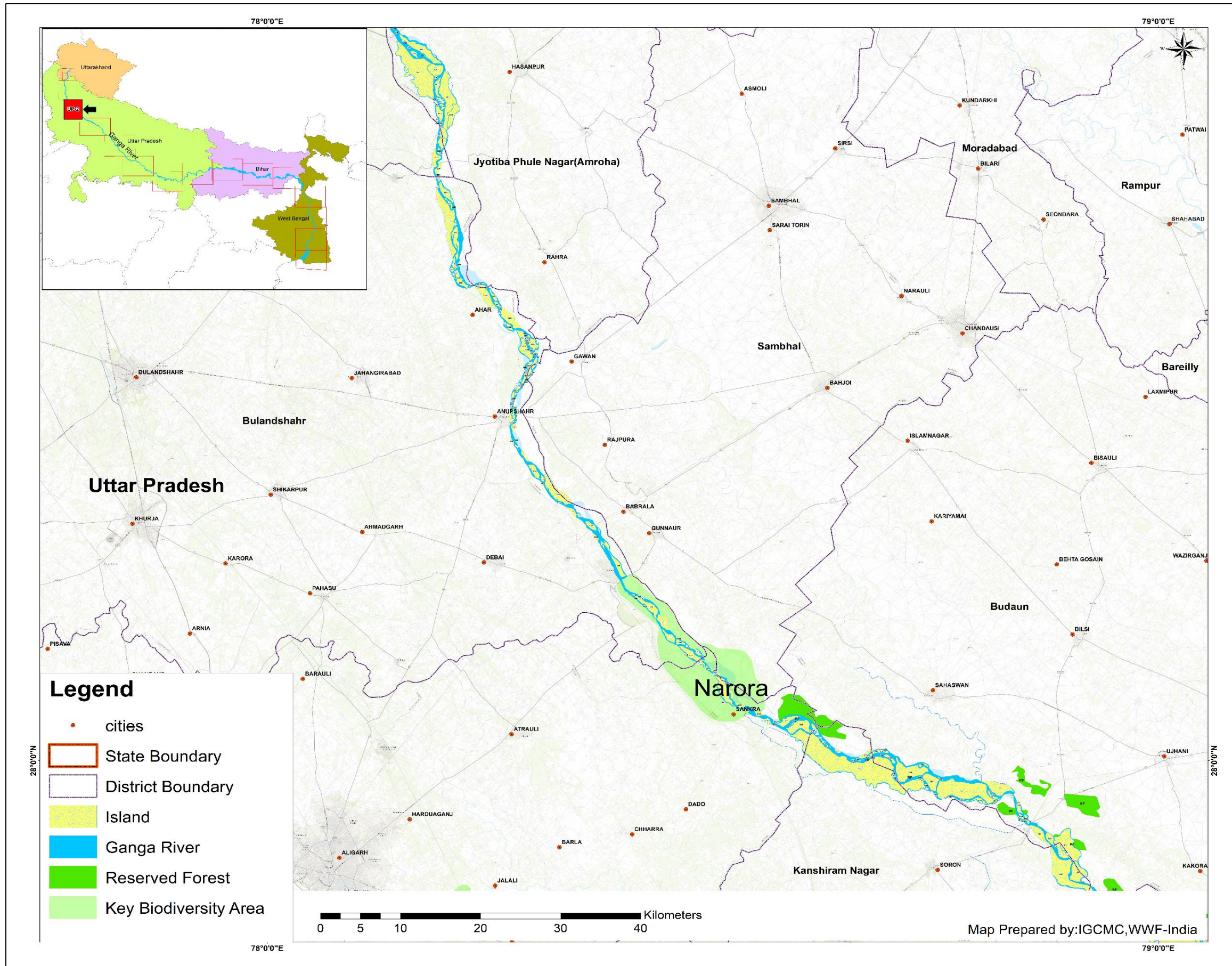
Map 1 : Map Showing The 15 Mapping Grids Used In This Study



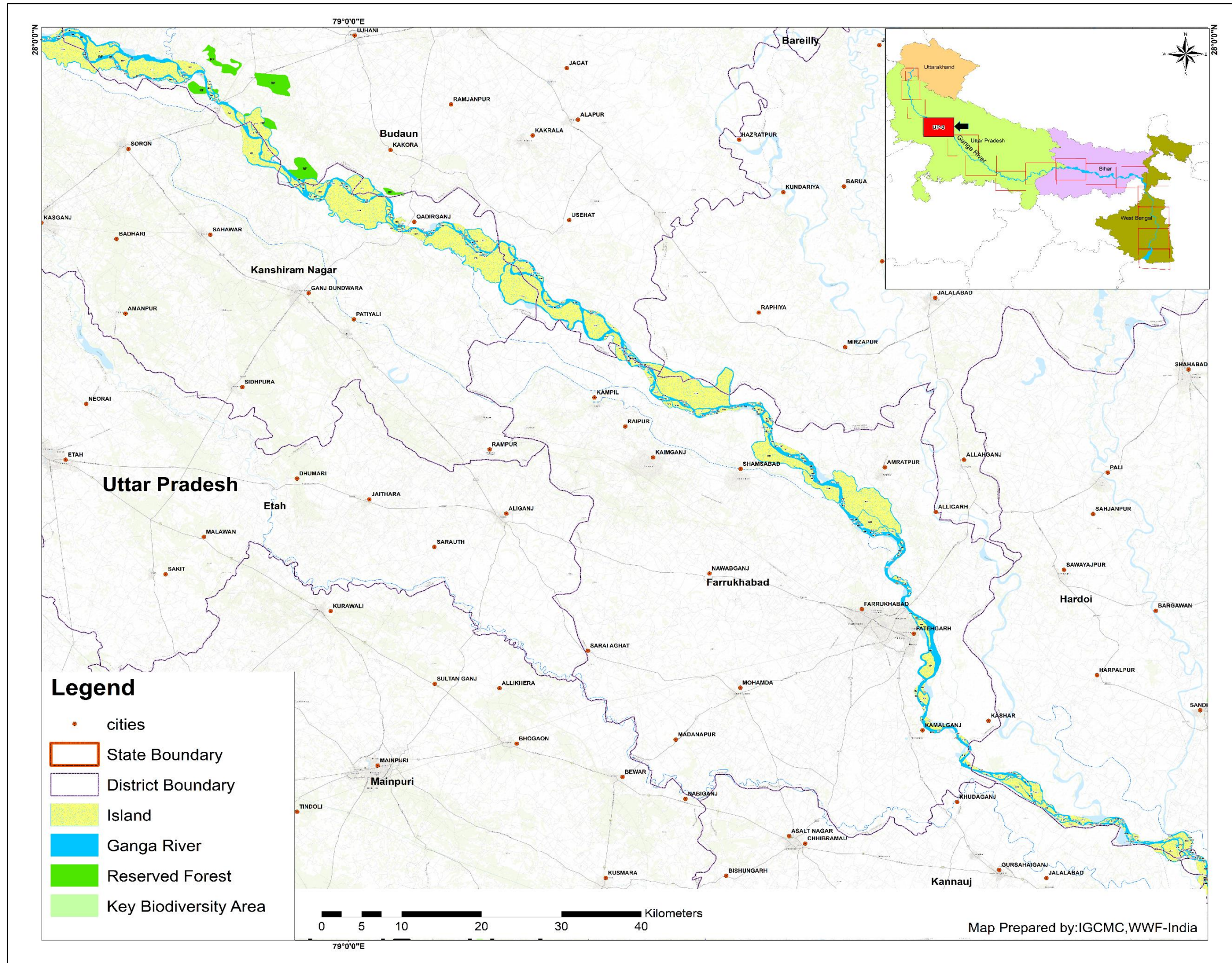
Map 2 : Uttarakhand Islands Grid - 1



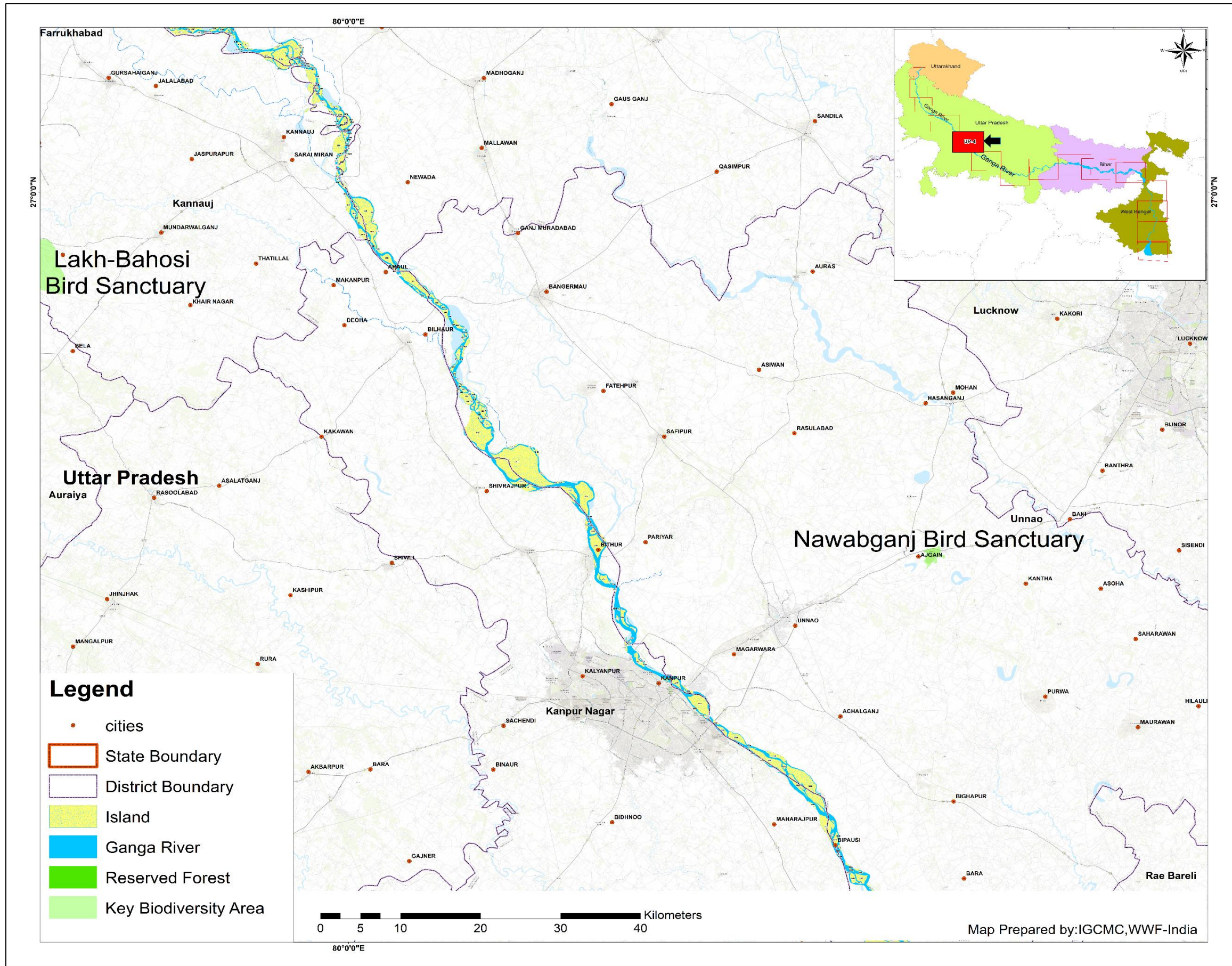
Map 3 : Uttar Pradesh Riverine Islands Grid - 1



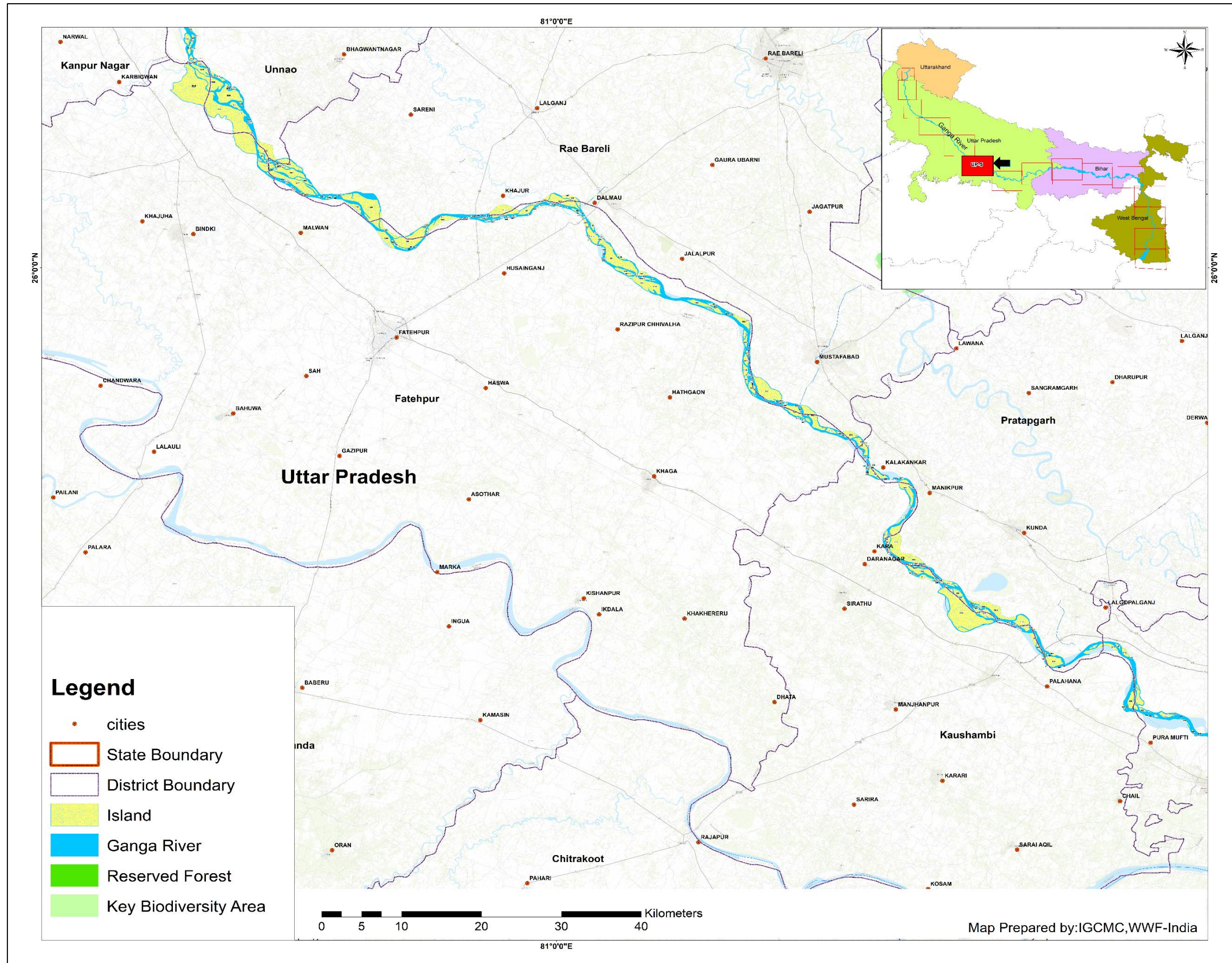
Map 4 : Uttar Pradesh Riverine Islands Grid -2



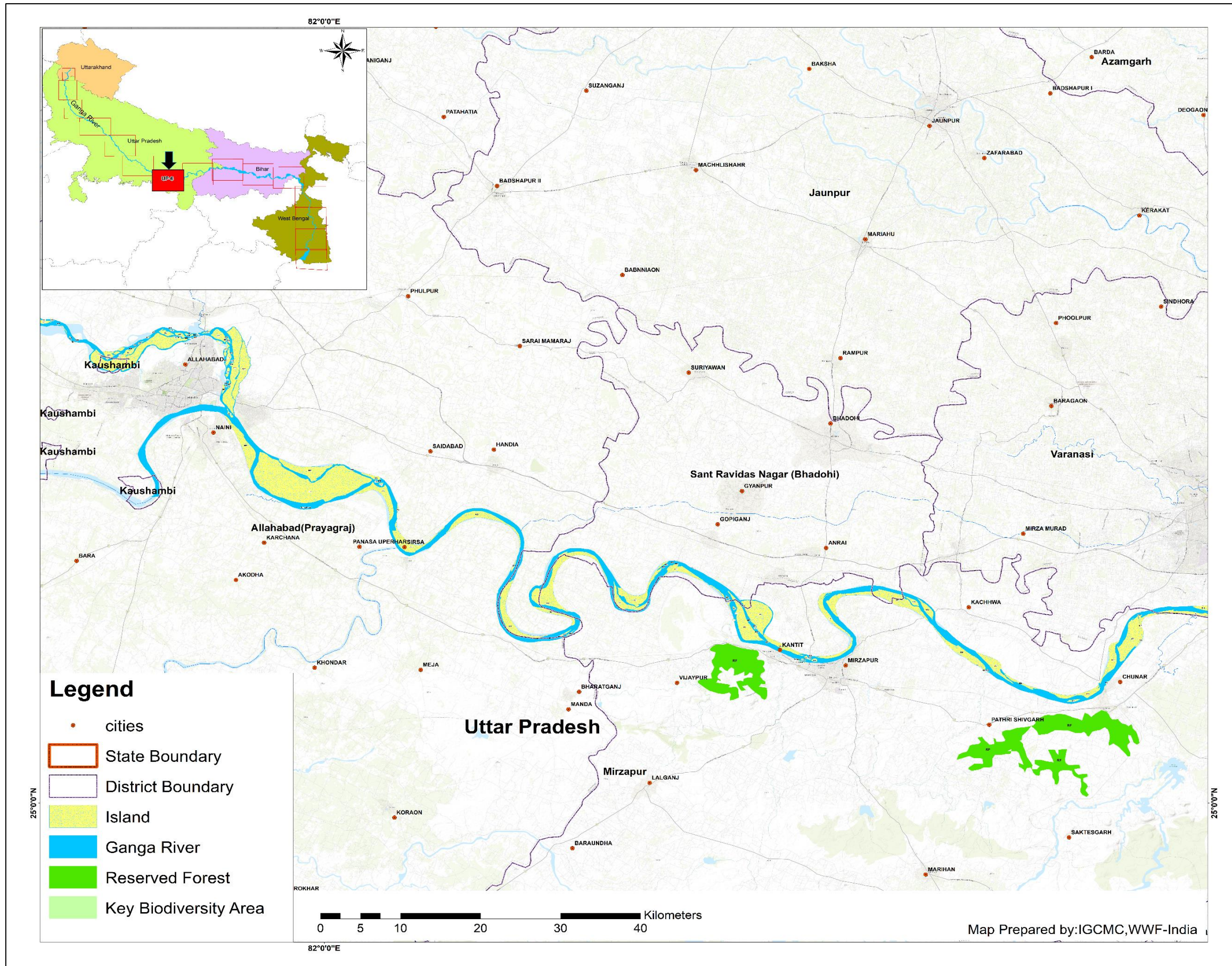
Map 5 : Uttar Pradesh Riverine Islands Grid - 3



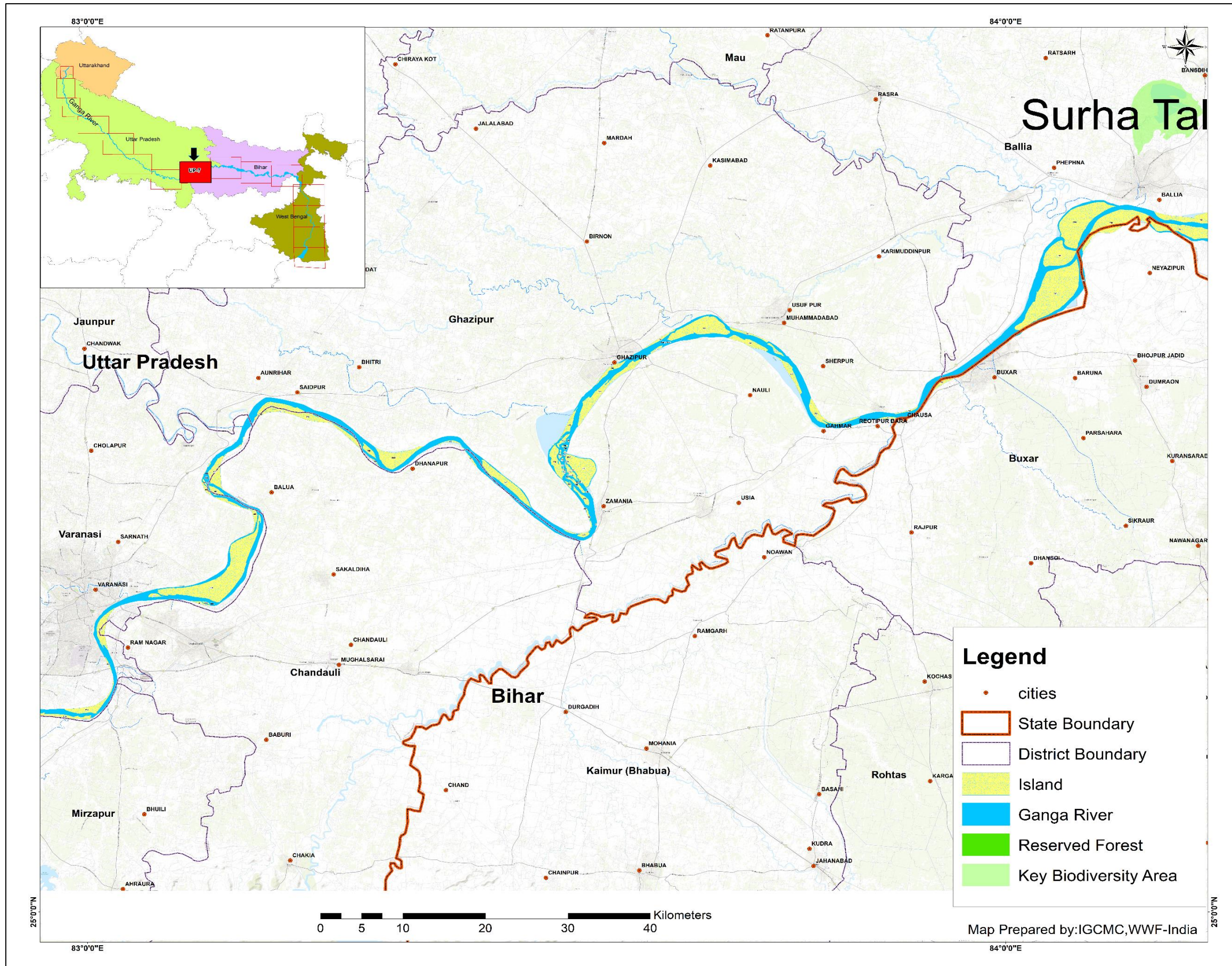
Map 6 : Uttar Pradesh Riverine Islands Grid - 4



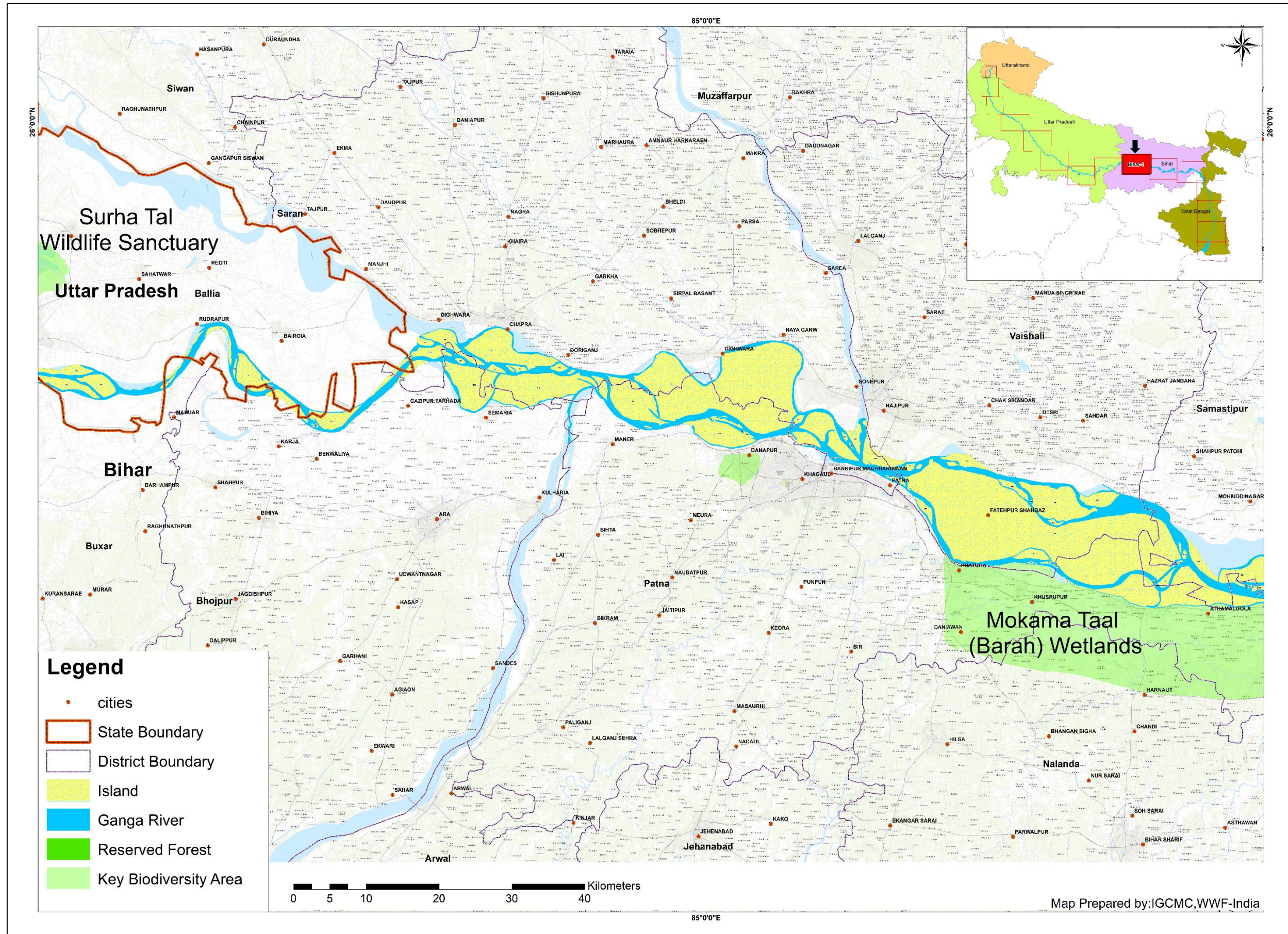
Map 7 : Uttar Pradesh Riverine Islands Grid - 5



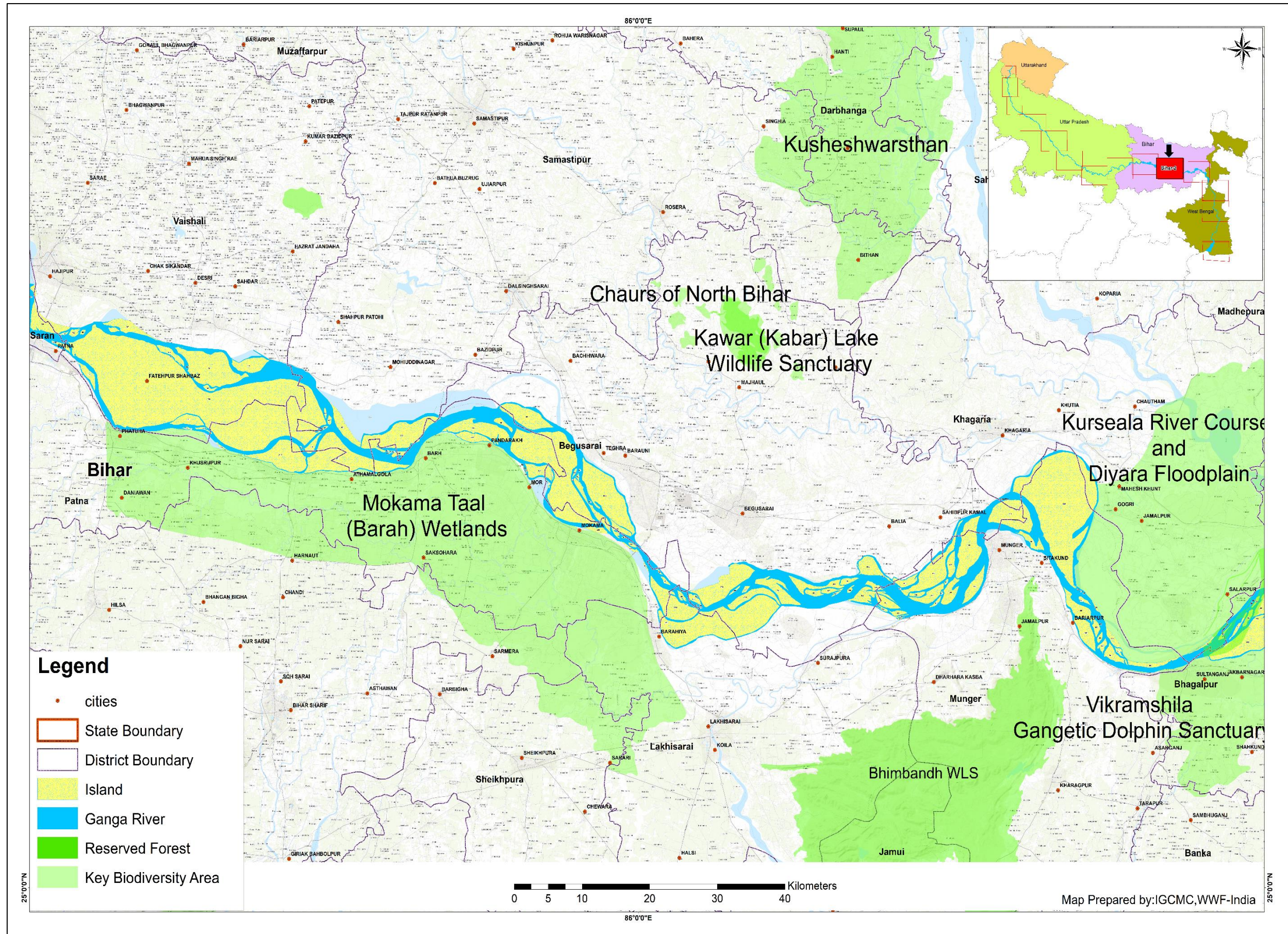
Map 8 : Uttar Pradesh Riverine Islands Grid - 6



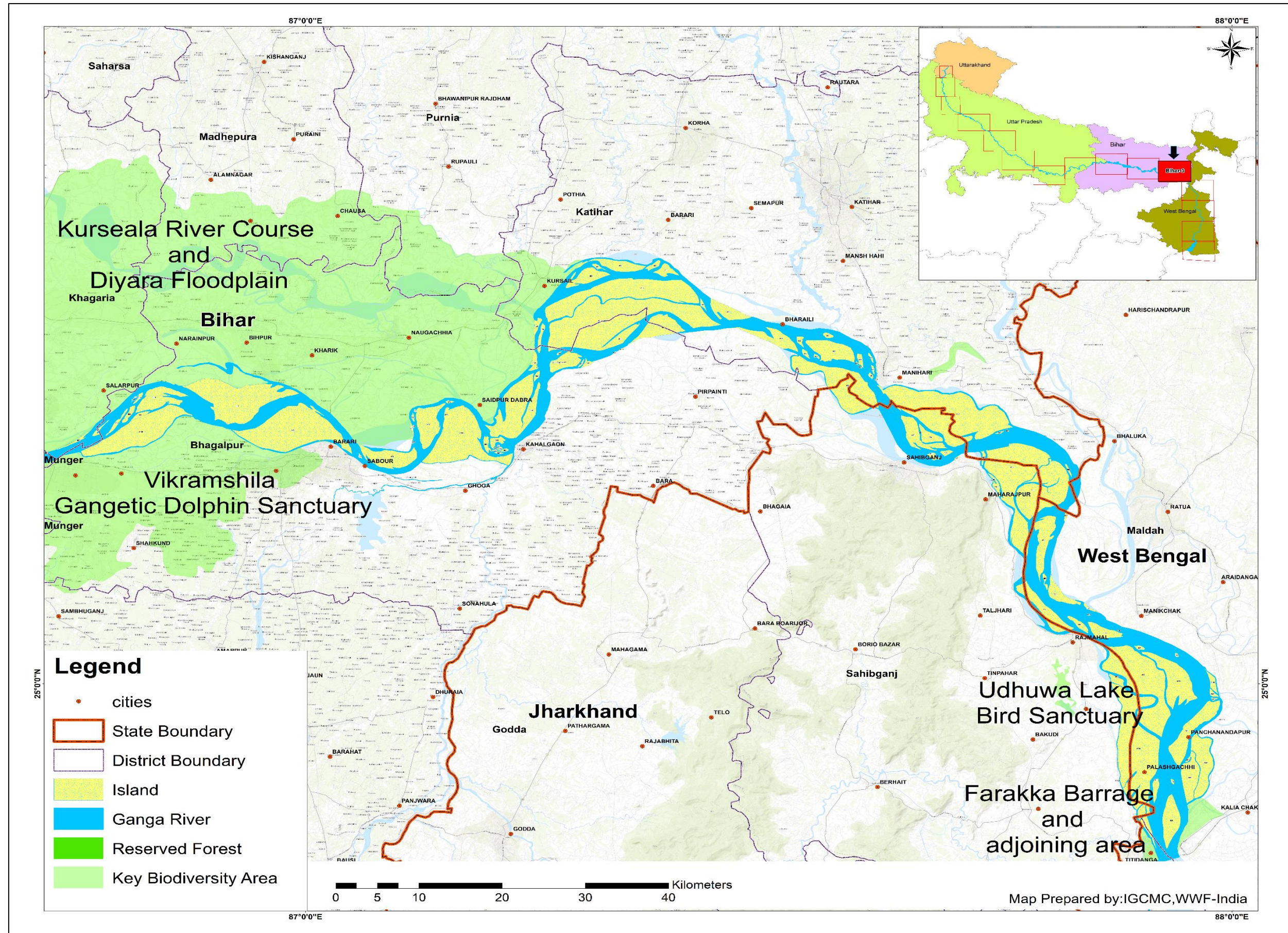
Map 9 : Uttar Pradesh Riverine Islands Grid - 7



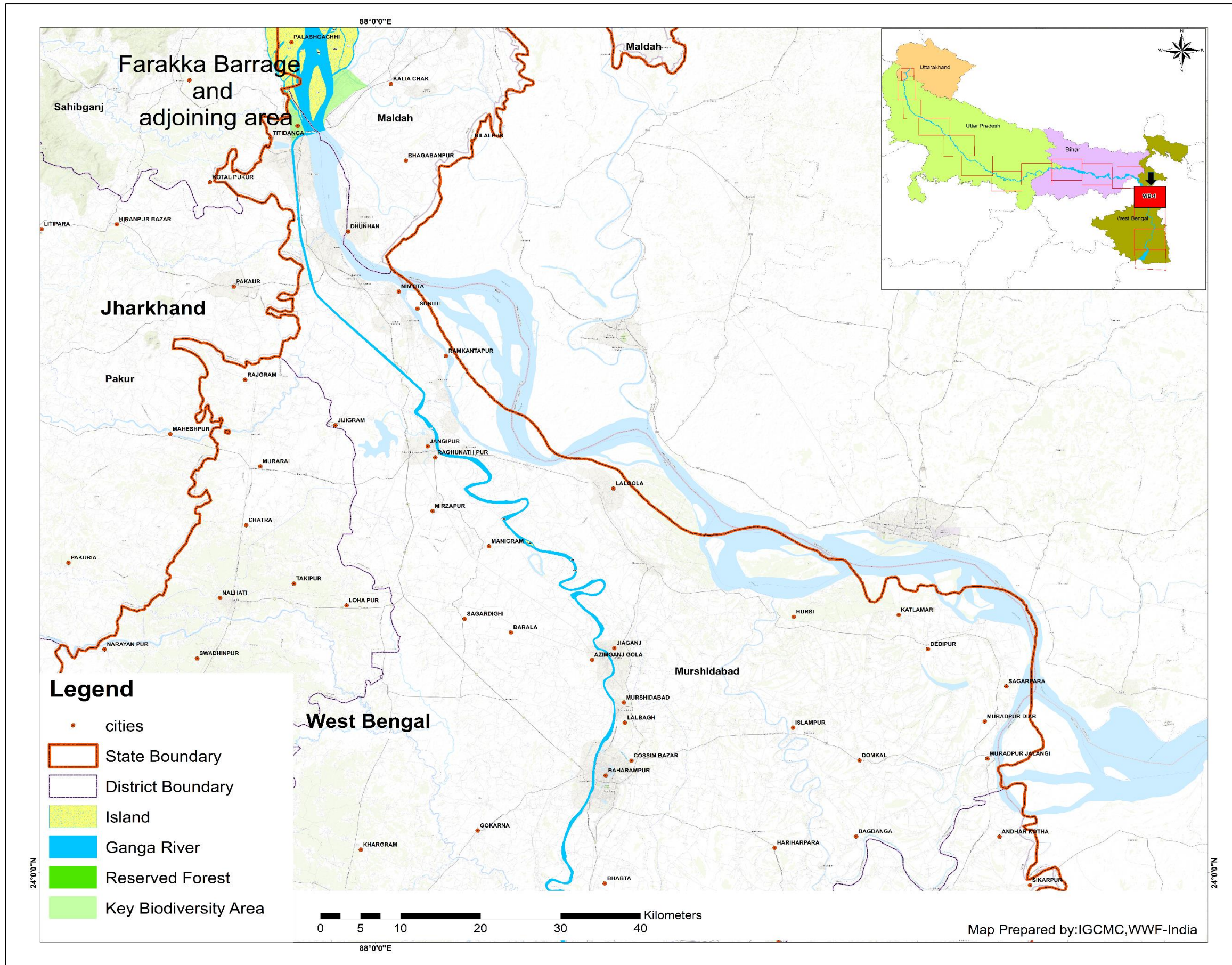
Map 10 : Bihar Riverine Islands Grid - 1



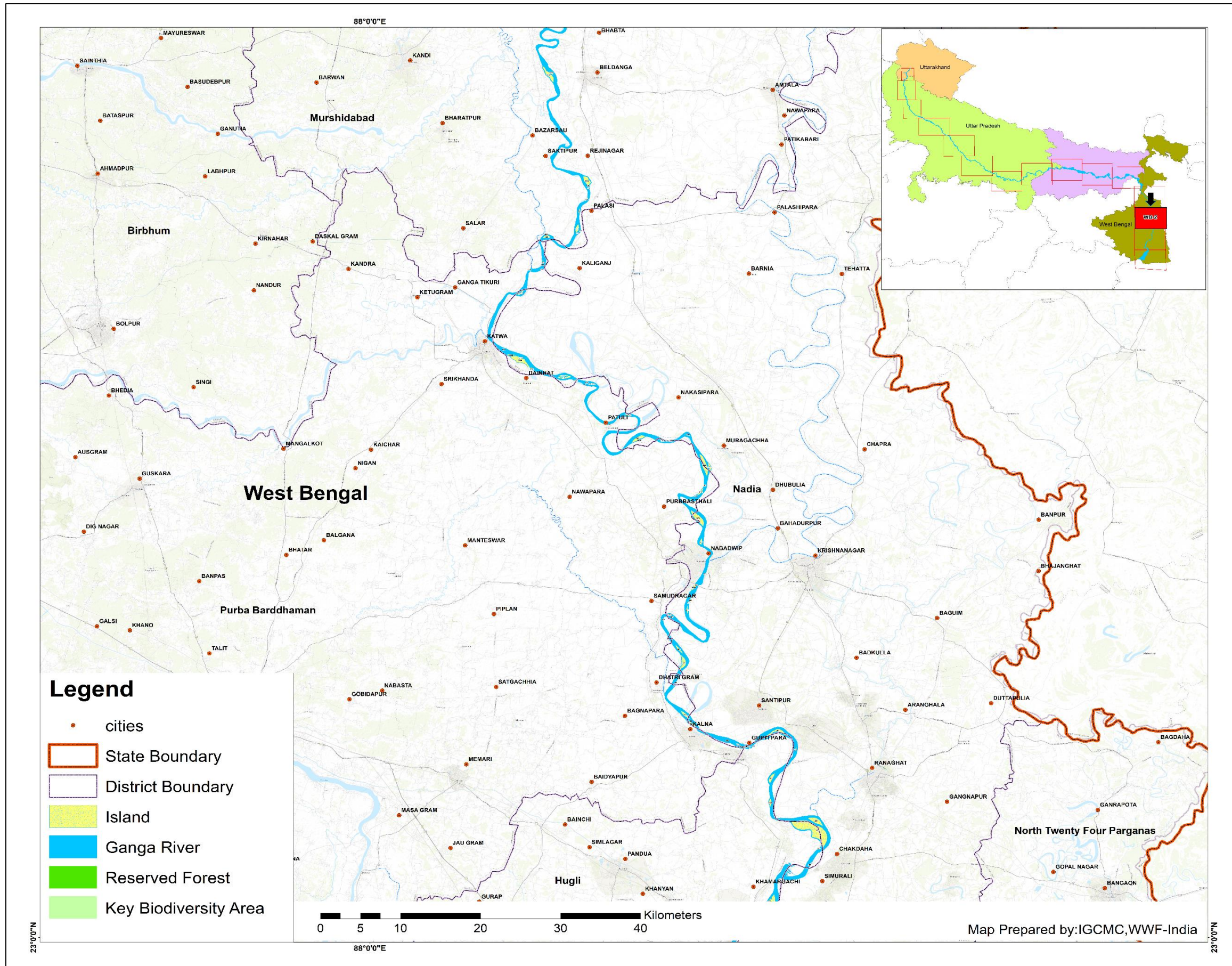
Map 11 : Bihar Riverine Islands Grid - 2



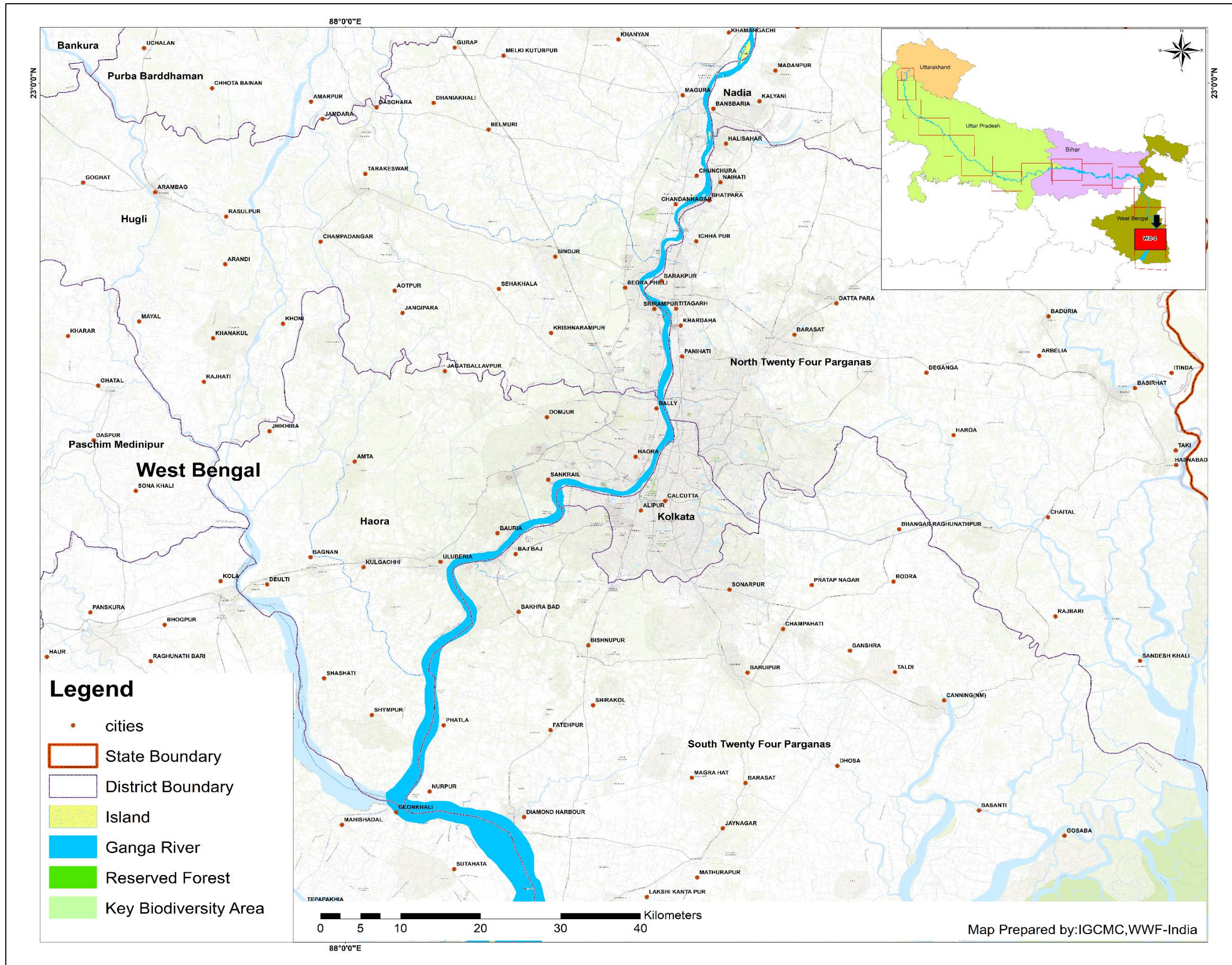
Map 12 : Bihar Riverine Islands Grid - 3



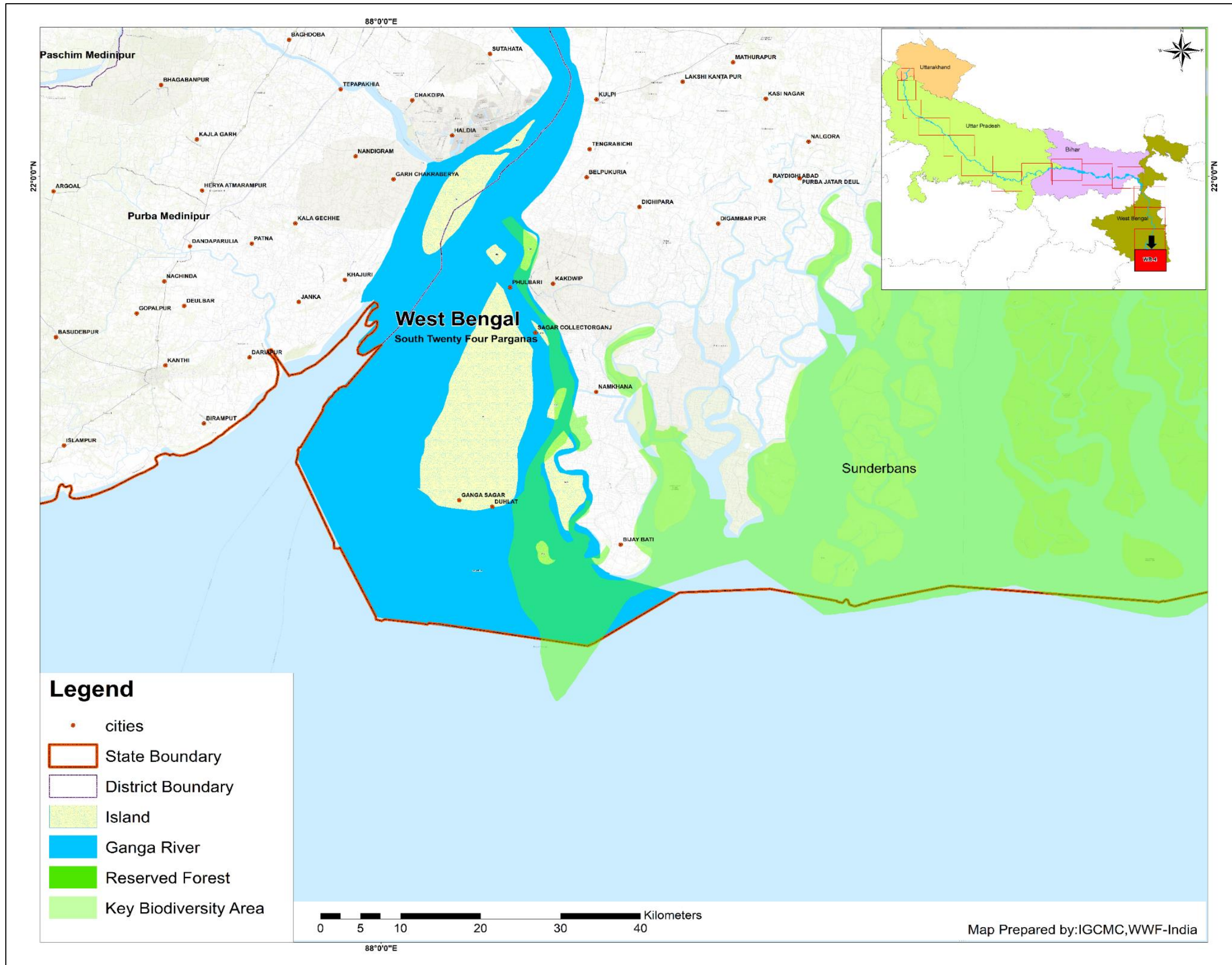
Map 13 : West Bengal Riverine Islands Grid - 1



Map 14 : West Bengal Riverine Islands Grid - 2



Map 15 : West Bengal Riverine Islands Grid - 3



Map 16 : West Bengal Riverine Islands Grid - 4

CHAPTER 5 – FIELD SURVEY OF GANGA RIVERINE ISLANDS

5.1 In this study, a total of 13 different islands in the Ganga River (including the Hooghly River stretch) were selected for survey. The field trips were carried out in different seasons – pre-monsoon, monsoon and post-monsoon to record various parameters such as vegetation, wildlife diversity, types of agriculture, submergence of islands, accessibility, threats to settlements, erosion issues, human-animal conflicts and so on. The flora and fauna were identified and recorded based on direct visual sightings as well as inputs from local residents on and around these islands. Furthermore, the data on agriculture and horticulture on the riverine islands were recorded in different seasons based on both visual sightings and interactions with concerned cultivators, and island and riparian village residents. The representative images of biodiversity, agriculture and landscape elements were recorded using a Nikon D3400 DSLR camera, a Sony DSLR camera and mobile phone cameras. The GPS coordinates were recorded using Garmin hand-held GPS and mobile phones wherever necessary. The details of the study sites along with a timeline of the field survey are presented in Table 8.

5.2 The details recorded during the field survey for all the islands in the Ganga River (including the Hooghly River stretch) are discussed in this chapter. Some of the **key findings** are as follows:

- ❖ **It is clear that all islands are coming under anthropogenic pressure as the growing population shrinks land availability for all uses on the adjacent mainland. A strong impression emerged that there is pressure to colonize islands for various usages.**
- ❖ **Islands with large settled populations have no masterplans, building regulations, sewage disposal infrastructure or environmental management plans.**

- ❖ The annual flooding and monsoonal submergence impact the *kharif* crop cycle on the cultivated islands but this is somewhat compensated by the *zaid* [summer] crop.
- ❖ The annual submergence is not a deterrent to colonization if other conditions such as proximity to the city and low land price are incentive factors.
- ❖ Use of chemical fertilizer, although not rampant, is prevalent.
- ❖ Seasonal changes in the area and form of riverine islands could be observed from the survey, confirming the findings of the mapping exercise. This resulted from the deposition of new sediments and erosion of island edges occurring during monsoon annually.
- ❖ The islands in the upper stretches of the Ganga River are comprised of a mixture of boulders and coarse sediments whereas the islands further downstream are comprised of finer sediments. This is so as the boulders break up into small stones and coarse sediments which grind together to produce finer sediment.
- ❖ Soil fertility is high owing to mineral-rich sediment deposits and high-water table. The crop grown depends on the demand and near a big city, vegetables are the main crop.
- ❖ Proper land ownership and records are available with residents on islands that are formed due to the separation of a mainland area caused by the shifting course of the river resulting in braiding.
- ❖ However, on newly formed islands and sandbars, most residents from neighboring villages practice cultivation based on first come first serve basis or with the help of local musclemen or with the involvement of some members from local authorities without having any ownership document.
- ❖ The islands with low human footprint are those vulnerable to high-velocity currents. Low human use creates space for wildlife to flourish. Thus, wild boars, nilgai, wild cats, and several native and migratory birds especially in Haridwar and Fatehpur Districts.

Elephant movement corridor was noted on some riverine islands of the Haridwar District. Otters were noted in the Bhagalpur area.

- ❖ Most of these faunal species retreat to higher land areas on the islands during monsoon floods and start venturing out as water recedes.
- ❖ The islands in the lower stretches of the Ganga River, especially in East UP, Bihar and Jharkhand are used mainly for agriculture and human-animal conflicts are a prime issue, especially with nilgai and wild boars. Feral cattle on the islands in Fatehpur, Mirzapur and Prayagraj Districts are also a huge menace to agriculture.
- ❖ In the case of islands such as Majhara *Diara* in Mirzapur District and the unnamed large island in Prayagraj District, the interlocutors reiterated that agriculture used to be practised till about two decades ago but slowly as most of the island got inundated during floods and inaccessible, cultivation declined paving way for natural forest dominated by Babool trees, *Ziziphus* sp., *Saccharum* grasses and other vegetation.
- ❖ Agriculture on islands varies from season to season with crops such as cucumbers, melon and *parwal* grown during pre-monsoon season and mustard along with different vegetables being grown during post-monsoon season.
- ❖ Islands such as Ramchandipur *Diara* in Varanasi District, Raghopur *Diara* in Vaishali District and Gopalpur *Diara* in Sahibganj District are heavily colonized with facilities such as pucca roads, multistoried houses and other buildings, water tanks, *panchayat* and block offices, schools and other facilities. While Ramchandipur island has been connected by a bridge to Varanasi District, there's a new highway under construction over Raghopur *Diara* with entry and exit routes being developed for round the year island connectivity. These developments are causing land values to rise

and increasing population size commands influence with politicians.

- ❖ Furthermore, several islands in the Ganga River stretch of Bihar, Jharkhand and West Bengal States are known hubs for crime and unlawful activities mainly due to jurisdiction issues with the island being a kind of a no man's land between districts on the opposing banks. Some District Magistrates suggested the need for a river police.
- ❖ The *Nayachar* island surveyed in the Hooghly estuary has been encroached heavily by residents from neighboring districts, its native vegetation cleared and rampant unchecked aquaculture farms have developed. On the other hand, *Char* Mohammadpur island in the Hooghly River stretch of Murshidabad District has dense tree plantations along with other native vegetation and agricultural fields.
- ❖ Chinsurah island in Hooghly River has variable location and size depending upon flood conditions. Since it is an island close to the urbanized Chinsurah Municipality, the authorities are planning to convert it into a tourism site to generate revenue for the cash-starved municipality. Lavanya island at Prayagraj is being considered a tourist resort by a private entrepreneur.
- ❖ Illegal sand mining takes place on sandbars which emerge post monsoons and are easy of access through the shallow or dry channel. If the head of the sandbar is thus damaged then the bar can be greatly depleted or washed out in the subsequent monsoon.

Table 8 : Details Of The Field Survey Of Ganga Riverine Islands

Sr. No.	Riverine Island	Survey Date/s	Sites visited
Islands in Ganga River (including Hooghly)			
1.	Island group in Ganga River stretch of Haridwar District	June & November, 2022	<p>Near Haridwar city [29°55'39.71"N, 78°9'24.52"E]</p> <p>Near Jagjeetpur village [29°54'32.97"N, 29°54'32.97"N]</p> <p>Near Rampur raighati & Bhikhampur [29°42'59.21"N, 78°11'15.18"E]</p>
2.	Unnamed island in Ganga River, Fatehpur District	5 th December, 2022	<p>Near Lalganj village [26°3'55.62"N, 80°48'8.93"E]</p> <p>Near Rampur Kalan village [26°3'8.98"N, 80°48'14.15"E]</p>
3.	Unnamed island in Ganga River, Prayagraj District	6 th June & 6 th December, 2022	<p>Near Lawayan Khurd village [25°20'8.06"N, 81°55'46.73"E]</p> <p>Near Deeha village [25°19'26.25"N, 82°0'11.80"E]</p> <p>Near Bhadkar Kachar Gairabad village [25°22'20.16"N,</p>

Sr. No.	Riverine Island	Survey Date/s	Sites visited
			81°56'58.25"E]
4.	Majhara <i>Diara</i> in Ganga River, Mirzapur District	7 th June & 7 th December, 2022	Near Semara (Majhara) village [25°12'33.20"N, 82°30'8.72"E]
5.	Ramchandipur <i>Diara</i> in Ganga River, Varnasi District	8 th June & 8 th December, 2022	Near Ramchandipur village [25°20'48.37"N, 83°8'30.64"E] Near Gobraha village [25°21'41.25"N, 83°9'35.73"E] Near Mokalpur village [25°22'37.35"N, 83°10'23.64"E]
6.	Raghopur <i>Diara</i> in Ganga River, Vaishali District	10 th June & 9 th December, 2022	Near Bidupur town [25°38'39.91"N, 85°19'53.44"E] Near Fatehpur block office [25°33'59.87"N, 85°20'48.08"E] Near Bishunpur village [25°34'57.10"N, 85°23'4.43"E]
7.	Unnamed island in Ganga River, Munger District	27 th August, 2022	Near Kastharni Ghat [25°22'57.45"N, 86°27'33.58"E] Munger Ganga bridge [25°24'23.64"N,

Sr. No.	Riverine Island	Survey Date/s	Sites visited
			86°26'59.55"E]
8.	Shankerpur <i>Diara</i> in Ganga River, Bhagalpur district	26 th August, 2022	Near Barai Ghat in Bhagalpur town [25°16'9.76"N, 87°1'35.00"E] Near Brahmababa Ghat in Raghampur village [25°18'46.00"N, 87°0'55.16"E]
9.	Gopalpur/Narainpur <i>Diara</i> in Ganga River, Sahibganj District	29 th August, 2022	Near Satuaghor village [25°14'21.83"N, 87°43'53.11"E]
10.	Piarpur <i>Diara</i> in Ganga River, Malda District	30 th August, 2022	Near Rajmahal [25° 1'18.16"N, 87°51'16.43"E]
11.	<i>Char</i> Mahamadpur in Hooghly River, Murshidabad District	September & October, 2022	<i>Char</i> Mahamadpur [23°49'20.26"N, 88°14'51.33"E]
12.	Nayachar Island, Hooghly estuary	July & August, 2022	On Nayachar Island [22° 0'57.08"N, 88° 7'5.17"E]
13.	Island in Hooghly River near Chinsurah Municipality	May, 2022	Sandeshwar Ghat [22°52'48.71"N, 88°23'51.17"E]

5.3 Island group in Haridwar District, Uttarakhand : Soon after crossing the Bhimgoda barrage, the main channel of the Ganga River is braided due to the presence of several riverine islands and sandbars, most of which are unstable and keep changing. For this study, a group of six different riverine islands namely – Bairagi camp, Dakshadweep, Unnamed Island 1, Jaspur Ranjeetpur, Rampur Raighati ka jungle and Unnamed Island 2 were selected. Table 9 provides the comparative details while Images 64-69 depict the visual observations as recorded during the field survey.

Table 9 : Observations On Riverine Islands In Ganga River Stretch Of Haridwar

Survey Data topics	Riverine Islands					
	Bairagi Camp	Dakshadweep	Unnamed Island 1 [29°53'36.63"N, 78° 8'42.90"E]	Jaspur Ranjeetpur Ka Jungle	Rampur Raighati Ka Jungle	Unnamed Island 2 [29°37'31.38"N, 78° 4'47.64"E]
Ownership & Jurisdiction	Revenue Land, Haridwar District	Revenue & Forest Land, Haridwar District	Forest Land, Haridwar District	Revenue Land [Private ownership], Haridwar and Bijnor District	Revenue Land [Private ownership], Haridwar and Bijnor District	Revenue Land [Private ownership], Haridwar and Bijnor District
Area of the Island [Sq. Km]	2.16	1.17	1.0	6.33	3.40	2.84
Nature of Island	Vegetated	Vegetated	Vegetated	Vegetated	Vegetated	Sandbar
District & villages associated	Haridwar	Haridwar	Haridwar	Haridwar and Bijnor District	Haridwar and Bijnor District	Haridwar and Bijnor District
Agriculture & crop cultivation	No	No	No	Rabi [Wheat], Kharif [Maize] & Zaid [Water melon, Musk melon,	Rabi [Wheat], Kharif [Maize] & Zaid [Water melon, Musk melon,	Zaid [Water melon, Musk melon, cucumber]

Survey Data topics	Riverine Islands					
	Bairagi Camp	Dakshadweep	Unnamed Island 1 [29°53'36.63"N, 78° 8'42.90"E]	Jaspur Ranjeetpur Ka Jungle	Rampur Raighati Ka Jungle	Unnamed Island 2 [29°37'31.38"N, 78° 4'47.64"E]
				cucumber]	cucumber]	
Livestock or Cattle grazing	No	Yes Cow, Sheep & Buffalo	No	Yes Cow & Buffalo	Yes Cow & Buffalo	No
Whether submerged or exposed during monsoon?	Partially submerged every year while completely submerged once in 3-4 years	Partially submerged every year while completely submerged once in 3-4 years	Partially submerged every year while completely submerged once in 3-4 years	Partially submerged every year while completely submerged once in 3-4 years	Partially submerged every year while completely submerged once in 3-4 years	completely submerged every year
Permanent settlements present or absent?	Yes, Illegal settlement	No, Temporary settlement occurs during Kumbh and	No	No	No	No

Survey Data topics	Riverine Islands					
	Bairagi Camp	Dakshadweep	Unnamed Island 1 [29°53'36.63"N, 78° 8'42.90"E]	Jaspur Ranjeetpur Ka Jungle	Rampur Raighati Ka Jungle	Unnamed Island 2 [29°37'31.38"N, 78° 4'47.64"E]
		other Fair				
Connectivity & accessibility of the island	Connectivity through a bridge over river channel	Connectivity through two bridge over river channel	Through personal boats	Through personal boats	Through personal boats	Through personal boats
Natural Vegetation diversity	No vegetation	Yes, Ground cover usually cleared once in year. Scattered trees mainly of Khair, Palas and Semal.	<i>Saccharum</i> sps., Jhau and Scattered trees mainly of Khair, Palas and Semal.	<i>Saccharum</i> sps. & Jhau	<i>Saccharum</i> sps. & Jhau	<i>Saccharum</i> sps. & Jhau
Bioresource utilization	No	No	No, Forest Land	Dried grasses collected for thatching hut roofs, making	Dried grasses collected for thatching hut roofs, making	Dried grasses collected for thatching hut roofs, making

Survey Data topics	Riverine Islands					
	Bairagi Camp	Dakshadweep	Unnamed Island 1 [29°53'36.63"N, 78° 8'42.90"E]	Jaspur Ranjeetpur Ka Jungle	Rampur Raighati Ka Jungle	Unnamed Island 2 [29°37'31.38"N, 78° 4'47.64"E]
				mats & ropes	mats & ropes	mats & ropes
Faunal diversity (habitat & movement corridor)	No	Yes, Elephant, Nilgai & Jackal	Yes, Elephant, Nilgai & Jackal	Yes, Elephant, Nilgai & Jackal	Yes, Elephant, Nilgai & Jackal,	No
Nesting sites of turtles/otters present?	No	No	No	No	No	Yes [As per interlocutors from this area]
Native or Migratory birds visiting?	Yes	Yes	Yes	Yes	Yes	Yes
Human-animal conflict if any?	Yes	Yes	No	Yes	Yes	No
Hunting or any other illegal activity pertaining to wildlife?	Not reported during survey	Not reported during survey	Not reported during survey	Not reported during survey	Not reported during survey	Not reported during survey
Sand mining or any	No	Mining banned	Not reported	Mining	Mining	Not reported

Survey Data topics	Riverine Islands					
	Bairagi Camp	Dakshadweep	Unnamed Island 1 [29°53'36.63"N, 78° 8'42.90"E]	Jaspur Ranjeetpur Ka Jungle	Rampur Raighati Ka Jungle	Unnamed Island 2 [29°37'31.38"N, 78° 4'47.64"E]
other activity?			during visit	reported during survey	reported during survey	
Land records availability	Not found	Not found	Forest land	Not found	Not found	Not found
Any other information?	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.



Image 64 : Dakshadweep Island Connected With Haridwar District Through A Bridge



Image 65 : Construction Activities On Bairagi Camp Island



Image 66 : Nilgai In The Natural Vegetation Of A Riverine Island In Haridwar



Image 67 : Unnamed Island 2 In Haridwar District [Note: This is a sandbar devoid of any vegetation & completely submerges under water]



Image 68 : Temporary Settlements And Cattle Rearing On The Island - Rampur Raighati Ka Jungle Located Between Haridwar & Bijnor Districts



Image 69 : A Flock Of Black-Winged Stilts At Dakshadweep And Bairagi Camp Islands

5.4 **Riverine Islands in Ganga River stretch of Uttar Pradesh** : Four different islands viz.: Unnamed island in Fatehpur District, Unnamed island in Prayagraj District, Majhara *Diara* in Mirzapur District and Ramchandipur *Diara* in Varanasi District were selected for this study. Among these, the island of Prayagraj is the largest in terms of size and is believed to be the oldest too. Agriculture, temporary settlements and sand mining were observed during the field survey of this island. Conflicting Statements by interlocutors in different villages do not lead to a clear picture of any land ownership on this island. As per the information reiterated by interlocutors, this island was not used for agriculture during the last two decades which has led to a dense vegetation that also harbors wild boars and nilgai. The Ramchandipur island in Varanasi is the most developed island with round the year connectivity through a permanent bridge and according to field information, settlements are believed to have been initiated here more than 100 years ago. All the modern-day city facilities such as road connectivity, round the year electricity supply, water storage tanks, village panchayat offices, municipal schools and even a small marketplace exists on this island. The Majhara *Diara* in Mirzapur and Unnamed Island in Fatehpur are naturally colonized by riparian grasses and other flora that harbor wild boars, nilgai and feral cattle all of which cause a menace to agriculture in surrounding villages. While land ownership claims exist in the case of Majhara *Diara*, the island in Fatehpur is accessed and utilized by local village residents from both Fatehpur and Rae Bareilly Districts. as per their mutual understanding. Further details of these islands are presented in Table 10 while Images 70-84 depict some important field observations.

Table 10 : Field Observations On Ganga Riverine Islands In Uttar Pradesh State

Survey Data topics	Riverine islands			
	Unnamed Island in Fatehpur District	Unnamed Island in Prayagraj District	Ramchandipur <i>Diara</i> in Varanasi District	Majhara <i>Diara</i> in Mirzapur District
Ownership & Jurisdiction	Island falls between Fatehpur & Rae Bareilly Districts; No private ownership of any individual recorded.	Island falls entirely in Prayagraj District; Claims of private ownership on lands in the central part of the island, remaining area exploited for agriculture by residents from surrounding villages.	Island is part of Varanasi District; The lands on this island were controlled by local Zamindars of this region in early days, later on records created with local administration, lands sold and passed on to current generation.	Island located in Mirzapur District; Claims of private land ownership recorded during the field survey.
Current Area of Island [Sq. Km]	6.12	33.6	14.4	7.88
Nature of Island	Permanent island & densely vegetated	Permanent island, mostly vegetated	Permanent island with human settlements & agriculture	Permanent island, mostly vegetated
Villages	Lalganj, Adampur &	Bhadkar <i>Kachar</i>	Ramchandipur, Gobrha &	Semara & Majhara

Survey Data topics	Riverine islands			
	Unnamed Island in Fatehpur District	Unnamed Island in Prayagraj District	Ramchandipur <i>Diara</i> in Varanasi District	Majhara <i>Diara</i> in Mirzapur District
associated	Gonda	Gairabad, Lawayan Kalan Uparhar, Lawayan Khurd, Manaiya Uperhar, Jirat Lawaen Gairabad, Kakra <i>Kachar</i> Gairabad	Mokalpur	
Agriculture & crop cultivation	Very little agriculture, mainly cultivation of vegetables.	Barring the central part of the island, agriculture present with crops such as melon, pumpkin, cucumber, mustard and other seasonal vegetables.	Agriculture and horticulture major sources of income for residents on this island. Crops such as wheat, mustard, arhar, chana and various vegetables grown in the fields. Mango, papaya and banana <i>orchards</i> also present on the island.	Very little agriculture, mainly cultivation of vegetables and mustard.
Livestock or	Absent	Residents from	Cattle rearing mainly	Cattle grazing

Survey Data topics	Riverine islands			
	Unnamed Island in Fatehpur District	Unnamed Island in Prayagraj District	Ramchandipur <i>Diara</i> in Varanasi District	Majhara <i>Diara</i> in Mirzapur District
Cattle grazing		different villages take their cattle for grazing on the island.	buffalos and cows for milk.	recorded during field survey by residents of Majhara village.
Whether submerged or exposed during monsoon?	Almost fully submerged during monsoon barring central highland portion.	Fringe parts of the island submerged with central part exposed even during regular floods.	Central part of the island with houses and market area does not get submerged even during floods.	Entire island gets submerged during floods.
Permanent settlements present or absent?	No permanent or temporary settlements on the island.	Few scattered temporary settlements during pre and post-monsoon season.	Densely inhabited with city like settlements and other facilities.	Few scattered temporary settlements during pre and post-monsoon season.
Connectivity & accessibility of the island	The Ganga River channel adjoining Rae Bareilly District dries up significantly during non-monsoon season	Boats are a major source of accessing this island from the right bank of Ganga River while the channel	A permanent bridge connects this island with Varanasi District and provides round the year access.	The Ganga River channel adjoining Majhara & Semara villages dries up significantly during

Survey Data topics	Riverine islands			
	Unnamed Island in Fatehpur District	Unnamed Island in Prayagraj District	Ramchandipur <i>Diara</i> in Varanasi District	Majhara <i>Diara</i> in Mirzapur District
	providing unhindered access to this island.	towards left bank has reduced water during non-monsoon making it easy to access by tractors & trucks.		non-monsoon season providing unhindered access to this island.
Natural Vegetation diversity	Mostly dominated by <i>Saccharum</i> sp. Grasses.	Mostly dominated with <i>Saccharum</i> sp. Grasses and Babool trees.	Most of the trees such as Peepal, Gular, Pakad, Bargad, Babool, Neem and Shisham found on this island are planted. Some very old trees of <i>Ficus</i> sps. also present on the island.	<i>Acacia nilotica</i> (Babool), <i>Saccharum</i> sps. grasses, <i>Ziziphus</i> sps. (Wild ber), <i>Croton bonplandianus</i> (Ban tulsi), <i>Parthenium</i> (Congress grass) & <i>Solanum xanthocarpum</i> (Kantakari)
Bioresource utilization	<i>Saccharum</i> grasses collected for thatching roofs.	<i>Saccharum</i> grasses collected for thatching roofs & Babool wood	In some places <i>Saccharum</i> grasses collected for thatching	<i>Saccharum</i> grasses collected for thatching roofs, Babool wood

Survey Data topics	Riverine islands			
	Unnamed Island in Fatehpur District	Unnamed Island in Prayagraj District	Ramchandipur <i>Diara</i> in Varanasi District	Majhara <i>Diara</i> in Mirzapur District
		collected for burning.	roofs.	collected for burning and fruits of <i>Ziziphus</i> sp. (Wild Ber) collected for eating.
Faunal diversity (habitat & movement corridor)	Reports of various deer species, jackal, wild boar, nilgai and several birds recorded during field survey.	Wild boar, jackal, nilgai, feral cattle and various birds reported to be present on the island.	Occasional sightings of jackal, presence of nilgai reported and some bird species.	Feral cattle, nilgai and wild boar present in huge numbers. Few forest and grassland birds recorded during the survey.
Nesting sites of turtles/otters present?	Not present	Some turtle sightings reported by interlocutors on sandy slopes of the island.	Not present	Not present
Native or Migratory birds visiting?	Yes	Yes	Mostly native birds	Yes
Human-animal	Wild boar, Nilgai and	Nilgai and Wild boars	Nilgai and Wild boars	Wild boar, Nilgai and

Survey Data topics	Riverine islands			
	Unnamed Island in Fatehpur District	Unnamed Island in Prayagraj District	Ramchandipur <i>Diara</i> in Varanasi District	Majhara <i>Diara</i> in Mirzapur District
conflict if any?	Feral cattle major nuisance to agriculture	impacting agricultural produce especially pulses and tuberous crops	impacting agricultural produce especially pulses and tuberous crops	Feral cattle major nuisance to agriculture
Hunting or any other illegal activity pertaining to wildlife?	N.A.	N.A.	N.A.	N.A.
Sand mining or any other activity?	Not present	Sand mining recorded during field survey	Construction of houses, buildings, govt. offices, schools and markets taking place	Not present
Land records availability	No land records available for this island	Claims of land records availability with local tehsil and district office.	Proper land records available with Varanasi District administration and concerned Tehsil office.	Claims of land records availability with local tehsil office.
Any other	The residents from	The central highlands	Demands for more city	Some local residents

Survey Data topics	Riverine islands			
	Unnamed Island in Fatehpur District	Unnamed Island in Prayagraj District	Ramchandipur <i>Diara</i> in Varanasi District	Majhara <i>Diara</i> in Mirzapur District
information?	<p>riparian villages in Rae Bareilly District having easy access to this island are clearing the vegetation paving way for agriculture despite there being no land ownership.</p>	<p>on this island are claimed to be under private ownership and are being cleared for agriculture. The sandy slopes of these islands are cultivated upon by residents of riparian villages on Ganga River banks based upon availability & mutual understanding.</p>	<p>like facilities increasing by residents of this island.</p>	<p>of Majhara village claimed to be in possession of lands on this <i>Diara</i> along with some residents of Mirzapur town but could not produce any document despite requests.</p>



Image 70 : Saccharum Dominated Vegetation On The Riverine Island [Fatehpur District] – Habitat Of Muggers And Gharials



Image 71 : Agriculture Being Practiced On The Island. Thick Saccharum Growth In Background Serves As Wildlife Refuge [Fatehpur District]



Image 72 : Drying Up Of This Ganga River Channel Provides Unhindered Access To The Riverine Island [Fatehpur District]



Image 73 : Accessing The Riverine Island Near Bhadkar Kachar Gairabad Village [Prayagraj District]

[Note: There is no cultivation on sandy floodplain of the bank or the island]



**Image 74 : Part Of The Island As Observed Near Lawayan Khurd Village [Prayagraj Distt]
[Note: Saccharum Grass Cordon for Agriculture Plot Definition]**



Image 75 : Sand Collection Occuring From The Island During Pre-Monsoon Season [Prayagraj District]



**Image 76 : The Smaller Braid Channel Of Ganga River Near Semara Village During Post-Monsoon Season [Mirzapur District]
[Note: Drying Of This Channel Provides Unrestricted Access To The *Diara*]**



**Image 77 : Agriculture And Temporary Shelters During Pre-Monsoon Season [Mirzapur District]
[Note: Steel Wire Fencing For Keeping Out Wild Animals]**



Image 78 : Cattle Grazing On Majhara *Diara* [Mirzapur District]
[Note : The Naturally Occurring Grass Is Abundant, Supports Large Herds Unlike Contested Village Pastures]



Image 79 : Ramchandipur *Diara* As Observed In Pre-Monsoon Season [Varanasi District]
[Note : Trees of the Banks are found on the higher parts of the islands likely originating through animal/bird borne/wind borne seed dispersal]



Image 80 : Ramchandipur *Diara* As Observed In Post-Monsoon Season [Varanasi District]



Image 81 : Pucca Houses On Ramchandipur Island [Varanasi Distt]



Image 82 : Agriculture On Ramchandipur *Diara* [Varanasi District]



Image 84 : Mobile Tower On Ramchandipur Diara [Varanasi Distt.]



Image 83 : Water Storage Tank On Ramchandipur Diara [Varanasi Distt.]

- 5.5 **Riverine Islands in the Ganga River stretch of Bihar & Jharkhand :** A total of 4 different islands were surveyed in this stretch namely – Raghopur *Diara* in Vaishali, Unnamed island in Munger, Shankerpur *Diara* in Bhagalpur and Gopalpur *Diara* in Sahibganj Districts. Among these, the first three are located in Bihar State while the fourth is situated in Jharkhand.
- 5.6 **Raghopur Diara :** The notable of all islands is Raghopur *Diara* which is the biggest riverine island in the entire Ganga River stretch and is the only island to be declared as an independent block with 20 villages under its jurisdiction as part of the Vaishali District. It has its own multistoried block office with a Block Development Officer (BDO) on the island itself in Fatehpur village. Overall there are 88 villages, 20 *panchayats*, 10 High Schools, 68 Middle Schools, 20 bedded hospitals [Mohanpur], and 10 bedded Block hospitals at Fatehpur. The land value is Rs. 4-15 Lakhs/*katha*. Currently, the island is connected only with boats and pontoon bridges as observed during the survey, but a permanent bridge is being planned to give round the year connectivity for this island with both Vaishali and Patna Districts. Several hundred thousand people are dependent upon this island where they have had land ownerships and settlements for hundreds of years with agriculture and cattle rearing being chief sources of livelihoods.
- 5.7 **Unnamed island in Munger :** The other riverine island which is nameless is situated in the meandering section of the Ganga River in Munger District. It is completely surrounded by water on all sides with boats being the only means of access and is under dense vegetation dominated by *Saccharum* grasses.
- 5.8 **Shankerpur Diara :** This is another notable island situated close to Bhagalpur city as it falls within the Vikramshila Gangetic Dolphin Sanctuary limits. This land mass was separated from the mainland due to the change in river course and hence, has private land ownerships where agriculture is being practised. This island is also an important site for smooth-coated otters found only in this stretch along with several native and migratory bird species.

- 5.9 **Gopalpur Diara** : This island in Sahibganj District is a complicated case as some parts of the island fall in Bihar and some in West Bengal State boundaries. During the survey it was observed that it has been densely colonized in the last few years, permanent constructions are present, agriculture and livestock are chief sources of livelihood and demand for permanent connectivity is increasing.
- 5.10 Table 11 provides further details on these islands while Images 85-98 depict some important field observations.

Table 11 : Field Observations On Riverine Islands In Ganga River Stretch Of Bihar And Jharkhand States

Survey Data topics	Riverine islands			
	Raghopur <i>Diara</i> in Vaishali District	Unnamed Island in Munger District	Shankerpur <i>Diara</i> in Bhagalpur District	Gopalpur <i>Diara</i> in Sahibganj District
Ownership & Jurisdiction	<p>Island is an independent block with 20 villages under its jurisdiction as part of Vaishali District</p> <p>Most of the lands are privately owned with records being present in the block office located on the island.</p>	<p>Island is part of the Munger District and mostly vegetated.</p> <p>No claims of any private ownership was recorded for this island.</p>	<p>Entire island is part of Bhagalpur District</p> <p>It was separated from the mainland due to shift in river course. Hence, all lands are privately owned with proper records present.</p>	<p>Majority of island under Sahibganj District while some parts under Bihar and West Bengal State boundaries.</p> <p>Mostly people affected by floods and immigrants from Bangladesh settled on this island with claims of private land ownership.</p>
Current Area of Island [Sq. Km]	235	15.9	22.6	63.3
Nature of Island	Permanent island with settlements and agriculture	Permanent island with vegetation	Permanent island with agriculture	Permanent island with settlements and agriculture

Survey Data topics	Riverine islands			
	Raghopur <i>Diara</i> in Vaishali District	Unnamed Island in Munger District	Shankerpur <i>Diara</i> in Bhagalpur District	Gopalpur <i>Diara</i> in Sahibganj District
Villages associated	Fatehpur Sahbaz, Bishunpur, Kala <i>Diara</i> & Paharpur	Near Kastharni Ghat, Munger Ganga bridge	Near Barai Ghat & Near Brahmbaba Ghat	Satuaghor village
Agriculture & crop cultivation	Agriculture dominant source of livelihood. Pulses such as wheat, rice, mustard, arhar and chana; Vegetables such as brinjal, potato, karela, mutter and parwal; Fruits such as melon, musk melon, mango & banana grown here.	Agriculture only on fringe parts of the island.	Agriculture prevalent with crops such as mustard, potato, mutter and parwal grown here.	Agriculture prevalent with crops such as rice, cucumber, parwal, watermelon and mustard grown here.
Livestock or Cattle grazing	Livestock rearing present and it includes cows, buffaloes & goats. Cattle grazing mainly	Livestock & cattle grazing absent.	Livestock includes mainly buffaloes which graze on grass-dominated	Livestock includes mainly buffaloes which graze on grass-dominated areas on the island.

Survey Data topics	Riverine islands			
	Raghopur <i>Diara</i> in Vaishali District	Unnamed Island in Munger District	Shankerpur <i>Diara</i> in Bhagalpur District	Gopalpur <i>Diara</i> in Sahibganj District
	along roadsides or in grass-dominated areas on the island.		areas on the island.	
Whether submerged or exposed during monsoon?	Majority of island submerges during monsoon with only the central highland part including the block office remains unsubmerged.	Most island is submerged with some areas exposed.	Most island was observed to be submerged with only few higher lands in the central part remaining unsubmerged.	Central part of the island including where constructions are made were observed to be exposed during floods while remaining part of island submerged.
Permanent settlements present or absent?	Permanent and temporary settlements present on the island. Multistoried block office, panchayat offices, other Govt. buildings, police station, pucca houses,	Temporary settlements on the fringe parts of this <i>Diara</i> observed during the survey.	Temporary settlements	Few scattered temporary settlements during pre and post-monsoon season

Survey Data topics	Riverine islands			
	Raghopur <i>Diara</i> in Vaishali District	Unnamed Island in Munger District	Shankerpur <i>Diara</i> in Bhagalpur District	Gopalpur <i>Diara</i> in Sahibganj District
	roads, water storage tanks and all other facilities of a major city available on the island.			
Connectivity & accessibility of the island	Connected by boats and pontoon bridges from both Vaishali and Patna Districts. A permanent bridge being connected to provide round the year connectivity & access.	Only accessible by boats.	Only accessible by boats.	Only accessible by boats.
Natural Vegetation diversity	Several trees of Mango, Khajuri, Peepal, Neem, Semal, Bargad along with luxuriant growth of <i>Saccharum</i> sp. grasses	Most of the island is densely vegetated dominated by <i>Saccharum</i> sps. grasses	The natural vegetation occurs only on fringe parts of the <i>Diara</i> and comprises mainly by	Trees such as Neem, Peepal & Babool along with <i>Saccharum</i> sp. grasses and Bamboo present on this island.

Survey Data topics	Riverine islands			
	Raghopur <i>Diara</i> in Vaishali District	Unnamed Island in Munger District	Shankerpur <i>Diara</i> in Bhagalpur District	Gopalpur <i>Diara</i> in Sahibganj District
	present on this island.		<i>Saccharum</i> sps. grasses.	
Bioresource utilization	<i>Saccharum</i> grasses collected for thatching roofs & Babool wood collected for burning.	<i>Saccharum</i> grasses collected for thatching roofs.	<i>Saccharum</i> grasses collected for thatching roofs.	<i>Saccharum</i> grasses collected for thatching roofs.
Faunal diversity (habitat & movement corridor)	Wildlife on the island comprises of nilgai, wild boars, jackals, wild cat and several bird species.	No major faunal sightings or information could be obtained for this island.	As this island falls within Vikramshila Gangetic Dolphin Sanctuary, it serves as habitat for the endangered Smooth coated otters, riverine turtles and even Gharial. Furthermore, migratory birds such as Bar-headed Geese along with several	Barring presence of few nilgai and wild boar, no other faunal sightings or information obtained for this island.

Survey Data topics	Riverine islands			
	Raghopur <i>Diara</i> in Vaishali District	Unnamed Island in Munger District	Shankerpur <i>Diara</i> in Bhagalpur District	Gopalpur <i>Diara</i> in Sahibganj District
			other avifauna find their abode on this island.	
Nesting sites of turtles/otters present?	Not present	Not present	Nesting sites for otters and turtles present on the <i>Diara</i> .	Not present
Native or Migratory birds visiting?	Yes	N.A.	Yes	Native birds mostly.
Human-animal conflict if any?	Conflicts with Nilgai a major issue on this <i>Diara</i> .	N.A.	Few conflicts with nilgai and wild boar.	Some issue of nilgai conflict.
Hunting or any other illegal activity pertaining to wildlife?	N.A.	N.A.	N.A.	N.A.
Sand mining or any other	Sand mining on some parts of this <i>Diara</i> . City	N.A.	N.A.	Temporary settlements along with few pucca

Survey Data topics	Riverine islands			
	Raghopur <i>Diara</i> in Vaishali District	Unnamed Island in Munger District	Shankerpur <i>Diara</i> in Bhagalpur District	Gopalpur <i>Diara</i> in Sahibganj District
activity?	like constructions including multistoried Govt. offices, police stations, market area, road connectivity, mobile towers, water storage tanks etc. can be found on the island.			houses, a Govt. school and some other constructions observed on the island.
Land records availability	All land records pertaining to this island with Raghopur Block Office.	Not found	All land records pertaining to this island with concerned local administration of Bhagalpur District	All land records pertaining to this island with Sahibganj District Administration.
Any other information?	According to an article published in The Telegraph dated	N.A.	The Divisional Forest Officer of Bhagalpur Forest Division reiterated that since	Some parts of this island group are at tri-junction of Bihar, Jharkhand & West Bengal States with some

Survey Data topics	Riverine islands			
	Raghopur <i>Diara</i> in Vaishali District	Unnamed Island in Munger District	Shankerpur <i>Diara</i> in Bhagalpur District	Gopalpur <i>Diara</i> in Sahibganj District
	08/04/17, some bricks were unearthed from Raghopur <i>Diara</i> which could be linked to Harappan civilization. This was attributed to the proximity of this island with both Vaishali & Patna Districts. There is a potential of more archaeological explorations on this island which have not been explored further.		this island falls within a wildlife protected area, only agriculture is permitted to be carried out here.	interlocutors claiming to have id proofs from two different States. Before settlements on these islands, they were used by criminals and other anti-social elements as a safe haven due to the jurisdiction conflicts.



Image 85 : Accessing Raghapur *Diara* Through Boats In Post-Monsoon Season When Water Level Is High In Ganga River [Vaishali District]



Image 86 : Accessing Raghapur *Diara* During Pre-Monsoon Season When Water Level Is Low In Ganga River [Vaishali District]



Image 87 : Raghopur Block Office In Fatehpur Village On The Island [Vaishali District]



Image 88 : Other Govt. Constructions On Raghopur Diara [Vaishali District]



Image 89 : Village Settlements On Raghopur *Diara* [Vaishali District]



Image 90 : Nilgai Foraging On Agricultural Fields In Raghopur *Diara* [Vaishali District]



Image 91 : Part Of The Island As Observed During Monsoon Season [August, 2022] – River Is Still Below HFL At This Time [Munger District]



Image 92 : Part Of The Island As Observed During Monsoon [August, 2022] Near Kastharni Ghat [Munger District]



Image 93 : Shankerpur *Diara* Observed During Monsoon [August, 2022] From Vikramshila Setu [Bhagalpur District] – Note : Submergence neither permits buildings nor kharif crop



Image 94 : Part Of Shankerpur *Diara* Below Vikramshila Setu Observed During Post Monsoon Season [Bhagalpur District]



Image 95 : Smooth-Coated Otter Nesting Site On Shankerpur *Diara* [Bhagalpur District]



Image 96 : Presence Of Migratory Bar-Headed Geese Recorded During An Earlier Survey On This Island [Bhagalpur District]



**Image 97 : Part Of Gopalpur *Diara* During Monsoon Season Survey [Sahibganj District]
[Note: School Building On This Island]**



Image 98 : Boats Employed For Accessing *Diara* [Sahibganj District]

- 5.11 **Riverine Islands in Ganga River stretch and Hooghly River of West Bengal :** A total of 4 different islands were surveyed of which one lies in the main Ganga River stretch of Malda District while the remaining three are in the Hooghly River stretch including one *Nayachar* island in the Hooghly estuary.
- 5.12 **Piarpur Diara :** The Piarpur *Diara* in the Ganga River stretch falls partly under Sahibganj District and partly under Malda District and has similar jurisdictional conflicts as observed in Gopalpur *Diara*.
- 5.13 **Char Mahammadpur :** This island in the Hooghly River stretch of Murshidabad District is an old and uninhabited island which was once part of the land under Khaitan (India) Ltd. company. A part of this island is under planted forest cover while the remaining is utilized for agriculture by residents from nearby villages most of whom claim to be workers for the company.
- 5.14 **Island in Chinsurah :** The smallest island in this study situated in the Hooghly River stretch close to Chinsurah Municipality is an interesting example of an unstable riverine island whose *characteristics* are highly fluid and varying from year to year shaped by the flood levels and flood velocities. Currently covered by vegetation, this island is being planned to be developed as a recreational space by Chinsurah municipality which would include co-operation from the opposite municipality as well as NMCG which regulates the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016.
- 5.15 **Nayachar Island :** The last yet interesting island studied in the Hooghly estuary is *Nayachar* Island which is situated a little north of Sagar Island. Currently, under the jurisdiction of Purba Mednipur District, this island has been heavily encroached on by residents from this District along with residents of South 24 Parganas District. These people have cleared the native vegetation and are practising aquaculture for growing prawns, shrimps, etc. along with agriculture in some parts. Some abandoned infrastructure of the Fisheries department can also be found on this island. Further details about these study sites are presented in Table 12 while Images 99-112 depict major field observations.

Table 12 : Field Observations On Riverine Islands In Ganga & Hooghly River Stretches Of West Bengal

Survey Data topics	Riverine islands			
	Piarpur <i>Diara</i> in Malda District	<i>Char</i> Mohammadpur in Murshidabad District	Island near Chinsurah Municipality	Nayachar Island in Hooghly estuary
Ownership & Jurisdiction	This island is a conglomerate of some irregularly shaped islands part of which falls in Jharkhand and part of it falls in West Bengal.	The island falls under jurisdiction of Murshidabad District	This island is under jurisdiction of the Chinsurah town Municipality	This island is located near confluence of Hooghly River with Bay of Bengal between South 24 Parganas and Purba Medinipur Districts. Currently this island is under Purba Medinipur District Nayachar Coastal Thana under Haldia Subdivision.
Area of the Island [Sq. Km]	50.3	0.62	0.11	49.0
Nature of Island	Permanent island with settlements and agriculture	Permanent island with vegetation and agriculture	Vegetated island	Island with aquaculture farms and agriculture
Villages	Near Rajmahal	Administratively the		

Survey Data topics	Riverine islands			
	Piarpur <i>Diara</i> in Malda District	<i>Char</i> Mahammadpur in Murshidabad District	Island near Chinsurah Municipality	<i>Nayachar</i> Island in Hooghly estuary
associated		island is divided into 2 mouzas – Mahamadpur Mouza and <i>Char</i> Mahamadpur Mouza		
Agriculture & crop cultivation	Agriculture is the chief source of livelihood with crops such as mustard, rice, different vegetables and banana cultivation.	Most of the island is under agriculture with major cultivation of jute, mustard, paddy and different vegetables. Banana cultivation also prevalent on the island.	N.A.	Agriculture practiced in some parts of the island
Livestock or Cattle grazing	Livestock mainly buffalo on the island.	N.A.	N.A.	The buffalo grazing community of 24 Parganas exploited this island indiscriminately for grazing for 6 months every year.
Whether	The central highland	Most part of the island	Moslty	Most part gets submerged

Survey Data topics	Riverine islands			
	Piarpur <i>Diara</i> in Malda District	<i>Char</i> Mahammadpur in Murshidabad District	Island near Chinsurah Municipality	Nayachar Island in Hooghly estuary
submerged or exposed during monsoon?	parts of the island remain exposed while rest of land gets submerged during monsoon.	gets inundated and inaccessible during monsoon season.	submerged during monsoon	during monsoon
Permanent settlements present or absent?	Both permanent and temporary settlements present on the island.	No permanent settlements on this island. Only temporary shelters during cultivation season.	Absent	Out of 4663 ha land of Nayachar, around 1250 ha was handed over to the Fisheries department in 1988. At present there is a tourist lodge, a makeshift jetty, a generator room and some other infrastructure that exists on 4 hectare land where the Fisheries department has allowed 13 cooperatives to undergo

Survey Data topics	Riverine islands			
	Piarpur <i>Diara</i> in Malda District	<i>Char</i> Mohammadpur in Murshidabad District	Island near Chinsurah Municipality	Nayachar Island in Hooghly estuary
				pisciculture.
Connectivity & accessibility of the island	Only accessible by boats.	Only accessible by boats.	Only accessible by boats.	Only accessible by boats.
Natural Vegetation diversity	Scattered trees on the island. <i>Saccharum</i> sps. grasses dominate the landscape.	A patch of planted forest trees comprising mainly of Jarul, Arjun and Shirish found on one part of the island. Along with this <i>Saccharum</i> sps. grass dominant on island banks.	Riparian grasses dominating the native vegetation	Mangrove vegetation and <i>Saccharum</i> grasses on some fringe parts of the island.
Bioresource utilization	<i>Saccharum</i> grasses collected for thatching roofs.	Fruits from planted trees collected.	N.A.	N.A.
Faunal diversity (habitat & movement)	No significant wildlife observed or recorded from interlocutors	The island is home to diverse avifauna including several native and	Some birds visiting this island	N.A.

Survey Data topics	Riverine islands			
	Piarpur <i>Diara</i> in Malda District	<i>Char</i> Mahammadpur in Murshidabad District	Island near Chinsurah Municipality	<i>Nayachar</i> Island in Hooghly estuary
corridor)	during the survey.	migratory bird species. It is also the breeding ground for Open billed storks and Red wattled lapwings.		
Nesting sites of turtles/otters present?	N.A.	N.A.	N.A.	N.A.
Native or Migratory birds visiting?	N.A.	Several native and migratory birds visit the island.	Some native birds visiting the island	Some native birds visiting the island
Human-animal conflict if any?	N.A.	N.A.	N.A.	N.A.
Hunting or any other illegal activity pertaining to	N.A.	N.A.	N.A.	N.A.

Survey Data topics	Riverine islands			
	Piarpur <i>Diara</i> in Malda District	<i>Char</i> Mahammadpur in Murshidabad District	Island near Chinsurah Municipality	<i>Nayachar</i> Island in Hooghly estuary
wildlife?				
Sand mining or any other activity?	N.A.	N.A.	N.A.	N.A.
Land records availability	Land records if any would be fragmented as this island is partly in Jharkhand & partly in West Bengal.	Several years ago, this island was owned by a private individual which was then transferred to Khaitan Group as part of sugarcane farmlands in this region. Since the company deserted this region, there has not been any further records of land ownership as observed during the survey. Even the local taluka & District	N.A.	Some land records were available with Fisheries Department

Survey Data topics	Riverine islands			
	Piarpur <i>Diara</i> in Malda District	<i>Char</i> Mohammadpur in Murshidabad District	Island near Chinsurah Municipality	<i>Nayachar</i> Island in Hooghly estuary
		administration doesn't have any information pertaining to this island.		
Any other information?	These were also formed due to Ganga River course shifts and are mostly colonized by flood affected people and immigrants from Bangladesh.	In the last 3-4 decades, the island morphology has undergone changes and it has shifted eastwards. No concrete structure of any kind present on the island.	N.A.	A committee from MoEFCC in 2012 recommended against any industrial activity on this island and proposed this to be developed for eco-tourism and existing aquaculture farms present then without harming the ecology. The island is also susceptible to cyclonic storms, tsunamis and other natural hazards.



Image 99 : Part Of The *Diara* During Monsoon Season In Malda District [Note: Investment In Buildings Is Very Low Owing To Flood Threat, Huts Lie Abandoned At This Time]



Image 100 : Another Part Of The Island As Observed During The Field Survey [Malda District]



Image 101 : Part Of *Char* Mahammadpur Under Planted Forest [Murshidabad District]



Image 102 : Local Residents Involved In Fishing Activity At *Char* Mahammadpur [Murshidabad District]



Image 103 : Jute Cultivation By Local Residents On *Char* Mohammadpur [Murshidabad District]



Image 104 : Cattle Reared On *Char* Mohammadpur [Murshidabad District]

A TIME SERIES SHOWING DYNAMICS OF ISLAND AT CHINSURAL IN HOOGHLY RIVER

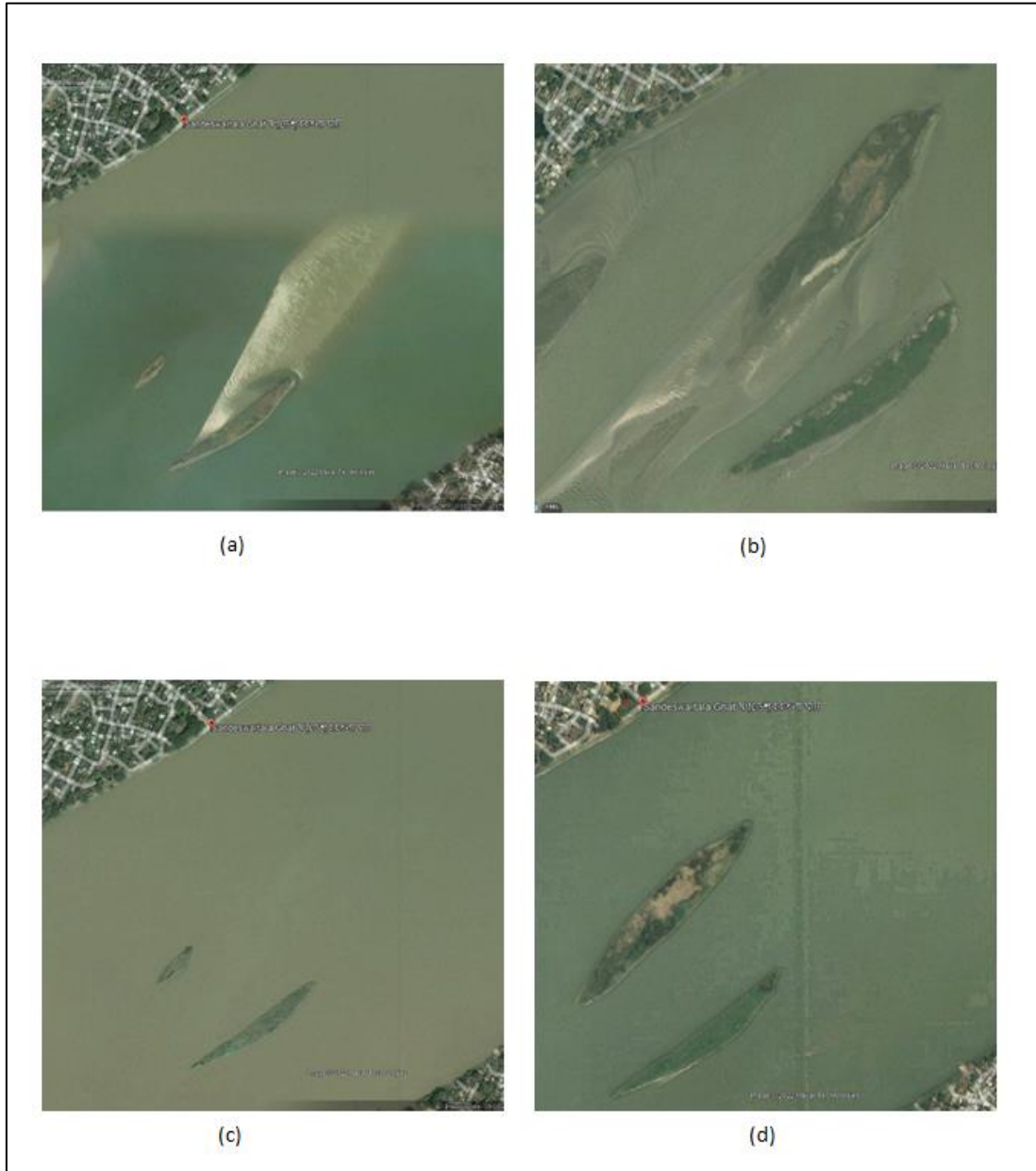


Image 105 : (a) 2003 – Island Is In A Formative Stage With Little Vegetation (b) 2005 – Islands In Centre And West Firm Up (c) June, 2008 – Central Island On Verge Of Disappearance (d) May, 2007 – Emerging Island On West Washed Out

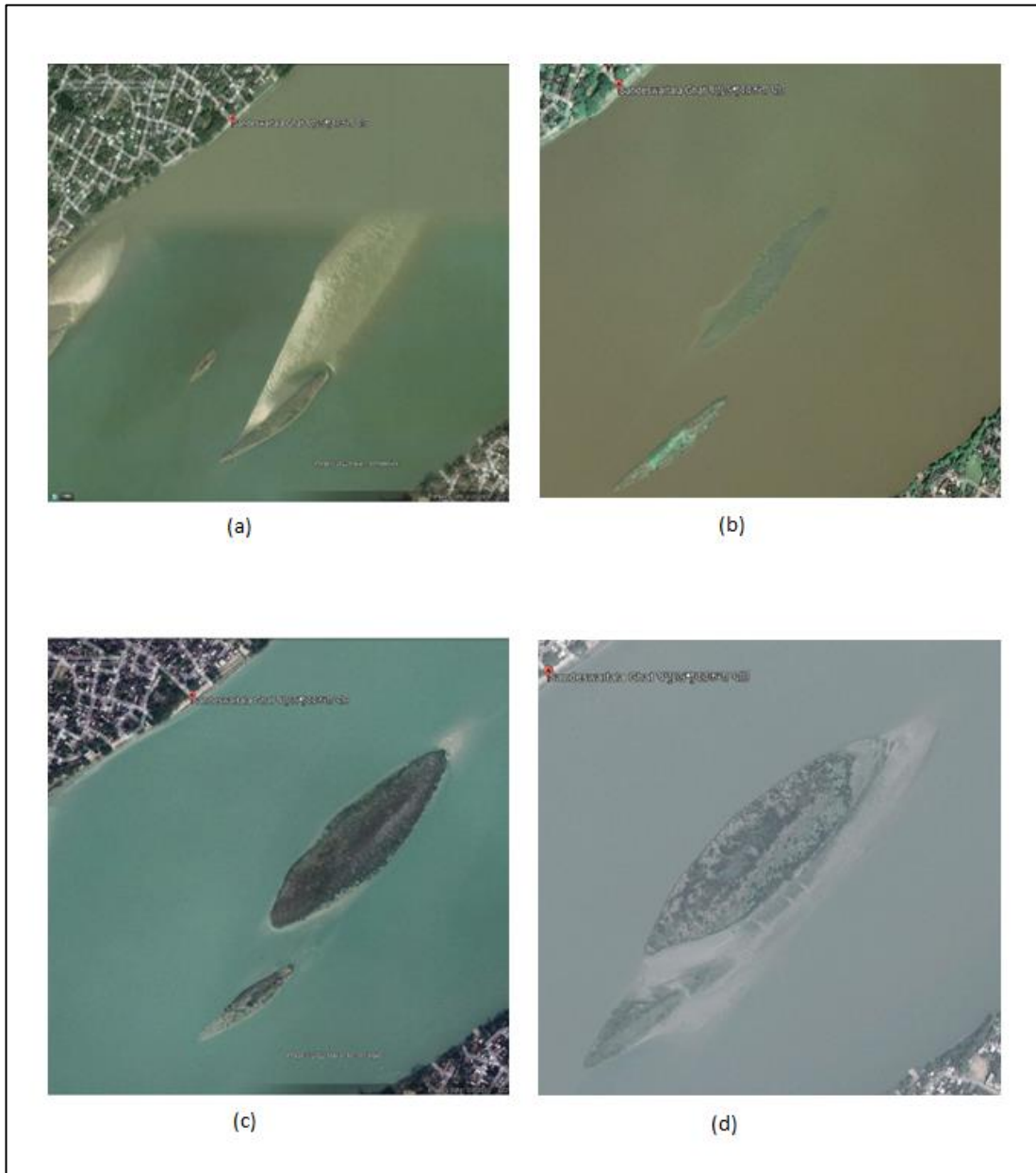


Image 106 : (a) Jan, 2009 – Central Island On Verge Of Disappearance (b) Oct, 2009 – Post Monsoon Central Island Remains (c) Jan, 2011 – Central Island Enlarges With More Silt (d) March, 2012 – Only Central Island Remains With Two

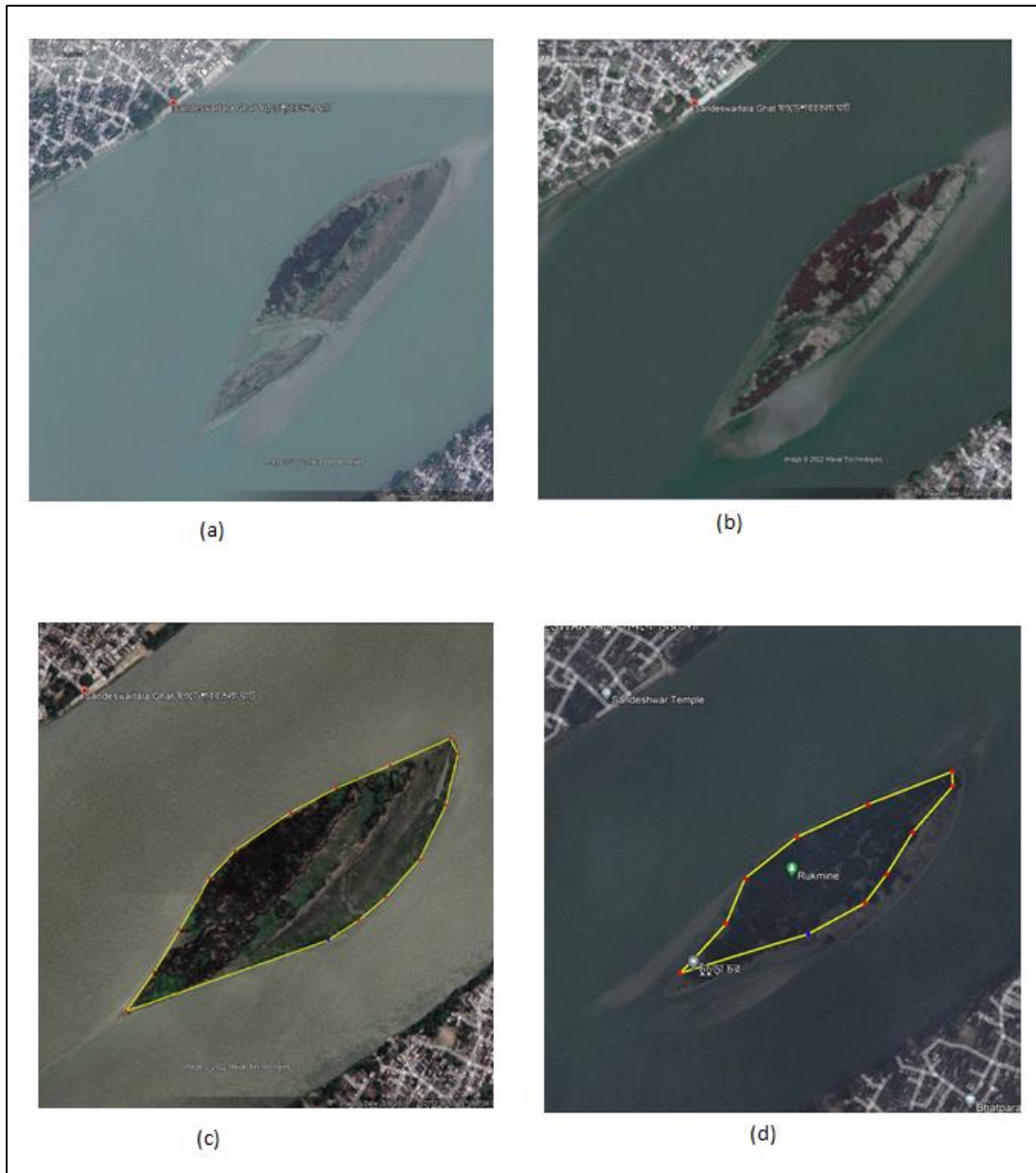


Image 107 : (a) November, 2012 – Only Central Island Remains (b) March, 2014 – Central Island Remains With Both Humps (c) May, 2018 – Central Island Remains With Increased Vegetation – Area 14.28 Ha (d) Jan, 2021 – Central Island Area Shrinks To 7.61 Ha [Yellow Line]



Image 108 : March, 2022 – Central Island Area Increases To 11.15 Ha [Yellow Line Shows 2018 Area of 14.28 ha]



Image 109 : Residents From Neighboring Districts Arriving On *Nayachar* Island Through Boats [Purba Medinipur District]



Image 110 : An Aquaculture Tank On Nayachar Island [Purba Medinipur District]



Image 111 : Defunct Building Of Fisheries Department On Nayachar Island [Purba Medinipur District]



Image 112 : Mangrove Vegetation On *Nayachar* Island [Purba Medinipur District]

CHAPTER 6 – FIELD SURVEY RESULTS FOR ISLANDS IN OTHER RIVERS

- 6.1 Five islands/island groups in other rivers were selected for comparative study. The secondary data pertaining to these islands was collected online through different knowledge repositories along with interactions with various experts. Based on these data, the sites for the field survey were selected and the field trips were carried out. The GPS coordinates were recorded using Garmin hand-held GPS and mobile phones wherever necessary. Table 13 contains the details of the sites surveyed.
- 6.2 The detailed observations recorded during the field survey of riverine islands in the Narmada, Mahi, Godavari and Brahmaputra rivers are presented in this section. Some of the key findings are as follows:

- During a comparative survey of other riverine islands, it was recorded that Khadol island in Mahi River and Govali Bet in Narmada River are completely privatized islands with plans of developing them into resorts and other facilities. A cricket stadium has also been constructed by the owner of Govali Bet Island for recreation. Thus, it is clear that the islands are becoming vulnerable to ill thought-out commercial proposals without reference to the health of the river or to legal issues.
- In the case of the Godavari River, the newly formed riverine islands are known locally as 'Lankas' and are owned by the State Government which then leases them to marginalized communities for practising agriculture as a livelihood.
- The Majuli island in the Brahmaputra River has gained tremendous popularity as a tourism site with visitors from India and abroad traveling here to learn more about its cultural heritage and experience the natural beauty through eco-friendly cottages and resorts. It has become the first island district of the country. However, it is highly erosion-prone losing several square kilometres every monsoon with compensatory gains when the floods recede and is now being opened up to tourism infrastructure and connectivity which is likely to diminish its 'islandic' feeling as well as its natural habitats

- The Mandhata island is a hilly island which is famous for the Omkareshwar temple and attracts thousands of pilgrims annually. Bridges have been constructed to increase connectivity and access while unregulated, unplanned and ugly constructions diminish the sacred character while adversely impacting the natural landscape.

Table 13 : Details Of Islands Surveyed For Comparative Analysis

1.	Kabirvad island and Govali Bet in Narmada River, Gujarat	15 th May, 22 nd July, 18 th September and 18 th December, 2022	Kabir Maharaj temple on the island [21°45'43.58"N, 73° 8'32.91"E] Near Tavra village [21°43'52.16"N, 73° 3'17.40"E]
2.	Khadol and Valvod islands in Mahi River, Gujarat	16 th April and 22 nd September, 2022	Near Khadol village [22°19'3.39"N, 73° 2'57.34"E] Near Valvod village [22°18'21.12"N, 72°55'2.32"E]
3.	Islands in Godavari River, East Godavari District, Andhra Pradesh	17 & 18 July, 2022	Near Rajahmundry town [16°59'49.11"N, 81°46'9.44"E] Near Jonnada village [16°46'59.30"N, 81°51'34.99"E] Near Yanam [16°43'36.09"N, 82°12'8.16"E]

4.	Majuli and Umananda Islands in Brahmaputra River, Assam	23 to 26 November, 2022	Guwahati city [26°11'24.46"N, 91°44'50.16"E] Dakhinpat Satra [26°55'25.10"N, 94°16'36.70"E] Kamlabari Satra [26°56'55.53"N, 94° 9'59.35"E]
5.	Mandhata island in Narmada River, Madhya Pradesh	9 th February, 2023	Omkareshwar [22°14'34.53"N; 76° 9'12.44"E]

6.3 Riverine Islands in Narmada & Mahi Rivers : Five islands – Kabirvad, Govali Bet and Mandhata islands in Narmada River along with Khadol and Valvod islands in Mahi River were surveyed for comparison. Among these, Mandhata island, located about 80 km from Indore city in the Khandwa District of Madhya Pradesh on the Narmada River, is one of the most popular riverine islands in India owing to the presence of Omkareshwar temple dedicated to Lord Shiva. The island is a *shaktipeeth* [site of great reverence]. Several other ancient constructs such as ashrams, statues, temples of other deities and even a fort of an erstwhile kingdom are present on this island. The island is connected with the mainland by two recent pedestrian bridges which are primarily used by pilgrims to travel on foot. Several boats also provide a means of transport to different parts of this island. The other two islands - Kabirvad and Govali *Bet* are situated close to each other in the Narmada river stretch of Bharuch District in Gujarat state. Among these, the former island derived its name from the fact that Sant Kabir planted a Banyan tree (known locally as 'Vad') on this island which proliferated and has spread across the entire Kabir temple complex constructed here. This site has emerged as a popular place for

tourists and pilgrims thereby serving as an important source of livelihood for local residents. Although this island is only accessible by boats, the smaller channel of Narmada River towards the left bank dries up during summers and a temporary track is created for accessing this island. The natural vegetation on this island chiefly comprises trees such as Babool, Peepal, Bargad, Neem, Jamun, Imli and Mango along with several shrubs and herbs. During the field survey, 32 different birds were sighted on this island of which 2 birds were classified as 'Near Threatened' in the IUCN Red List namely – *Esacus recurvirostris* (Great thick-knee) and *Ciconia episcopus* (Asian Woolly neck). Other fauna on this island include – Nilgai, wild boars, langur and a few sightings of crocodiles and leopards. A significant part of the island is also under agriculture which is carried out by members of the Patel community from Nikora and Angareshwar villages lying on the opposite bank of the Narmada River. The other island – Govali *Bet* is located further downstream of Kabirvad and is a private island with restricted entry. Based on information from interlocutors, it was learnt that this island had been bought by a businessman from this state and has been turned into an agricultural and recreational place. A sports stadium could also be seen present on this island which serves as a recreational sports site. The farmlands and horticulture activities are also undertaken by privately hired labourers by the owner of this island. Images 113-121 depict the major field observations of these islands.



Image 113 : Google Earth Image Showing Mandhata Island In Narmada River In 2010 [Khandwa District]



Image 114 : Google Earth Image Showing Mandhata Island In Narmada River In 2022 [Khandwa District]



Image 115 : Mandhata Island As Observed During The Field Survey In February, 2023 [Khandwa District]



Image 116 : Google Earth Image Showing Location Of Kabirvad Island [Bharuch District]



Image 117 : Old And Sacred Banyan Tree At Kabir Temple Complex [Bharuch District]



Image 118 : Boats Employed For Accessing Kabirvad Island [Bharuch District]



Image 119 : Settlements On Kabirvad Island [Bharuch District]



**Image 120 : Google Earth Image Showing Location Of Govali Bet Island [Bharuch District]
Note: A Stadium In The Top West Corner Of The Island**



Image 121 : Settlements On Govali *Bet* As Seen From Narmada River Bank [Bharuch District]

6.4 **Riverine Islands in Godavari River** : Several irregularly shaped islands of varying sizes are present in the Godavari River stretch of East Godavari District which are known locally as 'Lankas'. Some of these Lankas were surveyed for comparison during the monsoon season and it was observed that most of these islands were connected to the mainland only through boats. Based on information from interlocutors including some Govt. officials, all these islands are owned by State Govt. and given on lease to poor and marginalized people mainly for agriculture. Besides various crops, banana and coconut produce is a major source of livelihood on these islands. **During monsoons, most of these Lankas are submerged forcing these people to retreat to the mainland and spend their time in flood shelters until water recedes.** Images 122-126 depict the field observations of these Lanka islands in East Godavari Distt.

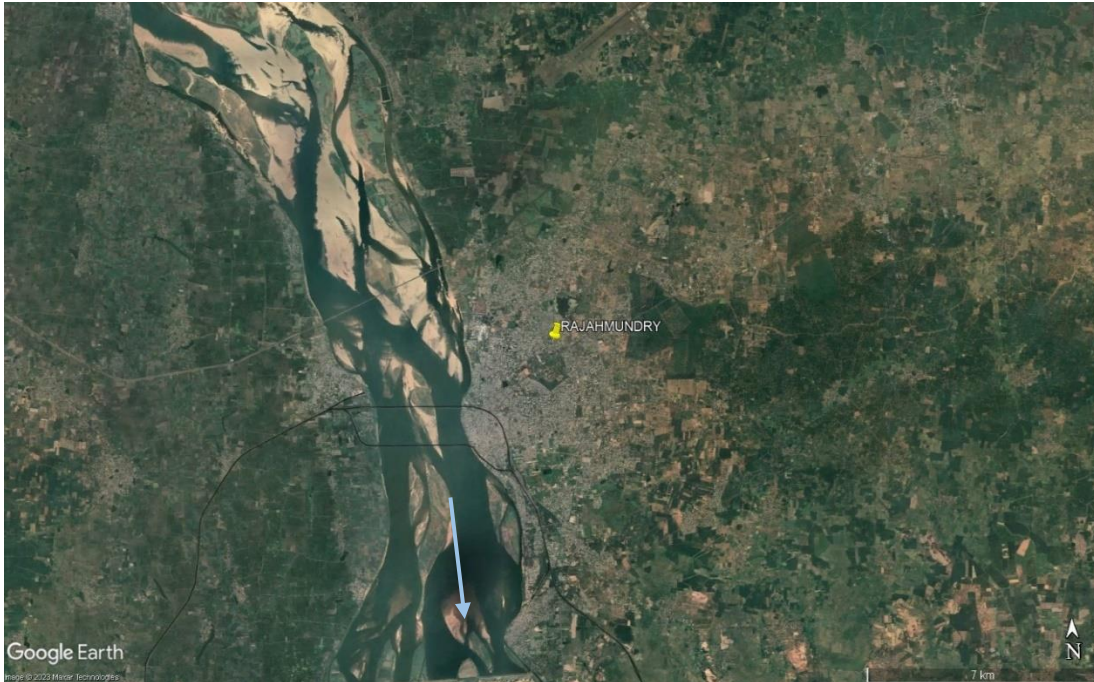


Image 122 : Google Earth Imagery Showing Riverine Islands In Godavari River Stretch Near Rajahmundry Town [East Godavari District]



Image 123 : Typical Situation Of Riverine Islands (Lankas) In Godavari River At Peaks in Monsoon [East Godavari District]



Image 124 : Some Lanka Islands In Godavari River Near Rajahmundry Town Have Wild Vegetated Landscape [East Godavari District]



Image 125 : A Riverine Island In Godavari River As Observed Near Yanam Town [East Godavari District]



Image 126 : Submerged 'Lankas' Near Jonnada Village In East Godavari District
[Only Mature Tree Canopies Visible in Flooded Situation]

6.5 Riverine islands in Brahmaputra : Majuli island in Brahmaputra river stretch of Assam was surveyed for comparative study. It is one of the largest and most inhabited riverine islands in the world with an area of 483 Sq. km. presently (before 1950 it was 1250 sq. km.) with a population of 1,67,304 (Census 2011). Recently, in the year 2016, this island was designated as an independent District under Jorhat Division and it consists of three Mauzas viz. Ahatguri, Kamalabari and Salmora, 20 Gaon Panchayats (village councils) and 248 cadastral villages. Currently, the island can only be accessed through ferry services from Jorhat. Majuli has also gained importance in the tourist map of India with increasing tourist footfall leading to mushrooming of several hotels, restaurants and eco-friendly resorts on this island. The interlocutors reiterated that developing facilities, rich cultural heritage (various 'Satras'), natural beauty and wildlife coupled with the ferry experience of approaching this island are some major reasons for burgeoning tourism here which in turn is benefiting the native residents. However, large-scale erosion is causing

huge land losses which has already shrunk the island and without erosion control all investment here remains vulnerable to the raging Brahmaputra. Images 127-131 depict the field observations on Majuli island in Assam.



Image 127 : Google Earth Imagery Showing Location Of Majuli Island [Majuli District]



Image 128 : Govt. Ferry Service To Majuli Island [Majuli District]



Image 129 : Kamlabari Satra [Monastery] On Majuli Island



Image 130 : Eco-Friendly Bamboo Cottages On Majuli Island for Tourism



Image 131 : Promoting Majuli Island Tourism By Govt. Of Assam

CHAPTER 7 – ECOSYSTEM SERVICES FROM RIVERINE ISLANDS

7.1 Riverine landscapes are among the most productive ecosystems in the world and have been serving as resource areas for human populations. Various ecosystem functions in these landscapes provide a range of benefits, many of which are of fundamental importance to human well-being, health, livelihoods, and survival (Costanza *et al.*, 1997; Millennium Ecosystem Assessment (MA), 2005; TEEB Foundations, 2010). The benefits that humans derive from functioning ecosystems, the ecological *characteristics*, functions or processes that directly or indirectly contribute to human well-being are described as 'Ecosystem Services' (Costanza *et al.*, 2011). Ecosystem processes and functions may contribute to ecosystem services, but they are not synonymous as they describe biophysical relationships (such as the carbon cycle). Ecosystem services, on the other hand, only exist if they contribute to human well-being [directly or indirectly] and cannot be defined independently (Boyd & Banzhaf, 2007; de Groot *et al.*, 2002). The ecosystem services concept offers an opportunity to unravel the complex pathway linking ecosystem structure and ecological processes to human well-being, in 'socio-ecological systems. These include both the ecological and human dimensions and are also comprised of social practices, governance and institutional structures, technology and the values of nature for humans (Potschin & Haines-Young Citation, 2017).

7.2 The most widespread categorization of ecosystem services prescribed by the Millennium Ecosystem Assessment divides them into four broad categories :

- **Provisioning Services** : These include tangible goods and products that are of direct importance to human survival and well-being such as plant and animal-based food, fiber, wood-based products, water for drinking and other purposes, medicines, ornamental resources and other miscellaneous goods.
- **Regulating Services** : These services relate to the capacity of natural and semi-natural ecosystems to regulate essential ecological processes and life support

systems through bio-geochemical cycles and other biosphere processes. In addition to maintaining ecosystem (and biosphere) health, these services benefit humans directly and indirectly in various forms such as regulating climatic conditions, regulating air and water quality, erosion control, water purification, natural hazards regulation, and regulating pollination, amongst several other benefits.

- **Cultural Services** : These services include those non-material benefits that humans obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic services which also include educational services, eco-tourism services, sacred natural sites and social benefits.
- **Supporting Services** : Supporting services are those that are necessary for the production of all other ecosystem services. They differ from provisioning, regulating, and cultural services in that their impacts on people are often indirect or occur over a very long time, whereas changes in the other categories have relatively direct and short-term impacts on people. Some examples of these services include soil formation, primary production, water cycling, nutrient cycling and supporting biodiversity.

7.3 Riverine islands are an integral part of the riverine landscapes which have varied resources, land use patterns and contributions to the ecosystem based on various factors, particularly in India. Their role in providing ecosystem services for riparian communities is essentially integrated within the larger role of riverine ecosystem services. However, it is important to highlight that the rising human population along the rivers and on larger islands, human activities such as clearance of wildscapes, large-scale construction, cultivation and sand mining are endangering the long-term sustainable provision of ecosystem services from river islands. Expanding human footprints on these landscapes are resulting in large-scale land use changes leading to depletion in natural resources and associated ecosystem services. The most common ecosystem services observed were:

- Collection of *Saccharum* grasses in dried forms for thatching roofs

- Collection of Babool and other wood resources as fuelwood
- Grass and herbaceous plants on the islands serving as fodder for cattle,
- Fertile soil, replenished annually, for agriculture
- Riparian vegetation wherever prevalent serving to prevent land erosion and also supporting numerous wildlife habitats along with movement corridors
- Supporting rich birds and butterflies diversity aiding in pollination services
- Recreation and tourism services

The details of these ecosystem services as observed on the different study sites in the Ganga River are presented in Table 14 while services from some other major riverine islands in India are presented in Table 15.

Table 14 : Ecosystem Services Obtained From Ganga Riverine Islands

ISLAND NAME	PROVISIONING SERVICES	REGULATING SERVICES	CULTURAL SERVICES	SUPPORTING SERVICES
Islands group in Haridwar District	Fertile soil for agriculture; <i>Saccharum</i> grasses resource for various purposes; Khair and Imli wood resources, Palash flowers collection, Sand collection	Vegetated islands controlling land erosion, sequestering carbon, regulating local climatic conditions, Pollination services	Dakshadweep & Bairagi camp islands used for festivities and auspicious occasions as part of Kumbh Mela Kshetra	Providing habitat and serving as movement corridors for animals such as deer, elephant, crocodiles and various birds, nutrient cycling in soil, primary production
Unnamed island in Fatehpur District	Collection of <i>Saccharum</i> grasses & Babool wood from the island	Completely vegetated island controlling land erosion & regulation of local climate, Pollination services	---	Providing habitat for wild boars, deer, jackal and several birds, nutrient cycling in soil, primary production
Unnamed island in Prayagraj District	Collection of <i>Saccharum</i> grasses & Babool wood from the island; Using fertile soil for agriculture; Grass	Densely vegetated island parts aid in stabilizing and controlling island erosion, regulate local	Some parts of the island and other sandbars utilized during Magh Mela and Kumbh Mela	Provides habitat for nilgai, wild boar and several birds, supports nutrient cycling & primary production,

ISLAND NAME	PROVISIONING SERVICES	REGULATING SERVICES	CULTURAL SERVICES	SUPPORTING SERVICES
	resource for cattle grazing; Sand resource for construction	climate and air quality, Pollination services		Supports soil formation & enrichment
Majhara Diara in Mirzapur District	Collection of <i>Saccharum</i> grasses, wild ber fruits & Babool wood from <i>Diara</i> ; Fodder resource for cattle; Fertile soil resource for agriculture	Densely vegetated island parts aid in stabilizing and controlling island erosion, regulate local climate and air quality, Pollination services	---	Provides habitat for nilgai, wild boar and several birds; Supports nutrient cycling & primary production; Supports soil formation & enrichment
Ramchandipur Diara in Varanasi District	Collection of <i>Saccharum</i> grass, Babool wood & Bamboo for various purposes; Fodder resources for cattle grazing; Collection of fruits from various trees such as Mango, Papaya, Jackfruit and	Presence of numerous trees including some old ones along with other vegetation help in stabilizing the island and regulating local climatic conditions	Presence of some temples and sacred old trees on the island catering to cultural linkages for island dwellers; Presence of primary school for educational	Provides habitat and nesting sites for various birds and few mammals

ISLAND NAME	PROVISIONING SERVICES	REGULATING SERVICES	CULTURAL SERVICES	SUPPORTING SERVICES
	others; Fertile soil resource for agriculture		services; Extensive human habitation	
Raghapur Diara in Vaishali District	Saccharum grasses, Bamboo & Babool wood collection; Fertile soil for agriculture; Several fruit trees providing resources; Fodder for cattle; Sand resource for construction	Presence of numerous trees including some old ones along with other vegetation help in stabilizing the island and regulating local climatic conditions, Pollinating services	Presence of sacred trees & temples on this island; This island is also being planned for eco-tourism; Excavations on some part of this island have established its archaeological linkages with Harappan civilization	Rich diversity of trees and other riparian vegetation support habitat of wild boars, nilgai, jackal, wild cat and several native and migratory birds specially during winters
Unnamed island in Munger District	Collection of <i>Saccharum</i> grass from the island	Presence of riparian grasses aid in island stabilization & local climate regulation,	---	The riparian grasses provide habitat for some birds

ISLAND NAME	PROVISIONING SERVICES	REGULATING SERVICES	CULTURAL SERVICES	SUPPORTING SERVICES
		Pollinating services		
Shankerpur Diara in Bhagalpur District	Fertile soil for agriculture; <i>Saccharum</i> grass collection	Some growth of riparian grasses helps in island stabilization and erosion control	Importance from Wildlife tourism point of view as part of Vikramshila Dolphin Dolphin Sanctuary	Supporting rich biodiversity habitat & nesting sites including that of Endangered Smooth Coated Otters, Gharials and several native/migratory birds
Gopalpur Diara in Sahibganj District	Fertile soil for agriculture; <i>Saccharum</i> grass collection; Collection of fish resources from waters around the island; Fodder for cattle grazing	Scattered trees and riparian grasses aid in island stabilization & local climate regulation, Pollinating services	Some old and sacred trees, temples and educational institutions present on the island	The vegetation on island supports habitat for several birds including native species and few migratory ones visiting during winters
Piarpur Diara in Malda District	Fertile soil for agriculture; <i>Saccharum</i> grass collection;	Scattered trees and riparian grasses aid in island stabilization &	Some old and sacred trees, temples and	The vegetation on island supports habitat for several birds

ISLAND NAME	PROVISIONING SERVICES	REGULATING SERVICES	CULTURAL SERVICES	SUPPORTING SERVICES
	Collection of fish resources from waters around the island; Fodder for cattle grazing	local climate regulation	educational institutions present on the island	including native species and few migratory ones visiting during winters
Char Mahammadpur in Murshidabad District	Fertile soil for agriculture; Collection of different fruits & wood resources from planted forest on the island; Collection of fish resources from waters around the island	Planted forest and other riparian vegetation help in erosion control by stabilizing the islands & aid in local climate regulation, Pollinating services	---	This island supports habitat of birds such as Asian Open Bill storks & Red Wattled Lapwings, Several migratory birds also visit here during winters
Nayachar island in Hooghly Estuary	Aquaculture farm resources on the island; Collection of fish from waters around the island; Collection of mangrove resources from the island; Crop	Scattered mangroves and some riparian grasses contribute partly in local climate regulation	A temple and some primary educational services available on the island	The island provides breeding ground and habitat for several insects, fish and other macrofauna of estuarine environment, Several birds also visit

ISLAND NAME	PROVISIONING SERVICES	REGULATING SERVICES	CULTURAL SERVICES	SUPPORTING SERVICES
	cultivation on some parts of the island			and nest on this island

Table 15 : Ecosystem Services Obtained From Other Riverine Islands

ISLAND NAME	PROVISIONING SERVICES	REGULATING SERVICES	CULTURAL SERVICES	SUPPORTING SERVICES
Majuli Island, Assam	Fertile soil for agriculture & horticulture, Bamboo and other wood resources for construction, various fruits and non-timber produces from vegetation on the island, raw materials for handicrafts, fodder for cattle	Rich vegetation on the island aids in soil nutrient and water cycling, helps in regulating local climate and air, sequesters carbon, aids in pollination services	The Satras on this island comprise of rich cultural heritage which serve as important pilgrimage sites with some important fairs and events during the year. Tourism potential is very high on Majuli island and it has attracted several researchers in recent years as well.	The island harbors several birds, insects, reptiles, mammals and other fauna. It also serves as migratory corridors for tigers and elephants connecting Kaziranga National Park nearby.
Kabirvad Island, Gujarat	<i>Acacia & Prosopis</i> wood is collected as firewood, vegetation on the island	Vegetation of the island specially riparian grasses help	The island is named after a Banyan tree (known locally as	The island serves as habitat for nilgai, wild boar & crocodile along

ISLAND NAME	PROVISIONING SERVICES	REGULATING SERVICES	CULTURAL SERVICES	SUPPORTING SERVICES
	serves as cattle fodder, fertile soil benefits for agriculture	in bank stabilization, aid in regulating local climatic conditions, biodiversity of the island provides pollination services	'Vad') believed to have been planted by Saint Kabir. A temple has also been constructed here. Both these sites are important from religious tourism.	with supporting numerous birds including some rare species. Occasional leopard sightings have also been reported.
Mandhata Island, Madhya Pradesh	Dried wood and grasses collection from the vegetation of hills on the island, oxygen production	Vegetation of the hilly terrain on the island aids in soil stabilization, helps regulate the local climatic conditions	Omkareshwar temple on the island is a major religious attraction with lakhs of pilgrims and visitors coming here throughout the year. Along with this there are other temples and an old fort which are also tourist attractions.	Seasonal plant species including grasses on the island along with rich birds diversity

ISLAND NAME	PROVISIONING SERVICES	REGULATING SERVICES	CULTURAL SERVICES	SUPPORTING SERVICES
East Godavari River islands, Andhra Pradesh	Fuelwood collection, fertile soil for agriculture and horticulture, cattle fodder, fish resources from waters surrounding these islands	Vegetation of the island specially riparian grasses help in bank stabilization, aid in regulating local climatic conditions, biodiversity of the island provides pollination services	Some of the islands are tourist attractions	The islands support rich diversity of birds along with estuarine fauna
Divar Island, Goa	Mangrove resources near this island are collected for various purposes, fertile soil on the island for growing coconut and other crops, food resources from water surrounding this island, wild fruits from trees on the island	Island vegetation aids in soil stabilization and regulating local climate, Mangroves provide refuge from storms, Biodiversity of island provides pollination services	The rich cultural heritage of this island is attracting several tourists in recent years, Resorts and other facilities on the island	The island supports rich mangrove vegetation, riparian fauna and birds diversity.

- 7.4 **Valuation of Ecosystem Services** : Although the importance of ecosystems to human society has many dimensions (ecological, socio-cultural and economic), expressing the value of ecosystem services in monetary units is an important tool to raise awareness and convey the relative importance of ecosystems and biodiversity to policymakers. This also provides guidance in understanding user preferences and the relative value current generations place on ecosystem services. Research on the monetary valuation of ecosystem services dates back to the early 1960s but received wide attention with the publication of Costanza *et al.* (1997) and since then there has been a steady growth in the number of articles and reports on the monetary valuation of natural resources, ecosystem services and biodiversity. However, a significant analysis of global estimates of ecosystems and their services was undertaken by de Groot *et al.*, 2012 wherein monetary values were assigned to different services for 10 major biomes in the world.
- 7.5 The different biomes accounted for estimating the global ecosystem services estimates include – marine, coral reefs, coastal systems, coastal wetlands, inland wetlands, freshwater (lakes/rivers), tropical forests, temperate forests, woodlands and grasslands. When the riverine islands in the Ganga River are taken into consideration they are mainly under grass/woodland cover and fall within the riverine ecosystem. In order to calculate the monetary value of island ecosystem services - the global valuation for grasslands, woodlands and freshwater was taken into consideration and modified on a case-to-case basis. The details of some services and their estimates are presented in Table 16.
- 7.6 Among all the study sites – the islands in Haridwar District & Raghapur *Diara* have the highest valuation of **Rs. 683,921/ha/yr** while the island in Munger District has the lowest valuation of **Rs. 217,916/ha/yr**. If we add the global mean values of freshwater ecosystems, grasslands and woodlands it comes to **Rs. 715,924/ha/yr** which is close to the valuation achieved for Haridwar islands & Raghapur *Diara* where all these three ecosystems are well represented and provide ecosystem services more frequently to humans as compared to other riverine islands in the study region. However, it is important to note that the value of ecosystem services in

monetary terms does not suggest that these values should be used as a basis for establishing prices and clearly does not mean that they should be treated as private commodities that can be traded in private markets. Most of these ecosystem services are public goods and should never be privatized. Their monetary valuation is to highlight that these benefits are continually being enjoyed by society which would be lost if the island's natural conditions were to diminish were destroyed but could be retained if they were conserved. Thus, monetary valuations of ecosystem services to society can serve as a powerful and essential communication tool to inform better, more balanced decisions regarding trade-offs involved in land-use options and resource utilization.

Table 16 : Monetary Valuation Of Ecosystem Services From Riverine Islands In Ganga River

Ecosystem service	Monetary Valuation (INR/ha/yr)												
	I-1	I-2	I-3	I-4	I-5	I-6	I-7	I-8	I-9	I-10	I-11	I-12	
Water resource	148230	148230	148230	148230	148230	148230	148230	148230	148230	148230	148230	148230	--
Raw materials (firewood, dried grasses & other materials)	18283	18283	18283	18283	4345	18283	4345	4345	4345	4345	4345	18283	983
Food resources (wild or cultivated fruits/vegetables, fish resources, fodder for cattle, etc.)	110680	97726	101990	101990	110680	110680	8690	57553	57553	57553	57553	110680	195453
Erosion prevention	4673	3607	4673	4673	4673	4673	3607	3607	3607	3607	3607	4673	--
Climate regulation	3853	3279	3853	3853	3853	3853	3279	1639	2213	2213	2213	3853	1639

Ecosystem service	Monetary Valuation (INR/ha/yr)											
	I-1	I-2	I-3	I-4	I-5	I-6	I-7	I-8	I-9	I-10	I-11	I-12
Biodiversity habitat and movement services	204225	204225	204225	204225	102071	204225	49765	204225	102071	102071	102071	80509
Cultural services	193977	96988	193977	--	193977	193977	--	177580	96988	96988	--	24595
Grand Total	683921	572338	675231	481245	567829	683921	217916	597179	415007	415007	387790	303179

***I-1**: Islands in Haridwar District; **I-2**: Island in Fatehpur District; **I-3**: Island in Prayagraj District; **I-4**: Majhara *Diara* in Mirzapur District; **I-5**: Ramchandipur *Diara* in Varanasi District; **I-6**: Raghopur *Diara* in Vaishali District; **I-7**: Island in Munger District; **I-8**: Shankerpur *Diara* in Bhagalpur District; **I-9**: Gopalpur *Diara* in Sahibganj District; **I-10**: Piarpur *Diara* in Malda District; **I-11**: *Char* Mahammadpur in Murshidabad District; **I-12**: *Nayachar* island in Hooghly Estuary

Table 17 : Total Ecosystem Services Valuation For The Islands In Ganga River

SR. NO.	ISLAND	AREA	ECOSYSTEM SERVICE VALUATION (INR/HA/YR)	TOTAL ECOSYSTEM SERVICE VALUATION (INR/YR FOR ENTIRE ISLAND)
1.	Islands in Haridwar District	1350 hectares (13.5 sq. km.)	683921	923,293,350
2.	Island in Fatehpur Distt.	612 hectares (6.12 sq. km.)	572338	350,270,856
3.	Island in Prayagraj Distt.	3360 hectares (33.6 sq. km.)	675231	2,268,776,160
4.	Majhara <i>Diara</i> in Mirzapur Distt.	788 hectares (7.88 sq. km.)	481245	379,221,060
5.	Ramchandipur <i>Diara</i> in Varanasi Distt.	1440 hectares (14.4 sq. km.)	567829	817,673,760
6.	Raghopur <i>Diara</i> in Vaishali Distt.	23500 hectares (235 sq. km.)	683921	16,072,143,500
7.	Island in Munger Distt.	1590 hectares (15.9 sq. km.)	217916	346,486,440
8.	Shankerpur <i>Diara</i> in Bhagalpur Distt.	2260 hectares (22.6 sq. km.)	597179	1,349,624,540

SR. NO.	ISLAND	AREA	ECOSYSTEM SERVICE VALUATION (INR/HA/YR)	TOTAL ECOSYSTEM SERVICE VALUATION (INR/YR FOR ENTIRE ISLAND)
9.	Gopalpur <i>Diara</i> in Sahibganj Distt.	6330 hectares (63.3 sq. km.)	415007	2,626,994,310
10.	Piarpur <i>Diara</i> in Malda Distt.	5030 hectares (50.3 sq. km.)	415007	2,087,485,210
11.	<i>Char</i> Mahammadpur in Murshidabad Distt.	62 hectares (0.62 sq. km.)	387790	24,042,980
12.	Nayachar island in Hooghly estuary	4900 hectares (49 sq. km.)	303179	1,485,577,100

CHAPTER 8 - MAPPING THE LEGAL AND INSTITUTIONAL ASPECTS OF RIVER ISLANDS IN THE GANGA BASIN

Any policy initiative must be anchored in sound legal foundations and hence, towards this end constitutional provisions, existing regulations, evolving legal thought and case law were examined pertaining to riverine islands in India. The constitutional provisions provide the Parliament of India the power to develop regulations/laws pertaining to disputes arising for the inter-state rivers in the country. At the same time, States also have the right to legislate or enact provisions related to land issues. Thus, in the case of inter-state rivers we have two levels of legal frameworks, national and State level, the latter more focused on local people [cultivators mainly] issues of settlement and revenue and the former on the river as a hydrological and ecological entity. The divergence needs to be resolved as the long-term interests of all are better served by sustaining the robust health of the river. Through this thicket of the earliest known regulation pertaining to riverine islands in India is the Bengal Alluvion & Diluvion Regulation of 1825 developed by the erstwhile British administration which deals with ownership of lands either gained by river action or cut-off from the mainland due to course changes. The provisions of this Act were adopted in land regulations of different States such as Bihar, Odisha and even Punjab. Some land regulations such as that in Karnataka, Telangana and Assam have considered newly formed islands or *chars* in a river to be property of the Govt. The recent Ganga River Notification [2016] which applies to the rivers in the Ganga River basin protects a 100-year floodplain from unregulated development which can be interpreted to apply to islands as well. In some of the legal judgements examined, the courts have upheld that the river bed, land in the river and other materials are property of the Government. However, in cases where some land is accreted or cut off from the property of an individual residing on a river bank, the owner shall bear the benefits or loss as the case may be. The islands and sandbars in

the protected areas such as Vikramshila Gangetic Dolphin Sanctuary are protected by provisions of the Wildlife Act and Environment (Protection) Regulations which put them in conflict with other acts such as the National Waterway Act, 1982.

In general, most Acts and Regulations hold that land which lies between opposing banks belongs to the State although there are exceptions in the case of alluviated or diluviated lands. In any case, even if there are tenurial rights these do not amount to ownership by cultivators. It is also certain that none of the myriad laws and regulations permit permanent construction on river islands.

8.1 **Introduction** : River Ganga manifests a functional nexus where human lives, livelihoods, land and water are intertwined. Recognized as the 'National River' of the country, Ganga throughout its course from source to the sea creates diverse fluvial landforms due to the alluvial and diluvial action of the River. Historically, the regulatory approach to recognize access and use of these landforms has been based on whether they are fordable. For example, in the erstwhile Bengal Province, when a *Char* Island was thrown up in a large navigable river and if the river channel between the shore and *char* was fordable at any season of the year, the *Char* was considered an accession to the land or tenure of the persons whose principal estate is adjacent or contiguous. However, since the bed of a river is not the property of an individual, the non-fordable landforms in a navigable river generally, subject to any established usage, were at the disposal of the Government. Further, it is a settled position in law that if fluvial lands get submerged under water, these become the property of the government until the waters recede. Thus the location, seasonal changes in the landforms and their accessibility provide the basis for legal distinction between riverine landforms under customary tenure or any other arrangement between the government and a person.

8.2 **The Hybrid Environment And Contentions Of Ungoverned And Ungovernable Lands? - Limited Understanding Of The Legal Aspects Of River Islands** : Numerous fluvial landforms in the course of the River Ganga spread throughout the

Ganga Basin resemble features of an island some of which are fordable while others may be accessible only by a ferry. There is a noticeable diversity among these landforms that represent hybrid environments that are part land and part water. Importantly, the diversity is legally recognized under State legislation, revenue codes, and customary practices, and is known by different usage-based local names such as *Diara*¹, Chours, *Char* Islands and Gang Barar, Gang Shikast where the intimately enmeshed land and water present a legal challenge of ascertaining their true position under land, water and environment laws². More importantly, the fluvial landscapes of the Ganga Basin are inhabited by river communities known as Choruas (river gypsies). By far, the environmental historians and cultural geographers studying these communities in different parts of the Ganga Basin (mostly in West Bengal and Bihar) have held that these lands are ungoverned and ungovernable³. However, the understanding of the legal aspects of fluvial landforms in River Ganga is very limited and has not been studied in detail so far.

'River Island' is a legal term recognized under the Statutes

Diara/Char Island is a legally recognized term under the Bengal Regulation, 1825, the oldest legislation on the subject applicable in the Ganga Basin. The Bengal Alluvion and Diluvion Act, 1847 also uses the term 'river islands'. Subsequently, the term *Diara* is defined under Bihar Land Reform (Acquisition of Surplus Lands) Act, 1961 to include mid-stream islands. Therefore, it can be said that 'river island' is a legal term that has existed in the legal enactments, Bengal Regulations on alluvian lands and revenue codes and is supplemented by the use of locally prevalent terms as per the usage in the revenue records. Henceforth, the study used the term River Islands in its legal sense, complemented wherever there is use of local terms such as *Diara/Char/Chaur* as recognized under State or local level enactments.

¹ <https://www.agriculturewale.com/tal-diara-lands/>

² 'Diara' is the area on either side of rivers like Ganges, Saryu and Brahmaputra etc., which gets flooded with swelling of the rivers and is drained out as the flood water recedes, defined under the All India Co-ordinated Project for Diara land Improvement (AICRP-DI); Ministry of Agriculture <https://icar.org.in/content/aicrps-network-projects>

³ Kuntala Lahiri-Dutt, Gopa Samanta, *Dancing with the River: People and Life on the Chars of South Asia*, 2013, Oxford University Press; <https://academic.oup.com/yale-scholarship-online/book/29760>

8.3 The Ownership Of A River And Riverine Landforms - The Preliminary Legal Presumption And Contestation: The Need For The Legal Analysis

The common law presumption of ownership of these riverine landforms follows the ownership of a river. The ownership of an inter-state River is split between the Union Government of India and the Ganga Basin States for different purposes as per the Constitutional scheme which is elaborated in the subsequent sections below. This presumption, however, is complicated due to a plethora of State legislation applicable to such landforms, numerous judicial pronouncements, decrees by the local court and a superseding regime of national-level environmental regulations and conservation laws such as the Ganga Notification, 2016 and the Notification on Vikramshila Dolphin Sanctuary under the Wildlife (Protection) Act, 1972. Thus, on the one hand, State legislations and policies legitimize the livelihood rights of landless cultivators on these ever-changing landforms and on the other hand the Union-level environment and conservation laws warrant regulation of activities that interfere with river ecosystems and prevent pollution of rivers. There is thus a direct and intense contestation between the livelihoods regime and environmental regime so far as riverine land use is concerned.

8.4 Therefore, it is necessary that the existing regulatory framework applicable to these riverine landforms is examined thoroughly so as to ascertain various legal aspects related to them such as their ownership, permissible land uses, the regulated and prohibited activities including the infrastructure development and the extent of environmental protection that needs to be extended to these fluvial landscapes as essential riverine features that offer a range of ecosystem services required for aquatic biodiversity and human beings directly dependent on them.

8.5 This analysis of the legal framework on river islands, however modest in its enquiry of the regulatory contestations, overlaps, conflicts and oversights, also offers an opportunity to revisit some pertinent environmental regulations and issues therein.

Ownership Of a River Does Not Imply Ownership Over River Islands

The state is the owner of all flowing streams and rivers. This ownership follows from the Constitution's provisions and a large number of State-level irrigation laws⁴. Courts have also held the State as the Trustee of all natural resources to be held as Public Trust (MC Mehta Vs Union of India, 1996). However, unlike rivers and streams, the ownership of river islands does not automatically vest with the State Governments. It requires a procedure to be followed consisting of survey, demarcation and recording of river islands as such by the local revenue authorities. In other words, mere calling a riverine feature due to its physical attributes does not make it a *Diara*/river island to be owned and controlled by the State Government.

8.6 The Constitutional Position On Rivers And Environmental Protection Of Riverine Features Including River Islands :

Foremost, the constitutional provisions on rivers must be recalled so as to ascertain the true constitutional position with respect to law-making powers on water and rivers which are two distinct entities within the constitutional scheme.

8.7 There are four dimensions of the constitutional scheme on rivers that deserve mention here briefly. **One**, the State Government has the power to legislate on water⁵. The legislative power of the State Government on water also assumes the powers to legislate on the rivers as the rivers form the source of surface and groundwater availability within a State. However, this power is not absolute and is subject to the powers of the Union Government to legislate on the inter-state rivers and river valleys for their regulation and development in a way that is beneficial for the public at large⁶. River Ganga being an inter-State River also falls within the

⁴ Following the Constitutional scheme specially elaborating on the Article 48A (The duty of the government to protect environment) the courts have pronounced that all the natural resources including rivers and lakes are held in Public Trust by the state (M.C. Mehta v Kamal Nath, 1996). This provides the de-facto and de-jure ownership of rivers and its resources to the state government, subject to exceptions

⁵ Entry 17, List II- State List, Seventh Schedule, Constitution of India, 1950 <https://panchayat.gov.in/document/seventh-schedule-of-the-constitution-of-india/>

⁶ Entry 56, List-I, Union List, ibid

legislative powers of the Union Government for the purposes of regulating the activities in the larger public interest and to provide for the sustainable development of the Ganga Basin. There is no further legislative guidance under the Constitution on rivers. The extent and nature of regulation and law on inter-state rivers and river valleys have been left to the creative wisdom of the Union Government.

- 8.8 **Two**, the governments, both the Union and the States are under constitutional obligation to protect the environment from pollution including the pollution of rivers⁷. At the same time, the citizens have a constitutional duty to protect and improve the natural environment including lakes, rivers, forests and wildlife⁸. This dimension can be said to buttress all the legislative powers of both the Union and the State but has been optimally put to use by the Union Government in the exercise of its residuary powers where it has exclusive powers to legislate on matters not mentioned in the State list or the concurrent list⁹. Environment Protection is one such matter that does not fall under any of the lists of the Constitution while the components of the environment such as forest, wildlife, land, and water are part of the concurrent lists and State lists respectively. Further, the Union Government can also give effect to the international conventions and treaties by way of national legislation¹⁰.
- 8.9 The **3rd** dimension of rivers under the Constitution is with respect to inter-state river disputes and their resolution by a law made by the Parliament which is beyond the scope of this study but important to underline that the possibilities of contentions arising out of any future national level framework on fluvial landforms cannot be ruled out.
- 8.10 The **4th** and emerging dimension concerning rivers under the Constitution is the power of the Union Government to legislate on the development of National Waterways (NWs). This has been again left to the Parliament's discretion to declare

⁷ Article 48A

⁸ Article 51A(g)

⁹ Article 248

¹⁰ Article 253

certain rivers as NWs. The development of River Ganga as an NW-I under central legislation intersects with the legislative scheme on water, land and environment both at the State and the union level as we shall see in the subsequent sections. How the governments, executive and judiciary used the broad-based powers vested in them needs to be understood by investigating the State level enactments concerning the administration of land, water and revenue and public properties in the Ganga Basin States which is dealt with in the succeeding sections.

Limited And Generic Constitutional Guidance On Rivers And Protection Of Riverine Features

The Constitutional provisions merely empower the governments to legislate on water and rivers and the generic framework of obligations and duties for environmental protection has been laid down. The details as to the manner in which the rights, entitlements, and integrity of riverine ecosystems including the ecological features such as fluvial landforms are to be protected have been left to the wisdom of the legislature and their day-to-day management to the wisdom of local authorities.

- 8.11 **Provisions in the Constitution of India** : The Constitution of India includes detailed provisions with regard to the relationship between the centre and State governments. The distribution of powers between the Union Parliament and State Legislatures is dealt with in Articles 245 and 246. Article 245 empowers Parliament to make laws for the whole or part of the country, and the legislature of the State to make laws for the whole or part of that State, in both cases, subject to the provisions of the Constitution.
- 8.12 According to Article 246(1) Parliament is given exclusive powers to make laws with respect to any matters enumerated in List 1 in the Seventh Schedule to the Constitution. This list is known as “the Union List”. Likewise, Article 246[3] of the Constitution bestows powers on to State Govt.s for making laws on matters listed in List II of the Seventh Schedule. This is known as the ‘State List’. The Union or any State Legislature also has, according to Article 246(2) of the Constitution,

concurrent powers to legislate on any matters listed in List III in the Seventh Schedule and this is known as “the Concurrent List”.

- 8.13 In the Constitutional context of India and its quasi-federal *character*, the relationships centring around water issues have, of late, assumed vital importance. The discussions on federalism by far focus on centre-state financial and political relationships, balance of political power, issues of decentralization and local government. Thus, relevant Constitutional provisions like entry 17 [*water that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power*] are subject to the provisions of entry 56 of List I in the State List.
- 8.14 Entry 56 in the Union List, on the other hand, endows the Union Parliament with legislative authority over “regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest.”
- 8.15 Article 246 of the Constitution deals with the subject matter of laws to be made by the Parliament and by the Legislature of the States. As most of the rivers in the country are inter-State, the regulation and development of water of these rivers is a source of inter-State differences and disputes. Further Article 262(1) of the Constitution deals with disputes relating to inter-State rivers. It states that Parliament may, by law, provide for the adjudication of any disputes or complaints with respect to the use, distribution or control of the waters of or in any inter-State river or river valley. Article 262(2) States that Parliament may, by law, provide that neither the Supreme Court nor any other court shall exercise jurisdiction in respect of any such dispute or complaint as is referred to in Clause (1), notwithstanding anything in the Constitution. Pursuant to Article 262 of the Constitution Parliament enacted Inter-State Water Disputes Act in 1956.
- 8.16 More than water issues land within the river course a land-related ownership/property right issue the resolution of which is the crux of a riverine island policy. In this regard Entry 17 in the State List [the legislative domain of the State] has the following relevant Statements:

- *Land, that is to say, rights in or over land, land tenures including the relation of landlord and tenant, and the collection of rents; transfer and alienation of agricultural land; land improvement and agricultural loans; colonization.*
- *Land revenue, including the assessment and collection of revenue, the maintenance of land records, survey for revenue purposes and records of rights, and alienation of revenues.*

8.17 Rivers and stream beds are held in trust for the public by the State. The Doctrine of Eminent Domain is based on the principle that the State is the ultimate owner of all the natural resources which is entirely contrary to the concept of common property resources. Common property resources are available for utilization by each and every individual of the community and none of them can claim to have a right of private property over the same.

8.18 Fundamental rights are not absolute rights. They have reasonable restrictions. The right to property was one of the fundamental rights in the Constitution. However, this right was removed from the list of fundamental rights by the 44th Constitutional Amendment. This was because this right proved to be a hindrance towards attaining the goal of socialism and redistributing wealth (property) equitably among the people. The right to property is now a legal right and not a fundamental right.

8.19 Common Property Resources are usually non-exclusive resources to which rights of use are distributed among a number of co-owners, generally identified by their membership in a community or a village. **In the context of Indian villages, common property resources include community forests, common grazing grounds, tanks and their beds, foreshores, threshing grounds, rivers and riverbeds, where well-defined property regimes may not exist.** Common property resources are those resources which are accessible to the whole community or village and to which no individual has exclusive ownership or property rights. Around 26 percent of India's land mass (180 million hectares) can be classified as commons (Chopra and Gulati, 2001).

8.20 The Legal Regimes Applicable To River Islands In The Ganga Basin

8.21 **The State Level Legal Regimes On *Diara/Char* Islands** : As has been illustrated above, land and water are State subjects under the Constitution with the exception of inter-state rivers where the Union may exercise powers. The collective reading of the legislative powers of States over land and water also **shows that the river bed is under the ownership of the State government**. The common law principle of ownership of the all-flowing water, streams and rivers as well as the appurtenant land as the property of the Government has its origin in the legislations that precede the Constitutional scheme over land and water under the Seventh Schedule¹¹. In addition to the common law principles, the provincial Regulation of Bengal has played a central role in evolving the legal thinking and the procedure for cultivation on fluvial landscapes which has been subsequently adopted by other States.

8.22 The legislative powers under the Constitution are verily used by the States in the Ganga Basin to continue to adapt and apply the scheme of Bengal Regulation for the survey, acquisition and settlement of these lands for additional revenue generation¹². While all the Ganga Basin States recognize the land use of *Diara/Char* lands for seasonal agricultural activities, the degree of recognition and the procedure for the survey and settlement rights to cultivate and occupy these lands varies. The variations in the State regulations or their evolutionary trends on the fluvial landforms need to be looked at as a factor of socio-economic development, land reforms and recurrent river action that often impacts land availability. The Bengal Regulations need to be discussed in some detail since they have a bearing on present-day legal arrangements on *Diara/Char* Islands and will also be relevant for any change in the governance structures in future. What follows is the

¹¹ Originally, the Indian Easements Act, 1882 was applicable to the Bombay Presidency, Punjab Province, Pondicherry, Kerala and Ajmer-Merwara (Rajasthan), later it was extended to the whole of India

¹² Article 372 (1) of the Constitution provides for the continuance of the laws that were in force immediately before the commencement of the Constitution. 371 (1) Subject to the other provisions of this Constitution, all the law in force in the territory of India immediately before the commencement of this Constitution shall continue in force therein until altered or repealed or amended by a competent Legislature or other competent authority.

discussion on the regulations applicable to *Diara/Char* islands in the States of West Bengal, Bihar, Jharkhand, Uttar Pradesh and Uttarakhand (Ganga Basin) States.

8.23 West Bengal : The existing legal position on *Char* Islands in West Bengal is largely shaped by a series of regulations recognizing the customary usage of *Diaras*. The pertinent among them is the Bengal Alluvion and Diluvion Regulation, 1825 (Bengal Regulation No. XI of 1825) which needs a detailed discussion as it is this regulation that is widely applied to the erstwhile Bengal Province which included present-day States of Odisha, Bihar, Jharkhand, parts of Uttar Pradesh and Assam and consequently has influenced the legal basis and thinking of present-day enactments on alluvion management. Consequently, the Ganga basin States continue to apply the Bengal Regulation with exceptions and modifications that have been carried out in this law so far and form the basis for present-day law on the *Diara/Char* Islands¹³. The detailed discussion of this regulation is also warranted to understand its various provisions that courts have been applying in individual cases claiming occupancy and tenancy rights in *Diaras* whereas the law itself is based on customary practices that have a limited role in the present-day framework on land laws that were enacted after an extensive land reform were carried out throughout the country.

8.24 The Bengal Alluvion and Diluvion Regulation, 1825 – Ownership of ‘River Bed’ as the basis for possession of River Islands by the State Government: The Bengal Regulation of 1825 was born out of the need to regulate lands that were left out of the purview of Permanent Settlement (PS) of Bengal that was brought into effect in 1793 and established intermediaries such as Zamindars or Taluqdaars as the revenue collection agents from the peasants¹⁴. The fluvial landscapes were not made part of the PS as the intermediaries perceived these lands as wastelands that were also exposed to uncertainty due to which they generated low or no revenue

¹³ Amended by the Act No. 1 of 1903; Modified in its application to Oudh by the Act No. XVIII of 1876; Adapted and modified by the Government of India (Adaptation of Indian Laws) Order, 1937; Adapted and modified by the Adaptation of Laws Order, 1950

¹⁴ London School of Economics, The Permanent Settlement and the Emergence of a British State in Late-eighteenth-century India, 2023, <https://www.lse.ac.uk/Economic-History/Assets/Documents/WorkingPapers/Economic-History/2023/WP355.pdf>

for cultivating them¹⁵. Importantly, the Bengal Regulation of 1825 only deals with the claims over such lands and leaves other aspects such as assessment of revenue or survey and settlement procedure to be determined under earlier Regulation of 1819 and so forth. The Preamble of the Bengal Regulation of 1825 itself recognizes that due to frequent changes in the channels, *char* or 'small islands' are thrown up by the alluvion in the midst of the stream or on either side of the river resulting in loss or gain of lands in succession. Interestingly, there is also a reference to a similar phenomenon on the sea coast that borders eastern Bengal implying that the regulation is applicable to the islands in coastal areas. However, presently this Regulation will have very limited space in the coastal areas due to the Coastal Regulation Zone Notification, 2019 that defines coastal features including islands and is applicable presently in these areas¹⁶.

'Small Islands' and 'Char Islands' under the Bengal Regulation XI of 1825

Bengal Regulation XI of 1825 merely recognizes the phenomenon of frequent changes in river channels and uses the term 'small islands'. However, it does not define a 'small island'. Another term used under the Regulation is the *Char* Island. The regulation merely deals with the claims over such islands in different scenarios.

8.25 The Regulation, XI of 1825 also underlines that although the *Char* islands are known to be governed by 'law and customs of the country', these customs are not known to courts of justice and hence cannot be applied easily for determining the contesting claims of ownership or tenancy. Clearly, there had been no effort to document the customs that were prevalent for determining the rights and use of *Diaras/chars* before the regulation was brought and instead, a new regulation was promulgated that recognized but did away with the customs at the same time. The Bengal Regulation XI of 1825 thus presents a paradoxical attempt where on one hand it

¹⁵ Ibid

¹⁶ Section 1: Preamble, <http://www.bareactslive.com/ALL/UP243.HTM>; Also Eastern Bengal was referred to areas that are now in present day Bangladesh.

seeks to provide a framework on *char* islands on the other hand it stays away from being strictly prescriptive as the objective is the formulation of rules for the 'general information of individuals as well as the guidance of courts of judicature'.

- 8.26 In its limited objective, the Regulation does not create any new rights in these riverine landforms¹⁷. Rather, the law is to consider the clear, definite and established usage of the alluvial lands while deciding the claims to disputes. The relevant land use category for such lands has been named *Shikast Paiwast* (roughly translating to [lands] overthrown or submerged by water). Regulation XI 1825 deals with various scenarios that arise due to fluvial action.
- 8.27 In a scenario where there is an absence of any clear and definite usage, the general rules of ownership and use shall be applied by the courts of judicature which have been outlined. The gradual accesion of land from the recess of a river shall be considered an increment to the tenure of a person whose estate is annexed to such accession¹⁸. There is no permanent interest or ownership in the surplus land gained by the estate owner and the owner is not exempted from the revenue on this land levied by the competent authorities. Thus, the extent of interest in the alluvial lands is limited to usage and tenure subject to the payment of the revenue under the Bengal Regulation II, 1819 or any other regulation for the time being in force¹⁹.
- 8.28 In another scenario where river action intersects and breaks an estate apart and accede it to another property but the affected/intersected property could be identified, the original ownership shall be upheld²⁰.
- 8.29 In a third scenario where *Chars* are thrown up in a navigable river, where the main channel between the shore and such island is not fordable, it shall, according to the established usage be at the disposal of the Government. The Regulation XI of 1825 also clarifies that the bed of a river is the property of the Government and a *Char* in the middle of a navigable river is deemed to be akin to the river bed which is under

¹⁷ Section 2, Claims and disputes as to the alluvial lands to be decided by usage when clearly recognized and established

¹⁸ Section 4, Ibid

¹⁹ Proviso, section 4

²⁰ Section 4, ibid

direct ownership and disposal of the State government. Where the river channel is fordable at any season of the year, the *char* islands shall be considered accession to the land or tenures of persons whose estates may be most contiguous to it, subject to the increment of land by gradual accession.

- 8.30 In a fourth scenario where the *Chars* are thrown up in small shallow rivers, where the *jalkar* right of fishery may also exist, the *char* or the sandbank is the property of the individual if the *char* in a stream is formed by gradual accession or recession process; and any sand bank belongs to the proprietor of the river bed (State government).
- 8.31 In a fifth scenario, where the disputes with respect to lands gained or lost by the fluvial action arise and the situation is not covered under the Bengal Regulation XI of 1825, the courts of justice shall be guided by the best evidence that they may be able to obtain as per the established local usage or in the absence of any guidance, principles of equity and justice shall apply.
- 8.32 Very significantly, the Bengal Regulation XI of 1825 provides for a scenario where the bed of a navigable river is either encroached or obstructed. The proprietary claims over *char* islands mentioned in various scenarios in the Regulation are subject to the overarching right of the Government to remove any encroachment or other obstructions which appear to interfere with the safe and customary navigation or passage of boats in such rivers²¹. The Zila Magistrate in West Bengal or any other officer authorized by the Government for such purpose has the power for the removal of such obstruction. Thus, the navigability of rivers overrides the claims that may lead to encroachment or obstruction²². However, the Bengal Regulation of 1825 does not define a river bed²³, a navigable channel, customary navigation and obstruction which may have clear contestation with the established usage of *char* islands and rights settled in favour of the individuals or local institutions such as Panchayats having common rights over *chars* and fisheries.

²¹ Presumably, the powers for removal of obstruction in a navigable river are also derived from the Bengal Regulation of 1825 as has been provided in the National Inland Waterway Authority Act, 1985

²² Rule 5, the Bengal Regulation of 1825

²³ In the absence of any other definition, the definition of River Bed under the Ganga Order, 2016 shall prevail.

***Char* Island Akin To A River Bed: Ownership Of River Bed As The Legal Basis For Control Of River Islands By The Government²⁴**

The Bengal Regulation XI of 1825 clearly States that a *Char* thrown up in a navigable river, where the main channel is not fordable, shall be at the disposal of the Government. The basis for this ownership is the common law principle that the river bed is not the property of an individual but of the government and a *Char* in the middle of a navigable river is deemed to be akin to the river bed which is under direct ownership and disposal of the State government. Importantly, the Regulation also provides for the overarching right of the government to remove any encroachment in a navigable river.

8.33 The Bengal Alluvion and Diluvion (BAD) Act, 1847 – establishes the procedural mechanism for possession and control of river islands in a large navigable river :

- The Regulation of 1825 only provided for various scenarios the courts and revenue agencies were required to consider while ascertaining the ownership claims of *char* islands. The Regulation does not deal with the manner in which the investigations for scrutinizing these lands would be carried out. For this purpose, the BAD Act, 1847 was enacted. The Act has been amended several times to suit the present-day requirements and to prevent its applicability in areas outside the present-day State of West Bengal. The other States such as Odisha and Bihar have adopted their own version of this Act with State-specific amendments.
- The BAD Act, 1847 prescribes the procedure for investigations of lands gained from the sea or from rivers by alluvion or dereliction, or regarding the right of Government to ownership. The Act supersedes all other regulations applicable earlier. In other words, the survey investigation and scrutiny of the fluvial lands

²⁴ The River Bed thus assumes the central role in determining the claims and counter claims over the *char* islands. In this respect it can be said that the Ganga Order 2016, The IWTA Act, 1985 and the Bengal Regulation complement each other so far removal of encroachment from a navigable river is concerned.

could only be done under this law and all the pending claims before any legal forum were to be decided under this Act.

- The Government is empowered to institute and approve a survey from time to time which shall be done every ten years once the previous survey has expired in order to ascertain the changes that may have taken place since the previous survey and cause new maps to be made as per the latest survey²⁵. The Act also provided a schedule for different parts of the Bengal Province as to when the survey is to take place. Upon inspection and survey, if it is found that the land to an eState has been lost or added, the local revenue authorities are empowered to make an assessment of the same and adjust the revenue accordingly²⁶. In other words, changes in the lands due to river action form the basis for the assessment and fixation of revenue in alluvion or diluvion lands. However, these landforms are not absolved from revenue payment.
- Importantly, the BAD Act, 1847 has a dedicated provision for the river island. Whenever, upon survey, the local revenue authorities find that an island is thrown up in a large navigable river, the Government shall immediately take possession of such river island under Section 4 (3) of the Bengal Regulation XI of 1825 which shall be duly recorded by the local revenue authority. Any grievance or contesting claim against such possession of a River Island by the Government shall be filed as a regular suit in the Civil Court²⁷. Further, no suit or action with regard to River Islands shall lie in any court of justice against the Government except on proprietary rights to River Islands²⁸. Thus, the Act, 1847 builds on and takes forward the law of River Islands in a navigable river and the rule to its immediate possession by the Government.
- Subsequently, the Bengal Alluvial Land Settlement Act, 1858 was enacted to provide for the settlement of alluvial lands. This has been repealed by the State Government of West Bengal and has been replaced by the West Bengal Land Reforms Amendment Act, 1965.

²⁵ Section III, the Bengal Alluvion and Diluvion Act, 1847

²⁶ Section V & VI, *ibid*

²⁷ Section VII, *ibid*

²⁸ Section VIII, *ibid*

Scrutiny And Possession Of River Islands In A Navigable River By The Government

Thus, the Act, 1847 builds on and takes forward the law of River Islands in a navigable river and the rule to its immediate possession by the Government. Both the Regulation XI of 1825 and the BAD Act, 1847 consider River Islands as a special category of lands that are the property of the Government to be possessed immediately after these have come into existence. After the Government has taken possession, it has the power for initiating surveys and investigations for the settlement of fluvial lands including the river islands. The law however provides the space for any claims over the River Islands to be settled through a regular suit.

Distinction Between Fordable and Non-Fordable River Islands

The BAD Act, 1847 read with Regulation XI of 1825 brings out a clear distinction between River Islands in large navigable rivers and the islands in shallow rivers and streams. In this respect, the law under the Regulation of 1825 is far more evolved as it deals with ownership of such islands in large navigable rivers and shallow rivers. Clearly, in a large river that is not fordable, the rule of Government ownership of a riverbed is applicable. The regulations with respect to a fordable river also follow from the Act, 1847 where the gradual receding of a river is the basis to confer occupancy rights to the owner of adjacent estate. Since in the present system, the river bed is not the property of the individual, the State Government is the owner of it and by virtue of that a river island is also the property of the State Government.

8.34 Finally, the legal position on island *chars*/river islands in West Bengal clearly establishes the following aspects:

- i) The term 'river island' in a large navigable river is a legally recognized term as well as a separate legal category subjected to immediate control and possession by the State Government.
- ii) The possession of river islands by the Government is accompanied by the settlement of proprietary rights of individuals claiming such rights. Such settlement is at the discretion of the State Government.
- iii) The law of ownership of River Bed forms the basis for the possession of river islands by the State Government. River bed is not the property of an individual. It is under the eminent domain power of the Government²⁹.
- iv) The proprietary claims to the rights in the river islands can only be filed as a regular suit in a Civil Court.
- v) The Regulation and the Act applicable to River Islands distinguishes between islands in a large navigable river and those in shallow waters that are fordable. Thus, the future framework on river islands needs to take into account the legal position as it exists under the state-specific enactments.
- vi) While the series of Bengal Regulations and the Acts provide for the scrutiny and possession of river islands by the revenue authorities, these do not define a river island thrown in a large navigable river or those that are fordable. Thus, while the legal basis for the State's ownership over river islands is provided, the definitional clarity is missing in the colonial legislation.

8.35 **Bihar and Jharkhand** : In Bihar the legal and institutional frameworks on River Islands are more evolved than elsewhere. A combination of Bengal Regulations, the BAD Act, 1847 and the Bihar State Government's own procedural rules for mapping, scrutinizing and settling what are known as Khas Mahal (Government Estates) constitute the law of river islands in Bihar. It is observed that local courts as well as the Patna High Court have been adjudicating the claims and disputes over river

²⁹ The Ganga Order, 2016 under Section 3(s) defines a River Bed.
https://nmcg.nic.in/writereaddata/fileupload/47_AuthorityNotification.pdf

islands in view of the law laid down by the Bengal Regulation XI of 1825 and the Bengal Act, 1847³⁰. As would be seen that while the State Government of Bihar has enacted a series of legislations that deal with the river islands, their ownership and management in the State, the set of Bengal Regulations (as were applicable in Bihar during the colonial rule) continue to apply and have not been repealed. The post-independence State level enactments need to be briefly discussed to understand the legal position and the procedure for the settlement of rights over fluvial landforms in Bihar.

8.36 **Bihar Land Reforms (Fixation of Ceiling Area and Acquisition of Surplus Land) Act, 1961³¹ - Exclusive Powers of the Collector to declare a River Island as Diara Land**

- The primary objective of The Bihar Land Reforms (Acquisition of Surplus Land) (BLR) Act, 1961 is to pave the way for necessary land reforms in the State. For this purpose, the BLR Act, 1961 provides for the fixation of ceiling limits, restrictions on sub-letting the lands, resumption of land by certain raiyat for personal cultivation and acquisition of surplus land by the State Government. It is the 'acquisition of surplus land' that makes the scope of this legislation critical for the river islands in the State as the law underlines the intent of the legislature to treat certain lands emerging out of river action or fluvial lands to be surplus lands that can be acquired by the State Government.
- The BLR Act, 1961 is important from the perspective of the definition of River Islands. It would be worth mentioning here that neither the Regulation XI of 1825 nor the BAD Act, 1847 define a river island which leaves a grey area and presents challenges for the local revenue authorities to take possession of such lands in shallow as well as large rivers. This has also resulted in a large number of cases being filed in the local courts.

³⁰ See Satya Narayan Singh Vs State of Bihar

<https://www.casemine.com/judgement/in/5ab4ea4e4a93262f5111430f>

³¹ <http://www.bareactslive.com/BIH/BH402.HTM#0>

- The BLR Act, 1961 defines a ‘*Diara* Land³²’ to mean any land which is subject to diluvion or alluvion on account of any change in the course of a river or which lies between two embankments constructed to control a river and includes any land which may be surveyed as *Diara* land under the Bengal Survey Act, 1875 (Ben. Act V of 1875), or which after enquiry is declared as such by the Collector³³. There are three elements of this definition. Firstly, it’s the geographical and ecological *characteristic* of a land that is subjected to river action and is located either within the natural course of a river or emerges within embankments; Secondly, if a certain land faced with alluvion and diluvion action is surveyed as *Diara* which shows the prior recorded status of the land as *Diara* under the local revenue records and establishes its legal position as *Diara* under the Bengal regime of regulations on the subject. The third aspect is the enquiry and declaration of a certain land as ‘*Diara*’ by the District Collector. Thus, the additional feature of the legislation is that it empowers the Collector to declare a certain river island as *Diara*. Under the revenue records, *Diara* or *Chaur* lands are classified as Class V land (lands recognized and used for the settlement of people by the State Government) and the ceiling limit of such lands is 15.368 hectares. This means that a family of more than five members cannot have more than the stipulated area of land for seasonal cultivation.

³² ‘*Diara*’ word comes to ‘*Dias*’ meaning ‘earthen lamp’ i.e., bowl like land system on either side of the riverbank; All India Co-ordinated Project for *Diara* land Improvement (AICRP-DI), <https://www.agriculturewale.com/tal-diara-lands/>; ‘*Diara*’ is a local term referred to for lands that resemble river islands in Bihar and in the Ganges basin states in general; https://iigeo.org/wp-content/uploads/2022/06/P5_Manendra.pdf

³³ Section 2(e), Bihar Land Reforms (Fixation of Ceiling Area and Acquisition of Surplus Land) Act, 1961

First Statutory Definition of *Diara* Land (River Island) was attempted under the Bihar Land Reforms Act, 1961

Although the Bengal Regulation of 1825 and the Bengal Act, 1847 declared a River Island in a navigable river to be the property of the Government, these regulations did not define a *Char* Island. The BLR Act, 1961 defines it to include ecological traits, the survey, scrutiny and records and the third element of the power of the Collector to declare a certain land as *Diara*/River Island

8.37 Bihar Government Estate (Khas Mahal) Manual, 1953 – *Char*/*Diara* Islands to be recorded as Khas Mahal ‘Estates’ that could be acquired by the State Government by way of a Notification

- The Bihar Land Reforms Act, 1950 defines an ‘Estate’ to mean any land that includes fishery and ferry rights. It’s a special entry in the general register of records. In Bihar, an Estate can be vested in the State Government meaning that any land can be vested in the State by way of a Notification issued under the Bihar Land Reforms Act, 1950. The Act defines an Estate to include any land whether revenue-paying or revenue-free. Thus, rights in the lands in river islands including the ferry and fishery rights can be vested in the State Government by way of a Notification.
- The procedural aspects of the ‘Law of Estates’ in Bihar are detailed out in the Government Estate (*Khas Mahal*) Manual, 1953. The Manual, in particular, deals with the principles, policy and procedure for *Khas* management of Estates under the direct management of the Government. Thus, the term “Government Estates” is used to mean Estates under the direct management of the Government whether these are the property of the Government or are the Estates of private individuals brought under direct management of the Government. It also means any land, which is the property of the Government and as such would include Estates owned by Government which have been let to farm and leased for periods and also the wastelands but would not include lands belonging to other departments of

Government, e.g. roadside lands, so long as they are not relinquished by the department concerned to the Collector for management.

- The Manual provides the Rules for the acquisition of Estates that are under the direct management of the State Government. Importantly, ownership is not the premise for such management. The State Government can also assume the management of Estates under private ownership. The manner in which Government Estates (*Khas-Mahal*) can be acquired includes “Resumption of Island *Chars*”. Resumption in the context of *Khas Mahal* referred to in the Manual means the acquisition of land by the Government. In addition, the Manual, 1953 provides the powers and the procedure for the acquisition. Therefore, the Manual reveals that the policy of the Government for lands such as *Diara/Char* Islands is to manage them directly under Government supervision.
- Once the *Diara/Char* Islands are recorded as ‘Estates (Khas Mahal)’ they are under the direct control of the State Government and can also be leased out by the Government³⁴. This lease is based on a form of acceptance known as *Kabuliyat* on behalf of the lessor. The *Diara* Estates are also required to be assessed annually after the rains for the alluvion or diluvion action by an officer not below the rank of a Circle Inspector. The observation by the officer should be marked on the previous year’s map prepared by an *Amin* (a land officer) on all the changes that occurred in the *Diara* Estates. The map so updated by following this process should be relied upon solely for settlements and remissions etc.
- What emerges from the Manual 1953 read with Bihar Tenancy Act, 1885 and Bihar Land Reforms Act, 1961 that the States have put a legal and procedural system for the annual mapping and assessment of the Island *Chars* or *Diara* Estates and it’s not left unattended. The extent of direct management by the State Government and the regulation of activities in these lands for the purposes these have been leased or the land use

³⁴ Rule 24 talks about lease of char or diara lands.

contrary to what has been allowed under the Rules needs to be further ascertained through ground truthing of the legal provisions.

- The procedural details for dealing with the *Diara* lands in Bihar are also provided under the Manual. A responsible officer not below the rank of Sub-deputy Collector, or a Kanungo, [or Circle Inspector], should inquire on the spot after each year's rains and have marked on the previous year's map by an *Amin* all changes due to alluvion and diluvion, including changes in the classification of lands. This map should be relied on solely for settlements, remissions etc.³⁵

35

i. Appendix D(4) states that Rule 24 prescribes for the ascertainment and record of the changes that have occurred as a result of the previous rainy season. On basis of the ascertainment, the collector would be able to see:

- a. What land has been completely diluviated or rendered unculturable by sand deposit or for any other reason.
- b. What land has deteriorated as a result of sand deposit or otherwise without being rendered unculturable.
- c. What new land has accreted and is capable of cultivation.
- d. What land has improved as a result of deposit of silt.

The Collector is then in a position to do four things:-

- a. To accept a surrender of land, which a raiyat wishes to give up and to abate the rent due from such land in accordance with Section 52-A of the Bihar Tenancy Act.
- b. To make for the year remissions of rent for land which is wholly unculturable or has deteriorated. The amount of remission (a) for wholly unculturable land and (b) for land which has seriously deteriorated should be according to a standard scale. Where the non-occupancy raiyats are holding under kabuliyats of the form given in Appendix-A to the Government Estates Manual, the rates fixed by those kabuliyats should be considered when laying down a scale for remissions. Such remission is to be sharply distinguished from the reduction of rent which a Collector is required by Section 25-A of the Act or otherwise to make in consequence of the permanent deterioration of land.
- c. To settle newly accreted land, subject to any rights that the raiyats may have on it under Section 52-A (2) or by reason of the land accreting to the holding of a raiyat.
- d. To demand from non-occupancy raiyats additional rent for land which has improved subject to the rights secured to them by contract or by statute. For example, if rent has been determined under Section 46(6) of the Bihar Tenancy Act and the raiyat has agreed to pay that rent, he is entitled to hold the land for five years at that rent.

ii. Appendix E(1) refers to Section 180 of the Bengal Tenancy Act, the law which governs tenancy of char and diara lands, which requires a raiyat to hold char or diara land for twelve continuous years and acquire right of occupancy, until then, the raiyat shall be liable to pay rent as decided between him and his land lord. It means that till twelve years the non-occupancy raiyat will be paying rent and then he will acquire the right of occupancy.

iii. There is a Kabuliyat form via which the diara lands are allotted to raiyats by Collector on behalf of Government of Bihar. This form contains the rate and tenure of the raiyat as the tenant. It is also advisable to get these kabuliyats registered since "since the use of an unregistered written agreement as evidence is fraught with pitfalls"

iv. In absence of mutual agreement or kabuliyat, the rate of rent must be determined by the Civil Court.

8.38 Bengal Survey Act, 1875³⁶ And The Bihar Tenancy Act, 1885: The Survey And Tenancy Laws Establish River Islands As 'Estates' Where Rights Are Subject To Recognition By Revenue Authorities

- As discussed previously, the Bengal Alluvion and Diluvion Act, 1847 was enacted with the purpose of scrutinizing the riverine fluvial landforms and had stipulated a schedule for the survey and recording of tenure on these lands, including for the river islands. Over a period, the survey became central to the determination of revenue for these lands and a separate enactment dealing with the survey was felt necessary. The Bengal Survey Act, 1875, provides for a comprehensive procedure for the survey of 'any land' entered in the revenue rolls and is assessed separately including a *char* or island thrown up in a navigable river or in the sea which under the laws in force is at the disposal of the Government³⁷. However, the import of the term 'at the disposal of the Government' may have practical implications and could mean if the *Char* Island is not at the disposal of the Government it will not be surveyed. The survey under the Act includes the identification of boundaries and all other operations antecedent to and connected to the survey³⁸. The 'Estate' as defined under the Act also assumed significance in the context of river islands. In simple terms, any land recorded with revenue authorities which is to be separately assessed includes *Char* Islands. The Estate under the Act has also been defined as any land which is a separate holding free of land revenue and any land gained by alluvion or by dereliction or a river action or sea action to any Estate which is considered as an increment to the tenure to which such land has accreted. Importantly, an Estate cannot be subjected to permanent interest in land with the exception of *raiyyats* having the right of occupancy only including '*gharwali* holdings'. This Act is applicable in Bihar.

³⁶ <http://www.bareactslive.com/WB/WB656.HTM>

³⁷ Section 2, Definitions

³⁸ *ibid*

- Another law applicable to *Char* Islands or *Diara* in Bihar is the Bihar Tenancy Act, 1885. The Act also defines 'Estates' to include '*Khas Mahals*' (*land under direct ownership and maintenance of the revenue department*). The Act provides that a *Raiyat* can have tenancy rights over River Islands. *Raiyat* in the ordinary and simple sense of the term is a self-cultivator. The Act provides that a self-cultivator can acquire the right of occupancy of a *Diara* land if he has been holding the land for 12 continuous years and also has been paying the rent as agreed between him and the landlord³⁹. The right of occupancy will be acquired in the 12th year. The Tenancy in the *Diara* Lands can also be revoked by the Collector in case the cultivation is not feasible⁴⁰.

8.39 Bihar Special Survey Settlement Act, 2011⁴¹ And The Rules, 2012⁴² - Implications On Occupancy And Tenure Rights In *Diara* Islands

- Subsequently, the State Government also enacted Bihar (this Act is not applicable in Jharkhand) Special Survey Settlement Act 2011 which recognizes the enormous challenges with respect to conventional ways of maintaining land records in the State due to the interplay of numerous rivers that transcend from upstream and cause large scale erosion. The conventional methods would imply the survey and demarcations as were provided under the Bengal Alluvion Deluvion Acts as we have seen in earlier sections. The Act also notes that the very purpose of the survey is defeated if the time taken to complete these surveys spans over decades⁴³. Due to this, no revisional surveys could be taken up in Bihar. Since the computerization of data also did not yield the desired results due to frequent changes in the ground reality and the records maintained, the

³⁹ Section 180, the Bihar Tenancy Act, 1885

⁴⁰ Section 112, the Bihar Tenancy Act, 1885

⁴¹

https://prsindia.org/files/bills_acts/acts_states/bihar/2011/Bihar%20Act%20No.%2024%20of%202011.pdf

⁴² <http://www.bareactslive.com/BIH/bh767.htm#0>

⁴³ See Preamble of the Bihar Special Survey Settlement Act, 2011

gaps and the inconsistencies led to contesting land title claims. Due to this a survey and settlement with the use of modern technology has been desired necessary in Bihar. Thus, the Act provides a legal basis for conducting a fresh survey and settlement in the State. Under this law, a landholder can submit a self-declaration with respect to a land held by him⁴⁴. Upon verification, by the Anchal Adhikari⁴⁵, of records and genealogical table by the Settlement Officer, a verification certificate is issued to the landholder mandatorily within 15 working days⁴⁶. The self-certificate scheme and survey procedure are also applicable to the *Char* or *Diara* Islands in Bihar which implies that *Char* Islands will be settled as per this Act. The Record of Rights (RoR) finally published under this Act would be considered as the basis for land title in Bihar. However, legal proceedings in any court of law initiated prior to the commencement of this Act that were initiated under the Bihar Tenancy Act, 1885 would be decided as per the Tenancy law and not the 2011 Act.

- The discussion above on the Act, 2011 and the Rules 2012 may appear to be more on the survey of settlement for effective land records management system but these have serious ramifications on the *Diara/Char* islands due to the reason that these were subject to Bengal set of regulations and laws for a long time and the procedure provided under the Bihar Tenancy Act and the Bengal Survey Act, 1875 was applicable. The new changes, especially the provisions of self-declaration and surveys are also not in sync with the provision of occupancy for a period of 12 years as provided under the Bihar tenancy law. Any future framework on river islands needs to take note of the ground-level implications of these legislations since the communities inhabiting river islands are hardly aware of the most recent advancements in law and procedure for the management of *Char/Diara* lands.

⁴⁴ Section 5, the Bihar Special Survey Settlement Act, 2011

⁴⁵ Rule 6, the Bihar Special Survey Settlement Act, 2011

⁴⁶ Rule 6, the Bihar Special Survey and Settlement Act, 2011

8.40 Bihar Irrigation, Flood Management And Drainage Rules, 2003 - A Flood Disaster Management Perspective

- Since *Char/Diara* Islands are a creation of river action and are prone to river action, these landforms are vulnerable to flood events. The mainstream disaster management law does not have much focus on disaster preparedness and response in river islands. The Bihar Irrigation, Flood Management and Drainage Rules, 2003 categorize the irrigation infrastructure and drainage system on the basis of risks that an area might be faced with.
- There are three risk categories of locations within the Rules. Risk Category A includes man-made locations such as embankments which have the imminent risk of erosion and breach, Risk Category B also includes embankments but remote ones where erosion intensity is not much high. Risk category C includes sites that are prone to erosion and need to be protected before a river endangers the life and property of an area.
- Thus, all the potential sites that are at risk of being eroded or flooded shall be inventoried under the Rules and a list of vulnerable sites with their locations shall be prepared by the Executive Engineer, Irrigation Department with a detailed assessment of risks and be sent to subordinate officers for necessary action⁴⁷. In addition to this, the Chief Engineer shall issue a Flood Patrolling Order for taking advance measures such as flood control works. Importantly, if injury could be caused to public health or damage to properties due to encroachment of a river, stream or natural drainage then the said area/stream could be declared as “Drainage Works’ where encroachment is prohibited⁴⁸ and encroachment in the area could be removed by Div. Canal Officer as per the Rules⁴⁹.

⁴⁷ Rule 4

⁴⁸ Section 13 Bihar Irrigation Act 1997 and Rule 5

⁴⁹ Section 15, *ibid*

8.41 The Bihar Chaur, *Diara* And Gang Barar Public Land Temporary Settlement Policy, 2013 – The Latest Policy Approach On *Diara* Islands In Bihar

- This Policy represents the latest thinking on the temporary settlement of public lands on the payment of revenue for a short and fixed duration of five years. As the title of the Policy itself suggests, *Diaras* are public lands and the settlement is of temporary nature. The Policy does not provide for the survey, settlement and determination of revenue for *Diara* lands as has been provided under various laws discussed above.
- As per the Policy, the River Islands (Chaur, *Diara*, Gang Barar) are public lands and should be settled in favour of marginalized groups in Bihar. The Policy provides that the land coming from the rivers that are arable will be redistributed for the purposes of agriculture by self-cultivation. The land is to be redistributed to the weaker sections of the society such as Mahadalits, Scheduled Castes and Scheduled Tribes, Other Backward Classes and families of soldiers. As per the Policy, the land settled in favour of the above-mentioned categories of beneficiaries is non-transferable but can devolve hereditarily during the period of settlement. In case the settled land gets submerged within a period of settlement (5 years in general), the settlement shall automatically stand cancelled and no claim can be made against the Government.
- It is therefore required that either the State laws are suitably amended to conform to the Policy or the Policy provisions are supplemented by Guidelines that are helpful in clarifying the changes brought in the legal position. This is required for the revenue authorities and communities inhabiting the river islands.

**The Disconnect Between The Chaur/*Diara* Policy, 2013 And The Bihar
Tenancy Act, 1885 On The Issue Of River Islands**

Notably, the Policy's five-year period of resettlement runs contrary to the legal framework on land reforms, survey and settlement, tenancy, and acquisition of surplus lands that provide for a mechanism of annual survey and assessment that has been detailed in the Khas Mahal Manual, 1953. Particularly, the Tenancy Act necessitates land holding for twelve consecutive years for the occupancy rights. The Policy thus does not seem to be informed of the statutory position and the procedure for the settlement and occupancy rights in Bihar which is likely to lead to confusion on the ground.

8.42 The Chaur Development Schemes And Plans Being Implemented Since 2013-14⁵⁰ - Need For A Regulation On Infrastructure Development On River Islands

- After the Public Land Temporary Settlement Policy was launched, various developments and plans were initiated by the State Government including infrastructure development on the river islands which runs contrary to the legal position of these lands in the State and their permissible land use. The State laws as discussed above provide that these are surplus Estates that can be temporarily cultivated. No other land use is mentioned under the laws reviewed so far. However, various schemes aimed at the development of river islands are in contravention to the customary and legal position and land use of river islands in the State and must be reviewed.

8.43 Uttar Pradesh : The Regime Of Alluvial And Diluvial Mahals In Uttar Pradesh- The UP Land Code, 1950, The Rules On Assessment Of Alluvial Mahals In Temporarily Settled Districts And The Revenue Department Manual Of Orders, 1965:

⁵⁰ Final Annual Plan Bihar 2013-2014 available at http://nrcddp.org/file_upload/Annual%20Plan%20Bihar%202013-14.pdf

- In UP, the legal position on river islands is not very clear but instructive. As we have seen, a *Mahal* is a public land at the disposal of the Government with a special entry in the revenue records. Three sets of legal instruments acknowledge fluvial landforms that are known as alluvial Mahal. The UP-Land Revenue Code, 1950, the Rules on, “Assessment of Alluvial Mahals in Temporarily Settled Districts and the Revenue Department Manual of Orders, 1965 State that an *Alluvial Mahal* is one created by the river action where the area of alluvial deposit has increased resulting in income and revenue increment from such an area. A *Diluvial Mahal* is a result of a decrease in area due to river action, both swept away partially or fully and added to another revenue district partly or fully. There are arrangements for revenue collection and settlement in different scenarios when alluvial or diluvial action happens. Therefore, the Mahals and the land rights therein are protected as these are the recognized land revenue categories in Uttar Pradesh. There are also instructions on jurisdictional issues in cases of inter-district conflict on land rights and revenue collection. The management regime of these Mahals appears fluid in the absence of any detailed guidance on the same. These procedural aspects need further understanding and deeper analysis to bring out a clear position with respect to different scenarios due to river action each year.

8.44 Uttarakhand : The Fragments Do Not Include ‘River Islands’- The Uttaranchal Amendment Act, 2003

- The Uttaranchal Amendment Act 2003 (Further amended 2006) provides for the transfer of a ‘fragment’. A Fragment is a piece of land measuring roughly about 3 acres. Whether it can be located within a river is unclear. The sale, purchase and revenue to be levied on the fragments are to be further determined as per the Revenue Code. There is no reference to River Island under this law. Thus, it can be inferred that the legal position in Uttarakhand with respect to river islands or fragments that emerge due to river action is not very clear.

8.45 The Uttarakhand Flood Plain Zoning Act, 2012

- The relevant legislation is the Uttarakhand Flood Plain Zoning (UKFPZ) Act, 2012 provides for the powers of the State Government to notify areas by a State level authority constituted for the purpose. The law further empowers the State to acquire lands susceptible to flood action on the payment of compensation. Thus, it is these broad powers under this Act that could be applicable to river islands.
- The UKFPZ, 2012 is a new legislation with a potential application to River Islands that adjoin flood plain areas and could be notified as such by the Authority constituted for such purpose. There is a provision for compensating occupants of lands susceptible to floods based on a survey of the land by an authorized officer. The details of the survey and coverage could be only known with further verification.
- A few pertinent aspects of the Flood Plain Zone Act need discussion in this context. The Act States that a survey would be conducted by the Flood Zoning Authority to identify flood plains (the area which is susceptible to flood, as per the definition) and prior notice shall be given to the occupier of the land⁵¹. However, any officer or Flood Zoning Authority who enters the land shall, before leaving, tender compensation to the owner or occupier of such land for any damage which may have been caused and in case of dispute as to the sufficiency of the amount so tendered, the Flood Zoning Authority or such officer shall refer the matter to the State Government for its decision⁵². It may be concluded that compensation would only be provided when the damage is caused to the occupier's land, building or structure. Furthermore, the State Government after the report of the Flood Zoning Authority may alter the limits of the area as it considers necessary and shall make arrangements for rehabilitation of

⁵¹ Section 5

⁵² section 7

Colonies already existing in the flood plain. The State Government may restrict and prohibit activities in the flood plains after declaring the areas. Where any permission to undertake any activity in the flood plain has been refused to any person or where as a result of prohibition or restriction imposed on any person under this Act, such person suffers any damage, he shall be entitled to the payment of compensation as per the Land acquisition law.

- Therefore, it can be concluded that compensation can be received in two circumstances i.e., when land, building, and structure of the occupier has been damaged due to flood and in case of any person who suffers loss as a result of prohibition or restriction imposed in flood plain area. In determining the amount of compensation, any restriction to which the land is subjected under any other law for the time being in force in regard to the right of the person claiming compensation to carry on any activity on the land or otherwise to the use of the land shall be taken into consideration. Compensation shall be determined by agreement between the persons and the authority.

8.46 The National Level Legal Regimes Applicable To River Islands

- **The River Ganga Authorities (Rejuvenation, Protection and Management) Order, 2016 (hereinafter the Ganga Order, 2016)** is a Notification issued under the Environment (Protection) Act, 1986⁵³. The Ganga Order therefore has the same effect as the EPA. The Ganga Order, 2016 is a pertinent regulation with tremendous scope and institutional framework established under it that could lead to a future framework on the sustainable use and management of river islands. It provides a detailed framework for the environmental restoration and management of the River Ganga. In this respect, a brief discussion on the wider scope and key features of the Ganga Order, 2016 relevant for the river islands could be useful.

⁵³ https://nmcg.nic.in/writereaddata/fileupload/47_AuthorityNotification.pdf

- **The ‘National River’ Status of River Ganga** – what does it entail for River Islands? : Under this Order, the River Ganga is recognized as a ‘National River⁵⁴’. However, the implications of the ‘National River’ status of River Ganga from the conservation perspective need further elaboration. The analogy can be drawn with similar status accorded to, for example, forest ecosystems once these are notified as ‘National Parks’ under the Wildlife (Protection) Act, 1972 wherein the rights-claims, settlement process, regulation of permitted and prohibited activities with respect to land use and its resources are clearly laid out by way of a notification and further by way of a Forest Working Plan⁵⁵. Thus, though the geographical scope of the Ganga Order, 2016 is well defined, the functional scope of the Order is yet to be unpacked for the conservation and sustainable management of landforms along and within River Ganga. In this respect, the legal implications of the status of a ‘National River’ accorded to River Ganga with respect to various land uses within and along its banks are not fully extrapolated under the Notification and require further guidelines on specific ecosystems such as River Islands. The Order does not specifically refer to river islands or lands within the river.
- The ‘Urgent needs’ and the ‘River Basin Approach’ emphasized under the Preamble of the Ganga Order, 2016 : The Preamble to the Ganga Order, 2016 recognizes the ‘urgent need’ for undertaking six specific measures for ensuring effective abatement of pollution and rejuvenation of River Ganga. The first being the adoption of the river Basin approach through comprehensive planning and sectoral coordination⁵⁶. In other words, the Preamble itself establishes urgency to adopt the river basin approach which has been made a statutory requirement for the Ganga Basin. By doing so, the Order aims to realize the aspiration of the National Water Policy, 2012 that

⁵⁴ Preamble, The River Ganga Order, 2016

⁵⁵ The objective of comparing National River Vs National Park is not to suggest any transposing of the regime but to initiate a normative discussion for identifying the elements that could enhance conservation regime of a national river

⁵⁶ The Preamble (a)

calls for adopting a river basin approach as the fundamental principle for water governance in India. The implementation of this approach will require basin and sub-basin level organizations with capacities to prevent pollution and encourage augmentation of the basin's water and natural resources. The second urgent measure is the maintenance of the ecological flows for restoring ecological integrity that is essential for self-rejuvenation, regulation of development has also been recognized as an urgency⁵⁷.

- The third urgent measure to be undertaken under the Ganga Order is critical for the river islands as it pertains to imposing restrictions in areas abutting the River Ganga where reasonable restrictions could imposed on all activities to ensure ecological integrity from a river basin perspective⁵⁸. These restrictions could be extended to river islands as these are also abutting the flowing river. Such an interpretation would require that the State level legislations also align with the Order. However, a consensus needs to be drawn as it would enable the authorities under this Order to regulate activities that are detrimental to river ecology and health. Alternatively, the Order could be modified to explicitly state its applicability to river islands.
- The other three measures enabling urgent action by the authorities namely inspection by the authorities, sponsoring investigations and research and collection and dissemination of information and preparation of codes, and guidelines relating to the prevention, control, and abatement of environment pollution compliment the urgency clauses that are part of the Preamble as mentioned above. Thus, the Ganga Order, 2016 itself paves the way for the preparation of need-based codes and guidelines as and when required. The aspect of regulation of activities in areas abutting the river Ganga such as the River Islands can thus be dealt with by way of a specific legal instrument promulgated under the Order itself.

⁵⁷ The Preamble (b)

⁵⁸ Preamble (c)

- 'River Bed' and 'River Bed Farming' as defined under the Ganga Order 2016 – Definitions without accompanying provisions but offer the legal space for regulating land use in river islands
- The Definitions under the Ganga Order assume significance for the purposes of regulating activities in the River Islands. The Order provides for the definition of a Basin that includes the entire catchment including land, soil and vegetation which is relevant⁵⁹. The Order also defines 'deforestation' in the context of Ganga Basin to mean removal or reduction in forest cover or removal of trees and vegetation of a forest, excluding a planned clearance⁶⁰. This has the potential to go beyond just the control and abatement of pollution and can potentially lead to the enhancement of overall basin health and catchment improvement through a Forest Landscape Restoration (FLR) approach.
- Significantly, the Ganga Order, 2016 defines a 'River Bed' to mean the dried portion of the area of the River Ganga or its tributaries and includes the land by the side of the river or which retains the water in its natural channels when the greatest flow of water⁶¹. As discussed, and held in earlier sections both Bengal and Bihar series of enactments recognize that a *Char/Diara* Island in a navigable river is akin to a river bed and the Khas Mahal Rule reinforces that by providing that river islands are Khas Mahals (Estates) under direct ownership, control and management of the Government, subject to any established custom or usage which shall be proven in the records. Thus, River Islands could be extended legal protection under the Ganga Order, 2016. 'River Bed Farming' is also defined to include seasonal agriculture or farming on the River Bed of River Ganga or its tributaries during low flow of water⁶². The import of this definition is twofold. Firstly, the Order, 2016 recognizes the practice of cultivating the river bed seasonally in the Ganga Basin and indirectly also recognizes the farmer communities

⁵⁹ Section 3(b)

⁶⁰ Section 3(g)

⁶¹ Section 3(s)

⁶² Section 3(t)

involved in river bed farming. However, except for the definitions, there is no provision in the entire Order that deals with riverbed or riverbed farming in terms of regulatory or management schemes. This is a gap that needs to be filled by way of further deliberations with the Ganga Basin States.

**'River Bed' From The Bengal Regulation XI Of 1825 To The Ganga Order, 2016 -
The Gap That Needs To Be Covered**

The Bengal Regulation 1825 and Act of 1847 maintain that River Bed is the property of the Government and an island in a navigable river is akin to a river to be possessed immediately by the Government and all encroachments in a riverbed are to be removed, subject to established usage. The Ganga Order defines a River Bed but does not provide any further guidance on it. This is a potential area where the Ganga Order can be made explicit on the definition of River Bed to form the basis of regulations regarding River Islands.

8.47 The Scheme Of Pollution Control Laws - The Environment (Protection) Act, 1986 And The Water (Control Of Pollution And Abatement) Act, 1974

- The EPA, 1986 is an overarching law that is applicable to all ecosystems, including rivers and lands and has been used to issue important Notifications including the Ganga Order, 2016⁶³. The Notification on maintaining environmental flows in Ganga has also been issued under this legislation. The EPA, 1986 is applicable to the River Islands, irrespective of the ownership and the existing management regimes at the State level. All aspects of river islands can be regulated under the EPA that will have a superseding role with respect to the protection of the environment and river ecosystems. The term 'environment' under this legislation has been comprehensively defined to include water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants,

⁶³ Note that the previous notifications on the constitution of National River Ganga Basin Authority were issued under Section 3(3) of the Environment (Protection) Act, 1986

micro-organisms and property⁶⁴. The EPA can be used by anyone to invoke protection of the river and islands from industrial discharge in upstream of the catchment and to control and prohibit all activities in the Ganga Basin that affect its water quality and ecological integrity.

8.48 The EIA Notification, 2006 and the Ecologically Sensitive Area Notifications under the EPA, 1986

- As discussed, the EPA, 1986 provides the powers to the Central Government to issue directions and constitute authorities for the protection and amelioration of environment. The Environment Impact Assessment (EIA) Notification, 2006 has been issued under the EPA to assess the impact of developmental activities on the environment and natural ecosystems and to provide for the necessary safeguards by laying down specific and general conditions in the Environment Clearance (EC) Certificate given to the project proponents. The EIA establishes the system of environmental clearance either at the State or at the Central level depending on the nature, size and category that a project would fall into as per the A or B categories listed in the EIA for identifying projects and processes that can have a significant impact on the environment. The EIA Notification provides safeguards to the Protected Areas under the Wildlife Protection Act, 1972 by imposing a General Condition that if a project is located within 10km from the boundary of a PA, it shall be treated as a category 'A' (sensitive) project which is required to take clearance from the Central Government⁶⁵. Similarly, projects located in proximity to the Ecologically Sensitive Areas (ESA) will require permission from the central Government. The EIA is silent about the location of projects or processes within the River Islands or in proximity to them having an impact or being impacted by them in any way. Thus, there is an apparent gap in the EIA Notification on the aspect of protecting River stretches that are not PAs under the WLPA or ESA but are in need of

⁶⁴ Section 2(a), Environment (Protection) Act, 1986

⁶⁵ <http://www.environmentwb.gov.in/pdf/EIA%20Notification,%202006.pdf>

protection from further deterioration. The River Ganga Order, 2016 provides the required protection for the Ganga Basin from being polluted by the corresponding regulation under which projects are granted does not have a river-centric category for the clearance or regulation of projects or processes.

- The Ecologically Sensitive Areas (ESA) are also notified under the EPA, 1986 based on the ecological and natural heritage status of an area⁶⁶. At the outset, a distinction must be made between Eco Sensitive Zone (ESZ) and an Ecologically Sensitive Area (ESA). An ESZ is generally notified under the WLPA, 1972 around a Protected Area such as a wildlife sanctuary. Instead of an ESZ, a Buffer Zone may also be used to achieve the objectives of conservation of maintaining a safe corridor for wildlife. The ESAs are declared and notified under the EPA, 1986. The import of both notifications is very different from each other. An ESA is typically followed by a Management Plan or a Zonal Plan whereas the ESZ may have rules similar to a PA. Sometimes an ESA may be an entire valley, a landscape with unique features, or a habitat for a migratory bird which could also be protected as an ESZ. In practical terms, both categories are not exclusive of each other and may overlap.
- So far, in the Ganga Basin, the Bhagirathi eco-sensitive zone notification had been issued in 2012 and the Zonal Master Plan has also been approved by the MoEFCC⁶⁷.
- The import of this discussion for the River Islands needs to be brought out clearly. Using the ESA powers under the EPA, the MoEFCC can notify an area as an ESA and restrict activities including those being carried out within the River Islands if these have an impact on the water quality and ecological integrity of the River from the pollution perspective. The Ganga Order, 2016 provides direct powers to the authorities to undertake measures for protecting the entire catchment with or without the use of ESAs. Both the

⁶⁶ https://wwfin.awsassets.panda.org/downloads/indias_notified_ecologicallysensitive_areas.pdf

⁶⁷ https://forestsclearance.nic.in/DownloadPdfFile.aspx?FileName=0_0_8115125512171ApprovalofzonalmasterplanofBESZ.pdf&FilePath=../writereaddata/Addinfo/

MoEFCC and the MoJS are equipped with sufficient legal mandate to issue directions for regulating activities in the Ganga Basin. However, the tool of ESA allows an established mechanism of Master Planning of an ESA which could provide a more enabling management of River Islands whereas Ganga Basin-specific codes and guidelines under the Ganga Order, 2016 still need to be evolved.

The Key Strengths Of The Ganga Order, 2016 Could Be Used To Evolve A Uniform Management Regime For The River Islands

As we have seen there are a number of enactments that come into play so far as the ownership, possession, land use and occupancy rights in River Islands are concerned. These vary in each State. However, there is no law at the State or national level that provides the basis for uniformity in the management approaches of river islands across the States and the Basin. Ganga Order, 2016 is uniquely placed to evolve a framework that would apply uniformly to all the islands in the Basin from the ecological integrity and River Basin Management perspective.

8.49 The Regime Of Conservation Laws Is Applicable To River Islands – Wildlife (Protection) Act, 1972, The Biological Diversity (Amendment) Act, 2023, And The Indian Forest Act, 1927

- The Wildlife (Protection) Act, 1972 is applicable in the entire Ganga Basin and the River Islands in the Basin are no exception to it. The Vikramshila Gangetic Dolphin Sanctuary (VGDS) is the only dolphin sanctuary in India located in the Ganges Basin and is crucial for the conservation of the endangered Gangetic River dolphin (*Platanista gangetica*), the national aquatic animal⁶⁸. The VGDS that spans between Sultanganj to Kahalgaon was notified in 1990 under the WLPA, 1972. In the event where the River Islands exist within the VGDS, they have the status and regulatory regime of

⁶⁸ <https://wii.gov.in/nmcg/protected-areas-along-ganga/vikramshila-gangetic-dolphin-wildlife-sanctuary> ;

a Sanctuary. The MoEFCC has initiated a centrally sponsored scheme for the habitat protection of Gangetic Dolphins which provides an opportunity for the State to address issues from a holistic perspective taking into account the presence of river islands in the VGDS and their impacts on the habitats of the national aquatic animal⁶⁹.

Changes in the River islands within a sanctuary due to river action would require adjustments in the boundaries of the Sanctuary and the dilluvion so drifted away from the sanctuary and added somewhere else would follow the law of gradual or sudden recess of a river.

- The Indian Forest Act (IFA), 1927 provides for the constitution and management of forests. In the instances where the River Islands fall within the notified limits of a Reserved Forest or a Protected Forests (RF/PF) or any other category of forests as per the State Rules (State adaptation of IFA and the Rules exist and vary from State to State), the IFA, 1927 would apply. In all such instances, the River Islands would be administered and managed by the State Forest Departments. That does not negate the role of the water resources, irrigation or the State Pollution Control Boards. The Forest Department assumes a higher administrative role where permissions are generally obtained by other departments having a role such as the revenue and survey department. The rights and concessions of people living in the forests and the activities therein would be regulated as per the Forest Act and the Rules. Further, the forestry and agro-forestry schemes could also be implemented on river islands subject to the Working Schemes of the local Forest Department.
- The Biological Diversity (Amendment) Act, 2023 has an important role to play in the sustainable management and harvesting of biological resources from these special landforms. The Act covers conservation, use of biological

⁶⁹ <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1946399>

resources and associated knowledge for commercial or research purposes or for the purposes of bio-survey and bio-utilization. It provides a framework for access to biological resources and sharing the benefits arising out of such access and use. River islands represent a combination of terrestrial and riverine biodiversity. The BD Amendment Act, 2023 applies to river islands and could be used to its potential for example for the creation of Biodiversity Heritage Sites. Similarly, the powers of the State and the Central Government to prevent activities that have a negative impact on biological diversity could be put to use.

8.50 The Legal Regime On Inland Navigation And National Waterways And Compensation For Damages – The Inland Waterways Authority of India Act, 1985 and the Rules, 1986; the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (LARR) Act, 2013

- The laws on inland navigation in the rivers designated as National Waterways assume significance in the case of River Ganga and the presence of a large number of islands that fall enroute the navigation channels. Notably, the Ganga Order, 2016 does not deal with the impacts of navigation on river ecology, river regime, water quality, biodiversity and river regime in general. In this respect, it can be said that the despite National Waterways Act, 2016 and the Ganga Authorities Order, 2016 being notified in the same year and both of them concern NW-1, the Ganga River National Waterway, the two are delinked from each other and the Order 2016 makes no reference to the potential pollution sources arising out of plying of large vessels in NW-1.
- The potential impact of inland navigation and the conservancy works required for maintaining the routes and the desired depth have an ecological and legal bearing on river islands and therefore require a discussion. The Constitution provides that the Parliament (Union Government) has the power to make legislation with regard to shipping and navigation on inland waterways as regards mechanically propelled

vessels⁷⁰. The law-making power is accompanied by a caveat that States 'Rule of the Road on such waterways'. This implies that the declaration of national waterways and their control by the Centre is only confined to their use as waterways alone similar to national highways. While the Central Government can control and maintain part of a channel and appurtenant land required for navigation facilities, the river bed remains the property of the State Government.

- Consequent to this Constitutional scheme, the Central Government enacted the Inland Waterways Authority of India (IWAI) Act, 1985. The IWAIA, 1985 establishes a National Inland Waterways Authority (the Authority) and defines "appurtenant land" to mean all lands appurtenant to national waterway, whether demarcated or not⁷¹ meaning thereby that any land that is required for the development and maintenance of a waterway is appurtenant land that shall be at the disposal of the central Government in a declared National Waterway. The river islands would fall within the definition of appurtenant land for the purposes of NWs if they are located in a navigable channel of a waterway.
- The conservancy under the Act has been defined to include all the works except the protection of river banks against floods or preventing the erosion of banks on account of reasons not connected with shipping. This seems to be the case of powers without responsibility. While the Central Government can carry out all physical changes in the river regime by dredging etc., but is not obliged to carry out the protection works. Since IWAI is not responsible for erosion not connected with navigation, it would have no role to play as it would be extremely difficult to establish the connection between conservancy and river bank erosion upstream or downstream of a river.
- Importantly, the Authority has the powers to carry out the survey and investigations of the national waterways and appurtenant land and shall

⁷⁰ Entry 24, List-I: Union List, Article 246 of the Constitution of India, 1950

⁷¹ Section 2(a), IWAI Act, 1985; <https://iwai.nic.in/sites/default/files/7840133883ACTs%20Book-1%20Hindi%20and%20Eng.pdf>

prepare a scheme for this purpose⁷². The Authority can also carry out conservancy and training measures and do all the activities required for the safety of navigation and improvement of waterways⁷³. Among all, the Authority has the power to remove or alter any obstruction or impediment in the national waterways and the appurtenant land which may impede the safe navigation or endanger the safety of infrastructural facilities⁷⁴. In the instances where the obstruction has become lawful by reason of long continuance, the Authority shall pay compensation to the person suffering damage by such removal or alteration. The law further authorizes any person to enter the land or premises of any person for the purposes of surveys, investigations and connected actions⁷⁵. A perusal of Rules, 1986 shows that a procedure for entry and inspection by way of prior notice is provided⁷⁶.

- A number of inferences can be drawn from the above provision. Firstly, the IWAI Act, 1985 does not define obstruction or impediment. Secondly, it differentiates between lawful and unlawful obstruction without providing guidance as to what is an unlawful obstruction in a navigable river and who is to declare the unlawful nature of the obstruction. In other words, is it the sole prerogative of the IWAI to treat an obstruction as lawful or unlawful obstruction and on what basis? It must be mentioned that river islands are lawful obstructions as these are not man-made land infrastructure but a creation of the river's own ecological, hydrological and morphological functions. These islands are also representative of the natural behaviour of a river in terms of its sediment carrying capacity that shapes upstream and downstream landforms within the river and on its banks. Treatment of these features as obstruction requires a thorough scientific analysis. Further, river islands and their land uses are duly recognized and recorded

⁷² Section 14 (1)(a), IWAI Act, 1985;

⁷³ Section 14(1)(c)

⁷⁴ Section 14 (1) (e)

⁷⁵ Section 28

⁷⁶ Rule 33, Power to Enter Land or Premises

within the State land and revenue records. The next question is with respect to their lawful character. As we have seen, all the Ganga Basin States recognize these lands as surplus lands or Estates at the disposal of the State Government that can be used for additional revenue generation. The survey, settlement and revenue collection from these lands and their cultivators however has been an area of intense contestation within the State due to the fluid nature of these lands. That does not make the State Government or the occupants unlawful or having subsidiary rights over these lands.

Lawful Obstructions Vs Khas Mahals (Estates) – The Powers Of The IWAI Vs The Hybrid Ownership Structure Of River Islands

The case for the removal of obstructions in lieu of compensation for river islands is weary since the ownership of lands within river islands is not completely private. It's a case of hybrid ownership that is modulated by seasonal river behavior. If these islands are non-fordable, the Government assumes complete ownership and when these are fordable then temporary right holders have the ownership/occupancy. Therefore, since the ownership is hybrid in nature, it is complicated to determine compensation or resettlement and rehabilitation of persons whose primary source of livelihood would be affected due to the development of National Waterways. In this case, it seems the fate of the river islands would be governed more by a policy decision by the Government than what the legal provisions provide for.

- The last issue that must be dealt with is the compensation aspect. In case of removal or alteration of the lawful obstructions (land), the IWAI shall provide the compensation as per the land acquisition and compensation law⁷⁷. Thus, the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (LARR) Act, 2013 will apply.

⁷⁷ Section 14(1)(e)

The LARR Act is applicable to all infrastructure projects. A separate discussion is required on the application of the LARR Act in projects involving inland navigation and alteration of riverine features, particularly river islands. The LAAR Act, 2013 is a subsequent legislation and provides the mechanism for the determination of compensation in all cases involving loss of land, property and damages suffered by private persons due to developmental projects. The affected family under the LARR Act, 2013 includes not only persons whose land or primary source of livelihood is being affected but fisher folk and boatmen whose livelihoods will be affected by any acquisition of land. The Collector is to provide for the resettlement and rehabilitation of persons whose rights including fishing rights are involved⁷⁸. There are special provisions for Scheduled Caste and Scheduled Tribes under the LARR Act that become operational in the event of a project or acquisition affecting this group of persons⁷⁹. Finally, the rehabilitation and resettlement entitlements under the LARR Act are not only for both land owners but also for persons whose livelihoods are primarily dependent on lands to be acquired⁸⁰.

- In the context of river islands, not only the direct alterations but also the indirect alterations such as capital or maintenance dredging may impact the sediment regime or a river. However, it may be recalled that both Bengal and Bihar state-level enactments vest the ownership and control of river islands in large navigable rivers with the State Government who have been managing river islands as surplus lands and have issued temporary certificates for seasonal cultivation of these lands. Indeed, a large number of people and their livelihoods are dependent on river islands.

The Ganga Order, 2016 Under The EPA, 1986 And Powers Of The IWAI Under The Act, 1985 – EPA Shall Have The Superseding Effect And Applicability

⁷⁸ Section 31, LARR Act, 2013

⁷⁹ Section 4, the LARR Act, 2013

⁸⁰ The First and the Second Schedule LARR Act, 2013

While IWAI, Act, 1985 is a specific legislation on the development of National Waterway I and removal of obstructions for the said purposes, the EPA will supersede any other legislation as it has an overarching applicability when it comes to the protection and conservation of a river system, including the protection of riverine features and water quality⁸¹. The Ganga Order, 2016 will prevail over all other laws and regulations so far as the interventions under any other law have a negative impact on the Ganga Basin or any of its features protected under the Order.

Jal Marg Vikas Project (JMVP) and the Environment Impact Assessment for Dredging of River Ganga - The context of River Islands: The issue of application of EIA Notification, 2006 for dredging in National Waterways for the JMVP has been discussed by the Expert Appraisal Committee of the MoEFCC and then at the Committee of Secretaries in 2017. It would not be prudent to reiterate the differences in opinions between the two committees on the issue. Moreover, this discussion is beyond the scope of this study. Importantly, the EIA Notification, 2006 is silent on the aspect of projects involving desilting of rivers/dredging. Capital and maintenance dredging of rivers, channels and reservoirs has been exempted from the requirement of Environment Clearance by way of an amendment in the EIA Notification of 2016. However, the cumulative environmental impact assessment of the land use of nearly 2500 river islands in the main stem of the Ganga River and their implications on the river regime, navigability, and flow patterns especially in view of the Ganga Order 2016 could be carried out as the CEIA is supported by the Supreme Court rulings on the cumulative EIA. Similarly, the possibility of CEIA of the JMVP on the river islands needs to be considered given the presence of a large number of such islands and their looming urbanization.

⁸¹ Mantri Techzone Case, 2019; Arti vs Central Ground Water Authority, Original Application No. 438/2018; <https://indiankanoon.org/doc/123146283/>

8.51 The Sustainable Sand Mining Management Guidelines, 2016 and Enforcement & Monitoring Guidelines for Sand Mining, 2020

- It may be recalled that state-level regulations and policies in *Diara/Chaur* islands do not confer any rights in resources of rivers or river islands to the communities. These regulations merely recognize the established usage and confer temporary titles for usufruct rights in tenure for all fluvial landforms. The case for a fordable river island and sand bars contiguous to private holdings is entirely different but that does not confer the extractive rights to the landowners along the river. In a non-fordable river, the Government's control of Khas Mahal or Estate is applicable wherein all uses of river islands are subject to permissions from the revenue authorities.
- Sustainable Sand Mining and Management Guidelines, 2016 is applicable to river islands. Under the Sand Mining Guidelines, there is no distinct category of river islands. The Guidelines are applicable to all areas where sand, gravel, boulder and other minor minerals are available. The Guidelines outline that the following criteria should be considered for mining and these are as follows:-
 - i. A stable river is able to constantly transport the flow of sediments produced by watershed such that its dimensions (width and depth) pattern and vertical profile are maintained without aggrading (building up) or degrading (scouring down).
 - ii. The amount of boulders, cobbles, pebbles, and sand deposited in the river bed equals the amount delivered to the river from the catchment area and from bank erosion minus the amount transported downstream each year.
 - iii. It is the compulsive nature of rivers to meander in their beds and therefore they will have to be provided with adequate corridors for meandering without hindrance. Any attempt to diminish the width of the corridor (floodway) and curb the freedom to meander would prove counterproductive.

- iv. Erosion and deposition is a law of nature. The river stream has to complete its geomorphological cycles from youth, and maturity to old age.
- v. River capturing is unavoidable.
- vi. Fundamentally the lowest point of any stream is fixed by sea level.

All these criteria are to be kept in mind while conducting the District Survey Report which would form the basis of the processes for grant of lease for sand mining in a district.

8.52 The Urban Development And Permanent Infrastructure Within The River Islands

- The collective interpretation of the alluvion-diluvion regulations, land reforms laws of Bihar and the Tenancy Act or the Khas Mahal Manual point out the fact that the only permissible land use in the river islands is the temporary or seasonal cultivation that has been customarily done in the area (established land use). The enactments do not point out towards other exceptions. The survey and scrutiny procedures also mention the status recording with respect to tenure occupation alone. By custom temporary structures required by seasonal cultivators could be considered during the survey by Amin. However, the laws do not indicate any provision that allows for permanent structures.

Construction Free Zone – A Principle under the Ganga Order, 2016

Section 4 (ix) of the Ganga Order, 2016 States that the bank of River Ganga and its flood plain shall be a construction-free zone to reduce pollution sources, and pressures and to maintain its natural groundwater *recharge* functions; As per Section 6(3) no construction is allowed 'in River Ganga' – in this sense existing habitations are in violation of this notification. Proviso to Section 6 empowers the NMCG to review any construction which has come up prior to the

commencement of this Order (7 October, 2016). Thus, the Ganga Order has ample provisions to review the construction within the River Islands and undertake measures in view of the objectives under the Order.

- 8.53 **Fisheries in the Ganga Basin and Riverine Islands** : There are no specific provisions on fisheries in and around fluvial landforms or river islands. The Indian Fisheries Act, 1897 has been repealed and the new guidelines to States for formulating a Bill on Inland Fisheries and Aquaculture have been circulated⁸².
- 8.54 The **Coastal Zone Regulation** also applies to deltaic and estuarine islands. In *Vaamika Island v Union of India and Ors.* [(2013) 8 SCC 760], the issue before the Court was whether certain properties on an island in the Vembanad Backwaters of Kerala should have been categorised as CRZ 1, which restricts its rebuilding or expansion, in Kerala's CZMP. The Supreme Court held that the properties had been correctly categorised and that the owner had violated the law by constructing on the said island. The Supreme Court upheld the High Court's direction to demolish the illegal structures.
- 8.55 **Rights of Rivers** : This is a recent development whereby, on environmental grounds, rivers are to have legal personhood and thereby enjoy the protection of law. **One important consequence of considering a river as a legal person is that, while defended by humans as legal representatives, it cannot be owned by anyone.** (De Vries-Stotijn *et al.*, 2019).
- 8.56 **Punjab Land Revenue Act, 1887** : The Bengal Act was extended to Punjab, another alluvial terrain, with migrating rivers playing havoc with land ownership. Known as The Punjab Laws Act, IV of 1872, it is still in force (as amended by Section 4 of Punjab Act I of 1899). Relevant provisions are culled below :

⁸²<https://dof.gov.in/sites/default/files/201911/Guidelines%20for%20the%20States%20for%20framing%20a%20bill%20on%20inland%20fishereis%20and%20Aquacul%20ture%20%201.pdf>

- Meaning of riverain law. Riverain law is concerned with the effect on rights in the land of river action. Which is usually qualified according to its nature by the term's erosion, accretion and avulsion.
- Diluvion and alluvion: The two are applied to the process by which land is sucked into the channel by the inset of a river at one place and fresh land exposed at another by its retirement. The loss and gain thereby caused are respectively diluvion and alluvion.
- Avulsion: The word avulsion is an unhappy one to describe what takes place in the Punjab when part of an estate is transferred in a recognizable condition from the right to the left bank of the main channel of a river or vice versa. Avulsion means not the movement of land, but that of water.
- In case of land loss or gain, customs would be the basis of the decision. In the absence of custom rules laid down would facilitate the decision
- When a river by a sudden change in its course breaks through or intersects an estate, or by the violence of stream separates a considerable piece of land from one estate and joins it to another, "without destroying the identity and preventing the recognition of the land so removed," the land is to remain the property of the original owner.
- **Islands** : Islands thrown up in large and navigable rivers, the beds of which do not belong to private owners, are to be at the disposal of govt. if the channel between the island and the river bank is unfordable throughout the year. If the channel is fordable, the island is to become an accession to the estate on the nearer of the two banks. In the case of small rivers, the property in whose beds and the right of the fishery have been recognized as belonging to a private owner, the island also is to belong to him.

8.57 **Laws/Statutes with Regard to Riverine Islands in Bangladesh** : This country has time and again made efforts to define laws in relation to the river islands therein. Bangladesh consists mainly of riverine and deltaic deposits of three large rivers entering the country: the Brahmaputra, Ganges and Meghna rivers. All these three rivers have a considerable number of islands known locally as '*Chars*' most of which

are under tremendous human pressure. One of the major Acts in Bangladesh dealing with riverine islands was studied and is presented in this section.

8.58 The State Acquisition and Tenancy Act of 1950 (East Bengal Act) : Chapter XIII of the Act provides for “Incidents of holding of Raiyats, and Transfer, Purchase and Acquisition of Lands. Under the Chapter, the Act provides that a *raiyyat* shall have the right to occupy and use the land comprised in his holding in any manner he likes. Further, the holdings of a *raiyyat* or a share or any portion thereof can be transferred in the same manner and to the same extent as his other immovable properties. The Act states that when any land has been gained by accession, whether from the recess of a river or of the sea, it shall not be considered as an increment to the holding or tenancy of to which it may thus be annexed, **but shall vest absolutely in the Government** and shall be at their disposal.

8.59 Section 81 of Karnataka Land Revenue Act, 1964:

- i) Notwithstanding any law, custom or usage to the contrary all alluvial lands, **newly formed islands**, and abandoned river-beds, shall vest in the State Government, but the holder or occupant of the bank or shore on which such alluvial land is formed shall be entitled to the temporary use thereof, unless and until the area of the same exceeds one acre, in which case such land, **island** or river-bed shall be at the disposal of the Deputy Commissioner.
- ii) No land revenue shall be leviable regarding alluvial lands, newly formed islands or abandoned riverbeds during the period of temporary use.

8.60 Section 30 of The Andhra Pradesh (Telangana Area) Land Revenue Rules, 1951: The bed lands of rivers and nalas which get exposed due to recession of water and area fit for cultivation may be leased on Eksala basis for cultivation, preference being given to persons belonging to Scheduled Castes, Scheduled Tribes, Backward Classes or Harijans and subject to the condition that cultivation is restricted to creepers such as cucumber, melons, mustard and likewise, all the crops on the land shall be completely removed by the 31st May, so as not to obstruct the free flow or cause silting or general raising of the river bed.

- 8.61 **The Assam Land And Revenue Regulation, 1886:** In Chapter-I, Section 3, subsection (b) of this regulation, it is explicitly made clear that any **char or island** thrown up in a navigable river, under the laws in force, is at the disposal of Government. It is also explained in the regulation that any land gained by alluvion or by dereliction of a river to any estate is considered to be an increment to tenure to which the land has accreted and shall be deemed to be part of that estate.
- 8.62 **The Role Of Courts – Important Principles Applicable To River Islands Upheld By The Supreme Court And The High Courts**

Table 18 : Some Examples Of Court Judgements Pertaining To Riverine Islands

No	Name/Citation	Key Issue involved on River Islands	The Principle upheld by the courts
1.	Ambika Prasad Thakur And Ors vs. Maharaj Kumar Kamal Singh And Ors 1966 AIR 605, 1966 SCR (1) 753 ⁸³	Private property: Issue before the Hon'ble Allahabad High Court was: Whether the gradual accession of lands resulting into a <i>Diara</i> estate would entitle the claimants to its ownership under section 4 of the Bengal Alluvial and Diluvial Regulation XI of 1825?	In an Appeal, The Hon'ble Supreme Court held that mere fact of gradual accession does not entitle a person of the occupancy rights in all the Taufir Lands (surplus lands gained due to recess of a river) accreted in front of the lands of the private claimants. Survey and mapping are fundamental to any claim of such nature which must be ascertained by the local court by directing the revenue authorities. Without the survey and revenue records supporting the claim to alluvion lands could not be sustained.

⁸³ <https://indiankanoon.org/doc/1795477/>

No	Name/Citation	Key Issue involved on River Islands	The Principle upheld by the courts
2.	Ram Dhan Lal And Others vs. Radhe Sham And Others 1951 AIR 210, 1951 SCR 370 ⁸⁴	<p>Village Boundary Dispute: The key contention before the court was Whether the custom of Dhar Dhura in River Ram Ganga (deep stream as the basis for boundary and demarcations between village boundaries and properties) and to what extent the custom can be upheld by courts in case of changes in the river course? And whether the custom has limited application to gradual accretion and it did not extend to cases where old formations were suddenly severed by fluvial action?</p>	<p>In an Appeal the Supreme Court upheld that:</p> <ul style="list-style-type: none"> • The custom of <i>Dhar Dhura</i> will apply in cases of both gradual accession and sudden transfer of territory[ies]. • Section 2 of Regulation XI of 1825 makes it perfectly clear that a custom contrary to the provisions and of the Regulation would be enforceable only when it is a custom for determining the rights of proprietors of two or more contiguous Estates divided by the river. When the river ceases to divide the Estates, the rights of the riparian proprietors can be determined only in accordance with the provisions made in the Regulation itself.

⁸⁴ <https://indiankanoon.org/doc/907531/>

No	Name/Citation	Key Issue involved on River Islands	The Principle upheld by the courts
3.	Ram Badan Rai vs. Union of India Appeal (civil) 3782 of 1988 ⁸⁵	<p>Change and transfer of villages from one State jurisdiction to the other: Whether the Change and transfer of villages of one State to another State due to change in the boundaries as a result of fluvial action of Ganga was a valid legal exercise? Whether no change in the boundaries could be made as per Article 3 of the Constitution of India? Whether Uttar Pradesh State after the Bihar and Uttar Pradesh (Alteration of boundaries) Act, 1968 was applicable to instances of fluvial formations due to river action.</p>	<p>The Supreme court held that change and transfer of villages from one State to the other after due consultations between the States and duly formed procedure for their recording in the revenue registers is a valid exercise in law and cannot be challenged on the grounds of Article 3 of the Constitution. The Parliament has the overarching power to change or readjust the boundaries between States that may be guided by any reason including the river action.</p>

⁸⁵ <https://indiankanoon.org/doc/572696/>

No	Name/Citation	Key Issue involved on River Islands	The Principle upheld by the courts
4.	Uttam Kumar Paul vs. State of West Bengal WPA(P) 32 of 2021 ⁸⁶	Illegal activities on River Islands and using fluvial sand and earth - Whether dwellers of river islands are free to use its resources for industrial operation and processes such as brick kiln?	The Calcutta High Court restrained the activities by passing an injunction that alluvial lands cannot be used by private individual for any other activity than those allowed by the local authorities and the alluvial lands and river banks are to be restored to their original conditions.
	Ram Ran Vijay Pd. Sinha vs State of Bihar (1978) –	Whether occupancy rights in a <i>Diara</i> land cease to exist with the changes over its status in the revenue records?	Hon'ble Patna High Court Ruled that an owner of <i>Diara</i> is to be communicated on behalf of the Collector that the land has ceased to be a <i>Diara</i> Land. Occupancy and ownership claims of individuals are sustained over the public surplus land subject to their status in the revenue records.
	Chandraban shi Singh vs The State of Bihar & Ors (2014)	Whether mere calling a certain alluvial land as <i>Diara</i> confers it a legal status of a <i>Diara</i> land or it needs to be reflected as such under the Revenue	Hon'ble Patna High Court reprimanded the State for creating a controversy on the land of the plaintiff by declaring it <i>Diara</i> -khasmahal land where there was none, and termed the State's behaviour in the case concerned as 'mischievous'. The case was about land on which the plaintiff's family was settled for eighty

⁸⁶ <https://indiankanoon.org/doc/13951515/>

No	Name/Citation	Key Issue involved on River Islands	The Principle upheld by the courts
		Records?	years. His ancestors were raiyats as per the record of the State and jamabandi. Difference between calling and Recording Digha <i>Diara</i> Khasmahal was deliberated and it was adjudicated that mere naming a land a <i>Diara</i> land is not sufficient ground for Government to initiate any proceedings by the revenue authorities. The same must be recorded in the revenue records of the District.

CHAPTER 9 – STAKEHOLDER WORKSHOPS RELATED TO RIVERINE ISLANDS

9.1 As part of this study, three workshops were conducted to obtain information and feedback from different stakeholders concerned with riverine islands. In the first workshop held in September, 2022, representatives from various administrative backgrounds were consulted on administrative issues such as ownership of the islands, jurisdictional conflicts (inter-district and inter-state), administrative control of the island, availability of regulations pertaining to riverine islands, the role of forest department in safeguarding islands with rich biodiversity & wildlife movement and unchecked development on some larger islands. Along with a brief presentation of findings of the ongoing study, it was discussed the significance that riverine islands of the Ganga River play in safeguarding biodiversity and serving as crucial wildlife movement corridors. It was also discussed that larger islands such as Raghapur *Diara* have privatized lands for several years and as a designated block, it has its own administration looking after various issues on this island. It was also discussed that some islands closer to urban settlements can be explored for sustainable tourism but will have to overcome the challenges in ownership, jurisdiction and any other issues which might be there. The case of *Nayachar* Island in Hooghly estuary was also presented which highlighted undue exploitation of this land by clearing native mangrove vegetation and developing aquaculture farms. The workshop concluded by underlining the urgent need for policy interventions in order to safeguard these riverine islands vis-à-vis exploring them for future potentials. The details of this workshop are presented in Annexure VII.

9.2 The second stakeholder consultation workshop was held in-person at INTACH headquarters in Delhi during March, 2023 wherein representatives from various island and riparian communities were present to discuss issues such as the history of island settlements, natural resource utilization, agriculture, land ownership by

local communities, human-animal conflicts, flooding and erosion related losses. After presenting a brief highlight of ongoing work and sharing the key objectives behind this workshop, feedback from all individual stakeholders was recorded pertaining to their respective riverine islands. The islands in Haridwar are being employed for agriculture by the local residents settled here, but since they also fall within the movement corridors of wild animals including elephants, it brings several challenges the major one being the loss of crops. In the case of Raghopur *Diara*, the interlocutor reiterated that this is an old island with more than 2 lakh residents dependent upon it currently. Although the lands here are cheaper comparatively to nearby cities especially Patna with agriculture being the major land use, this is believed to change in coming times with a permanent connectivity boosting land prices and tourism activities on this island. Similarly, the riverine islands in Prayagraj Distt. are also being proposed for tourism development but the emphasis on conserving local biodiversity and ecology was made during the discussions. In the case of Gujarat, most islands are privatized lands with significant recreational projects being planned there. In conclusion, it was agreed that different islands have different scenarios and must be dealt with accordingly but with priority given to biodiversity which is a major beneficiary in the riverine ecosystem. The details of this workshop are presented in Annexure VIII.

- 9.3 The third and final workshop as part of this study was organized in person at INTACH headquarters in Delhi on 21st July, 2023 wherein subject experts, experienced administrators, environmental law specialists, NMCG staff and experts from the NH Division of INTACH participated in discussions and suggestions on the draft position paper emanating from the results of this study. Comprehensive presentations on the study background, field observations, legal perspectives, island formation and other deliberations were made which contributed to further strengthening of the position paper. It was reiterated by almost all participants that this study has reflected upon some key issues that have otherwise remained oblivious to both decision-makers and the common public. Furthermore, this is the right time to propose sustainable interventions through this policy position paper

for safeguarding the riverine islands and sandbars. It was also reflected through discussions that some more in-depth studies pertaining to island formations and their association with river ecology need to be carried out with respect to Ganga River and other major rivers of India. The details of this workshop are presented in Annexure – IX.

CHAPTER 10 – ISSUES PERTAINING TO RIVERINE ISLANDS

- 10.1 River islands have been a blind spot amongst basin managers, administrators and even river experts. Awareness about river islands varies from river to river and from State to State [even on the same inter-state river]. Confining this policy study to the Ganga basin, there is a surprising lack of awareness about islands amongst the public, the administrators, the State Water Resources Departments as well as stakeholders like the IWAI [Inland Waterways Authority of India]. Existing state-level regulations are outdated and national and state-level Acts/Regulations are not aligned towards the common objective of river conservation.
- 10.2 A *laissez faire* approach has, thus far, been taken towards river islands, which amounts to a scenario devoid of guiding policy. River islands are now coming under anthropogenic pressures as increasing population and land hunger consume the riparian zone and adjacent areas. Further delay in policy formulation and implementation can result in irreversible damages and intractable legal disputes. Prevention of a malady with foresight is always better than cure in hindsight. Step by step this policy study has brought us to the point where the critical issues can be elucidated in the following sections.
- 10.3 **Definition of River Islands :** A standard definition of an island is “**a piece of land surrounded by water throughout the year with some part remaining unsubmerged at all times**”. However, this definition is more applicable to non-monsoonal rivers with a fairly constant flow around the year. In the context of Ganga, the definition has to be modified to – “**a piece of land definitely surrounded by water during the monsoons and is fairly stabilized with natural vegetation**”. This definition would take care of the fact that the Ganga is facing humongous water abstraction which reduces the flow very significantly particularly in post-monsoon months thereby rendering the island fordable over at least one

side dry channel. It would also rule out sandbar formations. However, a sandbar, if not disturbed may graduate to island status over time.

10.4 **Identification of Islands** : Islands have been below the radar of decision-makers as well as the public at large and a major reason for this is the fact that almost all the islands, barring a handful, are nameless and thus do not resonate in any public, academic or administrative discourse. A system of nomenclature can be helpful in raising the island profile in public, administrative and riverine fraternity discourse.

10.5 **Applicability of Policy** : The proposed policy will apply to the main stem of the Ganga as well as tributaries and tributaries of those tributaries, as is required in a basin approach.

10.6 **Stakeholders** : The preceding study has identified the following stakeholders :

- ❖ Settlers with built residential establishments
- ❖ Cultivators with ownership documents
- ❖ Cultivators without ownership documents
- ❖ District Administration for administrative jurisdiction
- ❖ District Forest & Wildlife Dept. [for corridors, river sanctuaries, wildscapes and habitats, ecotourism]
- ❖ Basin Manager [NMCG] for resolution of complex issues arising out of actions or inactions of various stakeholders and as the human representative of the river systems
- ❖ IWAI [Inland Waterways Authority of India] as navigational routes can require island modification [horizontally]
- ❖ Urban local bodies & town planning departments in whose jurisdiction islands in urban stretches fall
- ❖ Wildlife having actual and potential habitats represented by DFO, CWW, relevant civil society organization[s]

10.7 **Ownership** : This is one major issue pertaining to the riverine islands of the Ganga River. As per law, all the land of the river bed belongs to the Government. The following typology of river islands has been observed as part of this study :

- iii. In some cases, where a part of the mainland gets separated from the bank owing to changes in river course and subsequently is surrounded by water on all sides, that island is still treated as private land belonging to the individual[s] from whose land it got disconnected. However, in such cases, due to the fluvial action of the river if more silt/sediment is deposited on such land leading to an increase in the area of that island, additionally accreted land should belong to the concerned Govt. authorities.
- iv. The case of fordable islands where tenurial rights but not ownership may exist.
- v. The case of non-fordable islands which belong to the State Governments in their entirety. Here again, the district authorities can give tenurial rights for cultivation only for limited periods.
- vi. Most of the newly formed sandbars, some of which get stabilized by an ecological succession of riparian vegetation, are not owned by any individual or recognized by any authority making them extremely vulnerable to unfettered exploitation mainly by the riparian communities in proximity of such a land.
- vii. In the case where islands are eroded away partly or completely, the tenants have no claims on the Government

10.8 All islands where tenures are granted have to be frequently surveyed as per extant State legislations/regulations for changes in area due to river action. However, this is hardly ever done by overworked administrations. Thus, during the fieldwork, there was hardly a cultivator on the surveyed islands who was able to show any official paper [*patta*].

10.9 **Jurisdictional Ambiguity** : In several districts along Ganga, the distinguishing boundary between districts on opposite banks lies within the river. But when the

river shifts course, sometimes by hundreds of meters, such course alteration creates a challenging situation. With these massive course shifts, there is also shifting in the size, shape and sometimes location of islands and sandbars which often leads to jurisdiction issues. Furthermore, in case where islands are formed due to cut-off separation from the bank, they may, over years, sometimes drift towards the opposite bank, thereby physically falling into the district on the opposite bank despite being part of another district.

10.10 During the field survey towards lower stretches of the Ganga River, particularly in the islands of Sahibganj and Malda Districts, it was also observed that these groups of islands fell in a tri-junction, with parts of these large island areas falling in different States viz. Bihar, Jharkhand & West Bengal. Under the Bengal Act, the centre line [thalweg] of the river channel is the line determining the territorial jurisdiction of the island – if an island falls on one side of the thalweg the district on the closer bank has jurisdiction. Further, alteration in the course can cause a shift in the centre line. However, jurisdiction remains indeterminate when the island partly falls into two districts, creating a no man's land, often exploited by criminal elements as a safe refuge. The islands particularly in the lower stretches of Ganga River in Bihar and Jharkhand are known locally as '*Diaras*' and were noted to be hotspots for criminal activities as stated by several interlocutors in the region. Factors such as jurisdictional conflicts, remote location and difficulty in accessibility resulted in several *Diaras* becoming a hub for anti-social elements.

10.11 **Encroachment** : The river islands are vulnerable to encroachers who clear the wild vegetation, woodlands and minor forestation to start cultivation. Despite persistent requests, none could show papers regarding land titles nor land revenue receipts. Off the record, it was understood that lower-level officials of the revenue department permitted cultivation against consideration. In some cases, especially parts of Jharkhand & West Bengal, immigrants from Bangladesh along with those affected by erosion have been settled on riverine islands. Several islands and sandbars are prone to encroachments chiefly from riparian communities owing to

the high pressure on land in riparian areas. Jurisdictional ambiguity creates a window of opportunity for encroachments which opportunity is exploited by residents of riparian towns and villages. In most cases observed during the field survey, the encroached islands were cleared of their native vegetation to pave the way for agriculture and in some cases constructions of permanent [some by govt. departments] nature were also observed.

10.12 **Legal Issues** : An extensive survey of legal issues [Chapter 8] has thrown up several complexities elaborated below :

- i. The States have been treating islands as surplus lands with a series of Acts/Regulations/Notifications responding to primarily ownership and settlement issues. The series starts with the Bengal Act of 1825 which applied to the areas which were under the Bengal Presidency. Successive Acts/Regulations/Notifications often contradict the earlier ones giving rise to contradictions and litigation.
- ii. All laws are agreed upon the fact that land in the river belongs to the government and thus cultivators do not own lands on the islands except in a few exceptional cases.
- iii. The national level legislation such as the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016, EIA Notification [to the extent applicable], and the Water Act – are oriented towards conserving the health of the river system.
- iv. The Wildlife Protection Act comes into play where river sanctuaries are involved and would therefore have a bearing on islands within the sanctuary zone as well as on the riparian buffer zone.
- v. The 1985 National Waterways Act's provisions enabling the removal of any obstruction in the navigational channel seem to belong to an era where the river systems were little understood and, in fact, taken for granted. Such a provision would allow unhindered modification of islands and bank profiles. Where islands are concerned the LARR Act would then come into play as LARR ACT not

only mandates compensation against land acquisition but also loss of occupations.

- vi. As no extant law/regulation permits construction on islands the islands on which construction has come up in violation, both by government and by private individuals, are on the wrong side of the law. The River Ganga (Rejuvenation, Protection and Management) Authorities Order, in fact, bars any construction on the 100-year floodplain of the river.
- vii. There clearly appears to be a need to simplify and consolidate the State-level laws to bring about internal consistency and align them with the objectives of the national-level laws. An overriding national legislation which balances the tenurial issues, the need to accommodate the existing genuine cultivators while attaining and sustaining the robust health of the river ecosystem seems to be required.

10.13 Vegetation & Biodiversity Loss : Several islands surveyed were found to have rich riparian vegetation often dominated by *Saccharum* sps. along with other grasses and some herbs/shrubs and trees. This vegetation is crucial in supporting habitats, as a movement corridor and as a food resource for various fauna including mammals, reptiles, amphibians and birds. However, those islands which have privately owned lands, have township-like development and are closer to major cities, are often stripped off their natural biota ultimately impacting biodiversity and ecology. Furthermore, nesting sites of turtles and several bird species, especially migratory species, are adversely impacted due to the transition to a human-dominated landscape. Thus, a certain amount of wildscape needs to be maintained on the islands – this would not only meet the needs of wildlife but also stabilize the islands. The creation of afforested patches in the island centre, around the highest point, would also create a place where wildlife could retreat to in floods.

10.14 Agricultural issues: Agriculture was observed to be an important human-induced activity on the riverine islands of the Ganga River. Several crops including rice, wheat, maize, mustard, various pulses, seasonal vegetables and fruits were found to

be cultivated on the islands and sandbars owing to the fertile alluvium deposits brought by the Ganga River and its tributaries. In islands closer to major cities, vegetables and fruits took more priority in island agriculture as compared to islands in remote locations. However, despite the rich alluvium deposition, fertilizers and pesticide usage was recorded among the surveyed sites which is not conducive to the river system.

10.15 **Construction on Islands:** With increasing human settlements, there is a spurt in the construction of multistoried houses, schools, panchayat offices, water tanks, markets, roads, permanent bridges and many other city-like facilities on some islands. In the absence of any enforcement of existing legislation/regulations, the residents owning lands on these islands are freely undertaking construction and an urban land market is beginning to emerge in a couple of cases. Despite the threat of damage during flooding, some islands, particularly those close to large cities, are now seeing changes in land use with urban colonization.

10.16 **Landuse Issues :** The following categories of land uses, deliberate or natural, were observed, although not uniformly applicable to each island :

- ❖ Woodlands, wildscapes, habitats
- ❖ Cultivation
- ❖ Settlements
- ❖ Cottage industry [fisheries hub on one island]
- ❖ Sand mining

Survey of literature and workshop inputs suggest the possibility that islands in urban stretches could be used for eco-tourism and light commercial development.

10.17 Construction of buildings and residential settlements is not recommended on the grounds that these are against extant law, vulnerable to floods, erode already shrinking wildlife habitats, can generate pollution affecting surface and groundwater regime, and will also affect aquatic life through increased traffic, noise

and light pollution. Such settlements will also create demands for road and bridge connectivity thereby opening the island to further undesired exploitation.

10.18 In the couple of exceptional cases where settlements are present their further vertical and horizontal expansion should be frozen. Even this would require an amendment of laws

10.19 **Cultivation** : Land left after meeting the requirement of a peripheral buffer riparian grass strip of adequate width and after retaining existing natural patches of woodlands and habitats may be permitted for agricultural use. Here, only organic inputs should be allowed and farmers trained in permaculture so as to co-exist with wildlife.

10.20 **Modification Issues** – it needs to be considered as to the circumstances under which modification of islands, in the horizontal and vertical plane, can be permitted.

- iii. For eg. an island keeps on expanding to narrow down its containing channels and thereby choke navigation. In such a situation the island may require horizontal modification of one of its containing channels to maintain navigation. The extent of modification should be minimal based on the requirements of large vessels.
- iv. Bridges for connectivity are also undesirable as they increase accessibility, rob the island of its isolated, undisturbed and natural status, driving up land costs which then attract construction demands by real estate lobbies.
- v. Sandmining of established islands as per the definition at the beginning of this Chapter may not be permitted as it destroys habitat, hurts river flow and destabilizes the islands
- vi. The possibility of adding soil from the edges towards the centre of the islands to create a refuge zone above HFL [high flood level] for wildlife may be considered.

- vii. Lastly, islands which have been cleared of natural vegetation for cultivation by encroachers need to be revegetated for stabilization as well as for restoring habitats

10.21 **Implementing Authority :** Which agency will be the implementing authority for the proposed island policy? For that matter should island policy be a standalone policy or an amendment to existing legal instruments? Since the issue largely comes under the Ministry of Jal Shakti [MoJS] and pertains to the Ganga River the likely option is MoJS acting through its lead agency on Ganga i.e. National Mission for Clean Ganga [NMCG].

10.22 The National Mission for Clean Ganga is mandated to undertake massive afforestation activities to conserve biodiversity, along with developing the flora & fauna and carrying out effective plans & policies to conserve dolphins, turtles and varieties of fish. So far such activities have been confined to the bank riparian areas. The islands' edges along their containing channels should also be considered as riparian zones.

10.23 NMCG administers some programs and projects directly and at the State level, State Program Management Groups (SPMGs) act as the implementing arm of State Ganga Committees. Thus, this newly created structure attempts to bring all stakeholders on a single platform to take a holistic approach to clean and rejuvenate Ganga. Further below are the District Ganga Committees, which include representation from the District Administration, presided upon by the District Magistrates. Further down the hierarchy are hundreds of Ganga Praharis or citizen volunteers with basic training.

10.24 Thus, this existing structure, consisting of the basin manager, district administration and volunteers, needs to be armed with policy instruments to manage the islands in consonance with the requirements of people's livelihoods, riverine ecology, ecosystem services and hydrology.

- 10.25 **Area of Policy Application** : The proposed policy should apply to the entire Ganga Basin i.e. tributaries and main stem of Ganga. Islands are often found at confluences and can be considered part of either river. Tributaries too have similar issues which are even less noticed than on the main river stem. Hence, differential treatment of tributaries and main stem is not advisable.
- 10.26 **Scenario Development:** Two scenarios can be visualized – (a) Business as usual and (b) policy-based regulated scenario.
- 10.27 **Business as Usual Scenario** : What would happen if the present situation is allowed to develop unhindered? Hardin's 'Tragedy of the Commons' model predicts the eventual overexploitation or degradation of all resources used in common. The tragedy of the commons refers to a situation in which individuals with access to a public resource (also called a common) act in their own selfish interest and, in doing so, ultimately deplete the resource for all. We can visualize a situation whereby more islands would be colonized, more habitats and woodlands cleared, more areas brought under cultivation, new sources of pollution would develop mid-river and growing populations would exert political pressures for flood protection measures, thereby completely destroying the natural *character* of the river.
- 10.28 **Policy Based Regulated Scenario** : Under a policy-regulated scenario consistency would be achieved amongst State level and national laws, the interests of cultivators accommodated, while river conservation and wildlife refuges would be the drivers of interventions or prevention of interventions. A very limited number of islands in the urban stretch can be permitted to have recreational activities and other select islands can have controlled eco-tourism activity, all in the non-monsoon season.

CHAPTER 11 – FINAL POSITION PAPER

Summary – The position paper offers a definition of river islands. It goes on to balance environmental, administrative and settlement challenges. Towards this end, it advocates a reconciliation between the objectives of national-level law and state-level legislation. The paper retains the interests of existing cultivators while preventing destructive and flood-vulnerable construction on islands. The paper also advocates amendments to the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016 to explicitly cover islands. It further addresses the potential contestation between the National Waterways Act and the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016. It also advocates the need for amendment in state-level legislation for internal consistency and consistency across the Ganga Basin. Further, the paper recommends amendments to state-level legislation to regularize and freeze residential and related construction where it has occurred on a large scale. A nomenclature system has also been proposed to name the islands thereby raising their visibility in the minds of stakeholders. Lastly, the position paper bats for the interest of wildlife and ecology which finds refuge on these islands.

11.1 **Introduction** : Riverine islands are integral parts of the river ecosystem throughout the world supporting rich biodiversity and facilitating their movements along with providing numerous other ecosystem services to mankind. However, in India, explosive pressures for urbanization and hunger for cultivable lands [which have been exhausted on the banks] have made islands vulnerable to human activities destructive of nature and to colonization which bodes ill for the river ecosystem.

11.2 **Focus of the Policy** : This position paper focuses on reconciling the mandate of various national-level laws amongst themselves, reconciling the mandates of national and state-level laws, highlights the need for the basin states to examine their several laws on the subject with a view to make them internally consistent.

The paper also suggests the need for exceptions for existing large-scale residential and related developments. Finally, the position paper bats for wildlife and wildscapes on river islands to maintain the integrity of the river ecosystem which system has greatly weakened due to human colonization of riparian areas. This last, if strengthened would maintain ecosystem services from the river islands.

11.3 **Policy Objectives :** This position paper aims to ensure the following objectives:

- v. Settling the ownership issues of the river islands
- vi. Settling the usage issues of the river islands
- vii. Promoting inventory and mapping of all river islands
- viii. Resolving legal anomalies

11.4 **Applicability of the Policy :** The policy emanating out of this position paper would be applicable to the main stem of the Ganga River along with its tributaries and tributaries of those tributaries. Inferences from this position paper can be drawn for applicability to other river systems in India.

11.5 **Intended Audience of this Position Paper :** The position paper would assist functionaries from the following institutions in contributions towards the development of policy options for addressing the issues pertaining to riverine islands:

- National Mission for Clean Ganga (NMCG)
- Central Ministries and agencies
- State Revenue and Tourism Departments
- Concerned District Administrations
- Concerned State and District Forest Departments
- NITI Aayog
- Inland Waterways Authority of India
- Experts and Researchers in this sector

- 11.6 **Defining the Riverine Islands** : For the current context, a river island can be defined as – “A piece of land definitely surrounded by water during the monsoons and is fairly stabilized with natural vegetation”.

Rationale for the definition – Owing to factors such as the construction of dams & barrages restricting the water flow and diversion of water into canals for agriculture, there is not sufficient water left in the Ganga River main stem during non-monsoon months that can actually be present on both channels around a riverine island. Most islands are thus left with one completely dried-up channel often referred to as ‘*Sota*’ which exposes them to unhindered access by local residents, i.e. making them fordable which was not the case earlier. It is only during the monsoon season that the island gets completely surrounded by Ganga River water on all sides and even gets submerged. Furthermore, the literature survey reveals that riverine islands are formed as successional vegetation leads to stabilization of sandbars which is also a significant differentiation character between these two land masses.

- 11.7 **Identification & Nomenclature of Islands** : More than 2000 islands and sandbars exist in the Ganga river main stem of which only some significant ones have been named such as Raghapur *Diara*, Shankerpur *Diara*, Ramchandipur *Diara*, *Char* Mahammadpur, *Nayachar* island and *Majhara Diara* to cite as few examples. Most others including the major riverine island of Prayagraj Distt. remain obscure due to the lack of any specific identification or nomenclature. Hence, it is essential to develop a system of island/sandbar identification so as to create their information database and safeguard them under appropriate regulations. Based on the field survey, it was recorded that the common terms used for referring to riverine islands are ‘*Taapu*’ in parts of Uttarakhand and Uttar Pradesh, ‘*Diara*’ in parts of eastern Uttar Pradesh, Bihar and Jharkhand, and ‘*Char*’ in parts of West Bengal. In some cases, the term – ‘*Reta*’ was ascribed for identification of sandbars an example of which is ‘*Kewatbir ka Reta*’ in Mirzapur Distt. However, the following matrix provides examples of a suggested system of nomenclature. The names should

ultimately be recorded in the various official maps. An additional column can be provided for common names [which may be provided where islands are nameless] :

State & District Name	Riverine island & Sandbars	Distance from River Origin	Final Nomenclature
State: Uttarakhand (Code – UK) District: Haridwar (Code – HR)	Code ' T ' can be used for stabilized riverine islands of any size falling in the district Code ' S ' can be used for sandbars of any size falling within the district	Example: Distance of island from river origin is 108 Kms & sandbar is 109 Kms.	For riverine island – UKHRI108 For sandbars – UKHRS109
State: Uttar Pradesh (Code – UP) District: Prayagraj (Code – PR) District: Varanasi (Code – VN)	Code ' R ' can be used for stabilized riverine islands of any size falling in the district Code ' S ' can be used for sandbars of any size falling within the district	Example: Distance of island from river origin is 519 Kms & sandbar is 522 Kms.	For riverine island – UPPRI519 For sandbars – UPPRS522 Varanasi – UPVNI & UPVNS
State: Bihar (Code: BR) District: Patna (Code – PT) District: Bhagalpur (Code – BG)	Code ' R ' can be used for stabilized riverine islands of any size falling in the district Code ' S ' can be used for sandbars of any size falling within the district	Example: Distance of island from the river origin is 1152 kms in Patna & 1356 Kms in Bhagalpur	For Patna: BRPTI1152 For Bhagalpur: BRBGI1356
State: Jharkhand (Code – JH)	Code ' R ' can be used for stabilized riverine islands of any size falling	Example: Distance of island from river origin	For Island: JHSBI1420

State & District Name	Riverine island & Sandbars	Distance from River Origin	Final Nomenclature
District: Sahibganj (Code – SB)	in the district Code ‘ S ’ can be used for sandbars of any size falling within the district	is 1420 Kms & sandbar is 1426 Kms.	For sandbar: JHSBS1426
State: West Bengal (Code – WB) District: Malda (ML) District: Murshidabad (MR)	Code ‘ R ’ can be used for stabilized riverine islands of any size falling in the district Code ‘ S ’ can be used for sandbars of any size falling within the district	Example: Distance of island from river origin is 1567 Kms and sandbar is 1634 Kms.	For Island: WBMLI1567 or WBMRI1567 For sandbar: WBMLS1634 or WBMRS1634
*NOTE:			
<ul style="list-style-type: none"> • In cases where the islands are known popularly by specific names, they can continue to be used in addition with this nomenclature. • All nameless islands may also be provided a simple common name – thus, the name of the nearest village can be attached to the words <i>taapu, diara, char</i> as the case may be • In cases where the islands are distributed in two Districts of either same or different States, the nomenclature can be suitably modified to reflect this situation. 			

11.8 **Key Stakeholders** : The preceding study has identified the following stakeholders :

- ❖ Settlers with built residential establishments
- ❖ Cultivators with ownership documents
- ❖ Cultivators without ownership documents
- ❖ District Administration for administrative jurisdiction

- ❖ District Forest & Wildlife Dept. [for corridors, river sanctuaries, wildscapes and habitats, ecotourism]
- ❖ Basin Manager [NMCG] for resolution of exceptional issues and monitoring
- ❖ IWAI [Inland Waterways Authority of India] as navigational routes can require island modification [horizontally]
- ❖ Wildlife having actual and potential habitats represented by DFO, CWW, relevant civil society organization[s]

11.9 **Ownership** : The State Government is/will be the owner of the islands in existence as on date of policy, those which may emerge later and those sandbars which evolve as islands. Where private property exists on certain islands, the gross footprint of the same will not be expanded and the remaining unregistered lands will remain in the ownership of the State. [The possibility of acquisition of privately owned lands on islands can also be examined].

Where tenurial rights or occupancy rights exist for cultivators the same may be honoured but must not be allowed to graduate to ownership.

11.10 **Jurisdiction** : The jurisdiction aspect has different scenarios –

- i. In the case both banks adjacent to an island are in the same district then the administration of that district would have jurisdiction of the entire island.
- ii. In the case the opposing banks are in different districts then the central line of the active river channel, determined during the peak flow of the river in the monsoon season of the policy notification year, will run through the island and the opposing districts will have jurisdiction up to the line which will be demarcated by markers. In the instance that an island shifts its position, the division line across the island will continue to remain frozen in position. However, the state govt. can exercise the preference to retain the entire island in a single district. This preference may be influenced by the existing revenue records.

- iii. In the case the island is entirely on one side of the central line of the active river channel as determined during the peak flow of the river in the monsoon season of the policy notification year, the island will remain in the jurisdiction of the district on the closer bank.
- iv. In case an island shifts position from one side of the central line, as determined above, to the other, the island will remain with the original district of jurisdiction.
- v. In the singular case of an island at a trijunction of States or districts, the jurisdictional boundaries can be partly resolved through the central line of river channel approach and partly through mutual accommodation.

11.11 Landuse :

- vi. The land use of islands falling in non-urban stretch of the rivers will be completely rural. Thus, no construction activity will be allowed here as is the law.
- vii. Where cultivation is being carried out cultivated area as on date of policy notification may be established by satellite imagery supported by ground truthing surveys. No further expansion of cultivable area is to be permitted and the remaining area is to be maintained wild or rewilded
- viii. On islands where there is no cultivated area the same are to be maintained wild or rewilded
- ix. In case cultivation is being carried out legitimately the agronomic practices will be completely organic and without a trace of chemical inputs and gradually transformed into permaculture with appropriate steps by the authorities.
- x. Further, sandmining will not be allowed on the defined islands.
- xi. Eco-tourism, observing eco-tourism code of conduct, may be allowed on the islands. Any temporary structures allowed will have to follow extremely strict definitions and regulations
- xii. Islands falling in the urban stretches may be allowed for eco-tourism use such as trails and camping and some forms of recreation and extremely strictly defined temporary construction with all pollution preventing measures. The construction zone may not exceed 1% of the island area for islands up to 5 ha spread. Above that a sharply sliding scale of the construction area apply. Thus, on an island of

250 sq. km. the temporary construction zone may not exceed 0.005% of the island area. The height of structures is not to exceed a single storey or 4m from ground level.

11.12 Construction on Islands - With regards to construction the following policy injunctions will be followed :

- iii. Existing construction on privately held lands within large settlements, as existing on date of policy, can remain. However, the expansion of footprint and vertical growth will be frozen as on date of policy notification. Even this will be an exception to state laws which will require an amendment
- iv. Construction on empty private plots is not to be allowed from the date of policy notification.

11.13 Accessibility : Construction of bridges to the islands from the banks is not to be permitted except in the case of islands with major existing settlements. In the rare case that an island has to be used for bridging, no loop from the bridge would provide access to the island, Post construction eco-restoration of disturbed areas must be carried out immediately.

11.14 River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016 : The conditions to be observed for floodplains, laid out in this far-reaching order, can be said to implicitly apply to river islands. However, as the Order fails to explicitly use the word river islands a lacuna exists which can be exploited through legal wordplay. Accordingly, the Order may be amended to include its application to river islands. Permission to facilitate eco-tourism by permitting temporary construction on islands in urban reaches of the river will require amendment in the state laws.

11.15 Further, the Order does not refer to the conservation of the morphology of the floodplains, banks and islands. Here, it is observed that under the National Waterways Act, the requirements of navigation can be met by removal of any obstruction in the channels. Such removal can affect both island and bank

morphology. As the NWA is an Act of Parliament and thus above the Order in hierarchy and also predates the Order it may be said to command precedence over the Order. This situation, of course, applies to National Waterway I stretch only. However, as there are a large number of islands this anomaly needs to be addressed by MoJS and the Ministry of Shipping & Transport.

11.16 State Laws : The states of Bihar and Bengal have modified the Bengal Alluvion Diluvian Act several times to accommodate newer political concerns. Jharkhand with a single District [Sahibganj] has not made any changes. Uttarakhand has also come up with two overlapping regulations. The UP Regulations have no specific allusion to river islands and thus lack clarity. All these laws need to be unified to be internally consistent within a state, consistent across states and with the national laws. Permission to facilitate eco-tourism by permitting temporary construction on islands in urban reaches of the river will require amendment in the state laws.

11.17 Wildlife Protection Act : The Act applies to river sanctuaries such as Vikramshila Dolphin Sanctuary. Large-scale navigational activities with high tonnage and draft motorized vessels create adverse impacts unacceptable under WPA. Any alteration of river islands in the Sanctuary would also impact several habitats. The solution may lie in the size of boats which may be laid down to be able to navigate the existing channels without modification.

11.18 EIA Notification, 2006 : While the EIA requirements are not applicable to waterways the same can be applicable to any developments on river islands and in and around wildlife sanctuaries. This mention here is only to draw the attention of stakeholders who intend such developments or regulators who are empowered to carry out EIAs and subsequent monitoring of environmental plans and may be mentioned as such in the final policy.

11.19 National Waterways Act, 1982 : This is again a call attention statement which may find mention in the policy so that actions under this Act are aligned with the conditionalities of other laws, national or state level. Apart from the River Ganga

Order conditionalities even tenures on islands call for compensation if islands are modified.

11.20 **Indian Forest Act (IFA), 1927** provides for the constitution and management of forests. In the instances where the River Islands fall within the notified limits of a Reserved Forest or a Protected Forests (RF/PF) or any other category of forests as per the State Rules (State adaptation of IFA and the Rules exist and vary from State to State), the IFA, 1927 would apply. In all such instances, the River Islands would be administered and managed by the State Forest Departments. The policy should draw attention to the relevance of this Act in some cases.

11.21 **Biological Diversity Act** : In case of thickly wooded islands with rich resources this Act may come into play and may accordingly be noted in the proposed policy.

11.22 **Coastal Regulation Zone Notifications** : These would come into play in the case of the estuarine islands and may be mentioned in the proposed policy for compliance in relevant cases.

LEGAL FRAMEWORK ANALYSIS MATRIX

SR. NO.	ACT, POLICY, ORDER OR REGULATION	RELEVANT PROVISIONS	DETAILED PROVISION	KEY ELEMENTS OF THE ACT/POLICY/PLAN/LAW/ORDER
I.	National Laws and Regulations Applicable to River Islands			
1.	Constitution of India, 1950	<p>Articles 48A, 51A (g), Article 246, Article 253</p> <p>Article 262: Role of the Union Government in adjudicating inter-state water disputes</p> <p>Entry 56 (List-I) of the Seventh Scheduled</p> <p>Entry 17 (List-II) of the Seventh Scheduled.</p>	<p>Article 48A: The State shall endeavor to protect the environment. It also emphasizes on safeguarding the forests and wildlife of the country. Article 48A imposes a duty on State to protect the environment from pollution by adopting various measures.</p> <p>Article 51A (g): It shall be the duty of each and every citizen of India to protect and improve the natural environment that includes lakes, rivers, forests, and wildlife.</p> <p>Article 246: Subject-matter of laws made by Parliament and by the Legislatures of States.</p> <p>Article: 248: Residuary Power of Legislation - (1) Subject to article 246A, Parliament] has exclusive power to make any law with respect to any matter not enumerated in the Concurrent List or State List.</p>	<p>There are three sets of provisions relevant to River Islands under the Constitution</p> <p>i) Provisions on the law-making powers of the union and the state governments including on natural resources enumerated under the Lists provided under the Constitution. This includes Residuary Powers of the Central Government</p> <p>ii) Provisions on obligation of the government and duty of the citizens for the protection and improvement of the natural environment including rivers</p> <p>iii) Provisions on River Disputes, Development of Rivers and River Valleys, Waterways and water</p> <p>All the three sets of constitutional provisions apply to river islands. The law-making powers of the Union and state governments with respect to river islands get reflected in the state level policies and Acts wherein state governments have legislated from the land ownership, use and revenue perspective. The central level legislation on environment, forest, biodiversity and wildlife are also applicable. Thus, the central</p>

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			<p>Article 253: Legislation for giving effect to international agreements</p> <p>Article 262: Constitution of India 1950</p> <p>(1) Parliament may by law provide for the adjudication of any dispute or complaint with respect to the use, distribution or control of the waters of, or in, any inter-State River or river valley.</p>	<p>government has not issued a legislation directly except those pertaining to environment. The law on national waterways is an instance of a central legislation issued as per the law-making powers of the Union under the Seventh Schedule that has direct bearing on river islands. In this respect, the principle of residual legislation will have to be carefully examined for the river islands having longer or permanent presence. Another pertinent area of analysis is the inter-state jurisdiction and coordination for the management of river islands. In case of pollution aspects, the law provides for the establishment of Joint Boards, a less explored provision under the Water Act, 1974. However, there are other issues of revenue, land assessment, rights and ownership to be determined based on a state's/Districts claim to the river islands.</p>
2.	Environment Protection Act 1986	Section 3, Section 5	Powers to undertake measures for prevention of environment pollution including restriction of areas and laying down of rules and standards for the protection of environment.	The EPA, 1986 is an overarching law that is applicable to all the ecosystems, including rivers and lands and has been used to issue Notifications including the Ganga River Basin Authority Notification of 2009 and the Notification on environmental flows 2018. Irrespective of the ownership and the existing management regimes, the EPA will be applicable to the River Islands, specially from the water quality standards and other pollution aspect perspectives. The regulation of operations and processes within the River Islands will need to carefully examined for the

SR. NO.	ACT, POLICY, ORDER OR REGULATION	RELEVANT PROVISIONS	DETAILED PROVISION	KEY ELEMENTS OF THE ACT/POLICY/PLAN/LAW/ORDER
				<p>regulation under the EPA. However, the NRGBA has the powers conferred upon to regulate activities in the entire Ganga Basin. The role of EPA would become clear once the legal status of river islands is fully ascertained. Importantly, the EPA provides for the Environment Impact Assessment under the Notification of 2006. There is no mention of EIA in case of development in a river island or development activities that have direct impact on ecological features of rivers such islands. However, the 2016 amendment to the EIA Notification has exempted dredging from the Environment Clearance process. However, the cumulative impact assessment of all the river islands on the river regime could be sought under the EPA. This is thus a grey area in law This needs to be examined more carefully.</p>
3.	Wildlife (Protection) Act 1972	Several provisions including section 18, 36A, 36B, 36C and others	Declaration protection and control of sanctuaries, designation of community reserves	<p>Some of the River Islands in the Ganga Basin are designated Protected Areas. The wildlife in the Ganga basin is protected under the WLPA, 1972. The River Islands will have the application of WLPA including for the purposes of designation of community reserves, conservation reserves and sanctuaries, if the conservation regime is to be enhanced. Some of the islands are already under the Protected Area Regime.</p>

SR. NO.	ACT, POLICY, ORDER OR REGULATION	RELEVANT PROVISIONS	DETAILED PROVISION	KEY ELEMENTS OF THE ACT/POLICY/PLAN/LAW/ORDER
4.	Water (Prevention and Control of Pollution) Act 1974	Chapter V of the Act	Chapter V provides for substantive as well as procedural details on the powers of the state governments to take samples and information, prohibition on the use of streams or well, restrictions on discharges	Water (Prevention and Control of Pollution) Act, 1974 is mainly concerned with the source pollution into water bodies. The pollution from within the river islands is likely to have severe impacts on river quality and hence the Water Act will apply. The cultivation carried out within river islands, use of water from the river channel, the habitations within and discharge of pollutants will attract the Water Act, 1974. The State Pollution Control Boards are required to look into the polluting activities within the river islands, the water quality in the stretches of the rivers with habituated islands and the source discharges, if any.
5.	Indian Forest Act, 1927	Chapter IV and V, among other provisions	Chapter II deals with Reserved Forests. Chapter IV deals with the Protected Forests, In PFs all activities are allowed unless specifically prohibited. Chapter V concerns protection of forests not being the property of the government i.e protection of forests for special purposes, on the request of the owners etc	The IFA, 1927 provides for the constitution and management of forests. In the instances where the River Islands are already part of RF/PF or any other category of forests as per the state Rules (state adaptation of IFA and the Rules exist and vary slightly from state to state), the IFA would apply. In all such instances, the River Islands would be administered and managed by the State Forest Departments. That does not negate the role of the water resources, irrigation or PCBs. The rights and concessions of people living in the forests and the activities therein would be

SR. NO.	ACT, POLICY, ORDER OR REGULATION	RELEVANT PROVISIONS	DETAILED PROVISION	KEY ELEMENTS OF THE ACT/POLICY/PLAN/LAW/ORDER
				regulated as per the forest Act and the Rules. Further, the forestry and agro-forestry schemes can be also be implemented on river islands as per the IFA.
6.	Forest (Conservation Act), 1980	All the provisions	The FCA, 1980 deals with the diversion of forest lands for non-forest purposes.	The Act slows down the rate of diversion of forests for non-forest purposes. In case of River Islands, it needs to be seen if these have been designated as RF/PF/PA. The application of FCA would entail protection from diversion and conservation of these islands as forests, if they have been recorded as such. The definition of forests as per the dictionary meaning as has been Ruled in the WP (C) 202/1995 TN Godavarman Case would also apply.
7.	Indian Fisheries Act, 1897	All the provisions	Section 2(3) The Act defines private waters as one where a person has exclusive right to fisheries including customary rights (Explanation to Section 2). Then there are provisions on the protection of fish from poisoning etc. and by express rules to be framed by the state government.	The Indian Fisheries Act has two implications for the river islands, the fishing communities living there or fishing around these islands. Firstly, the Act recognizes the right to fisheries in private waters which is private not only by the virtue of ownership but also existence of customary right to fishery in those waters. Second, the protection of fish can be ensured by the state government for regulating exploitation of fish diversity including a ban on fisheries for a maximum of two years and regulation of fish nets or engines of any sizes. The law has negligible penal provisions such as a

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				penalty of 100 Rs for the first offence and 10 Rs for continuation of offence which render it ineffective. The measures for protection should relate to the erection and use of fixed engines, construction of weirs; and dimension and kind of the nets to be used and the modes of using them. This act assumes importance for livelihood issues on river islands.
8.	Biological Diversity Act, 2002	All the provisions	The BD Act, 2002 does not provide specifically for the aquatic biodiversity but covers all kinds of biological resources and diversity – terrestrial-aquatic and marine. Section 23 provides for the functions of the state government, Section 24 provides the powers of the State Biodiversity Board to prohibit or restrict activities that violate the objectives of conservation of biodiversity. Section 36 provides duties of the Central Government that has a wide scope and potential for conservation of River Islands.	River islands represent a combination of terrestrial and riverine biodiversity. The BD Act, 2002 applies to river islands and could be used to its potential for example for the creation of Biodiversity Heritage Sites. Similarly, the powers of the state and the Central Government for preventing activities that have negative impact on biological diversity could be put to use. The Act covers conservation, use of biological resources and associated knowledge for commercial or research purposes or for the purposes of bio-survey and bio-utilization. It provides a framework for access to biological resources and sharing the benefits arising out of such access and use.
9.	National Environmental Policy (NEP)	All the provisions of the policy	The pertinent clause is with respect to the Incomparable Entities and Entities with Incomparable Values	Policy defines the basic principles of environmental conservation and management emphasizes need for priority allocation of societal

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	2006		(Clause 4: Principles)	resources for conservation of Entities of Incomparable Value (EIV), both natural and man-made, which may impact the well-being, broadly conceived, of a large number of persons. The NEP defines ‘Entities of Incomparable Values’ (EVI) as sites containing unique natural or man-made entities, (living and/or non-living), that provide critical life support environmental services and/or are essential for the well-being, broadly conceived, of a large number of people of present and future generations. The NEP argues for the mechanisms and processes to be set up for preserving the entities of incomparable values and calls for a separate code in this regard. The riverine islands can be considered as EIV and such needs recognition and conservation.
10.	Sustainable sand mining management guidelines, 2016			The extraction of sand and gravel from the river bodies with adoption of required environmental safeguards is required to be done as per these guidelines. Sand mining has a significant impact over river islands and as such are of importance for them.
II.	State Level Frameworks			
(A)	UTTAR PRADESH			

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11.	Revenue Department Manual of Orders, 1965 https://bor.up.nic.in/Act_And_Rules.htm	Rules on, “Assessment of Alluvial Mahals in Temporarily Settled Districts”	<p>An alluvial mahal means a mahal which has been demarcated and registered under these rules (Chapter I-A) as being liable to be affected by fluvial action.</p> <p>Alluvial means</p> <ul style="list-style-type: none"> (a) an actual increase in area caused by fluvial action ; (b) except as provided by paragraph A-61, an alluvial deposit which has enabled land that was previously barren to be brought under cultivation, or has increased the assessable sayar income of a mahal. <p>Diluvian means:</p> <ul style="list-style-type: none"> (a) an actual decrease in area caused by fluvial action ; or (b) a deposit of sand or other matter which has thrown land previously cultivated out of cultivation, or has diminished the letting value of cultivated land or the assessable sayar income of a mahal. <p>In case of Conditional long-term settlement, when there has been an</p>	<p>A Mahal under the UP-Land Revenue Code, 1950 is a local area held under a separate engagement for the payment of the land-revenue direct to Government. The essence of a Mahal is that it is considered as an special area with a separate arrangement for revenue collection and its ordinarily held as a commune by all the rights holders in a Mahal. An alluvial Mahal is one created by the river action where the area of alluvial deposit has increased resulting in income and revenue increment from such an area. A Diluvial Mahal is a result of decrease in area due to river action, either swept away partially or fully and added to another revenue district partly or fully. There are arrangements for revenue collection and settlement in different scenarios when alluvial or alluvial action happens. The reading of the law shows that the alluvial and diluvial Mahals are regarded as the legal categories for the purposes of revenue assessments and there are common property and livelihood rights. The Code, 1950 and the Orders issued therein provide for the areas that face alluvial/diluvian action in general. It is not specific to river islands but the provisions of the Code and the Orders are applicable to River</p>

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			<p>alluvial accretion to a mahal, and the cultivated area of such accretion amounts to more than ten per cent of the aggregate cultivated area of the mahal, as it stood at the time of the last assessment, and of the non-alluvial mahal, if any, owned by the proprietor in the same village, such alluvial accretion shall be liable to be assessed to revenue as a separate mahal under the rules relating to octennial settlements in this Chapter. No such assessment shall be made except in a year appointed for the assessment of the alluvial mahals of the pargana.</p> <p>Explanation—The term “alluvial accretion” in the above-mentioned paragraph and in paragraph A-16 includes not only the area actually added by fluvial action, but also the area which, at the time of the conditional settlement, was covered by the water of the river, but has since become dry through a change in the river-bed. It does not include land, barren at the time of such settlement which has been made culturable by subsequent changes in the riverbed.</p>	<p>Islands. Importantly, the Act does not use the word river islands and therefore no proximate definition of the term is available in Uttar Pradesh. A few specific points are as follows:</p> <ol style="list-style-type: none"> i. The alluvial mahals were considered for temporary settlements. ii. From the definitions, it can be inferred that alluvial and diluvian of an area was liable for revenue assessment. iii. In cases of conditional long-term settlement, the area which was barren at the time of settlement and had been made culturable by subsequent changes in the riverbed, was not considered for revenue assessment. The area which, at the time of the conditional settlement, was covered by the water of the river, but has since become dry through a change in the riverbed, was liable for revenue assessment. iv. In case of octennial settlement, the revenue was liable to re-assessed in case the area was reduced by diluvial action by more than 20 per cent below those accepted by the assessing officer

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			<p>An octennial settlement means a settlement of mahal demarcated as an alluvial mahal in which the revenue is liable to be re-assessed under section 96 of the United Provinces Land Revenue Act, 1901.</p> <p>(a) in the years appointed for the settlement of alluvial mahals in the pargana, or</p> <p>(b) in any year on application being presented by the proprietor to the Collector before December 15, claiming that the assets of the mahal have been reduced in consequence of diluvian by more than 20 per cent below those accepted by the assessing officer at the current settlement of the mahal.</p> <p>Chapter II, Para 18 states that, owing to a change in the deep stream of a river, part of a mahal is cut off from one district and becomes included in the boundaries of another district, the whole of the revenue of the mahal will continue to be paid in the district in which it has previously been paid, until the whole mahal, or in the case of a</p>	<p>at the current settlement of the mahal.</p> <p>v. Rule 1623 and Rule 1624, talks about changes caused in localities due to “deep stream” would not affect the compensation as decided by the government and will be payable by treasury of one collector. However if most of the area or the complete area is transferred from district of one collector to another, then there are two conditions that needs to be satisfied:</p> <ul style="list-style-type: none"> • the fard of the area (which is transferred by the river to another district), for the purpose of revenue tax, is registered in that district; and • there is a possibility of the owner of that area, to reside in that district <p>then, for the purpose of convenience, the fard, for the purpose of revenue tax would be added in the registry of that collector where the full area or most of the area is carried by the river into another district after the approval of both Bihar and U.P. government who would be approve such transition. And those villages whose land revenue is determined separately or are part of complex mahal and their land revenue is determined</p>

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			<p>mahal consisting of two or more villages with land revenue separately assessed or distributed on each village, until the whole village comprising the area is cut off, eg transferred to the other district under the orders of Government.</p> <p>No mahal will be so transferred unless by the deep stream rule, the village site is removed from one district to another. Where the two districts are under different Governments, the sanction of both the Governments will be necessary to the transfer and the rules in paragraphs 1623 and 1624.</p>	<p>separately, then after the approval of U.P. and Bihar Government would be, added as one State, if these villages are cut-off by the river from the district and the names of the villagers are on the areas which are cut-off and these villagers are inclined to reside in that district.</p>
(B)	UTTARAKHAND			
12.	The Uttaranchal (The U.P. Zamindari Abolition Land Reforms Act, 1950) (Adaptation and Modification Order, 2001) (Amendment) Act 2003".		<p>i. "Flood Plain" includes water channel, flood channel and that area of nearly low and which is susceptible to flood by inundation;</p> <p>ii. "Land" includes interest in lands, benefits arising out of lands and things attached to the earth or permanently fastened to anything attached to the earth;</p>	<p>The Uttaranchal Amendment Act. 2003 (Further amended 2006) provides for the transfer of a 'fragment'. A Fragment is a piece of land admeasuring roughly about 3 acres. The sale, purchase and revenue to be levied on the fragments is to be further determined as per the Revenue Code. There is no reference to river island under this law. Thus it can be inferred that the legal position in Uttarakhand with respect to river islands or fragments that emerge due river action is not very clear.</p>

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	Uttarakhand Flood Plain Zoning Act, 2012 https://www.indiacode.nic.in/handle/123456789/3423?view_type=search&sam_handle=123456789/2511		iii. “River” includes its tributaries; iv. “Water Channel” means the channel in which the flows of a river are generally confined.	The UFPZ, 2012 is a new legislation with a potential application to River Islands that adjoin flood plain areas that could notified as such by the Authority constituted for such purpose. There is a provision for compensating the occupants of lands susceptible to floods based on the survey of the land by an authorized officer. The details of the survey and the coverage could be only known through further verification. A few pertinent aspects of the Flood Plain Zone Act are as follows: i. The Act states that under section 5 survey would be conducted by the Flood Zoning Authority to identify flood plains (the area which is susceptible to flood, as per the definition) and prior notice shall be given to the occupier of the land. ii. However, section 7 states that any officer or Flood Zoning Authority who enters the land under section 5 shall, before leaving, tender compensation to the owner or occupier of such land for any damage which may have been caused and in case of dispute as to the sufficiency of the amount so tendered, the Flood Zoning Authority or such officer shall refer the matter to the State Government for its decision. iii. It may be concluded that compensation would

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				<p>only be provided when the damage is caused to the occupier's land, building or the structure.</p> <p>iv. Furthermore, the State Government after the report of the Flood Zoning Authority may alter the limits of area as it considers necessary and shall make arrangement for rehabilitation of Colonies already existing in the flood plain.</p> <p>v. The state government may restrict and prohibit activities in the flood plains after declaring the areas.</p> <p>vi. Where any permission to undertake any activity in the flood plain has been refused to any person or where as a result of prohibition or restriction imposed on any person under this Act, such person suffers any damage, he shall be entitled to the payment of compensation not exceeding the difference between the value of the land as determined under section 23 or section 24 of the Land Acquisition Act, 1894 (Central Act No. 01 of 1894) and the value which it would have, had the permission for carrying on any activity had been granted or the prohibition or restriction had not been imposed.</p> <p>vii. It can be concluded that compensation can be received in two circumstances i.e., when the land, building, structure of the occupier has been damaged due to flood and any person who suffers damage as a result of prohibition</p>

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				<p>or restriction imposed in the flood plain area.</p> <p>viii. In determining the amount of compensation, any restriction to which the land is subjected to under any other law for the time being in force in regard to the right of the person claiming compensation to carry on any activity on the land or otherwise to the use of the land, shall be taken into consideration.</p> <p>ix. Compensation shall be determined by agreement between the persons and the authority and shall not exceed Rs. 10,000. If exceeds the limit of Rs. 10,000 then the compensation shall only be provided after the State Government's approval.</p>
(C)	JHARKHAND			
13.	<p>Land Registration Act, 1876 (Bengal Act 7 of 1876)</p> <p>http://www.bareactslive.com/WB/WB438.HTM#:~:text=An%20Act%20to%20provide%20for,the%20proprietors%20and%2</p>	Section 2 of the Act	<p>i. “Estate” includes-</p> <p>(a) any land subject to the payment of land-revenue, either immediately or prospectively, for the discharge of which a separate engagement has been entered into with [the Government] ;</p> <p>(b) any land which is entered on the revenue-roll as separately assessed with land-revenue (whether the amount of such</p>	<p>In Jharkhand, the state legislation on land revenue provides for the registration of lands for the purposes of determining land revenue. The law creates an exception of certain lands to be registered as revenue free lands or lands that are exempt from land revenue. What appears from the legislation is that in Jharkhand revenue land is recognized as an estate or a Mauza and there is a third category of revenue free lands with proprietary rights. The implication of this legislation on river islands is that revenue collection is not a mandatory condition for a legal categorization of lands in a situation where a state has exempted certain</p>

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	0managers%20the reof.&text=as%20 follows%3A%2D-1.,the%20Land%20Registration%20Act%2C%201876.)		<p>assessment be payable immediately or prospectively), although no engagement has been entered into with [the Government] for the amount of revenue so separately assessed upon it as a whole;</p> <p>(c) any land being the property of [the Government] of which the Board shall have directed the separate entry on the general register hereinafter mentioned [or on any other register prescribed for the purpose by rule made under this Act]</p> <p>ii. “Mauza” means the area defined, surveyed and recorded as a distinct and separate mauza in</p> <p>(a) the general land-revenue survey which has been made of the [State] or</p> <p>(b) any survey made [by any Government] which may be adopted [by the State Government] by notification in the [Official Gazette] , as defining mauzas for the</p>	<p>special categories of lands to be recorded even without being the revenue categories. There is no category as river island under the Act. The specific sections have been outlined below:</p> <p>i. Section 9 talks about Register for revenue free lands. Register shall contain three parts: Part I. - Book of lands held exempt from revenue in perpetuity. Part II. - Book of lands occupied for public purposes without payment of revenue. Part III. - Book of unassessed waste-lands and other lands not included in Part I or Part II of the general register of revenue-free lands.</p> <p>ii. Section 15 talks about “Mauzawar register to be arranged according to local divisions.” Among other requirements, the rester shall contain name of every estate or revenue-free property to which any of the lands of the mauza appertain.</p> <p>iii. Section 19 talks about Intermediate Register which shall record all changes in the names of proprietors and managers of revenue-free properties, and in the character and extent of interest of each such proprietor and manager,</p>

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			<p>purposes of this clause in any specified area; and, where a survey has not been [so made or adopted by the State Government], such area as the Collector may, with the sanction of the Board of Revenue, by general or special order, declare to constitute a mauza</p> <p>iii. “Manager” means every person who is appointed by the Collector, the Court of Wards or by any Civil or Criminal Court to manage any estate or revenue-free property or any part thereof, and every person who is in charge of an estate or revenue free property or any part thereof on behalf of a minor, idiot or lunatic, or on behalf of a religious or charitable foundation [or as a trustee or executor]</p> <p>iv. “Proprietor” means every person being in possession of an estate or revenue-free property, or of any interest in an estate or revenue-free property, as owner</p>	<p>and such other changes affecting any entry standing in the general register of revenue-free lands, or any entry relating to revenue-free lands in the mauzawar register, as cannot conveniently be entered against such entry in the general or the mauzawar register. It shall also include “particulars of the change, with a reference to the authority under which it is made.”</p> <p>iv. Intermediate register shall record changes in the names of proprietors and managers of revenue free properties with a reference to the authority under which it is made.</p> <p>v. Section 33 talks about “Lands held without payment of rent deemed to be part of certain estates”. It states that all lands which are held without payment of rent, not being a revenue-free property entered in the general register of revenue-free lands be deemed to be a part of the estate within the local boundaries of which they are included; and, if they are not included within the local boundaries of any one estate, then to be a part of such neighbouring estate as the Collector shall, by an order under his seal and signature, declare.</p> <p>vi. Conclusion: There are revenue free lands as well as lands which are not revenue-free but are held without payment of rent. Such lands would be deemed to be an “Estate”.</p>

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			<p>thereof; and includes every farmer and lessee who holds an estate or revenue-free property directly from or under the Collector</p> <p>v. “Revenue-free property” means any land not subject to the payment of land-revenue which is included under one entry in any part of the general register of revenue-free lands</p>	<p>vii. Section 42 provides proprietary right in any estate or revenue-free property, whether by purchase, inheritance, gift or otherwise.</p>
14.	<p>The Chota Nagpur Tenancy Act, 1908</p> <p>https://www.indiacode.nic.in/bitstream/123456789/12213/1/30-1950_revenue.pdf#search=Chota%20Nagpur%20Tenancy%20Act,%201908</p>		<p>i. “estate” means land included under one entry in any of the general registers of revenue-paying lands and revenue-free lands prepared and maintained under the law for the time being in force by the Deputy Commissioner; and includes Government ‘khas mahals’ and revenue-free lands not entered in any register</p> <p>ii. “holding” means a parcel or parcels of land held by a Raiyat, and forming the subject of separate tenancy;</p> <p>iii. “korkad” means land by whatever name locally known such as ‘babhala khandwat’, ‘jalsasan’ or ‘ariat’, which has been artificially</p>	<p>The Tenancy law in Jharkhand does not have any particular reference to tenancy in the lands emerging of lost due to river action. Nor it deals with tenancy in River Islands that exist in the state. Rather the law deals with the process and accrual of tenancy rights created in a land.</p> <p>i. Section 14 of the act states that upon the resumption of a resumable tenure, every lien, sub-tenancy, easement or other right or interest created, without the consent or permission of the grantor or his successor-in-interest by the grantee or any of his successors, on the tenure, or in limitation of his own interest therein, shall be deemed to be annulled, except “Any Mundari khunt-kattidari tenancy”</p> <p>ii. Section 18 talks about “Bhuinhars and Mundari khunt-kattidars to be settled Raiyats</p>

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			<p>levelled or embanked primarily for the cultivation of rice, and,- (a) which previously was jungle, waste or uncultivated, or was cultivated upland, or which, though previously cultivated, has become unfit for the cultivation of transplanted rice, and</p> <p>(b) which has been prepared for cultivation by a cultivator (other than the landlord), or by the predecessor-in-interest (other than the landlord);</p> <p>iv. “Raiyat” means primarily a person who has acquired a right to hold land for the purpose of cultivating it by himself or by members of his family, or by hired servants or with the aid of partners; and includes the successor-in-interest of persons who have acquired such a right, but does not include a Mundari-khunkattidar.</p> <p>Explanation. - Where a tenant of land has the right to bring it under cultivation, he shall be deemed to have acquired a right to hold it for the purpose of cultivation,</p>	<p>in certain cases”. And includes all male members of Mundari Khunt Khatedari who hold such land and have been holding the land continuously for twelve years.</p> <p>iii. Under chapter XVIII, which includes special provisions regarding Mundari Khunt Khatedars, section 241 states that such land can be transferred without the consent of the landlord for any charitable, religious or educational purpose or for the purposes of manufacture or irrigation, or as building ground for any such purpose, or for access to land used or required for any such purpose.</p> <p>iv. Section 256 states that record of rights must be published to prove Mundari Khunt Khattidari.</p> <p>v. The act does not talk about korkad land</p>

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			<p>notwithstanding that he uses it for the purpose of gathering the produce of it or of grazing cattle on it.</p> <p>(2) A person shall not be deemed to be a Raiyat unless he holds land either immediately under a proprietor or immediately under a tenure-holder or immediately under a Mundari-khunt-kattidar.</p> <p>(3) In determining whether a tenant is a tenure-holder or Raiyat, the Court shall have regard to,-</p> <p>(a) local custom, and</p> <p>(b) the purpose for which the right of tenancy was originally acquired.</p> <p>v. “Raiyat having khunt-katti rights”</p> <p>(1) “Raiyat having khunt-katti rights” means a Raiyat in occupation of, or having any subsisting title to land reclaimed from jungle by the original founders of the village or their descendants in the male line, when such Raiyat is a member of family which founded the village or a descendant in the male line of any member of such family :</p>	

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			<p>Provided that no Raiyat shall be deemed to have khunt-katti rights in any land unless he and all his predecessors-in-title have held such land or obtained a title thereby virtue of inheritance from the original founders of the village.</p> <p>(2) Nothing in this Act shall prejudicially affect the rights of any person who has lawfully acquired a title to a khunt-kattidari tenancy before the commencement of this Act.</p> <p>vi. “Mundari-khunt-kattidari” Mundari- khunt-kattidar means a Mundari, who has acquired a right to hold jungle land for the purpose of bringing suitable portions thereof under cultivation by himself or by male members of his family, and includes,-</p> <p>(a) the heirs male in the male line of any such Mundari when they are in possession of such land or have any subsisting title thereto, and</p> <p>(b) as regards any portions of such land which has remained continuously in the possession of any such Mundari</p>	

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			and his descendants in the male line, such descendants.	
15.	Bihar Reforms Land Act, 1950		<p>i. “Estate” means any land and several fishery and ferry rights included under one entry in any of the general registers of revenue-paying lands and revenue-free lands, prepared and maintained under the law for the time being in force by the Collector of a district, and includes revenue-free land and several fishery and ferry rights not entered into any register and a share in or of an estate.</p> <p>ii. “Khas possession” used with reference to the possession of a proprietor or tenure-holder of any land used for agricultural or horticultural purposes means the possession of such proprietor or tenure-holder by cultivating such land or carrying on horticultural operations thereon himself with his own stock or by his own servants or by hired labour or with hired stock.</p>	<p>In Bihar, An Estate can be vested in the state government meaning that any land can be vested in the state by way of a Notification issued under the Bihar Land Reforms Act, 1950. The Act defines an Estate to include any land whether revenue-paying or revenue free. Thus, rights in the lands in river islands including the ferry and fishery rights can be vested in the state government by way of a Notification. The specific details of the provisions on this aspect are as follows:</p> <p>i. Tenure’ excludes Mundari Khunt Khattidari.</p> <p>ii. As per section 3, State by notification can vest an estate(revenue paying and revenue free in the State.</p> <p>iii. Section 4, states that, as a consequence of vesting, interests of the proprietor or tenure-holder in any building or part of a building comprised in such estate or tenure and used primarily as office or cutchery for the collection of rent of such estate or tenure, and his interests in trees, forests, fisheries, jalkars, hats, bazars, [mela] and ferries and all other sairati interests, as also his interest in all subsoil including any rights in mines and</p>

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				<p>minerals whether discovered or undiscovered, or whether been worked or not, inclusive of such rights of a lessee of mines and minerals, comprised in such estate or tenure (other than the interests of raiyats or under raiyats) shall, with effect from the date of vesting, vest absolutely in the State free from all incumbrances.</p>
16.	<p>Bihar Government Estate (Khas Mahal) Manual, 1953</p> <p>http://www.bareactslive.com/BIH/BH282.HTM</p>		<p>“Government Estates” is used to mean estates under the direct management of Government whether these are the property of Government or are the estates of private individuals brought under direct management of Government. It may also mean any land, which is the property of Government and as such would include estates owned by Government which have been let in farm and leased for periods and also the waste lands but would not include lands belonging to other departments of Government, e.g. roadside lands, so long as they are not relinquished by the department concerned to the Collector for management. This Manual unless it so appears from the context, deals with the principles, policy and procedure for khas management of estates under the</p>	<p>The Manual provides the Rules for the acquisition of Estates that are under the direct management of the state government. Importantly, ownership is not the premise for such management. The state government can also assume the management of estates under private ownership. The manner in which Government Estates (Khas-Mahal) can be acquired includes “Resumption of Island Chars” Thus the Rules for the acquisition of government lands applicable in Jharkhand, Bihar and West Bengal flow from the Regulation XI of 1825 and are applicable to river islands. In addition to the 1825 Regulation, the Manual, 1953 provides the powers and the procedure for the acquisition of what is termed as ‘Island Chars’ that is a combination of a formal and customary term. These estates are also referred to as Diara. The Policy of the government for such lands is to manage them directly under the government supervision.</p> <p>The Island Chars or Diara Lands can also be leased by</p>

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			direct management of Government.	<p>the Government. This lease is based on a form of acceptance known as Kabuliayt on behalf of the lessor. The Diara estates are also required to be assessed annually after the rains for the alluvion or dilluvion action by an officer not below the rank of a Circle Inspector. The observation by the officer should be marked on the previous year's map prepared by an Amin (a land officer) on all the changes occurred in the Diara estates. The map so updated by following this process should be relied upon solely for settlements and remissions etc. The detailed procedure for the annual verification of Diara estates has been provided under the Manual.</p> <p>What emerges from the Manual 1953 along with the Regulation XI of 1825 that the states have put a legal and procedural system for the annual mapping and assessment of the Island Chars or Diara Estates and its not left unattended. The extent of direct management by the state government and the regulation of activities in these lands for the purposes these have been leased or the land use contrary to what has been allowed under the Rules needs to be further ascertained to know the changing legal dynamics in these estates. The specific Rules under the Manual are outlined below:</p> <ul style="list-style-type: none"> • Rule 2 refers to acquisition of government estates via Regulation XI of 1825 • Rule 24 talks about lease of char or diara lands.

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				<p>Diara estates are liable to considerable changes annually from alluvion and diluvion. A responsible officer not below the rank of Sub-deputy Collector, or a Kanungo, [or Circle Inspector], should inquire on the spot after each rains and have marked on the previous year's map by an amin all changes due to alluvion and diluvion, including changes in classification of lands. This map should be relied on solely for settlements, remissions etc.</p> <ul style="list-style-type: none"> • Rule 33B provides for grant of fishing rights in river/tank/bandh
17.	Bihar Tenancy Act 1885		<p>Section 180 talks about char and diara lands and it states a raiyat will hold char or diara land for twelve continuous years and acquire right of occupancy, until then, the raiyat shall be liable to pay rent as decided between him and his land lord. It means that till twelve years the non-occupancy raiyat will be paying rent and then he will acquire the right of occupancy.</p>	<p>The Bihar Tenancy Act adds another dimension of tenancy to the Island Chars or Diara estates. As per this Act a Raiyat can have tenancy rights over such lands. Raiyat in the ordinary and simple sense of the term is a self-cultivator. The Act provides that a self cultivator can acquire right of occupancy of a Diara land if he has been holding the land for 12 continuous years and also has been paying the rent as agreed between him and the landlord. The right of occupancy will be acquired in the 12th year. The Tenancy in the Diara Lands can also be revoked by the Collector in case the cultivation is not feasible (Section 112, the Tenancy Act). The form and nature of tenancy and the counter claims disputing state's power to allocate Diara lands on the payment of rent needs further investigation and analysis.</p>

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(D)	BIHAR			
18.	The Bihar Chaur, Diara and Gang Barar Public Land Temporary Settlement Policy, 2013	All the provision of this policy	Several Policy Provision including 2(ii) and Provision 4 (v), (vii)	<p>The Chaur Diara Settlement Policy, 2013 represents the latest thinking on formalization of state’s policy for temporary settlement of public lands on the payment of revenue for short and fixed duration of five years. The Policy does not provide for the survey and the determination of rent for Diara lands settled in favour of marginalized groups in Bihar. The Policy provides that the land coming of the rivers that are arable will be redistributed for the purposes of agriculture by self-cultivation. The land is to be redistributed to the weaker sections of the society such as Mahadalits, Scheduled Castes and Scheduled Tribes, Other Backward Classes and the family of soldiers.</p> <p>As per the Policy, the land settled in favour of above-mentioned categories of beneficiaries is nontransferable but can devolve hereditarily during the period of settlement. In case the settled land gets submerged within a period of settlement (5 years in general), the settlement shall automatically stand cancelled and no claim can be made against the government.</p> <p>Notably, the Policy’s five-year period of resettlement runs contrary to the annual survey and assessment provisions provided in the Khas Mahal Manual, 1953 and the occupancy rights under the Bihar Tenancy Act,</p>

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				1885 as it necessitates land holding for twelve consecutive years for the occupancy rights.
19.	Maun/Chuar Development Schemes 2013-14			<p>The Bihar Government has also launched schemes for the development of Maun, Chaur and Diara areas for increasing the productivity in these areas. The schemes target increasing land productivity upto 200kg/ha/year and development of capture fisheries by supplying improved fingerlings at subsidized rate. These schemes indicate the organized interventions within the rivers at farms and fisheries with no mention of their impacts on river regimes.</p> <p>Similarly, another scheme called Mukhya Mantri Samekit Chaur Vikas Yojna, 2023 has been launched for the development of fisheries in Chaur</p> <p>(https://pmmodiyojana.in/mukhyamantri-samekit-chaur-vikas-yojana/)</p>
20.	The Bihar Tenancy Act, 1885	Same as described under Jharkhand		
21.	The Bengal Alluvion and Diluvian Regulation, 1825 (Regulation 2 of 1825) and	All the provisions		A series of Regulations on Alluvion and Diluvian claims were issued before a provincial legislation came into being in 1847. The Regulation 2 gives guidance on the issue of state claim and jurisdiction over the river estates. The Regulation provides that the ‘Claims and disputes as to alluvial lands to be decided by usage when clearly recognized and established’, the main channel of the river dividing the estates shall be the constant boundary between them, whatever changes

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	(Bengal Regulation No. 11 of 1825)			<p>may take place in the course of the river, by encroachment on one side the accession on the other) the usage shall govern the decision of all claims and disputes relative to alluvial land between the parties whose estates may be liable to such usage.</p> <p>Regulation 4 talks about ‘When land may be gained by gradual accession, [whether] from the recess of a river [or of the sea]’, it shall be considered an increment to the tenure of the person to whose land or estate is thus annexed, whether such land or estate be held immediately from [Government] by a zamindar or other superior landholder, or as a subordinate tenure by any description of under-tenure whatever.</p> <p>However, the increment of land thus obtained shall not entitle the person in possession of the estate or tenure to which the land may be annexed to a right of property or permanent interest therein beyond that possessed by him in the estate or tenure to which the land may be annexed, and shall not in any case be understood to exempt the holder of it from the payment to the [Government] of any assessment for the public revenue to which it may be liable under [the provisions of Regulation II, 1819, or of any other Regulation in force.</p> <p>When a char or island may be thrown up in a large navigable river (the bed of which is not the property of</p>

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				<p>an individual) [or in the sea], and the channel of the river [or sea] between such island and the shore may not be fordable, it shall, according to established usage, be at the disposal of [Government].</p> <p>If the channel between such island and the shore be fordable at any season of the year, it shall be considered an accession to the land, tenure or tenures of the person or persons whose estate or estates may be most contiguous to it.</p> <p>Sand bank or char may be thrown up in small and shallow rivers, the right of the beds of which , lie with jalkar right of fishery, then the right of such thrown char and sand bank would also lie with the proprietor.</p> <p>In all cases of claims and disputes respecting land gained by alluvion, or by dereliction of river [or the sea], which are not specifically provided for by the rules contained in this Regulation, the Courts of Justice will then decide such claims and disputes by the best evidence they may be able to obtain or established local usage if there be any applicable to the case, or, if not, by general principles of equity and justice.</p> <p>Regulation 5 states that nothing in the ‘The Bengal Alluvion and Diluvion Regulation, 1825’ shall constitute encroachment neither it will prevent Government who may be duly empowered for that</p>

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				purpose, from removing obstacles which appear to interfere with the safe and customary navigation of such rivers, or which shall in any respects obstruct the passage of boats by tracking on the banks of such rivers, or otherwise.
22.	The Bengal Alluvion and Diluvian Act, 1847			The Act provides for the mapping and assessment of changes in the river estates due to alluvion and diluvian action. Section 5A. talks about ‘Assessment of land reformed on original site’. It states whenever any land which has been washed away from or lost to any estate paying revenue directly to Government re-appears above the water and reforms at the original site of such land, the proprietor of the estate from the sadar jama of which a deduction has been made under Section 5 on account of the land so washed away or lost, shall have the right to resume immediate possession of the land so reformed, subject to the payment of revenue in respect thereof, with effect from the date on which such revenue is assessed. Such revenue shall be assessed at the same rate as that obtaining for the sadar jama of the remainder of the estate on the date on which possession is so resumed, and shall bear to the sadar jama the same proportion as the area of the land so reformed bears to the areas of the remainder of the estate. This assessment with the reasons there of shall be forthwith reported by the local revenue-authorities for the information and orders of the Board of Revenue whose orders thereupon shall be final]. This provision was further explained in

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				functional terms under the Khas Mahal Manual, 1953 that provides the manner of assessment of such land by the Revenue Officer and Amin and the levying of revenue after such assessments.
23.	The Bengal Alluvial Land Settlement Act, 1858			This was enacted for the settlement of land gained by alluvion in the erstwhile Presidency of Fort William in Bengal.
(E)	WEST BENGAL			
24.	The Bengal Alluvion and Diluvion Regulation, 1825 (Bengal Regulation No. 11 of 1825)	Same as described under Bihar		
25.	The Bengal Alluvion and Diluvion Act, 1847	Same as described under Bihar		
26.	The Bengal Alluvial Land Settlement Act, 1858		N/A in India	This was enacted for the settlement of land gained by alluvion in the erstwhile Presidency of Fort William in Bengal.
27.	The West Bengal Land Reforms Act, 1955		i. "Land" means land of every description and includes tank, tank-fishery, fishery, homestead, or land used for the purpose of live-stock breeding, poultry farming, dairy or land comprised in tea garden, mill, factory, workshop, orchard, hat,	One of the important imports of this legislation on river estates is that if a Raiyat wishes to change the use of the land situated within a municipal corporation/municipality area and if the land involves a water body, the land use change of such a land is not permissible under the law. The specific provisions are as follows:

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			<p>buzar. Ferries, tolls or land having any other sairati interests, and any other land together with all interests and benefits arising out of land and things attached to the earth or permanently fastened to anything attached to earth.</p> <p>ii. “raiyat” means a person or an institution holding land for any purposes whatsoever.</p>	<p>i. Section 4B talks about ‘Maintenance and Preservation of Land’, and proviso of section 4(B) states that, provision of section 4(B) shall not apply to: ... <i>“the diminution in area or the change of character of any land or the conversion of any land for any purpose other than the purpose for which it was settled or previously held, in such diminution or change of character of any land or the conversion was made in accordance with the provisions of any law for the time being in force.”</i></p> <p>ii. Section 4 (c) talks about ‘Permission for change of area, character or use of land’. 4 (c) (1) states that A raiyat holding any land may apply to the Collector for Permission for change of area or character of such land or for conversion for any purpose other than the purpose for which it was settled or was being previously used or for alteration in the mode of use of such land. In 2000 amendment, Explanation to section 4C (1) was inserted which states: <i>“Explanation: -For the purposes of this sub-section, mode of use of land may be residential, commercial, industrial, agriculture excluding plantation of tea, pisciculture, forestry, sericulture, horticulture, public utilities or other use of land.”</i></p>

SR. NO.	ACT, POLICY, ORDER OR REGULATION	RELEVANT PROVISIONS	DETAILED PROVISION	KEY ELEMENTS OF THE ACT/POLICY/PLAN/LAW/ORDER
				<p>iii. Section 25 was amended in 2000, and it states that revenue payable by raiyat may be altered by revenue officer if the land held by raiyat and his family has increased or decreased in area by diluvian, amalgamation....</p> <p>iv. In 2010 amendment of in section 4(C), sub-clause (6) was inserted which states: ... <i>“Notwithstanding anything contained in the foregoing provisions of this section, where any plot of land not exceeding 0.03 acre situated in the areas falling within the local limits of any Municipal Corporation or Municipality, or any plot of land not exceeding 0.08 acre situated in the area not falling within the local limits of any Municipal Corporation or Municipality, other than any plot of land having water body of any description or size, has been changed, converted or altered in the area, character or mode of use of such plot of land in violation of the provision of sub-section (2) of section 4C and if the State Government, on the basis of any report of the Collector, is of the opinion that it is necessary to do so in the public interest, the State Government may, by order, authorise the Collector to regularise such change, conversion or alteration in the area, character or mode of use of the said plot of land, other than any plot of land having</i></p>

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				<p><i>water body of any description or size, [on payment of such fee depending on the different character or mode of use or size of the plot of land,] and in such manner, as may be prescribed.]”</i></p> <p>It means that any ‘plot of land’ having a ‘waterbody’ cannot be regularized</p>
28.	West Bengal Estates Acquisition Act, 1953		<p>i. “Agricultural land” means land ordinarily used for purposes of agriculture or horticulture and includes such land, notwithstanding that it may be lying fallow for the time being.</p> <p>ii. “Estate” or “tenure” includes part of an estate or part of a tenure;</p> <p>iii. “Non-agricultural land” means land other than agricultural land [or other than land comprised in a forest];</p> <p>iv. “homestead” means a dwelling house together with—any courtyard, compound, garden, out-house, place of worship, family grave-yard, library, office, guest-house, tanks, wells, privies, latrines, drains and boundary walls annexed to or appertaining to such dwelling house</p>	<p>This legislation allows the state government to acquire a privately held estate by way of Notification that provides for the assessment of compensation for such purpose.</p> <p>i. Section 5(aa), talks about ‘effect of notification of vesting of estate in State’. It states that all lands in any estate comprised in a forest together with all rights to the trees therein or to the produce thereof and held by an intermediary or any other person shall vest in the State.</p> <p>ii. Section 6 talks about Right of intermediary to retain certain lands, such as:</p> <ul style="list-style-type: none"> • an intermediary can hold agricultural land in his Khas possession, not exceeding twenty-five acres in area, as may be chosen by him: Provided that in such portions of the district of Darjeeling as may be declared by notification by the State Government to be hilly portions, an

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				<p>intermediary shall be entitled to retain all agricultural land in his Khas possession, or any part thereof as may be chosen by him</p> <ul style="list-style-type: none"> • Tank fishery' means a reservoir or place for the storage of water, whether formed naturally or by excavation or by construction of embankments, which is being used for pisciculture or for fishing, together with the sub-soil and the banks of such reservoir or place, except such portion of the banks as are included in a homestead or in a garden or orchard and includes any right of pisciculture or fishing in such reservoir or place • where the intermediary is a corporation or an institution established exclusively for a religious or a charitable purpose or both, or is a person holding under a trust or an endowment or other legal obligation exclusively for a purpose which is charitable or religious or both—land held in <i>Khas</i> by such corporation or institution, or person, for such purpose [including land held by any person, not being a tenant, by leave or license of such Corporation or institution or person • so much of requisitioned land as the intermediary would be entitled to retain after taking into consideration any other

SR. NO.	ACT, POLICY, ORDER OR REGULATION	RELEVANT PROVISIONS	DETAILED PROVISION	KEY ELEMENTS OF THE ACT/POLICY/PLAN/LAW/ORDER
				<p>land which he may have retained under the other clauses;</p> <ul style="list-style-type: none"> • Explanation.—‘Requisitioned land’ means any land which was in the Khas possession of the intermediary and which was requisitioned by Government under the provisions of any law for the time being in force or was occupied by Government in pursuance of rule 49 of the Defence of India Rules and continued to be subject to requisition or occupation on the date mentioned in the notification issued under section 4; • so much of land in the unauthorised occupation of refugees from East Bengal immediately before the date of vesting as an intermediary would be entitled to retain after taking into consideration any other land which he may have retained under the other clauses; • <i>Explanation.</i> —‘Refugees from East Bengal’ includes those who are displaced persons within the meaning of the Rehabilitation of Displaced Persons and Eviction of Persons in Unauthorised Occupation of Land Act, 1951 (West Bengal Act No. 16 of 1951) • <i>Exception.</i> — [Subject to the provisions contained in sub-section (3), nothing in this

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				<p>sub-section] shall entitle an intermediary [or any other person] to retain any land comprised in a forest [or any land comprised in any embankment as defined in the Bengal Embankment Act, 1882 (Bengal Act No. 2 of 1882), the proper maintenance of which should, in the opinion of the State Government, be taken over by the State Government in the public interest]</p> <p>It can be concluded that exception to (3) allows forest land to be utilized for tea-garden after State Government's approval. However, it can be interpreted that <i>“any land comprised in any embankment as defined in the Bengal Embankment Act, 1882 (Bengal Act No. 2 of 1882), the proper maintenance of which should, in the opinion of the State Government, be taken over by the State Government in the public interest”</i> is still not permissible via any exception to exception.</p> <p>Section 6(4) states that in the case of lands comprised in a forest [or in any embankment, referred in the Exception to sub-section (1)] and held by a person other than an intermediary which vest in the State, such person shall, for the purpose of assessment of compensation, be deemed to be an intermediary.</p>

11.23 Areas of Focus (Natural Resource & Livelihoods) :

- ❖ **Vegetation & Biodiversity:** Most of the non-urban islands which have their native biodiversity intact will be protected in the same form and expansion of cultivated zones will not be further permitted in order to maintain their biodiversity habitat and other ecosystem services. In larger islands with human settlements, identification of barren lands is to be done for carrying out afforestation activities so as to prevent erosion and enhance carbon sequestration along with biodiversity benefits.
- ❖ **Island Agriculture :** Permaculture practices are to be promoted on cultivated areas of the river islands so as to eliminate chemical inputs and promote agro-ecology.
- ❖ **Livelihood Activities on the Island :** All river islands will be inventoried and mapped. Further clearance of lands for cultivation is to be prohibited. Regulations are to be formulated with respect to bioresource collection such as wood, grasses and wild fruits from the islands.

11.24 Key risks and Mitigation strategies :

- **Island erosion** – Erosion of riverine islands is a major issue as observed on Raghapur *Diara* along with other islands. The most environment-friendly approach to this challenge is stabilizing the island banks with riparian grass, especially *Saccharum* sps. and other native riparian vegetation. Not only do these provide long-term bank stability but also support native biodiversity and enhance climate resilience.
- **Criminal activities on riverine islands** – Due to their separation from the mainland, several islands especially in parts of Bihar and Jharkhand are known to be hubs of criminal activities which often are difficult to tackle owing to

accessibility and jurisdiction issues. In order to deal with this situation, it is imperative to develop the concept of 'River Police' that can be equipped with ways and means of dealing with such situations and having their authority over the entire river stretch including the islands.

11.25 **Monitoring and Implementation :** National Mission for Clean Ganga (NMCG) can be the nodal body for developing and implementing riverine island policy. Any activity concerning the riverine islands and sandbars would need prior approval from them. The State Ganga Committees in conjunction with the concerned District Administration can effectively monitor the implementation of guidelines from time to time and apprise about the same to NMCG.

CHAPTER 12 – HIGH LEVEL MONITORING FRAMEWORK

12.1 A typical monitoring framework consists of **inputs, outputs, outcomes and impacts connected with each other through a logical causal chain**. Each of these stages ought to be measurable in defined parameters, sometimes quantitatively and often qualitatively. Converting this position paper into a policy and thereafter assessing the policy implementation would require a monitoring framework. In the following sections, a monitoring framework is laid out to provide the **milestones and/or performance indicators** of the progress of this position paper. A time schedule for the same is, however, not outlined. The work would have to be driven by the Union Govt. ministries, MoJS and MoEF&CC, preferably the former.

FROM POSITION PAPER TO POLICY

12.2 This position paper provides the **inputs** for policy formulation. The **sequential steps** by which this position paper is converted into a policy [**outcome**] are envisaged as follows :

- i. Position paper is discussed by various official stakeholders individually at State levels
 - **Output** : Revised draft of a single state-level Act which replaces earlier legislation/regulations with the objective of conserving islands in natural or [in case of occupied islands] to near natural conditions
 - **Risk** : States may have other priorities and it would be for the Central agency to overcome state inertia in a time-bound manner
- ii. MoEF&CC, MoJS and Ministry of Shipping & Transport to discuss and align or iron out grey areas and potential conflicting positions amongst their various Acts/Notifications in alignment with the pointers in this position paper
 - **Output** : MoEF&CC, MoJS and the Ministry of Shipping & Transport resolve areas of ambiguity and potential conflict among their various Acts/Notifications

- **Risk** : Navigation routes in contentious zones need to be resolved by the 3 Ministries
- iii. Central Ministries/Agencies and State representatives discuss the alignment of their revised drafts to align or iron out grey areas
- **Output** : Central and State positions come into concord
 - **Risk** : The freezing of expansion of cultivation on uncultivated islands may be a sticking point from the State’s perspective as they are under pressure from landless farmers and the real estate constituency.
- iv. Central Ministries to enact amendments to their existing Acts/Notifications in accordance with discussions
- **Output** : Amended Central Notifications
 - **Risk** : Ganga Notification can easily be amended by MoJS to reflect ‘islands’ explicitly
- v. States to enact revised legislation/regulation in accordance with the discussions
- **Output** : Revised legislation/Regulations at the state level
 - **Risk** : If legislation is required this would run the risk of rejection or watering down in Assemblies
- vi. Island Policy to be notified by Central Govt as an amendment to the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016
- **Output** : Island Policy to become binding on all stakeholders
 - **Risk** : Whether district administrations will have the resources and time to deal with this additional responsibility and whether the central implementing agency [preferably NMCG] will devote resources to monitor the implementation

12.3 The **outcome** of the above exercise would be the formation and notification of a robust legal framework governing river islands in the Ganga River basin.

12.4 The **impact** of the policy, if robustly implemented, would be observed in the :

- a) Prevention of further built colonization on islands
- b) No further expansion of cultivated area on the islands
- c) Increase in wildscape, riparian grass habitats and woodlands with concomitant increase in faunal populations
- d) Regulated urban development and freeze in the development of urbanizing islands
- e) Islands in urban stretches will be developed in compliance with river-friendly formulations in the policy

FROM POLICY TO IMPLEMENTATION

12.5 Once the formal policy, i.e. the **input** at this stage, is in place its actual implementation can commence. The following outputs are expected :

- i. District administrations, Forest Departments, Tourism Departments, and Town Planning Departments are sensitized to their respective State level revised Acts/Regulations and are directed to carry out ground-level surveys annually to ensure policy recommendations are being implemented
 - **Output** : Landuse control will be effected on all islands, sand mining will be restricted to sandbars, building activity will be checked, bridge connectivity to islands will be further curtailed, biodiversity inventory of islands will be carried out, cultivation expansion will be restrained, organic/permaculture agriculture will be promoted where cultivation allowed, rewilding of islands promoted where tenures lapse, eco-tourism codes dutifully enforced, jurisdictional issues resolved, policing extended to islands
 - **Risk** : Often the right noises are made at the top level of the official hierarchy but additional responsibility without commensurate increment in resources leads to indifference to the new responsibility. Also, junior officials and field-level staff who have been able to exploit the grey areas and lack of monitoring may adhere to the old ways
- ii. The basin manager i.e. NMCG would direct the SMCGs to file annual district-wise reports on the implementation measures as well as the status of the islands. A remote sensing LULC [landuse/landcover] exercise carried out post-monsoon should be

carried out by NMCG annually to compare changes from year to year. Ganga Mitras/District Ganga Committees may carry out field checks from time to time

- **Output** : This would ensure that islands do not change landuse, except where permitted in the urban stretch compliant with policy regulations. It would also ensure that the district administrations are faithfully implementing landuse aspect of the policy
- **Risk** : No serious risk is seen in this particular monitoring effort. Any change, if noted, would be immediately informed to the responsible agency and SMCG

iii. Resolution of navigational issues : from time to time IWAI may require changes in channels which may affect the horizontal profile of the islands. The IWAI proposals would have to be vetted by the various stakeholders [including tenure holders] to find a mutually acceptable solution

- **Output** : All agencies and affected individuals would seek mutual accommodation consistent with extant laws and island policy
- **Risk** : Where wildlife sanctuary exists or is notified in the future changes to islands may be difficult

iii. Nomenclature of Islands : By naming the islands they would become cognizable land entities in the public and administrative mind space. This exercise may be carried out and further maps of the rivers may reflect these nomenclatures

- **Output** : Islands to acquire a systematic nomenclature which is reflected on district maps and river maps
- **Risk** : No significant risk anticipated

12.6 Outcome : The outcome of the stated outputs should be the implementation of policy on the ground and thus maintaining the ecological and morphological integrity of the river system, landuse compatible with the river, safeguarding river islands from undesirable use, promoting riverine biodiversity, enabling eco-tourism and extension and integration of urban river fronts and city dwellers with the river in a meaningful bond.

12.7 Impact : A significant contribution to maintaining the river as a natural entity.

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ANNEXURE I : LIST OF RIVERINE ISLANDS & SANDBARS IN GANGA RIVER

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1	30.093981	78.299825	Uttarakhand	Garhwal	Barren Land/ Sand Bar	0.000007660
2	30.094028	78.300140	Uttarakhand	Garhwal	Barren Land/ Sand Bar	0.000013400
3	30.094022	78.299966	Uttarakhand	Garhwal	Barren Land/ Sand Bar	0.002566786
4	30.096854	78.300526	Uttarakhand	Dehradun/G arhwal/Teh ri Garhwal	Vegetation/For est	17.43887430 0
5	30.102556	78.297900	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.000588275
6	30.102621	78.299789	Uttarakhand	Dehradun/T ehri Garhwal	Barren Land/ Sand Bar	1.571103676
7	30.096531	78.295599	Uttarakhand	Dehradun/ Garhwal	Vegetation/For est	69.61741759 0
8	29.986504	78.216341	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.297152616
9	29.986826	78.216527	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.000280295
10	29.986817	78.216559	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.001912015
11	29.986845	78.216618	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.000526206
12	30.021392	78.237647	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.000004740
13	30.021474	78.238190	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.000026200
14	30.020904	78.237511	Uttarakhand	Dehradun	Vegetation/For est	0.506886544

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
15	29.974262	78.189786	Uttarakhand	Dehradun/Haridwar	Barren Land/Sand Bar	6.336081925
16	29.973413	78.192427	Uttarakhand	Dehradun	Barren Land/Sand Bar	1.709877090
17	29.973264	78.194290	Uttarakhand	Dehradun	Barren Land/Sand Bar	1.810532974
18	29.977431	78.190027	Uttarakhand	Haridwar	Barren Land/Sand Bar	2.003993604
19	29.982195	78.196162	Uttarakhand	Dehradun/Haridwar	Barren Land/Sand Bar	2.177762869
20	29.981295	78.195698	Uttarakhand	Dehradun	Barren Land/Sand Bar	0.004641844
21	30.058683	78.280910	Uttarakhand	Dehradun/Garhwal	Barren Land/Sand Bar	35.557869530
22	30.069420	78.285642	Uttarakhand	Dehradun	Barren Land/Sand Bar	5.567172015
23	30.072056	78.286052	Uttarakhand	Dehradun	Barren Land/Sand Bar	0.978735264
24	30.072830	78.287466	Uttarakhand	Dehradun	Barren Land/Sand Bar	0.494184994
25	30.070739	78.287434	Uttarakhand	Dehradun	Barren Land/Sand Bar	0.140398126
26	30.050369	78.273066	Uttarakhand	Garhwal	Barren Land/Sand Bar	10.662068030
27	30.043463	78.272399	Uttarakhand	Garhwal	Barren Land/Sand Bar	38.006258420
28	30.039337	78.271776	Uttarakhand	Garhwal	Barren Land/Sand Bar	0.148312059
29	29.975357	78.195198	Uttarakhand	Dehradun	Barren Land/Sand Bar	0.002011935
30	29.980855	78.201755	Uttarakhand	Dehradun/Haridwar	Vegetation/Forest	89.041945890

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
31	29.979478	78.193071	Uttarakhand	Dehradun/H aridwar	Barren Land/ Sand Bar	4.793423830
32	29.975205	78.194976	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.003367836
33	29.976515	78.198591	Uttarakhand	Dehradun	Vegetation/For est	4.480868815
34	29.976470	78.200847	Uttarakhand	Dehradun	Barren Land/ Sand Bar	1.133895349
35	29.987033	78.206960	Uttarakhand	Dehradun	Barren Land/ Sand Bar	3.357768158
36	29.991131	78.202418	Uttarakhand	Dehradun	Vegetation/For est	0.810532527
37	29.990251	78.201005	Uttarakhand	Dehradun	Vegetation/For est	4.156329896
38	29.988366	78.200010	Uttarakhand	Dehradun	Vegetation/For est	6.375804169
39	29.989535	78.220929	Uttarakhand	Dehradun	Barren Land/ Sand Bar	2.257387642
40	29.988949	78.220788	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.033221945
41	29.988679	78.220480	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.146191772
42	29.986277	78.220422	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.000000467
43	29.986410	78.220578	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.000002100
44	29.986381	78.220565	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.000013900
45	29.986395	78.220573	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.000044900
46	29.986461	78.220481	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.032402591
47	29.986764	78.220825	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.173200476

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	
48	29.992741	78.227652	Uttarakhand	Dehradun	Barren Land/ Sand Bar	1.413588512
49	29.989870	78.224311	Uttarakhand	Dehradun	Vegetation/For est	13.63989814 0
50	29.987293	78.221699	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.310188231
51	29.987186	78.223136	Uttarakhand	Dehradun	Barren Land/ Sand Bar	2.677948997
52	29.984443	78.217018	Uttarakhand	Dehradun/G arhwal	Barren Land/ Sand Bar	6.000593026
53	29.983837	78.223026	Uttarakhand	Dehradun/G arhwal	Barren Land/ Sand Bar	4.685821048
54	29.982601	78.221430	Uttarakhand	Garhwal	Barren Land/ Sand Bar	0.000075100
55	29.982700	78.220646	Uttarakhand	Garhwal	Barren Land/ Sand Bar	0.124110507
56	29.982565	78.220420	Uttarakhand	Garhwal	Barren Land/ Sand Bar	0.400274828
57	29.991687	78.227699	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.000117519
58	29.990850	78.226891	Uttarakhand	Dehradun	Barren Land/ Sand Bar	1.438559961
59	29.988320	78.226307	Uttarakhand	Dehradun/G arhwal	Barren Land/ Sand Bar	36.32955942 0
60	29.984885	78.218997	Uttarakhand	Dehradun	Barren Land/ Sand Bar	0.081438609
61	30.027999	78.251565	Uttarakhand	Dehradun/G arhwal	Barren Land/ Sand Bar	86.23980646 0
62	30.005671	78.223877	Uttarakhand	Dehradun/G arhwal/Hari dwar	Vegetation/For est	573.1192043 00

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
63	29.996957	78.238146	Uttarakhand	Dehradun/Garhwal	Barren Land/Sand Bar	6.993176709
64	30.004886	78.241601	Uttarakhand	Garhwal	Barren Land/Sand Bar	66.625979370
65	29.987059	78.219613	Uttarakhand	Dehradun	Barren Land/Sand Bar	5.596671748
66	30.020013	78.245385	Uttarakhand	Dehradun	Barren Land/Sand Bar	0.051207914
67	30.019341	78.245968	Uttarakhand	Dehradun/Garhwal	Barren Land/Sand Bar	0.786261181
68	30.017580	78.246467	Uttarakhand	Garhwal	Barren Land/Sand Bar	6.286400885
69	30.019660	78.247990	Uttarakhand	Garhwal	Barren Land/Sand Bar	0.392322313
70	30.026060	78.252925	Uttarakhand	Garhwal	Barren Land/Sand Bar	10.535008160
71	30.034861	78.269302	Uttarakhand	Garhwal	Barren Land/Sand Bar	21.506590890
72	29.963746	78.185957	Uttarakhand	Dehradun/Haridwar	Vegetation/Forest	5.436348799
73	29.960514	78.185030	Uttarakhand	Haridwar	Barren Land/Sand Bar	2.502565357
74	29.960090	78.185678	Uttarakhand	Haridwar	Barren Land/Sand Bar	0.666253236
75	29.962490	78.187030	Uttarakhand	Dehradun	Barren Land/Sand Bar	0.145307807
76	30.049349	78.263916	Uttarakhand	Dehradun	Vegetation/Forest	3.268376842
77	30.042905	78.255413	Uttarakhand	Dehradun/Garhwal	Vegetation/Forest	34.597687000
78	30.044532	78.263544	Uttarakhand	Dehradun/Garhwal	Vegetation/Forest	219.457950900
79	29.951534	78.177557	Uttarakhand	Haridwar	Barren Land/	22.86382058

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	0
80	29.942387	78.162856	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.789436775
81	29.941086	78.163761	Uttarakhand	Haridwar	Barren Land/ Sand Bar	8.413855736
82	29.921492	78.164673	Uttarakhand	Haridwar	Barren Land/ Sand Bar	19.18817822 0
83	29.904688	78.163568	Uttarakhand	Haridwar	Barren Land/ Sand Bar	6.137490259
84	29.901143	78.165366	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.972537754
85	29.896069	78.165649	Uttarakhand	Haridwar	Barren Land/ Sand Bar	13.39914418 0
86	29.893093	78.165434	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.394279798
87	29.892448	78.168440	Uttarakhand	Haridwar	Barren Land/ Sand Bar	15.74360504 0
88	29.891542	78.165983	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.909082431
89	29.886209	78.168872	Uttarakhand	Haridwar	Barren Land/ Sand Bar	12.11115976 0
90	29.884314	78.171826	Uttarakhand	Haridwar	Barren Land/ Sand Bar	9.959613688
91	29.885538	78.173174	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.247907232
92	29.887867	78.172195	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.261426420
93	29.861908	78.168136	Uttarakhand	Haridwar	Barren Land/ Sand Bar	32.47573045 0
94	29.861973	78.168408	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.116853538
95	29.860807	78.169732	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.917649176

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
96	29.859146	78.171443	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.144405081
97	29.859715	78.171783	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.403987063
98	29.853702	78.170484	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.462787776
99	29.858632	78.166472	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.683224408
100	29.860638	78.164987	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.669318358
101	29.847513	78.173288	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.952214192
102	29.846348	78.175294	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.320185015
103	29.845571	78.175324	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.363800169
104	29.845364	78.174448	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.414136295
105	29.848564	78.173585	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.628344410
106	29.844348	78.171752	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.271766908
107	29.842368	78.173792	Uttarakhand	Haridwar	Barren Land/ Sand Bar	12.34942333 0
108	29.841724	78.171102	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.631497936
109	29.839220	78.171529	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.175014331
110	29.844816	78.175439	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.281863160
111	29.869029	78.158840	Uttarakhand	Haridwar	Vegetation/For est	1220.356969 000
112	29.861563	78.171438	Uttarakhand	Haridwar	Barren Land/	0.752297009

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	
113	29.864543	78.167088	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.338061097
114	29.863224	78.168951	Uttarakhand	Haridwar	Barren Land/ Sand Bar	4.248374803
115	29.864103	78.169573	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.129658019
116	29.865945	78.168783	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.000337447
117	29.865181	78.168765	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.587305222
118	29.863402	78.170249	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.000333460
119	29.865805	78.169847	Uttarakhand	Haridwar	Barren Land/ Sand Bar	4.934600874
120	29.872424	78.145980	Uttarakhand	Haridwar	Barren Land/ Sand Bar	12.97009467 0
121	29.864915	78.145362	Uttarakhand	Haridwar	Barren Land/ Sand Bar	14.62267867 0
122	29.868239	78.147140	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.813998075
123	29.870596	78.148633	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.135847605
124	29.865620	78.143926	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.292240493
125	29.864242	78.143721	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.000047000
126	29.864249	78.143561	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.000164212
127	29.864259	78.143621	Uttarakhand	Haridwar	Agriculture	0.005299893
128	29.864193	78.143549	Uttarakhand	Haridwar	Agriculture	0.091032829
129	29.864270	78.143738	Uttarakhand	Haridwar	Barren Land/	0.093979885

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	
130	29.863729	78.143623	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.062544420
131	29.863676	78.144008	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.134986450
132	29.859377	78.146668	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.339476466
133	29.859121	78.147620	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.326272276
134	29.853660	78.156368	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.480454731
135	29.850147	78.157247	Uttarakhand	Haridwar	Vegetation/For est	6.814246213
136	29.850366	78.155151	Uttarakhand	Haridwar	Vegetation/For est	5.992023073
137	29.846661	78.156166	Uttarakhand	Haridwar	Vegetation/For est	2.609774179
138	29.847243	78.157643	Uttarakhand	Haridwar	Vegetation/For est	1.106463921
139	29.846090	78.157342	Uttarakhand	Haridwar	Vegetation/For est	0.377483318
140	29.845526	78.157218	Uttarakhand	Haridwar	Vegetation/For est	0.318793472
141	29.845084	78.157280	Uttarakhand	Haridwar	Vegetation/For est	0.187366728
142	29.845167	78.156932	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.026564504
143	29.844529	78.156902	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.000129517
144	29.844701	78.157277	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.237571701
145	29.844351	78.156834	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.133622889

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
146	29.844016	78.156894	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.050065357
147	29.843525	78.157006	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.432395801
148	29.842503	78.156858	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.126462424
149	29.842128	78.157884	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.380861748
150	29.842826	78.158570	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.167640429
151	29.842352	78.158604	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.014011467
152	29.844560	78.158237	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.039742972
153	29.844213	78.158262	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.011570454
154	29.844040	78.158322	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.018027600
155	29.843635	78.157851	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.017129524
156	29.845560	78.158642	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.278624715
157	29.843416	78.159078	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.477862809
158	29.840372	78.157165	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.323513617
159	29.830524	78.170863	Uttarakhand	Haridwar	Barren Land/ Sand Bar	38.04664966 0
160	29.821746	78.169803	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.066138340
161	29.822201	78.169436	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.964974310
162	29.825060	78.170920	Uttarakhand	Haridwar	Barren Land/	8.711309399

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	
163	29.836882	78.174416	Uttarakhand	Haridwar	Barren Land/ Sand Bar	8.808851134
164	29.836515	78.172448	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.119105819
165	29.837639	78.172379	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.181260162
166	29.835582	78.173673	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.100683341
167	29.835097	78.174189	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.594868883
168	29.835077	78.175150	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.361212247
169	29.834709	78.175983	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.026677731
170	29.833925	78.175169	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.202830939
171	29.833349	78.174044	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.455216833
172	29.833778	78.174338	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.169204309
173	29.833112	78.174540	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.218169038
174	29.832676	78.174147	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.012300316
175	29.832582	78.173732	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.066003982
176	29.833991	78.168329	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.411185773
177	29.822600	78.171928	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.810762595
178	29.820801	78.171191	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.945157850

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
179	29.819534	78.171342	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.475011002
180	29.817180	78.173313	Uttarakhand	Haridwar	Barren Land/ Sand Bar	13.62818578 0
181	29.817830	78.168225	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.528958011
182	29.815316	78.170260	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.440186432
183	29.816920	78.169855	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.781400065
184	29.811322	78.170617	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.560952899
185	29.806529	78.174389	Uttarakhand	Haridwar	Vegetation/For est	13.25678707 0
186	29.807820	78.170364	Uttarakhand	Haridwar	Barren Land/ Sand Bar	5.192323936
187	29.803240	78.168567	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.654723351
188	29.801516	78.168339	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.141317152
189	29.800942	78.168291	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.022342714
190	29.801195	78.169997	Uttarakhand	Haridwar	Barren Land/ Sand Bar	7.134408673
191	29.799078	78.170864	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.141222302
192	29.798647	78.170663	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.052637064
193	29.798526	78.171065	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.145313147
194	29.797802	78.170304	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.117023745
195	29.797759	78.171277	Uttarakhand	Haridwar	Barren Land/	1.116359896

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	
196	29.797750	78.171794	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.042196770
197	29.797398	78.171817	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.075849785
198	29.807741	78.171180	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.061627101
199	29.805121	78.170728	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.476287302
200	29.805370	78.171319	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.455693801
201	29.806811	78.171132	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.207524250
202	29.806252	78.172254	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.968332126
203	29.805022	78.173830	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.274920662
204	29.805645	78.173943	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.088140962
205	29.805531	78.173230	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.078270170
206	29.798956	78.174285	Uttarakhand	Haridwar	Barren Land/ Sand Bar	41.05755483 0
207	29.802032	78.175180	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.710416872
208	29.796530	78.179181	Uttarakhand	Haridwar	Vegetation/For est	60.51511615 0
209	29.808105	78.178971	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.376315624
210	29.808548	78.179807	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.455733440
211	29.807752	78.176792	Uttarakhand	Haridwar	Vegetation/For est	20.89928439 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
212	29.806112	78.179800	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.278283030
213	29.806100	78.181653	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.375519086
214	29.805500	78.181279	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.616534409
215	29.802853	78.180337	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.773932473
216	29.813242	78.174831	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.297296928
217	29.812552	78.175413	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.190042366
218	29.818856	78.178292	Uttarakhand	Haridwar	Vegetation/For est	108.8663157 00
219	29.813592	78.181335	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.996958618
220	29.791757	78.183251	Uttarakhand	Haridwar	Barren Land/ Sand Bar	63.30475552 0
221	29.796082	78.185987	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.101732812
222	29.792860	78.186622	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.513798912
223	29.794501	78.185418	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.067297668
224	29.794152	78.187174	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.180421317
225	29.794041	78.185986	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.073401286
226	29.792390	78.174620	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.989439926
227	29.794210	78.173349	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.130368370
228	29.765900	78.200129	Uttarakhand	Haridwar	Barren Land/	4.790684655

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	
229	29.767903	78.197873	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.011455139
230	29.772936	78.193634	Uttarakhand	Haridwar	Barren Land/ Sand Bar	63.17515192 0
231	29.777587	78.192368	Uttarakhand	Haridwar	Vegetation/For est	29.12618561 0
232	29.776940	78.190364	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.718451276
233	29.772610	78.196756	Uttarakhand	Haridwar	Barren Land/ Sand Bar	5.597267406
234	29.776584	78.196061	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.484108127
235	29.775585	78.196500	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.341107111
236	29.776549	78.196681	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.131597810
237	29.774713	78.197546	Uttarakhand	Haridwar	Vegetation/For est	0.491540003
238	29.774467	78.197335	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.236300729
239	29.772310	78.198619	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.016179090
240	29.772094	78.199087	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.088198106
241	29.771442	78.199181	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.126559994
242	29.771183	78.199061	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.241902936
243	29.770648	78.199838	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.183098590
244	29.770666	78.199004	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.261348304

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
245	29.771007	78.199875	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.030736073
246	29.771243	78.199570	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.003998852
247	29.773410	78.186773	Uttarakhand	Haridwar	Barren Land/ Sand Bar	9.600418387
248	29.772716	78.183645	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.309135341
249	29.771366	78.182592	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.448794393
250	29.769568	78.186415	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.001287196
251	29.769549	78.187097	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.935014797
252	29.769703	78.186612	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.003493849
253	29.769918	78.186757	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.007110221
254	29.769500	78.186210	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.134888725
255	29.770936	78.185217	Uttarakhand	Haridwar	Barren Land/ Sand Bar	6.460587811
256	29.768726	78.188003	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.000173503
257	29.768426	78.188148	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.074286697
258	29.769012	78.188641	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.179795378
259	29.767673	78.189484	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.107602568
260	29.752249	78.201805	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.000602430
261	29.761918	78.196532	Uttarakhand	Haridwar	Barren Land/ Sand Bar	78.78359272

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	0
262	29.760192	78.204228	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.510923176
263	29.758557	78.203517	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.330956097
264	29.756762	78.203252	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.548154143
265	29.756316	78.204573	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.477089097
266	29.710321	78.181485	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.949072759
267	29.710730	78.181210	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.768716129
268	29.713018	78.181273	Uttarakhand	Haridwar	Barren Land/ Sand Bar	16.95713747 0
269	29.719437	78.185370	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.511645808
270	29.720764	78.184816	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.618656906
271	29.692629	78.167653	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.498222171
272	29.691172	78.167269	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.040442636
273	29.690375	78.166789	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.427248204
274	29.690625	78.166944	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.198405848
275	29.690408	78.165709	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.046768605
276	29.695525	78.169961	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.430759040
277	29.695902	78.168992	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.821161505

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
278	29.694659	78.167926	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.529537779
279	29.696684	78.170794	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.517428677
280	29.698331	78.167988	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.227957633
281	29.697239	78.166173	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.426771672
282	29.700677	78.174287	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.002247873
283	29.701032	78.174019	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.649609655
284	29.698570	78.172770	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.418699987
285	29.731905	78.191380	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.465235922
286	29.736800	78.193050	Uttarakhand	Haridwar	Barren Land/ Sand Bar	11.66011397 0
287	29.738643	78.192247	Uttarakhand	Haridwar	Barren Land/ Sand Bar	4.390020829
288	29.740125	78.195247	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.896206232
289	29.743379	78.198037	Uttarakhand	Haridwar	Barren Land/ Sand Bar	29.26849307 0
290	29.737848	78.196999	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.882949901
291	29.746241	78.203607	Uttarakhand	Haridwar	Barren Land/ Sand Bar	77.42365514 0
292	29.749423	78.208510	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.586511578
293	29.748155	78.210402	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.000682649
294	29.747294	78.210011	Uttarakhand	Haridwar	Barren Land/	0.395236360

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	
295	29.747502	78.209455	Uttarakhand	Haridwar	Barren Land/ Sand Bar	4.255294599
296	29.747364	78.208781	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.365765690
297	29.747937	78.208735	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.072018165
298	29.745069	78.206657	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.286544405
299	29.745275	78.207357	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.097755109
300	29.743592	78.206993	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.266991988
301	29.743655	78.208567	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.506926520
302	29.745000	78.209589	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.547031131
303	29.749359	78.199069	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.364329557
304	29.750407	78.200763	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.183224394
305	29.749393	78.201524	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.170585109
306	29.750135	78.199562	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.018205380
307	29.750508	78.199785	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.048500486
308	29.747053	78.200595	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.592345104
309	29.747140	78.201033	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.052488542
310	29.743029	78.195454	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.254933638

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
311	29.741366	78.193423	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.951664170
312	29.745218	78.195687	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.349733451
313	29.741487	78.195756	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.087050983
314	29.762630	78.192346	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.904470198
315	29.766652	78.187469	Uttarakhand	Haridwar	Barren Land/ Sand Bar	4.974687984
316	29.888269	78.147010	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.573423188
317	29.664026	78.146613	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.120861935
318	29.662273	78.145820	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.177808881
319	29.659985	78.145730	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.724851832
320	29.658356	78.146039	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.748753255
321	29.657423	78.145739	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.092593346
322	29.656441	78.145403	Uttar Pradesh	Bijnor/Hari dwar	Barren Land/ Sand Bar	0.646047392
323	29.655312	78.145083	Uttar Pradesh	Bijnor/Hari dwar	Barren Land/ Sand Bar	0.230654707
324	29.652644	78.144052	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.258410892
325	29.653699	78.142194	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.125961250
326	29.650204	78.138197	Uttar Pradesh	Bijnor	Vegetation/For est	0.022828409
327	29.646785	78.139321	Uttar	Bijnor	Barren Land/	9.449799387

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
328	29.650362	78.143263	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.827385626
329	29.648800	78.143253	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.478025357
330	29.648783	78.144598	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.899511213
331	29.643748	78.137242	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.546662850
332	29.645070	78.129928	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	16.83876705 0
333	29.641673	78.109960	Uttar Pradesh, Uttarakhand	Bijnor/Hari dwar	Barren Land/ Sand Bar	24.05328470 0
334	29.641399	78.106556	Uttar Pradesh, Uttarakhand	Bijnor/Hari dwar	Barren Land/ Sand Bar	0.933269694
335	29.643564	78.112420	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.489024108
336	29.642288	78.114981	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.524841611
337	29.644578	78.109165	Uttar Pradesh,Utt arakhand	Bijnor/Hari dwar	Barren Land/ Sand Bar	1.169565347
338	29.639076	78.104523	Uttar Pradesh, Uttarakhand	Bijnor/Hari dwar	Barren Land/ Sand Bar	15.45661165 0
339	29.637038	78.113585	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.852124184
340	29.638879	78.117160	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	4.648328413
341	29.639450	78.094694	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.152184150
342	29.636868	78.092348	Uttarakhand	Haridwar	Barren Land/ Sand Bar	27.55326770

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	0
343	29.639734	78.091540	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.591487260
344	29.637883	78.088343	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.324210637
345	29.638396	78.087741	Uttarakhand	Haridwar	Barren Land/ Sand Bar	3.077505112
346	29.638112	78.082125	Uttarakhand	Haridwar	Barren Land/ Sand Bar	6.735872005
347	29.634021	78.079912	Uttarakhand	Haridwar	Barren Land/ Sand Bar	8.129489069
348	29.629786	78.076735	Uttarakhand	Haridwar	Barren Land/ Sand Bar	2.640911123
349	29.630178	78.074931	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.726761671
350	29.678015	78.163563	Uttar Pradesh	Bijnor/Hari dwar	Agriculture	658.4211094 00
351	29.655638	78.154081	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.189070413
352	29.658722	78.158499	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	16.12875104 0
353	29.657413	78.154126	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.251012843
354	29.657367	78.154357	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.014574301
355	29.657547	78.155340	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.783907855
356	29.657655	78.158214	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.437950111
357	29.656548	78.157607	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.661693488
358	29.662909	78.163108	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.342025558

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
359	29.661963	78.160095	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.682321583
360	29.662548	78.160103	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.096845479
361	29.661275	78.158742	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.252241673
362	29.663718	78.161822	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.553656840
363	29.669008	78.166155	Uttar Pradesh	Bijnor/Hari dwar	Barren Land/ Sand Bar	0.869715473
364	29.668443	78.165828	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.000013800
365	29.668274	78.165677	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.066260384
366	29.668256	78.166102	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.045164067
367	29.668515	78.166572	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.119625373
368	29.669072	78.167379	Uttar Pradesh	Bijnor/Hari dwar	Barren Land/ Sand Bar	0.419589230
369	29.670193	78.168884	Uttar Pradesh	Bijnor/Hari dwar	Barren Land/ Sand Bar	4.664381012
370	29.671887	78.168852	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.741188487
371	29.677301	78.169824	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.661324354
372	29.679133	78.171308	Uttarakhand	Haridwar	Barren Land/ Sand Bar	1.757291303
373	29.627908	78.089555	Uttar Pradesh	Bijnor/Hari dwar	Barren Land/ Sand Bar	1.857813606
374	29.628753	78.090786	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.197814276
375	29.629542	78.089649	Uttarakhand	Haridwar	Barren Land/ Sand Bar	0.360297523

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	
376	29.624518	78.087673	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.133378956
377	29.614321	78.074515	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.129885116
378	29.611727	78.071483	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.263585904
379	29.611940	78.072601	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.034944209
380	29.608200	78.068061	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.272092996
381	29.054620	78.077027	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.108474788
382	28.565118	78.201722	Uttar Pradesh	Bulandshah r	Vegetation/For est, Agriculture	519.3768287 00
383	28.476812	78.262248	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	0.089438470
384	28.478792	78.258081	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	22.52449036 0
385	27.606907	79.397321	Uttar Pradesh	Farrukhaba d	Vegetation/For est	84.75509651 0
386	26.979723	80.016309	Uttar Pradesh	Hardoi/Kan nauj	Vegetation/For est	409.7548978 00
387	26.759069	80.152179	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.013702161
388	26.766868	80.150018	Uttar Pradesh	Unnao	Vegetation/For est	79.36327924 0
389	26.782857	80.132067	Uttar Pradesh	Unnao	Vegetation/For est	57.79305391 0
390	26.787022	80.126643	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	1.570079906
391	26.691460	80.232409	Uttar Pradesh	Unnao	Vegetation/For est	0.050025726

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
392	26.467387	80.383275	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	11.478331770
393	26.246775	80.591262	Uttar Pradesh	Unnao	Barren Land/Sand Bar	16.669450370
394	26.245189	80.588404	Uttar Pradesh	Unnao	Barren Land/Sand Bar	1.424917740
395	25.402944	87.345043	Bihar	Bhagalpur/Katihar	Agriculture	5375.746260000
396	25.464465	87.316905	Bihar	Katihar	Barren Land/Sand Bar	44.050143320
397	25.452827	87.304164	Bihar	Katihar	Vegetation/Forest, Agriculture	505.900894200
398	25.430770	87.343181	Bihar	Katihar	Agriculture	3137.970060000
399	25.394753	87.250106	Bihar	Katihar	Barren Land/Sand Bar	103.430106100
400	25.385755	87.254147	Bihar	Bhagalpur/Katihar	Vegetation/Forest	119.635766600
401	25.359344	87.280762	Bihar	Bhagalpur/Katihar	Vegetation/Forest	478.647191100
402	25.357382	87.297634	Bihar	Bhagalpur	Barren Land/Sand Bar	18.692343620
403	25.357532	87.304227	Bihar	Bhagalpur	Barren Land/Sand Bar	55.649838320
404	25.368687	87.273765	Bihar	Bhagalpur	Barren Land/Sand Bar	12.602673870
405	25.358955	87.246375	Bihar	Bhagalpur	Barren Land/Sand Bar	116.544716100
406	25.386373	87.337898	Bihar	Bhagalpur	Vegetation/Forest	356.192228300
407	25.369406	87.333895	Bihar	Bhagalpur	Agriculture	4.498999051

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
408	25.373654	87.341625	Bihar	Bhagalpur	Agriculture	11.115929410
409	25.396008	87.380766	Bihar	Bhagalpur/ Katihar	Vegetation/Forest	822.860298500
410	25.384524	87.500676	Bihar	Katihar	Barren Land/ Sand Bar	600.014731500
411	25.381552	87.534153	Bihar	Katihar	Barren Land/ Sand Bar	61.994144110
412	25.367851	87.540145	Bihar	Katihar	Barren Land/ Sand Bar	46.475947930
413	25.388457	87.564198	Bihar	Katihar	Barren Land/ Sand Bar	50.930123980
414	25.371062	87.567009	Bihar	Katihar	Vegetation/Forest	861.996890800
415	25.360630	87.598741	Bihar	Katihar	Barren Land/ Sand Bar	72.985122630
416	25.364959	87.551554	Bihar	Katihar	Barren Land/ Sand Bar	22.445323120
417	25.357538	87.594989	Bihar	Katihar	Barren Land/ Sand Bar	7.224002209
418	25.353186	87.598711	Bihar	Katihar	Vegetation/Forest	4.664676939
419	25.333144	87.575140	Bihar, Jharkhand	Bhagalpur/ Katihar/Sahibganj	Agriculture	2391.451884000
420	25.343506	87.610182	Bihar	Katihar	Barren Land/ Sand Bar	25.871706110
421	25.350192	87.612331	Bihar	Katihar	Barren Land/ Sand Bar	23.631509090
422	25.363501	87.610281	Bihar	Katihar	Barren Land/ Sand Bar	25.285947320
423	25.346465	87.616329	Bihar	Katihar	Barren Land/ Sand Bar	17.557182340

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
424	25.280125	87.664455	Jharkhand	Sahibganj	Barren Land/ Sand Bar	0.000243401
425	25.279967	87.664419	Jharkhand	Sahibganj	Barren Land/ Sand Bar	0.010722616
426	25.280326	87.664128	Jharkhand	Sahibganj	Barren Land/ Sand Bar	0.105396949
427	25.280205	87.663836	Jharkhand	Sahibganj	Barren Land/ Sand Bar	0.523179225
428	25.277629	87.674112	Jharkhand	Sahibganj	Vegetation/For est	260.3743791 00
429	25.278550	87.664202	Jharkhand	Sahibganj	Vegetation/For est	638.9328109 00
430	25.253370	87.677957	Jharkhand	Sahibganj	Barren Land/ Sand Bar	65.58040880 0
431	25.257423	87.691764	Jharkhand	Sahibganj	Barren Land/ Sand Bar	58.29739403 0
432	25.299701	87.692490	Bihar,Jharkh and	Katihar/Sah ibganj	Agriculture	4821.095510 000
433	25.280243	87.749216	Bihar	Katihar	Barren Land/ Sand Bar	18.27221526 0
434	25.282213	87.757746	Bihar	Katihar	Barren Land/ Sand Bar	4.902471694
435	25.251989	87.731461	Bihar,Jharkh and	Katihar/Sah ibganj	Barren Land/ Sand Bar	46.21627750 0
436	25.215078	87.767325	Bihar,Jharkh and,West Bengal	Katihar/Sah ibganj/Mald ah	Agriculture	3377.603073 000
437	25.251379	87.702743	Jharkhand	Sahibganj	Barren Land/ Sand Bar	15.20990875 0
438	25.416161	87.457061	Bihar	Katihar	Barren Land/ Sand Bar	487.6964946 00
439	25.422281	87.429281	Bihar	Katihar	Barren Land/ Sand Bar	39.74922448 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
440	25.466053	87.375364	Bihar	Katihar	Barren Land/ Sand Bar	85.02640999 0
441	25.460637	87.388848	Bihar	Katihar	Vegetation/For est	194.1187814 00
442	25.466327	87.333009	Bihar	Katihar	Agriculture	512.8631452 00
443	27.393583	79.630968	Uttar Pradesh	Farrukhaba d	Barren Land/ Sand Bar	3.221403277
444	27.388303	79.636812	Uttar Pradesh	Farrukhaba d	Barren Land/ Sand Bar	19.87798962 0
445	27.386869	79.644190	Uttar Pradesh	Farrukhaba d	Barren Land/ Sand Bar	9.603165958
446	27.374241	79.646646	Uttar Pradesh	Farrukhaba d	Vegetation/For est	133.3732945 00
447	27.338314	79.650487	Uttar Pradesh	Farrukhaba d	Vegetation/For est	311.6069234 00
448	27.354337	79.653889	Uttar Pradesh	Farrukhaba d	Barren Land/ Sand Bar	6.514179867
449	27.315651	79.645586	Uttar Pradesh	Farrukhaba d	Vegetation/For est	25.53881158 0
450	27.311250	79.637485	Uttar Pradesh	Farrukhaba d	Barren Land/ Sand Bar	29.80409431 0
451	27.323353	79.645393	Uttar Pradesh	Farrukhaba d	Barren Land/ Sand Bar	2.526506926
452	27.310074	79.646522	Uttar Pradesh	Farrukhaba d	Barren Land/ Sand Bar	9.026821060
453	27.291267	79.646777	Uttar Pradesh	Farrukhaba d	Vegetation/For est	14.61678809 0
454	27.294645	79.647189	Uttar Pradesh	Farrukhaba d	Barren Land/ Sand Bar	5.368546819
455	27.306052	79.637441	Uttar Pradesh	Farrukhaba d	Barren Land/ Sand Bar	1.196416376
456	27.303872	79.645820	Uttar	Farrukhaba	Vegetation/For	106.5682329

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh	d	est	00
457	27.301044	79.642763	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	9.240785000
458	21.913703	88.128991	West Bengal	South Twenty Four Parganas	Agriculture, Settlements	318.340415500
459	21.919262	88.165499	West Bengal	South Twenty Four Parganas	Vegetation/Forest	536.319681200
460	21.972231	88.090818	West Bengal	Purba Medinipur/South Twenty Four Parganas	Vegetation/Forest	4413.563729000
461	22.043459	88.151177	West Bengal	Purba Medinipur	Barren Land/Sand Bar	377.946986800
462	22.743162	88.357617	West Bengal	Hugli	Barren Land/Sand Bar	1.187182989
463	22.874057	88.388440	West Bengal	Hugli	Vegetation/Forest	6.373721898
464	22.877091	88.393557	West Bengal	Hugli	Barren Land/Sand Bar	4.831865483
465	22.876688	88.402092	West Bengal	Hugli	Vegetation/Forest	10.050741510
466	22.932678	88.405858	West Bengal	Hugli	Barren Land/Sand Bar	2.878881932
467	22.942568	88.408853	West Bengal	Hugli	Vegetation/Forest	20.110366750
468	23.010586	88.417969	West Bengal	Hugli/Nadia	Vegetation/Forest	4.765002143
469	23.008314	88.425150	West Bengal	Nadia	Barren Land/Sand Bar	3.969835750

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
470	23.030396	88.442937	West Bengal	Hugli	Vegetation/Forest	13.150973960
471	23.024666	88.442950	West Bengal	Hugli/Nadia	Barren Land/Sand Bar	0.894615770
472	23.034730	88.445197	West Bengal	Hugli	Vegetation/Forest	6.884821374
473	23.032242	88.445653	West Bengal	Hugli	Barren Land/Sand Bar	0.764898002
475	23.039084	88.448079	West Bengal	Hugli	Vegetation/Forest	9.867209281
476	23.033584	88.448906	West Bengal	Hugli/Nadia	Agriculture	127.581937500
477	23.079884	88.493497	West Bengal	Hugli	Barren Land/Sand Bar	2.704360086
478	23.097360	88.503948	West Bengal	Hugli	Barren Land/Sand Bar	3.007995723
479	23.115037	88.494774	West Bengal	Hugli/Nadia	Agriculture	439.512165700
480	23.127026	88.500296	West Bengal	Nadia	Agriculture	67.587233730
481	23.174327	88.450895	West Bengal	Hugli	Vegetation/Forest	31.845306090
482	23.205763	88.477905	West Bengal	Nadia	Barren Land/Sand Bar	3.996123885
483	23.223374	88.455743	West Bengal	Hugli/Nadia	Agriculture	71.128516290
484	23.209634	88.430136	West Bengal	Hugli	Barren Land/Sand Bar	0.787883704
485	23.211598	88.413423	West Bengal	Nadia	Barren Land/Sand Bar	6.654000515
486	23.215644	88.401258	West Bengal	Nadia	Barren Land/Sand Bar	2.390260198
487	23.235619	88.361901	West Bengal	Nadia	Barren Land/	0.244917841

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	
488	23.237050	88.360611	West Bengal	Nadia	Barren Land/ Sand Bar	0.542601381
490	23.233930	88.360796	West Bengal	Purba Barddhama n/Nadia	Barren Land/ Sand Bar	21.37728811 0
491	23.243916	88.353920	West Bengal	Purba Barddhama n/Nadia	Barren Land/ Sand Bar	27.78189101 0
492	23.285112	88.345241	West Bengal	Nadia	Barren Land/ Sand Bar	2.601723818
493	23.278896	88.342804	West Bengal	Purba Barddhama n/Nadia	Barren Land/ Sand Bar	2.217927126
494	23.300690	88.351112	West Bengal	Purba Barddhama n/Nadia	Agriculture	55.28069796 0
495	23.315478	88.347029	West Bengal	Nadia	Vegetation/For est	18.81630798 0
496	23.348466	88.329457	West Bengal	Purba Barddhama n	Barren Land/ Sand Bar	1.896743085
497	23.351535	88.338780	West Bengal	Nadia	Barren Land/ Sand Bar	0.721226442
498	23.358362	88.356358	West Bengal	Nadia	Barren Land/ Sand Bar	11.57395627 0
499	23.368106	88.357853	West Bengal	Nadia	Barren Land/ Sand Bar	0.807087176
500	23.371263	88.359822	West Bengal	Nadia	Barren Land/ Sand Bar	1.772794447
501	23.368914	88.358843	West Bengal	Nadia	Barren Land/ Sand Bar	0.300609249
502	23.386350	88.366307	West Bengal	Nadia	Barren Land/	1.307638852

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	
503	23.398022	88.376196	West Bengal	Nadia	Vegetation/Forest	1.748681947
504	23.433429	88.371461	West Bengal	Nadia	Vegetation/Forest	14.161658130
505	23.479217	88.360348	West Bengal	Purba Barddhaman	Barren Land/Sand Bar	5.186593602
506	23.483101	88.365869	West Bengal	Purba Barddhaman	Barren Land/Sand Bar	4.420710028
507	23.494768	88.376048	West Bengal	Purba Barddhaman	Barren Land/Sand Bar	0.596663968
508	23.516870	88.374996	West Bengal	Purba Barddhaman/Nadia	Agriculture	87.796115230
509	23.550031	88.356919	West Bengal	Nadia	Vegetation/Forest	6.240596915
510	23.543783	88.328358	West Bengal	Purba Barddhaman	Barren Land/Sand Bar	5.140623460
511	23.544063	88.337503	West Bengal	Nadia	Barren Land/Sand Bar	1.680859728
512	23.543660	88.335576	West Bengal	Nadia	Barren Land/Sand Bar	0.144329543
513	23.571824	88.289919	West Bengal	Purba Barddhaman/Nadia	Barren Land/Sand Bar	9.914145191
514	23.605616	88.250943	West Bengal	Purba Barddhaman	Barren Land/Sand Bar	7.570633637
515	23.606175	88.245176	West Bengal	Purba Barddhaman	Barren Land/Sand Bar	0.300167762

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
516	23.605672	88.247402	West Bengal	Purba Barddhaman	Barren Land/ Sand Bar	0.978406584
517	23.604694	88.241061	West Bengal	Purba Barddhaman	Barren Land/ Sand Bar	0.381335774
518	23.609337	88.231477	West Bengal	Purba Barddhaman/Nadia	Barren Land/ Sand Bar	3.836050090
519	23.612702	88.218319	West Bengal	Nadia	Vegetation/Forest	26.411656490
520	23.614628	88.217226	West Bengal	Nadia	Vegetation/Forest	14.169231520
521	23.643382	88.150415	West Bengal	Nadia	Barren Land/ Sand Bar	1.255491325
522	23.705232	88.169150	West Bengal	Nadia	Barren Land/ Sand Bar	11.652116980
523	23.704723	88.167642	West Bengal	Nadia	Barren Land/ Sand Bar	0.666912572
524	23.730842	88.179148	West Bengal	Purba Barddhaman	Vegetation/Forest	1.179749135
525	23.730773	88.192813	West Bengal	Purba Barddhaman	Barren Land/ Sand Bar	1.511878764
526	23.735707	88.193622	West Bengal	Purba Barddhaman	Barren Land/ Sand Bar	0.143208879
527	23.738417	88.194418	West Bengal	Purba Barddhaman	Barren Land/ Sand Bar	5.050426367
528	23.766133	88.198060	West Bengal	Murshidabad	Barren Land/ Sand Bar	18.260446870
529	23.769000	88.197787	West Bengal	Murshidabad	Barren Land/ Sand Bar	0.448928285

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
530	23.770121	88.232969	West Bengal	Murshidabad	Barren Land/ Sand Bar	1.466702608
531	23.772335	88.234409	West Bengal	Murshidabad	Barren Land/ Sand Bar	0.949172728
532	23.774728	88.234669	West Bengal	Murshidabad	Barren Land/ Sand Bar	0.127545211
533	23.775197	88.232637	West Bengal	Murshidabad	Vegetation/Forest	25.438195520
534	23.794452	88.235055	West Bengal	Murshidabad	Barren Land/ Sand Bar	6.020608200
535	23.807627	88.242651	West Bengal	Murshidabad	Barren Land/ Sand Bar	7.258088999
536	23.820412	88.244773	West Bengal	Murshidabad	Barren Land/ Sand Bar	0.500474951
537	23.819704	88.245630	West Bengal	Murshidabad	Barren Land/ Sand Bar	0.562529066
538	24.483079	88.062645	West Bengal	Murshidabad	Barren Land/ Sand Bar	2.533189870
539	24.846578	87.934362	West Bengal	Maldah	Vegetation/Forest	751.708445300
540	24.860333	87.909385	Jharkhand, West Bengal	Sahibganj/ Maldah	Vegetation/Forest	52.860751900
541	24.881175	87.917689	West Bengal	Maldah	Vegetation/Forest	128.527123500
542	24.890609	87.935969	West Bengal	Maldah	Barren Land/ Sand Bar	18.617154390
543	24.946348	87.958193	West Bengal	Maldah	Agriculture	1137.988197000
544	25.032070	87.940502	West Bengal	Maldah	Barren Land/ Sand Bar	15.044714070
545	25.040117	87.900349	West Bengal	Maldah	Barren Land/ Sand Bar	40.437188660

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
546	24.995851	87.899606	Jharkhand, West Bengal	Sahibganj/ Maldah	Agriculture	3262.988288 000
547	25.058846	87.862262	West Bengal	Maldah	Vegetation/For est	368.1115368 00
548	25.059327	87.878131	West Bengal	Maldah	Barren Land/ Sand Bar	6.138420922
549	25.066051	87.834533	West Bengal	Maldah	Barren Land/ Sand Bar	142.8349124 00
550	25.077281	87.845553	West Bengal	Maldah	Barren Land/ Sand Bar	5.230087870
551	25.084349	87.847652	West Bengal	Maldah	Barren Land/ Sand Bar	38.85143996 0
552	25.084586	87.797643	Jharkhand, West Bengal	Sahibganj/ Maldah	Vegetation/For est	842.9458306 00
553	25.103193	87.816556	West Bengal	Maldah	Barren Land/ Sand Bar	384.1094262 00
554	25.155208	87.797481	West Bengal	Maldah	Barren Land/ Sand Bar, Sand Mining	859.7106651 00
555	25.187973	87.821022	Bihar,West Bengal	Katihar/Mal dah	Barren Land/ Sand Bar	30.60784887 0
556	25.217143	87.796135	Bihar,Jharkh and,West Bengal	Katihar/Sah ibganj/Mald ah	Agriculture	2273.548099 000
557	25.114474	87.798408	West Bengal	Maldah	Barren Land/ Sand Bar	50.19970319 0
558	25.238260	87.823488	Bihar	Katihar	Barren Land/ Sand Bar	31.57190707 0
559	25.307808	87.225682	Bihar	Bhagalpur	Agriculture	2137.152758 000
560	25.343008	87.249650	Bihar	Bhagalpur	Barren Land/ Sand Bar	47.71646647 0
561	25.266948	87.196040	Bihar	Bhagalpur	Barren Land/ Sand Bar	98.52659147 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
562	25.269845	87.206942	Bihar	Bhagalpur	Barren Land/ Sand Bar	118.5571500 00
563	25.260289	87.204407	Bihar	Bhagalpur	Barren Land/ Sand Bar	13.41605707 0
564	25.260462	87.213883	Bihar	Bhagalpur	Barren Land/ Sand Bar	31.09075916 0
565	25.257413	87.208810	Bihar	Bhagalpur	Barren Land/ Sand Bar	18.70303845 0
566	25.262502	87.209724	Bihar	Bhagalpur	Barren Land/ Sand Bar	16.12774731 0
567	25.263024	87.204596	Bihar	Bhagalpur	Barren Land/ Sand Bar	7.019821242
568	25.265696	87.208252	Bihar	Bhagalpur	Barren Land/ Sand Bar	2.292324584
569	25.293398	87.171117	Bihar	Bhagalpur	Barren Land/ Sand Bar	224.9813383 00
570	25.314487	87.155705	Bihar	Bhagalpur	Barren Land/ Sand Bar	23.44178442 0
571	25.288307	87.133774	Bihar	Bhagalpur	Barren Land/ Sand Bar	926.6424384 00
572	25.297090	87.115962	Bihar	Bhagalpur	Barren Land/ Sand Bar	23.50873239 0
573	25.304337	87.118371	Bihar	Bhagalpur	Barren Land/ Sand Bar	6.335507443
574	25.286291	87.116680	Bihar	Bhagalpur	Barren Land/ Sand Bar	5.512234362
575	25.285211	87.114603	Bihar	Bhagalpur	Barren Land/ Sand Bar	30.22642780 0
576	25.270188	87.116398	Bihar	Bhagalpur	Barren Land/ Sand Bar	6.418742565
577	25.254039	87.059015	Bihar	Bhagalpur	Barren Land/ Sand Bar	13.70669539 0
578	25.252683	87.089495	Bihar	Bhagalpur	Vegetation/For	952.1583267

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					est	00
579	25.283884	86.985901	Bihar	Bhagalpur	Agriculture	3562.602847000
580	25.316223	86.928101	Bihar	Bhagalpur	Agriculture	3097.020535000
581	25.284353	86.778038	Bihar	Bhagalpur/ Khagaria	Barren Land/ Sand Bar	58.467114570
582	25.291416	86.796236	Bihar	Bhagalpur	Barren Land/ Sand Bar	103.278049100
583	25.300637	86.809316	Bihar	Bhagalpur	Barren Land/ Sand Bar	103.589175100
584	25.298430	86.821325	Bihar	Bhagalpur	Barren Land/ Sand Bar	79.237241750
585	25.318798	86.819586	Bihar	Bhagalpur	Barren Land/ Sand Bar	43.943938620
586	25.316798	86.813682	Bihar	Bhagalpur	Barren Land/ Sand Bar	6.087585691
587	25.320359	86.817216	Bihar	Bhagalpur	Barren Land/ Sand Bar	2.792699599
588	25.317016	86.843276	Bihar	Bhagalpur	Vegetation/For est	838.867986600
589	25.271992	86.751755	Bihar	Khagaria	Barren Land/ Sand Bar	65.311757040
590	25.250682	86.682851	Bihar	Khagaria/M unger	Barren Land/ Sand Bar	266.407315400
591	25.259995	86.632502	Bihar	Munger	Barren Land/ Sand Bar	280.348087600
592	25.269215	86.616053	Bihar	Munger	Barren Land/ Sand Bar	98.968217500
593	25.262972	86.638356	Bihar	Munger	Barren Land/ Sand Bar	53.494139470
594	25.279247	86.629774	Bihar	Munger	Barren Land/ Sand Bar	162.101049400

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
595	25.278906	86.612650	Bihar	Munger	Barren Land/ Sand Bar	55.88410054 0
596	25.290574	86.607685	Bihar	Munger	Barren Land/ Sand Bar	128.0913110 00
597	25.293833	86.613645	Bihar	Munger	Barren Land/ Sand Bar	2.836839100
598	25.319889	86.592015	Bihar	Munger	Barren Land/ Sand Bar	62.50247788 0
599	25.313048	86.607079	Bihar	Munger	Barren Land/ Sand Bar	25.29011586 0
600	25.313560	86.583267	Bihar	Munger	Agriculture	491.4294173 00
601	25.330288	86.587841	Bihar	Munger	Barren Land/ Sand Bar	1.897231742
602	25.328157	86.591944	Bihar	Munger	Barren Land/ Sand Bar	1.793527727
603	25.332555	86.584102	Bihar	Munger	Barren Land/ Sand Bar	3.702468696
604	25.386113	86.520499	Bihar	Munger	Barren Land/ Sand Bar, Sand Mining	247.3695326 00
605	25.414241	86.494931	Bihar	Begusarai/K hagaria/Mu nger	Vegetation/For est	1450.566703 000
606	25.379143	86.438501	Bihar	Begusarai/ Munger	Agriculture	1374.177059 000
607	25.360328	86.415219	Bihar	Munger	Agriculture	237.4406576 00
608	25.340648	86.408777	Bihar	Munger	Agriculture	23.65812087 0
609	25.329987	86.413937	Bihar	Munger	Vegetation/For est	385.2500054 00
610	25.326979	86.370404	Bihar	Munger	Vegetation/For est	87.94399555 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
611	25.326878	86.384083	Bihar	Munger	Vegetation/Forest	400.254657600
612	25.360227	86.390835	Bihar	Begusarai/Munger	Agriculture	1289.146153000
613	25.328482	86.402721	Bihar	Munger	Barren Land/Sand Bar	8.459106209
614	25.318394	86.394987	Bihar	Munger	Barren Land/Sand Bar	56.562051360
615	25.341973	86.354928	Bihar	Begusarai/Munger	Agriculture	248.984206700
616	25.333618	86.347116	Bihar	Munger	Barren Land/Sand Bar	6.038635033
617	25.344852	86.323698	Bihar	Begusarai/Munger	Vegetation/Forest	40.637043680
618	25.300472	86.349244	Bihar	Munger	Agriculture	13.911433970
619	25.302477	86.349043	Bihar	Munger	Vegetation/Forest	24.164191390
620	25.318561	86.330552	Bihar	Begusarai/Munger	Vegetation/Forest	278.311507000
621	25.325418	86.307741	Bihar	Begusarai/Munger	Vegetation/Forest	442.344607600
622	25.306186	86.344567	Bihar	Munger	Barren Land/Sand Bar	95.676951700
623	25.310878	86.324350	Bihar	Munger	Barren Land/Sand Bar	41.887189420
624	25.336320	86.313191	Bihar	Begusarai/Munger	Barren Land/Sand Bar	119.547276600
625	25.332535	86.281629	Bihar	Begusarai	Barren Land/Sand Bar	39.458500370
626	25.327506	86.262412	Bihar	Begusarai	Barren Land/Sand Bar	27.872754520

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
627	25.330850	86.256032	Bihar	Begusarai	Vegetation/Forest	108.502940300
628	25.341640	86.279653	Bihar	Begusarai	Vegetation/Forest	125.052834500
629	25.337190	86.234638	Bihar	Begusarai	Vegetation/Forest	440.688991100
630	25.328451	86.233319	Bihar	Begusarai	Vegetation/Forest	134.995829000
631	25.331213	86.185461	Bihar	Begusarai	Barren Land/Sand Bar	669.076229100
632	25.321085	86.075224	Bihar	Begusarai/Lakhisarai	Barren Land/Sand Bar	107.407694900
633	25.324548	86.077871	Bihar	Begusarai	Barren Land/Sand Bar	7.553672436
634	25.312613	86.080677	Bihar	Begusarai	Barren Land/Sand Bar	0.976797105
635	25.313831	86.082511	Bihar	Begusarai	Barren Land/Sand Bar	1.643323468
636	25.312254	86.083660	Bihar	Begusarai	Barren Land/Sand Bar	3.945677544
637	25.315011	86.076957	Bihar	Begusarai	Barren Land/Sand Bar	0.893122381
638	25.314222	86.077794	Bihar	Begusarai	Barren Land/Sand Bar	0.319471742
639	25.316012	86.062223	Bihar	Lakhisarai	Barren Land/Sand Bar	6.061497882
640	25.324672	86.058043	Bihar	Lakhisarai	Barren Land/Sand Bar	77.491026960
641	25.341784	86.036460	Bihar	Patna	Barren Land/Sand Bar	50.305850360
642	25.351925	86.028090	Bihar	Patna	Barren Land/Sand Bar	17.660513680
643	25.359046	86.009775	Bihar	Patna	Barren Land/	19.77185014

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	0
644	25.381779	85.992020	Bihar	Patna	Barren Land/ Sand Bar	35.53002135 0
645	25.379082	85.988819	Bihar	Patna	Barren Land/ Sand Bar	53.66364685 0
646	25.402991	85.972503	Bihar	Begusarai/P atna	Barren Land/ Sand Bar	233.0809683 00
647	25.390169	85.981456	Bihar	Begusarai/P atna	Barren Land/ Sand Bar	13.71701118 0
648	25.461809	85.915469	Bihar	Begusarai	Barren Land/ Sand Bar	28.04097385 0
649	25.464895	85.922217	Bihar	Begusarai	Barren Land/ Sand Bar	5.124935394
650	25.457283	85.919339	Bihar	Begusarai	Barren Land/ Sand Bar	24.66946469 0
651	25.425106	85.939286	Bihar	Begusarai/P atna	Barren Land/ Sand Bar	383.1584751 00
652	25.454341	85.912599	Bihar	Begusarai	Barren Land/ Sand Bar	1.353301804
653	25.429840	85.936058	Bihar	Begusarai	Barren Land/ Sand Bar	6.580454907
654	25.462888	85.867846	Bihar	Begusarai/P atna	Barren Land/ Sand Bar	436.5746144 00
655	25.449814	85.881804	Bihar	Begusarai	Barren Land/ Sand Bar	8.151987419
656	25.451706	85.873937	Bihar	Begusarai/P atna	Barren Land/ Sand Bar	22.79869436 0
657	25.458763	85.886147	Bihar	Begusarai	Barren Land/ Sand Bar	16.41109276 0
658	25.464838	85.850923	Bihar	Patna	Barren Land/ Sand Bar	7.013491973
659	25.466222	85.849089	Bihar	Patna	Barren Land/ Sand Bar	1.808270708

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
660	25.471176	85.844821	Bihar	Patna	Barren Land/ Sand Bar	7.501444062
661	25.460689	85.851191	Bihar	Patna	Agriculture	12.39313689 0
662	25.460815	85.889043	Bihar	Begusarai/P atna	Agriculture	5164.203053 000
663	25.524405	85.850909	Bihar	Begusarai/P atna	Vegetation/For est	1033.913286 000
664	25.515910	85.820529	Bihar	Patna	Barren Land/ Sand Bar	128.9704143 00
665	25.508949	85.786967	Bihar	Patna	Vegetation/For est	1097.122528 000
666	25.331242	86.127699	Bihar	Begusarai	Barren Land/ Sand Bar	35.31802526 0
667	25.332440	86.142642	Bihar	Begusarai	Barren Land/ Sand Bar	48.07238371 0
668	25.504336	85.683993	Bihar	Patna	Agriculture	1904.237737 000
669	25.483006	85.681709	Bihar	Patna/Sama stipur	Barren Land/ Sand Bar	78.47546919 0
670	25.485547	85.675051	Bihar	Patna	Barren Land/ Sand Bar	3.020665319
671	25.485135	85.671431	Bihar	Patna	Barren Land/ Sand Bar	10.02896669 0
672	25.485126	85.668986	Bihar	Patna	Barren Land/ Sand Bar	4.376207826
673	25.486281	85.667281	Bihar	Patna	Barren Land/ Sand Bar	5.988286536
674	25.514657	85.609650	Bihar	Samastipur	Vegetation/For est	499.2138964 00
675	25.511993	85.584572	Bihar	Samastipur	Barren Land/ Sand Bar	20.07477559 0
676	25.520656	85.590040	Bihar	Samastipur	Barren Land/	47.43673577

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	0
677	25.528268	85.584569	Bihar	Samastipur	Barren Land/ Sand Bar	31.23063736 0
678	25.493361	85.567826	Bihar	Patna/Sama stipur	Barren Land/ Sand Bar	167.6623404 00
679	25.489555	85.553240	Bihar	Samastipur	Barren Land/ Sand Bar	8.681828288
680	25.581832	85.485114	Bihar	Vaishali	Vegetation/For est	575.1338353 00
681	25.578826	85.432902	Bihar	Vaishali	Vegetation/For est	2230.177734 000
682	25.556105	85.430985	Bihar	Vaishali	Barren Land/ Sand Bar	67.94817095 0
683	25.579575	85.401299	Bihar	Vaishali	Barren Land/ Sand Bar	3.976055100
684	25.592995	85.379347	Bihar	Vaishali	Barren Land/ Sand Bar	245.6798255 00
685	25.590911	85.377922	Bihar	Vaishali	Barren Land/ Sand Bar	11.65228827 0
686	25.552270	85.412708	Bihar	Patna/Sama stipur/Vaish ali	Agriculture, Settlements	21617.34585 0000
687	25.621754	85.326130	Bihar	Vaishali	Barren Land/ Sand Bar	564.4555534 00
688	25.570090	85.268811	Bihar	Vaishali	Barren Land/ Sand Bar, Sand Mining	230.1408313 00
689	25.606150	85.226935	Bihar	Saran	Barren Land/ Sand Bar	0.843151556
690	25.601975	85.236982	Bihar	Saran/Vaish ali	Barren Land/ Sand Bar	80.17663824 0
691	25.607019	85.223559	Bihar	Saran	Barren Land/ Sand Bar	12.10428465 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
692	25.618371	85.262587	Bihar	Vaishali	Barren Land/ Sand Bar	31.08137823 0
693	25.617716	85.251746	Bihar	Vaishali	Barren Land/ Sand Bar	89.99755660 0
694	25.616944	85.237454	Bihar	Saran/Vaishali	Barren Land/ Sand Bar	27.43531149 0
695	25.637554	85.215623	Bihar	Saran/Vaishali	Barren Land/ Sand Bar, Sand Mining	796.3794987 00
696	25.650864	85.182407	Bihar	Saran	Barren Land/ Sand Bar	308.1120035 00
697	25.650804	85.171166	Bihar	Saran	Barren Land/ Sand Bar	43.42057399 0
698	25.640879	85.178825	Bihar	Saran	Barren Land/ Sand Bar	16.68211909 0
699	25.670135	85.114142	Bihar	Patna/Saran	Barren Land/ Sand Bar	96.84377472 0
700	25.653213	85.150605	Bihar	Saran	Agriculture	1414.056460 000
701	25.646668	85.110999	Bihar	Saran	Barren Land/ Sand Bar	0.000104153
702	25.648530	85.123398	Bihar	Patna/Saran	Vegetation/For est	370.8908817 00
703	25.650582	85.101516	Bihar	Patna/Saran	Barren Land/ Sand Bar	42.86940342 0
704	25.658136	85.043764	Bihar	Patna	Barren Land/ Sand Bar	0.016463704
705	25.657326	85.044266	Bihar	Patna	Barren Land/ Sand Bar	0.698115299
706	25.653691	85.051822	Bihar	Patna	Barren Land/ Sand Bar	49.44524975 0
707	25.668231	85.024399	Bihar	Patna	Barren Land/ Sand Bar	140.1172036 00

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
708	25.655309	85.016576	Bihar	Patna	Agriculture	1516.271164 000
709	25.705683	85.022490	Bihar	Patna/Saran	Agriculture, Settlements	12532.71419 0000
710	25.520428	85.401627	Bihar	Vaishali	Vegetation/For est	367.9820291 00
711	25.509681	85.422890	Bihar	Patna/Vaish ali	Barren Land/ Sand Bar	48.21976867 0
712	25.511689	85.399636	Bihar	Vaishali	Barren Land/ Sand Bar	18.37871402 0
713	25.511121	85.405930	Bihar	Vaishali	Barren Land/ Sand Bar	1.722356653
714	25.491259	85.447216	Bihar	Patna	Barren Land/ Sand Bar	34.28872666 0
715	25.691289	84.913217	Bihar	Patna/Saran	Vegetation/For est	2130.753666 000
716	25.661982	84.928428	Bihar	Patna	Barren Land/ Sand Bar	22.24023078 0
717	25.706090	84.869838	Bihar	Patna/Saran	Barren Land/ Sand Bar	244.5373946 00
718	25.703981	84.796267	Bihar	Bhojpur/Pat na/Saran	Agriculture	3308.311629 000
719	25.723208	84.833825	Bihar	Saran	Barren Land/ Sand Bar	28.72373694 0
720	25.728113	84.818883	Bihar	Saran	Barren Land/ Sand Bar	129.0773918 00
721	25.747674	84.756054	Bihar	Saran	Agriculture	2333.021711 000
722	25.726752	84.766134	Bihar	Saran	Barren Land/ Sand Bar	128.4990010 00
723	25.726489	84.740829	Bihar	Saran	Barren Land/ Sand Bar	122.7440785 00

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
724	25.735655	84.729175	Bihar	Saran	Barren Land/ Sand Bar	17.72546543 0
725	25.756621	84.653338	Bihar	Saran	Barren Land/ Sand Bar	140.9625447 00
726	25.752837	84.686009	Bihar	Bhojpur/Sar an	Vegetation/For est	783.7562367 00
727	25.735387	84.696816	Bihar	Bhojpur	Barren Land/ Sand Bar	54.33492770 0
728	25.744987	84.661175	Bihar	Bhojpur/Sar an	Barren Land/ Sand Bar	459.5352855 00
729	25.724054	84.635942	Bihar,Uttar Pradesh	Bhojpur/Sar an/Ballia	Barren Land/ Sand Bar	253.0551914 00
730	25.740902	84.634243	Bihar,Uttar Pradesh	Saran/Ballia	Barren Land/ Sand Bar	21.99901752 0
731	25.717692	84.610592	Bihar,Uttar Pradesh	Bhojpur/Sar an/Ballia	Barren Land/ Sand Bar	226.6242067 00
732	25.672487	84.540928	Bihar,Uttar Pradesh	Bhojpur/Bal lia	Vegetation/For est	805.3506005 00
733	25.664075	84.515352	Bihar	Bhojpur	Barren Land/ Sand Bar	14.65895357 0
734	25.664107	84.519715	Bihar	Bhojpur	Barren Land/ Sand Bar	9.830114312
735	25.687198	84.483320	Bihar,Uttar Pradesh	Bhojpur/Bal lia	Barren Land/ Sand Bar	432.8056201 00
736	25.707490	84.462615	Bihar,Uttar Pradesh	Bhojpur/Bal lia	Barren Land/ Sand Bar	17.58192433 0
737	25.721188	84.439804	Bihar,Uttar Pradesh	Bhojpur/Bal lia	Vegetation/For est	989.4628583 00
738	25.726891	84.418648	Uttar Pradesh	Ballia	Vegetation/For est	54.90687662 0
739	25.756001	84.400644	Uttar Pradesh	Ballia	Barren Land/ Sand Bar	233.4835700 00

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
740	25.737232	84.349673	Bihar,Uttar Pradesh	Buxar/Ballia	Barren Land/Sand Bar	192.441483200
741	25.713007	84.336180	Bihar,Uttar Pradesh	Buxar/Ballia	Barren Land/Sand Bar	71.556760220
742	25.708804	84.249674	Uttar Pradesh	Ballia	Vegetation/Forest	656.329174700
743	25.710062	84.203728	Bihar,Uttar Pradesh	Buxar/Ballia	Vegetation/Forest, Agriculture	844.038989500
744	25.725211	84.205613	Uttar Pradesh	Ballia	Vegetation/Forest	547.647593900
745	25.715753	84.119964	Bihar,Uttar Pradesh	Buxar/Ballia	Vegetation/Forest	982.244985000
746	25.661353	84.084158	Bihar,Uttar Pradesh	Buxar/Ballia	Barren Land/Sand Bar	25.327496070
747	25.645998	84.048113	Uttar Pradesh	Ballia	Agriculture	2080.301702000
748	25.687219	84.058155	Uttar Pradesh	Ballia	Agriculture	624.963161300
749	25.553172	83.933284	Bihar,Uttar Pradesh	Buxar/Ballia/Ghazipur	Barren Land/Sand Bar	108.176146900
750	25.524702	83.892307	Uttar Pradesh	Ghazipur	Agriculture	35.741578210
751	25.516632	83.871996	Bihar,Uttar Pradesh	Buxar/Ghazipur	Barren Land/Sand Bar	38.149977290
752	25.521930	83.807289	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	255.398172600
753	25.562251	83.764328	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	198.585710500
754	25.603842	83.719635	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	90.433308560
755	25.594978	83.719668	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	212.671404300
756	25.587752	83.749265	Uttar	Ghazipur	Barren Land/	58.42801943

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	0
757	25.610214	83.666738	Uttar Pradesh	Ghazipur	Vegetation/Forest	832.013157600
758	25.598825	83.622880	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	71.088496820
759	25.588448	83.620179	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	31.287573620
760	25.565740	83.570860	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	124.747470600
761	25.545239	83.567421	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	585.643394200
762	25.508729	83.522162	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	132.986557300
763	25.493224	83.518211	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	61.420259050
764	25.493239	83.523602	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	5.562371206
765	25.487231	83.519669	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	13.591323090
766	25.484975	83.520109	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	2.960140289
767	25.479862	83.520110	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	9.451528758
768	25.460725	83.526508	Uttar Pradesh	Ghazipur	Vegetation/Forest	82.665051510
769	25.462559	83.528350	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	2.679825792
770	25.461715	83.537871	Uttar Pradesh	Ghazipur	Agriculture, Settlements	637.968573200
771	25.449811	83.536884	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	5.533199379
772	25.470847	83.510714	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	275.280832100

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
773	25.478392	83.514544	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	24.57802829 0
774	25.473023	83.516736	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	7.165250689
775	25.467512	83.517272	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	1.704093360
776	25.461273	83.518745	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	1.126502995
777	25.460141	83.519557	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	5.491657235
778	25.457425	83.523367	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	2.413108821
779	25.457036	83.525845	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	2.354817352
780	25.456073	83.526167	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	0.560491555
781	25.456089	83.522343	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	0.808585280
782	25.446945	83.531721	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	67.52166161 0
783	25.449176	83.533536	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	3.176727538
784	25.447492	83.523325	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	29.48111562 0
785	25.434871	83.538350	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	85.89800004 0
786	25.439733	83.544146	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	0.676950006
787	25.421664	83.542005	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	2.382649722
788	25.413390	83.545723	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	34.86007642 0
789	25.405743	83.554475	Uttar	Ghazipur	Barren Land/	0.909022545

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
790	25.396213	83.534776	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	71.98343094 0
791	25.448703	83.456001	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	470.2382550 00
792	25.474800	83.417195	Uttar Pradesh	Chandauli/G hazipur	Barren Land/ Sand Bar	31.31502179 0
793	25.490925	83.394795	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	37.07386150 0
794	25.470584	83.313120	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	14.80254829 0
795	25.482300	83.306830	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	87.73133505 0
796	25.513042	83.238443	Uttar Pradesh	Chandauli/G hazipur	Barren Land/ Sand Bar, Sand Mining	678.2302948 00
797	25.519451	83.192874	Uttar Pradesh	Chandauli/G hazipur	Barren Land/ Sand Bar	49.61552761 0
798	25.523241	83.203973	Uttar Pradesh	Chandauli/G hazipur	Barren Land/ Sand Bar	51.12504299 0
799	25.464818	83.146070	Uttar Pradesh	Chandauli/V aranasi	Barren Land/ Sand Bar, Sand Mining	334.9878269 00
800	25.454989	83.129438	Uttar Pradesh	Varanasi	Barren Land/ Sand Bar	3.653519523
801	25.449357	83.127593	Uttar Pradesh	Varanasi	Barren Land/ Sand Bar	13.85540360 0
802	25.449725	83.130400	Uttar Pradesh	Varanasi	Barren Land/ Sand Bar	0.211420347
803	25.458785	83.129900	Uttar Pradesh	Varanasi	Barren Land/ Sand Bar	0.356841686
804	25.451805	83.129769	Uttar Pradesh	Chandauli/V aranasi	Vegetation/For est	62.42297075 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
805	25.440854	83.139720	Uttar Pradesh	Chandauli/Varanasi	Barren Land/Sand Bar	91.466999940
806	25.416663	83.164663	Uttar Pradesh	Chandauli/Varanasi	Barren Land/Sand Bar	164.273137100
807	25.331288	83.073961	Uttar Pradesh	Varanasi	Barren Land/Sand Bar	50.327069540
808	25.362087	83.138951	Uttar Pradesh	Varanasi	Agriculture	2108.626713000
809	25.322563	83.136047	Uttar Pradesh	Varanasi	Barren Land/Sand Bar	5.496365051
810	25.323438	83.129069	Uttar Pradesh	Varanasi	Barren Land/Sand Bar	14.677569210
811	25.323133	83.124909	Uttar Pradesh	Varanasi	Barren Land/Sand Bar	33.097237280
812	25.296053	83.018408	Uttar Pradesh	Chandauli/Varanasi	Barren Land/Sand Bar, Sand Mining	296.929675900
813	25.259197	83.022698	Uttar Pradesh	Varanasi	Barren Land/Sand Bar	23.380012670
814	25.219952	83.002146	Uttar Pradesh	Varanasi	Barren Land/Sand Bar	270.838553400
815	25.202745	83.005159	Uttar Pradesh	Varanasi	Barren Land/Sand Bar	0.026315152
816	25.203189	82.914253	Uttar Pradesh	Mirzapur	Barren Land/Sand Bar	0.135470085
817	25.193639	82.916205	Uttar Pradesh	Mirzapur	Barren Land/Sand Bar	17.502261720
818	25.176304	82.915527	Uttar Pradesh	Mirzapur	Barren Land/Sand Bar	25.933279880
819	25.202316	82.958819	Uttar Pradesh	Mirzapur/Varanasi	Barren Land/Sand Bar	295.018764300
820	25.177488	82.904800	Uttar Pradesh	Mirzapur	Vegetation/Forest	648.400042100

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
821	25.119546	82.844683	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	218.6438600 00
822	25.154048	82.882293	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar, Sand Mining	287.7191198 00
823	25.110832	82.840915	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	29.70826834 0
824	25.129954	82.878372	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	6.077146554
825	25.131250	82.781622	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	91.74871255 0
826	25.147446	82.751972	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar, Sand Mining	280.3439712 00
827	25.149309	82.732475	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	22.09171175 0
828	25.165919	82.714037	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar, Sand Mining	339.3361606 00
829	25.143641	82.742004	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	0.030007117
830	25.143466	82.744695	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	4.915342017
831	25.209020	82.675659	Uttar Pradesh	Mirzapur	Vegetation/For est	123.6441922 00
832	25.216038	82.621271	Uttar Pradesh	Mirzapur/Sa nt Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar, Sand Mining	808.8445404 00
833	25.217491	82.660672	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar, Sand Mining	62.60661161 0
834	25.191976	82.570505	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	379.4779566 00

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
835	25.154384	82.551642	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	20.90061308 0
836	25.156802	82.542269	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	14.25794646 0
837	25.157063	82.544484	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	3.200329588
838	25.158207	82.545538	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	2.328580759
839	25.154719	82.538343	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	9.702622036
840	25.153081	82.536487	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	6.679187875
841	25.155174	82.532222	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	4.237766343
842	25.155739	82.529085	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	0.510319783
843	25.174178	82.496719	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	0.721827749
844	25.202022	82.486187	Uttar Pradesh	Mirzapur/Sant Ravidas Nagar (Bhadohi)	Vegetation/Forest	727.1726222 00
845	25.170285	82.515099	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	195.2290026 00
846	25.197725	82.472855	Uttar Pradesh	Mirzapur/Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	571.1845246 00
847	25.191254	82.483083	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	1.499153725
848	25.190490	82.482906	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	1.256670881
849	25.188887	82.483842	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	2.230011111

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
850	25.184696	82.485573	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	1.601548353
851	25.183929	82.485532	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	0.435678904
852	25.197513	82.476377	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	1.872064458
853	25.213433	82.469907	Uttar Pradesh	Mirzapur/Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	4.310480904
854	25.209885	82.460182	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	10.337299800
855	25.204687	82.461991	Uttar Pradesh	Mirzapur	Barren Land/ Sand Bar	5.038980184
856	25.198050	82.459820	Uttar Pradesh	Mirzapur	Vegetation/Forest	4.721687315
857	25.221035	82.446597	Uttar Pradesh	Mirzapur/Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	64.110041810
858	25.222072	82.452561	Uttar Pradesh	Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	8.453530199
859	25.248466	82.401187	Uttar Pradesh	Mirzapur/Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar, Sand Mining	222.616439600
860	25.258509	82.395361	Uttar Pradesh	Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	1.329176750
861	25.260018	82.390474	Uttar Pradesh	Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	0.708322686

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
862	25.257567	82.383985	Uttar Pradesh	Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	1.497493200
863	25.255015	82.380957	Uttar Pradesh	Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	6.751688518
864	25.232013	82.355315	Uttar Pradesh	Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar, Sand Mining	408.029214300
865	25.220337	82.340734	Uttar Pradesh	Mirzapur/Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	270.393791100
866	25.238836	82.267781	Uttar Pradesh	Mirzapur/Sant Ravidas Nagar (Bhadohi)	Vegetation/Forest	940.761758100
867	25.203077	82.259325	Uttar Pradesh	Mirzapur/Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	158.705759200
868	25.183249	82.270022	Uttar Pradesh	Allahabad(Prayagraj)/Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	26.964447020
869	25.183629	82.276397	Uttar Pradesh	Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar	15.410049110
870	25.206420	82.216793	Uttar Pradesh	Allahabad(Prayagraj)/Sant Ravidas Nagar (Bhadohi)	Barren Land/ Sand Bar, Sand Mining	539.680162100

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
871	25.256972	82.213155	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	21.27617102 0
872	25.300189	82.176096	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar, Sand Mining	421.6603901 00
873	25.284987	82.099992	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	385.9033815 00
874	25.316084	82.082325	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	15.99790065 0
875	25.327762	82.059414	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	376.0987871 00
876	25.343686	82.063948	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	14.56901621 0
877	25.346982	82.058802	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	6.228410043
878	25.347535	82.060700	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	1.108853002
879	25.352432	82.053075	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	63.08899459 0
880	25.360198	82.031179	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	3.397568162
881	25.348679	81.983200	Uttar Pradesh	Allahabad(P rayagraj)	Vegetation/For est	3609.225044 000
882	25.359131	81.981980	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	480.7187399 00
883	25.386844	81.908183	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	456.5521249 00
884	25.420207	81.894258	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	25.36956236 0
885	25.464584	81.891711	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	31.38753679 0
886	25.456282	81.891682	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	3.021362360

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
887	25.451739	81.893126	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	12.87231720 0
888	25.449738	81.889478	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	5.030189619
889	25.453010	81.889987	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	2.965345771
890	25.473257	81.896282	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	12.14607797 0
891	25.480356	81.892509	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	73.43367933 0
892	25.478640	81.888129	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	0.003487607
893	25.488325	81.890356	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	43.26122975 0
894	25.446159	81.886739	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	22.08640458 0
895	25.477096	81.896911	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	0.853726142
896	25.485416	81.895844	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	3.448909782
897	25.498978	81.892879	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	18.39661228 0
898	25.502356	81.890268	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	1.228876288
899	25.500277	81.890332	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	0.976757142
900	25.497125	81.882548	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	15.90841523 0
901	25.503771	81.881569	Uttar Pradesh	Allahabad(P rayagraj)	Vegetation/For est	136.7961667 00
902	25.508015	81.868286	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	17.57878210 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
903	25.504861	81.856216	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	1.999816309
904	25.503629	81.855600	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	0.891854553
905	25.505887	81.859646	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	5.677463986
906	25.504632	81.847975	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	20.74190715 0
907	25.506002	81.849077	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	0.527131350
908	25.501332	81.850722	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	5.336710035
909	25.501532	81.845498	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	0.931573227
910	25.504496	81.838548	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	40.35987686 0
911	25.502095	81.838020	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	1.569591338
912	25.502308	81.833108	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	9.235274880
913	25.509575	81.829577	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	7.585138707
914	25.511039	81.827157	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	2.641117447
915	25.507227	81.822803	Uttar Pradesh	Allahabad(P rayagraj)	Vegetation/For est	70.67788300 0
916	25.507726	81.808784	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	1.322878375
917	25.502087	81.802032	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	8.510294447
918	25.496193	81.794033	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	10.42938830 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
919	25.494092	81.788069	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	1.579175959
920	25.490340	81.782749	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	1.740305440
921	25.486451	81.781314	Uttar Pradesh	Allahabad(P rayagraj)	Vegetation/For est	63.71451260 0
922	25.483232	81.770936	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	5.080741124
923	25.484517	81.762971	Uttar Pradesh	Allahabad(P rayagraj)/K aushambi	Vegetation/For est	125.5455558 00
924	25.484054	81.748137	Uttar Pradesh	Allahabad(P rayagraj)/K aushambi	Barren Land/ Sand Bar	29.11744288 0
925	25.499998	81.722162	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	4.583812042
926	25.501517	81.715321	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	5.846474976
927	25.497527	81.718213	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	0.899416612
928	25.511092	81.704490	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	18.72657491 0
929	25.517097	81.701719	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	1.831370729
930	25.519234	81.685432	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	55.90782070 0
931	25.520900	81.685850	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	2.766864550
932	25.520899	81.694864	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	6.498143556
933	25.518188	81.674061	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	11.21565653 0
934	25.519066	81.663201	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	6.484778416

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
935	25.518220	81.667940	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	2.340416158
936	25.524482	81.660597	Uttar Pradesh	Allahabad(P rayagraj)	Vegetation/Forest	24.245306150
937	25.549032	81.652709	Uttar Pradesh	Allahabad(P rayagraj)	Barren Land/ Sand Bar	16.475889940
938	25.537500	81.654377	Uttar Pradesh	Allahabad(P rayagraj)/K aushambi	Agriculture	92.643112330
939	25.534972	81.647399	Uttar Pradesh	Allahabad(P rayagraj)/K aushambi	Vegetation/Forest	138.962391800
940	25.527932	81.637168	Uttar Pradesh	Kaushambi	Vegetation/Forest	10.938726110
941	25.527835	81.641301	Uttar Pradesh	Kaushambi	Barren Land/ Sand Bar	1.177780875
942	26.745965	80.145280	Uttar Pradesh	Kanpur Nagar/Unnao	Agriculture	687.241074800
943	26.753560	80.155755	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	49.279789720
944	26.760214	80.146487	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	27.778312760
945	26.754543	80.150233	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.637339621
946	26.779487	80.131491	Uttar Pradesh	Unnao	Vegetation/Forest	57.761216880
947	26.777932	80.138456	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	9.768034899
948	26.781945	80.140892	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.045801152
949	26.780238	80.141178	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	3.816483120
950	26.784609	80.140021	Uttar	Unnao	Barren Land/	23.58517276

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	0
951	26.772418	80.139438	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	19.19085095 0
952	26.767838	80.144640	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	8.108187512
953	26.769384	80.154615	Uttar Pradesh	Unnao	Vegetation/Forest	0.004526281
954	26.770908	80.153875	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.405939447
955	26.774022	80.146660	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	48.10511794 0
956	26.769886	80.154384	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.015230223
957	26.762889	80.154820	Uttar Pradesh	Unnao	Vegetation/Forest	18.55029554 0
958	26.758621	80.152802	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.033994809
959	26.758707	80.153328	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.906708287
960	26.759098	80.152480	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.156751684
961	26.760147	80.151262	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	1.193288733
962	26.745363	80.161456	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	3.871709884
963	26.763720	80.146989	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	4.281609321
964	26.796419	80.126182	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	10.80123430 0
965	26.791341	80.122738	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/ Sand Bar	4.944579398

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
966	26.791128	80.123375	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/ Sand Bar	6.610018697
967	26.789899	80.129427	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	34.242868970
968	26.795373	80.124652	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	5.215242174
969	26.789570	80.133895	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.895892888
970	26.787347	80.136235	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	1.772792784
971	26.785439	80.134881	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	1.388271033
972	26.802013	80.121460	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	4.674305192
973	26.806666	80.118856	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	10.798175860
974	26.822760	80.121067	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.001678896
975	26.814999	80.118014	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	31.035802490
976	26.822057	80.126753	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	2.607592319
977	26.827188	80.122935	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	51.265282640
978	26.835505	80.131309	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	63.444759380
979	26.835383	80.126733	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	5.607870759
980	26.845360	80.128157	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	16.190795500
981	26.846642	80.131459	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	18.177215070

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
982	26.850671	80.132500	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	1.129085146
983	26.851516	80.129620	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.515775843
984	26.853001	80.129913	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	8.882388746
985	26.855209	80.129371	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	3.486888580
986	26.860097	80.121985	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	49.72877513 0
987	26.859253	80.118079	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	5.842697688
988	26.868321	80.113547	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	2.625684378
989	26.872227	80.106224	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	50.61357138 0
990	26.877775	80.106643	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	17.48312035 0
991	26.875519	80.110573	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	0.361794631
992	26.882939	80.100014	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	37.39841334 0
993	26.884365	80.101154	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	1.254958814
994	26.885061	80.091760	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/ Sand Bar	9.707555662
995	26.889979	80.082976	Uttar Pradesh	Kanpur Nagar	Barren Land/ Sand Bar	1.495335121
996	26.892925	80.080210	Uttar Pradesh	Kanpur Nagar	Barren Land/ Sand Bar	18.49170636 0
997	26.906209	80.073499	Uttar Pradesh	Hardoi/Kanpur Nagar/Unnao	Vegetation/For est	336.2851442 00

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
				o		
998	26.900136	80.071627	Uttar Pradesh	Kanpur Nagar	Barren Land/ Sand Bar	12.41000355 0
999	26.911998	80.057860	Uttar Pradesh	Kanpur Nagar	Barren Land/ Sand Bar	5.803755377
1000	26.919204	80.051139	Uttar Pradesh	Hardoi/Kanpur Nagar/Unnao	Barren Land/ Sand Bar	18.20097468 0
1001	26.919405	80.053711	Uttar Pradesh	Hardoi/Unnao	Barren Land/ Sand Bar	1.943318311
1002	26.928469	80.044182	Uttar Pradesh	Hardoi/Unnao	Barren Land/ Sand Bar	96.32850941 0
1003	26.943698	80.033376	Uttar Pradesh	Hardoi	Agriculture	38.59328730 0
1004	26.954821	80.016113	Uttar Pradesh	Hardoi/Kanpur Nagar	Barren Land/ Sand Bar	77.97715804 0
1005	26.948782	80.022865	Uttar Pradesh	Hardoi/Kanpur Nagar	Barren Land/ Sand Bar	17.32909049 0
1006	26.942691	80.026515	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	5.162357544
1007	26.967002	80.019355	Uttar Pradesh	Hardoi/Kanpur Nagar	Vegetation/Forest	6.561987358
1008	26.956401	80.024345	Uttar Pradesh	Hardoi/Kanpur Nagar	Vegetation/Forest	207.6718718 00
1009	26.958449	80.032368	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	6.506445580
1010	26.969187	80.028227	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	20.87328109 0
1011	26.978424	80.026756	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	11.79060384 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1012	26.984982	80.007852	Uttar Pradesh	Hardoi/Kannauj	Barren Land/Sand Bar	47.991232320
1013	26.977217	80.005718	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	40.171563920
1014	26.972709	80.008534	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	8.975433752
1015	26.967290	80.011701	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	10.008850420
1016	26.997154	79.997622	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	0.000175151
1017	26.987174	79.999525	Uttar Pradesh	Kannauj	Vegetation/Forest	86.123393570
1018	26.998561	79.996228	Uttar Pradesh	Kannauj	Agriculture	3.469025756
1019	27.006200	79.994568	Uttar Pradesh	Hardoi/Kannauj	Barren Land/Sand Bar	52.234895050
1020	27.010515	79.987211	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	0.001928536
1021	27.017130	79.987587	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	22.456833860
1022	27.013364	79.989107	Uttar Pradesh	Hardoi/Kannauj	Barren Land/Sand Bar	5.168279918
1023	27.023994	79.988375	Uttar Pradesh	Hardoi/Kannauj	Barren Land/Sand Bar	2.722187207
1024	27.032773	79.986420	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	1.819931965
1025	27.040747	79.999222	Uttar Pradesh	Hardoi	Vegetation/Forest	0.248883659
1026	27.037227	79.997562	Uttar Pradesh	Hardoi	Vegetation/Forest	0.938392520
1027	27.046179	79.999651	Uttar Pradesh	Hardoi/Kannauj	Agriculture	1.179768853

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1028	27.033624	79.993102	Uttar Pradesh	Hardoi/Kanauj	Barren Land/Sand Bar	161.117748900
1029	27.428970	79.619039	Uttar Pradesh	Farrukhabad	Vegetation/Forest	49.483412820
1030	27.425881	79.616258	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	4.633297067
1031	27.424812	79.624081	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	1.632218458
1032	27.428380	79.625807	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.969194406
1033	27.429101	79.622376	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.547969753
1034	27.429462	79.625695	Uttar Pradesh	Farrukhabad	Agriculture	0.090485416
1035	27.429206	79.624060	Uttar Pradesh	Farrukhabad	Agriculture	0.649108338
1036	27.431009	79.618607	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.514337702
1037	27.430884	79.619589	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.082968891
1038	27.430165	79.620924	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.165298329
1039	27.420187	79.629375	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	8.964433169
1040	27.414670	79.630294	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	5.827081398
1041	27.442586	79.604364	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	3.651566891
1042	27.450272	79.610750	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.436599652
1043	27.454336	79.616430	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	11.220481700
1044	27.457501	79.618043	Uttar	Farrukhabad	Barren Land/	0.318381053

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh	d	Sand Bar	
1045	27.457820	79.619432	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.890359192
1046	27.458577	79.620951	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.559686526
1047	27.459430	79.619170	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.386979445
1048	27.463807	79.620737	Uttar Pradesh	Farrukhabad	Vegetation/Forest	15.984335840
1049	27.468529	79.621550	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	8.933555003
1050	27.477208	79.606002	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	1.155674382
1051	27.478636	79.592685	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	7.770160941
1052	27.478706	79.595663	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	1.144532859
1053	27.476784	79.590152	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	4.060811889
1054	27.476761	79.588240	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.648511828
1055	27.478219	79.588781	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.571313909
1056	27.478366	79.589495	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.105399355
1057	27.479445	79.588583	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	2.178386475
1058	27.480976	79.588278	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.964314762
1059	27.480276	79.579687	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	9.219639540
1060	27.485448	79.576215	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	2.808156800

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1061	27.486427	79.574109	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.829983875
1062	27.486574	79.572427	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	2.865357149
1063	27.486561	79.570710	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.289428595
1064	27.487273	79.569099	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.785761837
1065	27.489510	79.572530	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	2.798777999
1066	27.489385	79.571311	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.312404014
1067	27.490616	79.568466	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	3.622388737
1068	27.492833	79.569528	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	7.205995920
1069	27.493476	79.564281	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	2.792764495
1070	27.508049	79.556016	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	10.607650530
1071	27.511716	79.581379	Uttar Pradesh	Farrukhabad	Agriculture	1918.517382000
1072	27.510771	79.556717	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	1.010519162
1073	27.510213	79.553620	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	1.211149821
1074	27.511972	79.555301	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	2.168100559
1075	27.514533	79.555190	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.323293717
1076	27.532813	79.543395	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	8.754776852
1077	27.531987	79.546137	Uttar	Farrukhabad	Barren Land/	0.841253318

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh	d	Sand Bar	
1078	27.532550	79.527839	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.475240764
1079	27.539615	79.519555	Uttar Pradesh	Farrukhabad	Vegetation/Forest	0.846162947
1080	27.538671	79.520253	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.659749396
1081	27.537991	79.521131	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.782955972
1082	27.541664	79.521473	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	1.175372438
1083	27.547796	79.520350	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.011337157
1084	27.547398	79.520564	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.228494462
1085	27.549507	79.518683	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	6.504260076
1086	27.546271	79.520565	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	1.450412412
1087	27.557666	79.510327	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	24.472518790
1088	27.554731	79.512066	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.603047918
1089	27.561881	79.508292	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	1.429724919
1090	27.560130	79.501893	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.680375468
1091	27.559439	79.503133	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	1.426318040
1092	27.561128	79.495711	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.463682755
1093	27.561391	79.493870	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.081515326

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1094	27.568213	79.492640	Uttar Pradesh	Farrukhabad	Vegetation/Forest	149.288248800
1095	27.570391	79.480470	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	1.743538292
1096	27.569921	79.480803	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.290787046
1097	27.570711	79.482869	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.300009533
1098	27.576833	79.475584	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	24.785089730
1099	27.585142	79.473648	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.610043470
1100	27.586742	79.468447	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	4.911559653
1101	27.590025	79.469755	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	47.228895340
1102	27.590439	79.466568	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	1.221810806
1103	27.589442	79.474621	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.496607070
1104	27.597049	79.475500	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	1.506639184
1105	27.599714	79.474433	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	6.035010829
1106	27.598634	79.473290	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	0.585964655
1107	27.599908	79.470186	Uttar Pradesh	Farrukhabad	Vegetation/Forest	82.389486130
1108	27.607612	79.464769	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	11.469001760
1109	27.609357	79.459844	Uttar Pradesh	Farrukhabad	Vegetation/Forest	43.695333110
1110	27.610216	79.454596	Uttar	Farrukhabad	Barren Land/	2.974119906

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh	d	Sand Bar	
1111	27.607645	79.458120	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	1.454724756
1112	27.605992	79.459328	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.223237755
1113	27.605523	79.459581	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.110063486
1114	27.615114	79.453630	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	16.993209810
1115	27.615227	79.460868	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	17.383674650
1116	27.613160	79.442698	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	2.678317383
1117	27.612605	79.444783	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.448922378
1118	27.612066	79.443649	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.408964784
1119	27.611932	79.439473	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.648049275
1120	27.613099	79.437059	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.814996888
1121	27.611657	79.431465	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	6.484898381
1122	27.608418	79.424558	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	92.223529630
1123	27.608812	79.409951	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	8.031048601
1124	27.606832	79.409835	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.665076646
1125	27.605893	79.407579	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	1.808698999
1126	27.608318	79.414022	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.877522700

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1127	27.603734	79.403399	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	11.882353000
1128	27.603399	79.398562	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	3.334375464
1129	27.607211	79.387099	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.000008600
1130	27.607225	79.387098	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.000012300
1131	27.607380	79.387073	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.002822321
1132	27.606697	79.386792	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.322239772
1133	27.612827	79.373320	Uttar Pradesh	Farrukhabad	Agriculture	99.718395570
1134	27.614672	79.378733	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	17.569892150
1135	27.617609	79.375477	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.832949331
1136	27.618706	79.373049	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	1.632410775
1137	27.621044	79.357279	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	14.799213520
1138	27.624125	79.354517	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	1.777419281
1139	27.620314	79.352239	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	13.486476130
1140	27.632461	79.340440	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	13.020087110
1141	27.640668	79.345331	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	2.307874539
1142	27.650159	79.335868	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	27.534320110
1143	27.654363	79.326698	Uttar	Farrukhabad	Barren Land/	2.131680528

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh	d	Sand Bar	
1144	27.656217	79.329130	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.343552078
1145	27.655382	79.330632	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.991841167
1146	27.657011	79.332076	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	5.364599870
1147	27.655582	79.335166	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	0.422734083
1148	27.660426	79.320686	Uttar Pradesh	Budaun/Farrukhabad	Vegetation/Forest	71.359391310
1149	27.663350	79.313725	Uttar Pradesh	Budaun/Farrukhabad	Barren Land/ Sand Bar	14.411595330
1150	27.667585	79.312753	Uttar Pradesh	Budaun/Farrukhabad	Barren Land/ Sand Bar	2.973317893
1151	27.673668	79.310382	Uttar Pradesh	Budaun/Farrukhabad	Barren Land/ Sand Bar	13.650680720
1152	27.668006	79.317826	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	33.898564330
1153	27.673632	79.308048	Uttar Pradesh	Budaun/Farrukhabad	Barren Land/ Sand Bar	3.149434795
1154	27.696935	79.296027	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	47.998603380
1155	27.711442	79.276990	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	23.253997770
1156	27.712036	79.275572	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	1.061288190
1157	27.711195	79.277609	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	1.417863227
1158	27.722499	79.255004	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	8.445990182
1159	27.723217	79.239967	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	14.642736790

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1160	27.717584	79.233560	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	0.023893024
1161	27.717643	79.233610	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	0.068718969
1162	27.718742	79.236757	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	5.692190143
1163	27.717669	79.230774	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	3.840055829
1164	27.725751	79.226456	Uttar Pradesh	Budaun	Agriculture	101.4795820 00
1165	27.720376	79.224222	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	6.680733226
1166	27.729424	79.212684	Uttar Pradesh	Budaun/Ka nshiram Nagar	Vegetation/For est	1951.860649 000
1167	27.751295	79.211800	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	0.095609778
1168	27.752513	79.213172	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	6.710449722
1169	27.747844	79.215452	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	25.60894964 0
1170	27.751064	79.209560	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	7.101479090
1171	27.753508	79.206667	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	2.421335927
1172	27.765165	79.200042	Uttar Pradesh	Budaun	Agriculture	2.595695669
1173	27.760162	79.205273	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	2.061145857
1174	27.769445	79.191845	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	9.417947288
1175	27.767889	79.188036	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	1.398030279

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1176	27.777117	79.184023	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	39.18438585 0
1177	27.781130	79.180814	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	2.451994489
1178	27.782864	79.184062	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	1.781810498
1179	27.774974	79.137336	Uttar Pradesh	Budaun/Kanshiram Nagar	Agriculture	2185.592518 000
1180	27.788290	79.150793	Uttar Pradesh	Budaun/Kanshiram Nagar	Agriculture	438.3711641 00
1181	27.776551	79.160573	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	1.368133800
1182	27.772268	79.153390	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	2.849372223
1183	27.774611	79.152828	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	16.76781328 0
1184	27.773081	79.150368	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.679386053
1185	27.772104	79.151269	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.156125184
1186	27.775293	79.147736	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.882068413
1187	27.775222	79.146244	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.243410542
1188	27.774791	79.147079	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.116526470
1189	27.775783	79.145045	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.288436358
1190	27.779967	79.146977	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.700183144
1191	27.780439	79.146110	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.183209783

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1192	27.782652	79.141445	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	10.58183355 0
1193	27.782123	79.139329	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	40.29688499 0
1194	27.783806	79.133311	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	5.482214510
1195	27.786472	79.138742	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	6.768361486
1196	27.787350	79.139698	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.776861309
1197	27.793370	79.134357	Uttar Pradesh	Kanshiram Nagar	Vegetation/For est	31.44510360 0
1198	27.791408	79.128755	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	4.609797741
1199	27.793335	79.127986	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	1.056831116
1200	27.794724	79.126434	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	2.094883232
1201	27.800894	79.124406	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	84.61531775 0
1202	27.755753	79.208697	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	2.179163707
1203	27.753126	79.208526	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	0.436304443
1204	27.752169	79.206895	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	1.631705769
1205	27.799170	79.094531	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	11.34335390 0
1206	27.802165	79.100159	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.000918537
1207	27.803366	79.099659	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	5.147006753

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1208	27.804005	79.101519	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	3.905675187
1209	27.805642	79.103941	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	1.549879181
1210	27.795680	79.091518	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	7.573122713
1211	27.794080	79.086945	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	6.865973260
1212	27.798984	79.082701	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.474449050
1213	27.797811	79.085917	Uttar Pradesh	Kanshiram Nagar	Agriculture	0.679688865
1214	27.799703	79.071647	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	1.418429344
1215	27.800689	79.072476	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.563718572
1216	27.800752	79.074243	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	1.439616003
1217	27.799105	79.067944	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	1.067291733
1218	27.798502	79.068538	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.162965038
1219	27.800823	79.069539	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.240989563
1220	27.806832	79.058899	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar, Sand Mining	93.58606121 0
1221	27.800607	79.061341	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	12.76288994 0
1222	27.800008	79.057024	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	17.43708119 0
1223	27.797697	79.057665	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	1.024024526

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1224	27.803640	79.057425	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	5.702305499
1225	27.804738	79.058073	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.778617097
1226	27.813412	79.046338	Uttar Pradesh	Kanshiram Nagar	Vegetation/Forest	70.882427550
1227	27.801461	79.049081	Uttar Pradesh	Kanshiram Nagar	Agriculture	36.631839520
1228	27.814905	79.046035	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	6.909776169
1229	27.812438	79.048227	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	13.058343730
1230	27.825041	79.009363	Uttar Pradesh	Budaun/Kanshiram Nagar	Agriculture	1995.158079000
1231	27.830518	79.020615	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	3.155404060
1232	27.829166	79.020069	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	5.853225552
1233	27.844089	79.015893	Uttar Pradesh	Budaun/Kanshiram Nagar	Agriculture	571.969346700
1234	27.845219	78.996690	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	8.562919893
1235	27.843263	78.999948	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	23.464243050
1236	27.848665	78.993477	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	8.524303259
1237	27.846058	78.993401	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	1.292508770
1238	27.848506	78.979995	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	2.421724087
1239	27.848644	78.977434	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	10.292144280

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1240	27.831700	78.967238	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	17.68186718 0
1241	27.846126	78.959728	Uttar Pradesh	Budaun/Kanshiram Nagar	Vegetation/Forest	195.4412782 00
1242	27.835308	78.956258	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	11.14426013 0
1243	27.831191	78.962121	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	1.287093452
1244	27.834942	78.962258	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	38.48571771 0
1245	27.843277	78.948117	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.064896221
1246	27.846528	78.947581	Uttar Pradesh	Budaun/Kanshiram Nagar	Barren Land/ Sand Bar	34.24742292 0
1247	27.847096	78.940923	Uttar Pradesh	Budaun/Kanshiram Nagar	Vegetation/Forest	85.23639063 0
1248	27.852978	78.943706	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	2.836251154
1249	27.849232	78.932646	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	0.006823619
1250	27.880426	78.901770	Uttar Pradesh	Budaun/Kanshiram Nagar	Vegetation/Forest	744.6199516 00
1251	27.849477	78.932898	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	0.021207815
1252	27.873203	78.914827	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	2.932746845
1253	27.882653	78.909803	Uttar Pradesh	Budaun/Kanshiram Nagar	Agriculture	258.6840101 00
1254	27.921980	78.866318	Uttar	Budaun	Vegetation/For	166.8679992

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		est	00
1255	27.911214	78.898265	Uttar Pradesh	Budaun/Ka nshiram Nagar	Agriculture	462.5337802 00
1256	27.954644	78.841023	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	0.061619483
1257	27.953357	78.843761	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	2.660285321
1258	27.956375	78.842798	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	17.02427403 0
1259	27.949192	78.843812	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	40.34733917 0
1260	27.941064	78.845728	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	23.09268499 0
1261	27.937684	78.844982	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	3.144493633
1262	27.936294	78.848998	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	8.154384128
1263	27.938446	78.852017	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	22.40604941 0
1264	27.936271	78.856317	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	4.635176181
1265	27.962221	78.835056	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	14.26991090 0
1266	27.971008	78.819637	Uttar Pradesh	Budaun	Agriculture	270.8332729 00
1267	27.968172	78.782569	Uttar Pradesh	Budaun	Vegetation/For est	953.9701342 00
1268	27.955647	78.815629	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	0.471449375
1269	27.957805	78.818853	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	12.64189440 0
1270	27.954981	78.815006	Uttar	Budaun	Barren Land/	3.180333474

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
1271	27.963501	78.813834	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	30.23751537 0
1272	27.963914	78.815574	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	2.038805571
1273	27.966900	78.812006	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	3.891822145
1274	27.956080	78.805048	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	10.18283382 0
1275	27.956777	78.797876	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	0.000275146
1276	27.958146	78.795124	Uttar Pradesh	Budaun	Vegetation/For est	45.29145350 0
1277	27.959201	78.779725	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	2.504249198
1278	27.962078	78.767640	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	5.345289522
1279	27.961935	78.763016	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	1.094736647
1280	27.960642	78.757062	Uttar Pradesh	Budaun	Vegetation/For est	2.855924238
1281	27.967162	78.745725	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	0.151118431
1282	27.963985	78.749491	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	7.798725905
1283	27.970545	78.739737	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	3.165128783
1284	27.974002	78.739507	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	5.702517690
1285	27.979011	78.734675	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	4.193355124
1286	27.982097	78.732186	Uttar Pradesh	Budaun	Barren Land/ Sand Bar	7.675292647

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1287	27.977580	78.744979	Uttar Pradesh	Budaun	Vegetation/Forest	195.421675200
1288	27.980682	78.755442	Uttar Pradesh	Budaun	Barren Land/Sand Bar	6.878105938
1289	27.989365	78.721654	Uttar Pradesh	Budaun	Vegetation/Forest	440.172468200
1290	28.001928	78.698730	Uttar Pradesh	Budaun	Barren Land/Sand Bar	37.303115910
1291	27.994951	78.736033	Uttar Pradesh	Budaun	Barren Land/Sand Bar	24.559420940
1292	27.983879	78.702629	Uttar Pradesh	Kanshiram Nagar	Barren Land/Sand Bar	5.960863875
1293	28.008095	78.686384	Uttar Pradesh	Budaun/Kanshiram Nagar	Barren Land/Sand Bar	50.394288700
1294	28.009932	78.679143	Uttar Pradesh	Budaun/Kanshiram Nagar	Barren Land/Sand Bar	3.067118757
1295	28.011543	78.693419	Uttar Pradesh	Budaun	Barren Land/Sand Bar	3.476777523
1296	28.003880	78.673810	Uttar Pradesh	Kanshiram Nagar	Barren Land/Sand Bar	5.894236282
1297	28.000941	78.664648	Uttar Pradesh	Kanshiram Nagar	Barren Land/Sand Bar	12.608056980
1298	28.000905	78.672740	Uttar Pradesh	Kanshiram Nagar	Barren Land/Sand Bar	2.530656076
1299	28.005846	78.689070	Uttar Pradesh	Budaun	Barren Land/Sand Bar	3.088738040
1300	28.002826	78.679766	Uttar Pradesh	Budaun/Kanshiram Nagar	Barren Land/Sand Bar	0.878423959
1301	28.000325	78.657558	Uttar Pradesh	Kanshiram Nagar	Barren Land/Sand Bar	8.903473338

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1302	28.019840	78.623708	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	10.61962848 0
1303	28.015430	78.629721	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	6.683301360
1304	28.024358	78.619720	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	4.320833681
1305	28.028758	78.616620	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	0.001634885
1306	28.030515	78.614397	Uttar Pradesh	Aligarh/Kanshiram Nagar	Barren Land/ Sand Bar	2.966064950
1307	28.033327	78.614846	Uttar Pradesh	Aligarh/Kanshiram Nagar	Vegetation/Forest	34.69253286 0
1308	28.031100	78.610351	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	4.002110812
1309	28.035648	78.596426	Uttar Pradesh	Aligarh	Vegetation/Forest	221.8236719 00
1310	28.040917	78.591145	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	5.296671644
1311	28.038881	78.588192	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	0.011877842
1312	28.038391	78.588978	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	2.406148565
1313	28.037038	78.587048	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	3.371069377
1314	28.041685	78.584240	Uttar Pradesh	Aligarh	Vegetation/Forest	113.3571791 00
1315	28.041644	78.561039	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	30.93957370 0
1316	28.038022	78.570302	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	2.563025001
1317	28.041088	78.571191	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	10.47114052 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1318	28.049734	78.552465	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	39.73968117 0
1319	28.058377	78.530435	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	36.31916579 0
1320	28.053015	78.537954	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	17.16321414 0
1321	28.073683	78.512882	Uttar Pradesh	Aligarh/Sambhal	Vegetation/Forest	230.3502196 00
1322	28.082952	78.505056	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	10.60756973 0
1323	28.069606	78.520411	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	25.50386030 0
1324	28.083437	78.515154	Uttar Pradesh	Aligarh/Sambhal	Barren Land/ Sand Bar	1.752234195
1325	28.093638	78.502614	Uttar Pradesh	Aligarh/Sambhal	Barren Land/ Sand Bar	34.13733542 0
1326	28.091317	78.502228	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	4.044100607
1327	28.097494	78.494006	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	12.12381450 0
1328	28.115072	78.481319	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	43.11397503 0
1329	28.109920	78.476699	Uttar Pradesh	Aligarh/Bulandshahr	Barren Land/ Sand Bar	155.9329379 00
1330	28.102301	78.482627	Uttar Pradesh	Aligarh/Bulandshahr	Barren Land/ Sand Bar	27.36576778 0
1331	28.111788	78.469796	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	4.452172959
1332	28.105048	78.488817	Uttar Pradesh	Aligarh	Barren Land/ Sand Bar	3.166253110
1333	28.124406	78.463409	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	36.65622420 0
1334	28.120095	78.471668	Uttar	Bulandshahr	Barren Land/	4.922928523

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh	r	Sand Bar	
1335	28.128191	78.462448	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	9.453520362
1336	28.130541	78.450748	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	83.531515710
1337	28.145525	78.444445	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar, Sand Mining	127.920019300
1338	28.161401	78.427185	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	158.658556700
1339	28.162424	78.423518	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	4.084195147
1340	28.170432	78.413416	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	2.179325355
1341	28.174242	78.411310	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	7.380269660
1342	28.173195	78.418127	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	2.344156866
1343	28.171496	78.420675	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	1.378405806
1344	28.210730	78.390320	Uttar Pradesh	Bulandshah r	Vegetation/Forest	145.305531200
1345	28.227035	78.376329	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	16.202529000
1346	28.235125	78.368721	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	21.106318560
1347	28.246735	78.363173	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	61.496407500
1348	28.257539	78.350449	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	13.730353890
1349	28.261766	78.341410	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	47.425062250

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1350	28.284316	78.324442	Uttar Pradesh	Bulandshahr/Sambhal	Agriculture	354.845769300
1351	28.270470	78.327579	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	1.963457107
1352	28.291381	78.309122	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	2.123571600
1353	28.296438	78.308831	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	18.159497630
1354	28.303701	78.299691	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	91.457092720
1355	28.320076	78.289644	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	37.668963940
1356	28.329426	78.279824	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	9.197771819
1357	28.335385	78.275058	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	11.484451640
1358	28.337064	78.278432	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	7.442261726
1359	28.353661	78.273388	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	3.371320593
1360	28.355659	78.277254	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	1.402685656
1361	28.366238	78.276336	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	21.377479190
1362	28.369313	78.273660	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	1.355778942
1363	28.360058	78.274049	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	48.343492410
1364	28.373535	78.274257	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	2.421360325
1365	28.371861	78.275921	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	2.458318296
1366	28.374877	78.276161	Uttar	Bulandshahr	Barren Land/	0.143535242

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh	r	Sand Bar	
1367	28.377820	78.275987	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	7.288303697
1368	28.379801	78.274522	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	0.633577250
1369	28.380068	78.276233	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	0.836840785
1370	28.387094	78.278408	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	36.347605350
1371	28.384924	78.278691	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	3.410585388
1372	28.393141	78.279735	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	10.389125630
1373	28.395741	78.283657	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	1.126291089
1374	28.391991	78.284419	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	1.322395239
1375	28.393418	78.283820	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	1.937766427
1376	28.395314	78.282749	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	0.357817448
1377	28.399131	78.284870	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	0.904238295
1378	28.403964	78.291265	Uttar Pradesh	Bulandshahr/Sambhal	Barren Land/ Sand Bar	67.397570900
1379	28.394529	78.286685	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	2.000747187
1380	28.399896	78.291057	Uttar Pradesh	Bulandshahr/Sambhal	Barren Land/ Sand Bar	2.165917199
1381	28.398329	78.290322	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	0.517954280
1382	28.404476	78.295777	Uttar Pradesh	Sambhal	Barren Land/ Sand Bar	3.559276066

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1383	28.407707	78.298012	Uttar Pradesh	Sambhal	Barren Land/ Sand Bar	1.990354074
1384	28.407683	78.290387	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	7.531398717
1385	28.409677	78.290069	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	5.315199199
1386	28.413204	78.289347	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	3.755535508
1387	28.418020	78.296507	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	0.001638016
1388	28.418679	78.296891	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	1.514074725
1389	28.414656	78.294287	Uttar Pradesh	Bulandshahr/Sambhal	Barren Land/ Sand Bar	26.422992520
1390	28.417517	78.298015	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	0.587597665
1391	28.417236	78.300018	Uttar Pradesh	Bulandshahr/Sambhal	Barren Land/ Sand Bar	39.021525560
1392	28.417351	78.303135	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	1.396762372
1393	28.423572	78.300100	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	0.450970600
1394	28.423052	78.303562	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	1.157990797
1395	28.427919	78.299414	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	3.449751187
1396	28.427385	78.301825	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	5.782083082
1397	28.430952	78.296476	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	6.847776357
1398	28.431184	78.294692	Uttar Pradesh	Bulandshahr	Barren Land/ Sand Bar	1.019969775
1399	28.436782	78.298239	Uttar	Bulandshahr	Vegetation/For	86.26073807

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh	r	est	0
1400	28.438445	78.291743	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	0.979485216
1401	28.439855	78.292276	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	0.420234528
1402	28.443404	78.292857	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	18.693047980
1403	28.447481	78.288892	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	0.618087996
1404	28.446166	78.290044	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	3.124562421
1405	28.464955	78.272593	Uttar Pradesh	Bulandshahr	Vegetation/Forest	208.681026900
1406	28.455426	78.271823	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	32.010641850
1407	28.459376	78.266684	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	1.068544128
1408	28.469686	78.260927	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	2.008371576
1409	28.473006	78.261061	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	2.202451222
1410	28.488208	78.253932	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	38.974048850
1411	28.487548	78.245286	Uttar Pradesh	Bulandshahr/Jyotiba Phule Nagar(Amroha)	Vegetation/Forest	218.571434500
1412	28.501070	78.242649	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.744130507

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1413	28.499975	78.236916	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	4.117658515
1414	28.499091	78.230876	Uttar Pradesh	Bulandshahr/Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	3.274998113
1415	28.497550	78.227077	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	1.177609365
1416	28.501601	78.218631	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	67.292971500
1417	28.544436	78.211279	Uttar Pradesh	Bulandshahr	Vegetation/Forest	148.124742500
1418	28.563168	78.210791	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	11.694243390
1419	28.584480	78.204238	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	28.585949890
1420	28.580894	78.209510	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	3.122602923
1421	28.596049	78.200446	Uttar Pradesh	Bulandshahr	Vegetation/Forest	118.655046600
1422	28.601832	78.191088	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	3.297378116
1423	28.610267	78.191841	Uttar Pradesh	Bulandshahr/Hapur	Barren Land/Sand Bar	16.570282600
1424	28.632209	78.189403	Uttar Pradesh	Hapur	Barren Land/Sand Bar	100.914452800
1425	28.637732	78.194545	Uttar Pradesh	Hapur	Barren Land/Sand Bar	1.818378622
1426	28.639385	78.192618	Uttar Pradesh	Hapur	Barren Land/Sand Bar	21.171871950
1427	28.654966	78.192234	Uttar	Hapur	Barren Land/	3.215332314

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
1428	28.652806	78.196866	Uttar Pradesh	Hapur/Jyotiba Phule Nagar(Amroha)	Vegetation/Forest	160.772282300
1429	28.664536	78.194447	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.000033600
1430	28.664906	78.195576	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.613185006
1431	28.668932	78.195332	Uttar Pradesh	Hapur/Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	10.167077170
1432	28.678115	78.193342	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	83.848058030
1433	28.685739	78.196332	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	21.808747270
1434	28.688309	78.191209	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	7.609222409
1435	28.693032	78.193120	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	17.904517260
1436	28.692857	78.187684	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.721831104

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1437	28.690550	78.189056	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	2.941286638
1438	28.691439	78.197077	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	10.661595440
1439	28.706208	78.191572	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	79.634702840
1440	28.716108	78.188915	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	9.822386411
1441	28.722953	78.167175	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Agriculture	1090.762495000
1442	28.745667	78.172590	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Agriculture	289.173340900
1443	28.740847	78.164667	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	32.573202770
1444	28.747823	78.158892	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	3.639636205
1445	28.739052	78.174416	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	3.179364821

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1446	28.753087	78.154856	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	1.371347757
1447	28.755009	78.152789	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Vegetation/Forest	1.447945255
1448	28.763371	78.144588	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	5.575419306
1449	28.768399	78.142186	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	7.134173624
1450	28.771082	78.140659	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	2.811932781
1451	28.769280	78.143125	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	3.773762203
1452	28.769650	78.136992	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.642143114
1453	28.773040	78.138470	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.822896012
1454	28.774662	78.138126	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.418733893

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1455	28.778323	78.142175	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Vegetation/Forest	21.903309900
1456	28.778153	78.138101	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	7.748929521
1457	28.783320	78.136458	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	9.390957142
1458	28.788724	78.136132	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	16.065307260
1459	28.791732	78.134717	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	26.222302890
1460	28.794528	78.139691	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	10.815418330
1461	28.791118	78.138695	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.318204776
1462	28.802375	78.144779	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	4.025583003
1463	28.800281	78.144555	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	2.407924254

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1464	28.806647	78.146710	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	2.866962184
1465	28.809740	78.147622	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.618053357
1466	28.812229	78.150713	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.026453364
1467	28.828319	78.152849	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.034690526
1468	28.814500	78.151302	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	3.120667351
1469	28.818858	78.149363	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	69.947826310
1470	28.828392	78.157418	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	11.819758170
1471	28.820578	78.154323	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	14.855193500
1472	28.836346	78.155877	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	46.813906920

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1473	28.837530	78.158368	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	6.949338005
1474	28.845214	78.155258	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	9.121471394
1475	28.826846	78.149256	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	3.042487594
1476	28.824808	78.148046	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	1.772996995
1477	28.850018	78.153489	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	1.420834409
1478	28.867168	78.135566	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	11.037281810
1479	28.865414	78.139100	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	3.128888567
1480	28.864601	78.141993	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	2.221013177
1481	28.862680	78.132293	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	2.560114632

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1482	28.864706	78.132122	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	7.218000377
1483	28.889726	78.108483	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	17.269391370
1484	28.882506	78.104956	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	35.572170410
1485	28.878823	78.100449	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	6.633888887
1486	28.875421	78.105239	Uttar Pradesh	Meerut/Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	19.241079760
1487	28.875934	78.102931	Uttar Pradesh	Meerut/Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	1.995541639
1488	28.877418	78.101676	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.174630826
1489	28.889613	78.114883	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Vegetation/Forest	26.028890110
1490	28.875136	78.124342	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	20.920001600

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1491	28.875663	78.118749	Uttar Pradesh	Meerut/Jyotiba Phule Nagar(Amroha)	Vegetation/Forest	320.235443200
1492	28.900191	78.107179	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	5.085757793
1493	28.898921	78.110651	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	5.460967384
1494	28.906703	78.110687	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	40.264391460
1495	28.910098	78.123150	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	6.163750721
1496	28.910958	78.125433	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	1.080614051
1497	28.910693	78.105747	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	9.027222697
1498	28.916310	78.101824	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	2.573560720
1499	28.913536	78.102436	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.955355648

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1500	28.914094	78.103788	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/ Sand Bar	0.640880642
1501	28.911829	78.103159	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/ Sand Bar	0.898793577
1502	28.919618	78.111658	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/ Sand Bar	302.489884800
1503	28.919276	78.103353	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/ Sand Bar	0.767212138
1504	28.924108	78.102941	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/ Sand Bar	4.493585432
1505	28.929167	78.102359	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/ Sand Bar	0.849095493
1506	28.927626	78.102108	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/ Sand Bar	0.448754834
1507	28.935082	78.100768	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/ Sand Bar	7.341503071
1508	28.949195	78.095058	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/ Sand Bar	10.880907250

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1509	28.942377	78.097264	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	10.771700380
1510	28.945057	78.094899	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	1.454191400
1511	28.944023	78.093974	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.727186292
1512	28.949469	78.091966	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.786616494
1513	28.948528	78.091585	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	0.639729761
1514	28.969050	78.076102	Uttar Pradesh	Meerut	Barren Land/Sand Bar	4.003516087
1515	28.958387	78.085418	Uttar Pradesh	Meerut/Jyotiba Phule Nagar(Amroha)	Barren Land/Sand Bar	82.671305420
1516	28.973704	78.067659	Uttar Pradesh	Meerut	Barren Land/Sand Bar	49.243394730
1517	28.982097	78.061235	Uttar Pradesh	Meerut	Barren Land/Sand Bar	27.966560850
1518	28.985632	78.056478	Uttar Pradesh	Meerut	Barren Land/Sand Bar	0.815557647
1519	28.984501	78.059671	Uttar Pradesh	Meerut	Barren Land/Sand Bar	1.215391820
1520	28.984285	78.061897	Uttar Pradesh	Meerut	Barren Land/Sand Bar	1.636408968

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1521	28.985449	78.060773	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.993913562
1522	28.980086	78.067571	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	2.306396894
1523	28.979229	78.062549	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.183138899
1524	28.992825	78.047598	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	3.566032768
1525	28.997304	78.046078	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.559410361
1526	29.010623	78.052955	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.057882793
1527	29.005885	78.051264	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	20.34543402 0
1528	29.012558	78.063254	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	63.40891393 0
1529	29.015926	78.068745	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	8.066557787
1530	29.016656	78.070242	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.042255142
1531	29.016449	78.073681	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.998365702
1532	29.017357	78.061139	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.473731131
1533	29.022639	78.086855	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	11.46384058 0
1534	29.031521	78.085525	Uttar Pradesh	Meerut/Jyot iba Phule Nagar(Amro ha)	Vegetation/For est	309.7577930 00
1535	29.041538	78.095923	Uttar Pradesh	Meerut/Jyot iba Phule Nagar(Amro ha)	Barren Land/ Sand Bar	3.519326352

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1536	29.049942	78.086376	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	39.49626947 0
1537	29.055406	78.085511	Uttar Pradesh	Meerut/Jyot iba Phule Nagar(Amro ha)	Barren Land/ Sand Bar	33.46811012 0
1538	29.056229	78.070458	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	2.094253269
1539	29.059806	78.070107	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	11.15382645 0
1540	29.073054	78.072946	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	8.562820426
1541	29.069644	78.072749	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	2.732051068
1542	29.077366	78.074485	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	8.013576696
1543	29.081389	78.068445	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	8.430738877
1544	29.085121	78.069377	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	47.46786415 0
1545	29.096828	78.064574	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	85.82005160 0
1546	29.107447	78.061786	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.970185464
1547	29.105826	78.063763	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	4.280070654
1548	29.105266	78.067415	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	8.757698871
1549	29.123735	78.061211	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	21.78159461 0
1550	29.129834	78.062075	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	5.632687322
1551	29.129512	78.059140	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	13.94505839 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1552	29.613687	78.061852	Uttar Pradesh	Bijnor/Hari dwar	Barren Land/ Sand Bar	87.45885546 0
1553	29.619821	78.067505	Uttar Pradesh	Bijnor/Hari dwar	Barren Land/ Sand Bar	5.832861551
1554	29.605555	78.059204	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	11.01927239 0
1555	29.599701	78.066922	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	5.048931903
1556	29.602599	78.062570	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.663359965
1557	29.600281	78.064735	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.969558368
1558	29.593480	78.069220	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.618796133
1559	29.589614	78.068385	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	4.938871925
1560	29.586221	78.068445	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	6.554306282
1561	29.586579	78.070456	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.281446301
1562	29.585194	78.070017	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.249139146
1563	29.583888	78.069342	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.231247760
1564	29.585750	78.067596	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.366906779
1565	29.583348	78.062395	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.777866224
1566	29.582906	78.064444	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	11.27333116 0
1567	29.581720	78.066417	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	5.941817042
1568	29.574883	78.064877	Uttar	Bijnor	Barren Land/	58.34177054

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	0
1569	29.573010	78.059695	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	3.594577658
1570	29.570191	78.061179	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	4.740509270
1571	29.568968	78.059750	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.574142796
1572	29.567410	78.059989	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.853835670
1573	29.567095	78.061277	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.300109293
1574	29.565816	78.062628	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.015327792
1575	29.565879	78.061664	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.324819101
1576	29.562737	78.056189	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	96.63424400 0
1577	29.547344	78.056812	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	158.6435773 00
1578	29.540138	78.051322	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	6.168188416
1579	29.543470	78.049963	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	3.654906123
1580	29.547727	78.047452	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.794914372
1581	29.553491	78.050661	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	5.365253455
1582	29.537793	78.051340	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.388426005
1583	29.526954	78.060427	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	25.56221835 0
1584	29.520687	78.061994	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.600107029

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1585	29.512130	78.058620	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.511382046
1586	29.510311	78.058947	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	7.741778599
1587	29.507799	78.059604	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	3.204266928
1588	29.504259	78.057453	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	7.131623653
1589	29.506556	78.056505	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.168702932
1590	29.500548	78.057296	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.969513680
1591	29.500362	78.055152	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.411458852
1592	29.499491	78.054493	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.520284908
1593	29.489989	78.058768	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	66.06105252 0
1594	29.482425	78.056647	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.940905519
1595	29.476180	78.055600	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	22.05372960 0
1596	29.479145	78.054038	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	9.002762485
1597	29.475471	78.052126	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	3.299440897
1598	29.473963	78.049430	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.037073005
1599	29.472359	78.049088	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.940007594
1600	29.471991	78.047841	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.260349255
1601	29.467568	78.049665	Uttar	Bijnor	Barren Land/	29.16542522

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	0
1602	29.465798	78.047442	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.961226266
1603	29.464632	78.052534	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.187593263
1604	29.460279	78.051990	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	15.63818594 0
1605	29.460745	78.050151	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.760405669
1606	29.458643	78.054822	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.711759328
1607	29.456132	78.055029	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.483962962
1608	29.451288	78.054536	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.177741078
1609	29.450190	78.053582	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	21.11628289 0
1610	29.449873	78.056962	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.690419050
1611	29.448841	78.057790	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.669963980
1612	29.447731	78.056848	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.180019128
1613	29.450099	78.054529	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.307508931
1614	29.443155	78.055560	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	0.274006842
1615	29.440521	78.055430	Uttar Pradesh	Bijnor/Muza ffarnagar	Barren Land/ Sand Bar	3.466732971
1616	29.440364	78.054293	Uttar Pradesh	Muzaffarnag ar	Barren Land/ Sand Bar	0.300777710
1617	29.441656	78.054668	Uttar Pradesh	Bijnor/Muza ffarnagar	Barren Land/ Sand Bar	0.630788227

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1618	29.436270	78.050208	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.261115079
1619	29.436615	78.050466	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.148935825
1620	29.436859	78.050092	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.024750963
1621	29.433107	78.047334	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	2.399117627
1622	29.427335	78.044844	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.977656181
1623	29.420157	78.046778	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	7.467083559
1624	29.421564	78.044051	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.523172139
1625	29.420916	78.045023	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.602065108
1626	29.418243	78.047089	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.092333318
1627	29.422809	78.048663	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.005304369
1628	29.421601	78.048476	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.829494175
1629	29.415927	78.051885	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.139365907
1630	29.412289	78.053237	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.759838818
1631	29.404328	78.052553	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	9.590259177
1632	29.406953	78.053616	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	2.921319626
1633	29.398675	78.052115	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.579179653

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1634	29.394078	78.052387	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	10.564942230
1635	29.387560	78.052868	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	0.943724644
1636	29.385688	78.052375	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	0.396160798
1637	29.384097	78.051605	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	0.210496508
1638	29.381970	78.047359	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	0.994988579
1639	29.380395	78.047079	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	0.493790070
1640	29.381439	78.043186	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	3.229495635
1641	29.377104	78.035980	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	1.929557246
1642	29.377513	78.038715	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	7.126095533
1643	29.377446	78.039806	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	4.129892465
1644	29.375266	78.035790	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	3.262101818
1645	29.372422	78.039192	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	1.166604057
1646	29.373251	78.035789	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	1.664369197
1647	29.371371	78.036069	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	2.344268623
1648	29.369860	78.037488	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	7.694274831
1649	29.362797	78.040709	Uttar Pradesh	Muzaffarnagar	Vegetation/Forest	72.240995100

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1650	29.367415	78.034763	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.584655865
1651	29.365214	78.034078	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	3.145905634
1652	29.362729	78.034061	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.000995014
1653	29.363095	78.033813	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.219257716
1654	29.362260	78.034035	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.289942661
1655	29.361212	78.034584	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.995734626
1656	29.359426	78.035648	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	7.431151997
1657	29.358201	78.034320	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.425069161
1658	29.354250	78.039466	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	8.431121697
1659	29.356097	78.039504	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	2.983925883
1660	29.357025	78.038214	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.068566517
1661	29.357289	78.037435	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.460696918
1662	29.357588	78.035439	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.607065110
1663	29.362903	78.035170	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.036184736
1664	29.354754	78.044965	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.384286406
1665	29.356418	78.047986	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	4.736638881

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1666	29.353459	78.048784	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.614126905
1667	29.356582	78.046963	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.518099498
1668	29.356116	78.046410	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.269997948
1669	29.364081	78.044135	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	10.388952500
1670	29.349965	78.053525	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	7.755236175
1671	29.348127	78.056826	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.178868444
1672	29.346599	78.056754	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.555571834
1673	29.347188	78.057818	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.427999570
1674	29.347675	78.061365	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.170877360
1675	29.343672	78.069087	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.284354366
1676	29.341768	78.070599	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	3.943902747
1677	29.341059	78.072733	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	2.388378424
1678	29.340278	78.072128	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	2.419165647
1679	29.336972	78.076628	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	29.717135170
1680	29.337563	78.082290	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	4.277356782
1681	29.338558	78.083013	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.324831419

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1682	29.336984	78.084090	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	1.471503582
1683	29.333803	78.083260	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	1.587081777
1684	29.333841	78.085655	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	4.600935939
1685	29.336269	78.085572	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	0.711009071
1686	29.328859	78.090463	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	3.070274099
1687	29.328553	78.089182	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	0.435313398
1688	29.325038	78.091697	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	4.904401984
1689	29.322824	78.093707	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	0.378448158
1690	29.316168	78.096032	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	36.045642560
1691	29.317886	78.093472	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	4.434448501
1692	29.318600	78.097648	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	3.438199956
1693	29.316010	78.099034	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	2.766596485
1694	29.283025	78.094006	Uttar Pradesh	Muzaffarnagar	Agriculture	0.000630699
1695	29.295873	78.098895	Uttar Pradesh	Bijnor/Muzaffarnagar	Vegetation/Forest	269.958647000
1696	29.310169	78.094236	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	0.006215178
1697	29.308274	78.095913	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	18.995850850

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1698	29.308121	78.093309	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.581347383
1699	29.312462	78.103089	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	5.303727893
1700	29.305363	78.104387	Uttar Pradesh	Bijnor/Muzaffarnagar	Barren Land/ Sand Bar	4.178029393
1701	29.308074	78.104861	Uttar Pradesh	Bijnor/Muzaffarnagar	Barren Land/ Sand Bar	1.515448721
1702	29.308224	78.102889	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.513182731
1703	29.300213	78.105478	Uttar Pradesh	Bijnor/Muzaffarnagar	Barren Land/ Sand Bar	3.087656047
1704	29.297424	78.094086	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	4.516513185
1705	29.299702	78.092962	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.740505456
1706	29.301362	78.093493	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.885009426
1707	29.303432	78.093067	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.765798767
1708	29.296434	78.093006	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.239121983
1709	29.294740	78.093487	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	2.214613744
1710	29.293065	78.092913	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.794955913
1711	29.287110	78.093291	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	3.833763683
1712	29.282883	78.092665	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	3.971470592
1713	29.276855	78.093281	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	6.800775094

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1714	29.274957	78.094771	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.955561504
1715	29.282941	78.098977	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.868290426
1716	29.281600	78.098372	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.363069661
1717	29.288395	78.103927	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	4.451770028
1718	29.294854	78.106723	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	2.776501399
1719	29.292460	78.105749	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	5.077236692
1720	29.296350	78.106016	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.864370230
1721	29.274504	78.097506	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.472833128
1722	29.273446	78.095865	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.759567197
1723	29.266514	78.097268	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	1.329159360
1724	29.263944	78.098578	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	2.969522235
1725	29.261429	78.098288	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	2.641493602
1726	29.258683	78.099279	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	2.739988099
1727	29.242548	78.096998	Uttar Pradesh	Meerut/Muzaffarnagar	Agriculture	376.663179100
1728	29.254122	78.102955	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.804875840
1729	29.256881	78.100726	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	0.747930571

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1730	29.251772	78.105287	Uttar Pradesh	Meerut/Muzaffarnagar	Barren Land/Sand Bar	1.726745551
1731	29.245017	78.106328	Uttar Pradesh	Meerut	Barren Land/Sand Bar	2.447171328
1732	29.238473	78.104025	Uttar Pradesh	Meerut	Barren Land/Sand Bar	0.141936878
1733	29.236609	78.104280	Uttar Pradesh	Meerut	Barren Land/Sand Bar	7.987962181
1734	29.230503	78.102479	Uttar Pradesh	Meerut	Barren Land/Sand Bar	0.962039428
1735	29.225345	78.091286	Uttar Pradesh	Meerut	Barren Land/Sand Bar	15.091557740
1736	29.221463	78.089115	Uttar Pradesh	Meerut	Barren Land/Sand Bar	1.774382001
1737	29.219488	78.088493	Uttar Pradesh	Meerut	Barren Land/Sand Bar	0.230541507
1738	29.219311	78.089935	Uttar Pradesh	Meerut	Barren Land/Sand Bar	0.404030092
1739	29.217861	78.090100	Uttar Pradesh	Meerut	Barren Land/Sand Bar	2.637586131
1740	29.216801	78.090769	Uttar Pradesh	Meerut	Barren Land/Sand Bar	0.689631658
1741	29.214559	78.090949	Uttar Pradesh	Meerut	Barren Land/Sand Bar	0.573490042
1742	29.213239	78.091895	Uttar Pradesh	Meerut	Barren Land/Sand Bar	1.526816664
1743	29.209121	78.094082	Uttar Pradesh	Meerut	Barren Land/Sand Bar	0.554581392
1744	29.206868	78.096994	Uttar Pradesh	Meerut	Barren Land/Sand Bar	0.821299261
1745	29.205729	78.098404	Uttar Pradesh	Meerut	Barren Land/Sand Bar	0.653679690
1746	29.206043	78.099954	Uttar	Meerut	Barren Land/	1.406722883

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
1747	29.205127	78.097572	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.001999245
1748	29.204166	78.099186	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	2.766841891
1749	29.200337	78.102003	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	11.29399045 0
1750	29.194714	78.104109	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	31.07674494 0
1751	29.195411	78.106858	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.785045408
1752	29.194125	78.108673	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.349971863
1753	29.196522	78.105354	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.198191712
1754	29.190341	78.110701	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.281853311
1755	29.187967	78.110061	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.917119889
1756	29.177826	78.105695	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	15.07181886 0
1757	29.175671	78.106547	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.888924869
1758	29.169298	78.100077	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.435837087
1759	29.166390	78.098571	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	3.194733427
1760	29.162647	78.096236	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.626113987
1761	29.163425	78.096101	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.200534894
1762	29.160628	78.094902	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.873348663

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1763	29.160745	78.090014	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	5.480936183
1764	29.161077	78.091937	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	2.253011597
1765	29.158251	78.092524	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	2.819280017
1766	29.156198	78.083940	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.011601589
1767	29.150371	78.076229	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	77.18729888 0
1768	29.154484	78.089185	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	2.969862770
1769	29.157453	78.089953	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	2.274171175
1770	29.150046	78.081111	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.625943668
1771	29.151782	78.079396	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.362851365
1772	29.147448	78.071939	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	2.145322629
1773	29.145449	78.067996	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.324840741
1774	29.145948	78.069250	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.084307817
1775	29.146082	78.071015	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.303571926
1776	29.138937	78.062988	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.429288646
1777	29.130429	78.055797	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	1.473510765
1778	29.124222	78.058067	Uttar Pradesh	Meerut	Barren Land/ Sand Bar	0.598798123
1779	29.122464	78.058223	Uttar	Meerut	Barren Land/	0.291142111

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
1780	28.511077	78.212784	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	34.408461650
1781	28.506826	78.210568	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	6.480709383
1782	28.510308	78.209307	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	5.670066810
1783	28.515186	78.207470	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	18.077255390
1784	28.518144	78.211964	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	0.020876286
1785	28.521506	78.209745	Uttar Pradesh	Bulandshahr	Barren Land/Sand Bar	36.007469760
1786	24.384729	88.143473	West Bengal	Murshidabad	Barren Land/Sand Bar	3.892280417
1787	24.385483	88.144944	West Bengal	Murshidabad	Barren Land/Sand Bar	0.483019037
1788	24.358400	88.172820	West Bengal	Murshidabad	Vegetation/Forest	24.010744320
1789	24.340720	88.220596	West Bengal	Murshidabad	Barren Land/Sand Bar	2.086812801
1790	24.328858	88.223441	West Bengal	Murshidabad	Barren Land/Sand Bar	1.240544131
1791	25.558583	81.648159	Uttar Pradesh	Allahabad(Prayagraj)/Kausambi	Barren Land/Sand Bar	4.979170857
1792	25.581577	81.645818	Uttar Pradesh	Allahabad(Prayagraj)	Barren Land/Sand Bar	0.417221535
1793	25.586794	81.639808	Uttar Pradesh	Allahabad(Prayagraj)	Barren Land/Sand Bar	55.599692160
1794	25.592777	81.630945	Uttar Pradesh	Allahabad(Prayagraj)	Barren Land/Sand Bar	16.395823990

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1795	25.591328	81.612737	Uttar Pradesh	Allahabad(P rayagraj)/Pr atapgarh	Vegetation/For est	105.3407253 00
1796	25.592933	81.603367	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	19.72954774 0
1797	25.576809	81.558799	Uttar Pradesh	Kaushambi/ Pratapgarh	Vegetation/For est	165.1288424 00
1798	25.572532	81.551212	Uttar Pradesh	Kaushambi	Barren Land/ Sand Bar	5.918330845
1799	25.572340	81.569339	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	5.355920600
1800	25.570650	81.564296	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	3.008194821
1801	25.586845	81.555193	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	20.37424575 0
1802	25.586429	81.546735	Uttar Pradesh	Kaushambi/ Pratapgarh	Barren Land/ Sand Bar	5.436399650
1803	25.585001	81.549306	Uttar Pradesh	Kaushambi/ Pratapgarh	Barren Land/ Sand Bar	4.623439601
1804	25.584017	81.551533	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	4.486937966
1805	25.592398	81.541791	Uttar Pradesh	Kaushambi/ Pratapgarh	Barren Land/ Sand Bar	32.38745935 0
1806	25.579798	81.547761	Uttar Pradesh	Kaushambi	Barren Land/ Sand Bar	2.088172320
1807	25.601381	81.535645	Uttar Pradesh	Kaushambi/ Pratapgarh	Vegetation/For est	69.22187432 0
1808	25.618488	81.522942	Uttar Pradesh	Kaushambi/ Pratapgarh	Vegetation/For est	189.8372471 00
1809	25.612176	81.535627	Uttar Pradesh	Kaushambi/ Pratapgarh	Barren Land/ Sand Bar	14.98091170 0
1810	25.613313	81.518955	Uttar Pradesh	Kaushambi/ Pratapgarh	Barren Land/ Sand Bar	4.041922073

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1811	25.611339	81.520802	Uttar Pradesh	Kaushambi	Barren Land/ Sand Bar	2.623347621
1812	25.616649	81.514215	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	4.037447603
1813	25.618758	81.508152	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	4.307137229
1814	25.623240	81.496576	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	1.660900648
1815	25.634521	81.472242	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	1.996523688
1816	25.628684	81.480526	Uttar Pradesh	Kaushambi/ Pratapgarh	Vegetation/For est	135.9092385 00
1817	25.639507	81.467253	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	9.195711474
1818	25.635899	81.474228	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	13.31932582 0
1819	25.637346	81.468815	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	0.927321520
1820	25.636203	81.478332	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	4.380724348
1821	25.634684	81.478759	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	0.248625582
1822	25.632676	81.478679	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	0.507465209
1823	25.651141	81.450909	Uttar Pradesh	Kaushambi/ Pratapgarh	Vegetation/For est	61.43799085 0
1824	25.646025	81.454322	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	3.624266778
1825	25.653713	81.444538	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	0.893011926
1826	25.661413	81.441728	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	58.88387207 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1827	25.658144	81.437167	Uttar Pradesh	Kaushambi/Pratapgarh	Barren Land/Sand Bar	6.214576703
1828	25.662595	81.432062	Uttar Pradesh	Kaushambi/Pratapgarh	Barren Land/Sand Bar	2.654188983
1829	25.663223	81.429408	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	0.413743115
1830	25.664816	81.428819	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	2.800883202
1831	25.664354	81.425642	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	9.383639167
1832	25.666655	81.414988	Uttar Pradesh	Kaushambi	Vegetation/Forest	53.657822590
1833	25.674225	81.409703	Uttar Pradesh	Kaushambi/Pratapgarh	Vegetation/Forest	153.526428500
1834	25.672505	81.398831	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	10.458596340
1835	25.671195	81.404270	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	5.750913545
1836	25.678389	81.411008	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	5.895452762
1837	25.677023	81.411359	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	2.098153431
1838	25.680399	81.412708	Uttar Pradesh	Pratapgarh	Barren Land/Sand Bar	1.327522564
1839	25.680507	81.403514	Uttar Pradesh	Kaushambi/Pratapgarh	Barren Land/Sand Bar	0.001904064
1840	25.680146	81.406558	Uttar Pradesh	Kaushambi/Pratapgarh	Barren Land/Sand Bar	7.993911110
1841	25.678942	81.402611	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	2.432539155
1842	25.681266	81.404637	Uttar Pradesh	Pratapgarh	Barren Land/Sand Bar	0.994187317
1843	25.681534	81.400798	Uttar	Pratapgarh	Barren Land/	0.859634496

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
1844	25.681592	81.395078	Uttar Pradesh	Kaushambi/Pratapgarh	Barren Land/Sand Bar	6.224931858
1845	25.686371	81.401298	Uttar Pradesh	Pratapgarh	Agriculture	106.183570200
1846	25.687252	81.384045	Uttar Pradesh	Pratapgarh	Barren Land/Sand Bar	7.794061362
1847	25.693437	81.373739	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	2.127128415
1848	25.695191	81.372772	Uttar Pradesh	Kaushambi/Pratapgarh	Barren Land/Sand Bar	0.498948859
1849	25.712755	81.369773	Uttar Pradesh	Kaushambi/Pratapgarh	Barren Land/Sand Bar	32.607018090
1850	25.708583	81.370046	Uttar Pradesh	Pratapgarh	Barren Land/Sand Bar	0.838063761
1851	25.703696	81.372396	Uttar Pradesh	Kaushambi/Pratapgarh	Vegetation/Forest	55.345267160
1852	25.713913	81.373793	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	3.070805200
1853	25.732831	81.389024	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	25.568827450
1854	25.741207	81.399100	Uttar Pradesh	Kaushambi	Barren Land/Sand Bar	3.680861108
1855	25.760359	81.393052	Uttar Pradesh	Kaushambi/Pratapgarh	Vegetation/Forest	194.325176700
1856	25.774101	81.387954	Uttar Pradesh	Pratapgarh	Barren Land/Sand Bar	2.899805706
1857	25.773351	81.385569	Uttar Pradesh	Pratapgarh	Barren Land/Sand Bar	0.313113460
1858	25.773498	81.381611	Uttar Pradesh	Pratapgarh	Barren Land/Sand Bar	1.989387552
1859	25.773975	81.375494	Uttar Pradesh	Pratapgarh	Barren Land/Sand Bar	0.707929632

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1860	25.773382	81.369685	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	1.779499748
1861	25.778578	81.367795	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	3.773900124
1862	25.778943	81.360468	Uttar Pradesh	Kaushambi/ Pratapgarh	Vegetation/For est	118.8551729 00
1863	25.784646	81.350005	Uttar Pradesh	Kaushambi	Barren Land/ Sand Bar	6.773622066
1864	25.786595	81.348507	Uttar Pradesh	Kaushambi	Barren Land/ Sand Bar	0.544691030
1865	25.780825	81.348636	Uttar Pradesh	Kaushambi	Barren Land/ Sand Bar	0.457938743
1866	25.779719	81.349076	Uttar Pradesh	Kaushambi	Barren Land/ Sand Bar	0.261488915
1867	25.783307	81.350712	Uttar Pradesh	Kaushambi	Barren Land/ Sand Bar	0.162166422
1868	25.786704	81.354217	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	1.495816616
1869	25.788138	81.351037	Uttar Pradesh	Kaushambi/ Pratapgarh	Barren Land/ Sand Bar	4.962547961
1870	25.786599	81.353537	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	0.819778393
1871	25.796421	81.350917	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	4.781752958
1872	25.796785	81.348766	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	1.578481510
1873	25.803722	81.344180	Uttar Pradesh	Pratapgarh	Barren Land/ Sand Bar	3.013887311
1874	25.808643	81.342373	Uttar Pradesh	Pratapgarh/ Rae Bareli	Vegetation/For est	116.5097754 00
1875	25.812158	81.347114	Uttar Pradesh	Pratapgarh/ Rae Bareli	Barren Land/ Sand Bar	8.576117627

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1876	25.813220	81.344311	Uttar Pradesh	Pratapgarh/Rae Bareli	Barren Land/Sand Bar	2.361859845
1877	25.808960	81.349360	Uttar Pradesh	Pratapgarh	Barren Land/Sand Bar	0.395439677
1878	25.820364	81.323259	Uttar Pradesh	Fatehpur/Rae Bareli	Barren Land/Sand Bar	11.292093450
1879	25.821093	81.330617	Uttar Pradesh	Fatehpur/Rae Bareli	Vegetation/Forest	93.355378680
1880	25.822045	81.317811	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	15.483432620
1881	25.824962	81.308621	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	41.192594880
1882	25.839316	81.287903	Uttar Pradesh	Fatehpur/Rae Bareli	Vegetation/Forest	235.108174300
1883	25.838730	81.271473	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	6.575162325
1884	25.836994	81.277793	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	6.681429361
1885	25.835876	81.277067	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	0.827734286
1886	25.844413	81.269389	Uttar Pradesh	Fatehpur/Rae Bareli	Vegetation/Forest	179.861546600
1887	25.848362	81.274081	Uttar Pradesh	Rae Bareli	Barren Land/Sand Bar	6.359577149
1888	25.852176	81.269981	Uttar Pradesh	Rae Bareli	Barren Land/Sand Bar	0.844525773
1889	25.855037	81.255718	Uttar Pradesh	Rae Bareli	Barren Land/Sand Bar	0.000061000
1890	25.853602	81.256130	Uttar Pradesh	Rae Bareli	Barren Land/Sand Bar	6.802534523
1891	25.855033	81.252378	Uttar Pradesh	Rae Bareli	Barren Land/Sand Bar	9.883885657
1892	25.856696	81.248583	Uttar	Rae Bareli	Barren Land/	2.699144630

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
1893	25.856726	81.250886	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	0.766810049
1894	25.863238	81.222292	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	6.696556918
1895	25.870856	81.219719	Uttar Pradesh	Fatehpur/Rae Bareli	Vegetation/Forest	65.256103290
1896	25.878523	81.218042	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	3.431217123
1897	25.882379	81.219480	Uttar Pradesh	Fatehpur/Rae Bareli	Barren Land/ Sand Bar	10.460288100
1898	25.885145	81.215298	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	4.600970727
1899	25.901479	81.213001	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	48.273137330
1900	25.918988	81.212354	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	37.466378740
1901	25.908245	81.214635	Uttar Pradesh	Fatehpur/Rae Bareli	Barren Land/ Sand Bar	13.761155560
1902	25.949946	81.195896	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	6.348313142
1903	25.950974	81.191721	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	7.114403423
1904	25.943318	81.214696	Uttar Pradesh	Fatehpur	Vegetation/Forest	0.148836035
1905	25.941911	81.208607	Uttar Pradesh	Fatehpur	Vegetation/Forest	113.250534100
1906	25.961794	81.172417	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	10.533918990
1907	25.959780	81.175638	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	4.852726298
1908	25.958551	81.178713	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	5.603207048

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1909	25.958888	81.166921	Uttar Pradesh	Fatehpur	Vegetation/Forest	136.565144200
1910	25.955948	81.171699	Uttar Pradesh	Fatehpur	Vegetation/Forest	16.210144650
1911	25.978765	81.109611	Uttar Pradesh	Fatehpur	Vegetation/Forest	138.669319600
1912	25.987365	81.107101	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	16.027609730
1913	25.989418	81.098375	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	0.480125780
1914	25.988728	81.095066	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	12.266138970
1915	25.990738	81.097939	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	1.207236254
1916	25.990214	81.092434	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	1.097297572
1917	25.990666	81.093757	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	0.234234207
1918	25.992956	81.089432	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	1.739705655
1919	25.996023	81.076542	Uttar Pradesh	Fatehpur	Vegetation/Forest	76.173084640
1920	26.032427	81.049711	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	0.002847564
1921	26.011241	81.068423	Uttar Pradesh	Fatehpur	Vegetation/Forest	455.404157600
1922	26.034376	81.040599	Uttar Pradesh	Fatehpur	Vegetation/Forest	128.011780600
1923	26.037684	81.043565	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	2.356132466
1924	26.034349	81.035487	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	0.781392957
1925	26.032415	81.049334	Uttar	Fatehpur	Barren Land/	0.443373277

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
1926	26.030539	81.048487	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.894398149
1927	26.030002	81.037463	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	3.181715572
1928	26.024441	81.046137	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.861693014
1929	26.021926	81.052774	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	1.316451466
1930	26.020410	81.053077	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.733715898
1931	26.019268	81.054419	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.523747699
1932	26.015743	81.053068	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	4.065407044
1933	26.010434	81.051595	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	1.600820895
1934	26.010408	81.053857	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	1.751375562
1935	26.007883	81.052672	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.460215509
1936	26.045449	81.034914	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	3.560115771
1937	26.054867	81.031027	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	2.682732146
1938	26.053767	81.030734	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.626177377
1939	26.053128	81.032468	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.253533911
1940	26.053025	81.031659	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.097522818
1941	26.054879	81.029610	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.356991877

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1942	26.055779	81.028645	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.469809170
1943	26.057511	81.028772	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.000038000
1944	26.057517	81.028797	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.000246060
1945	26.057953	81.029202	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.380690124
1946	26.057694	81.028788	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.006022416
1947	26.058718	81.023520	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	3.088504209
1948	26.057621	81.025348	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.115031256
1949	26.056900	81.025896	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.648837461
1950	26.060468	81.022784	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	26.37617976 0
1951	26.065326	81.012247	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	6.243083068
1952	26.066311	81.002624	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	8.315660158
1953	26.067620	80.999186	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	1.842902903
1954	26.068325	80.994051	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	7.731764376
1955	26.063404	80.975273	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.323937962
1956	26.066313	80.981789	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	14.09182680 0
1957	26.077313	81.012693	Uttar Pradesh	Rae Bareli	Agriculture	1.035712380

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1958	26.072247	81.016103	Uttar Pradesh	Fatehpur/Rae Bareli	Vegetation/Forest	87.164955760
1959	26.071389	81.007015	Uttar Pradesh	Fatehpur/Rae Bareli	Vegetation/Forest	251.625228100
1960	26.073006	80.984320	Uttar Pradesh	Fatehpur/Rae Bareli	Barren Land/Sand Bar	47.932749930
1961	26.062425	80.967395	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	103.999319700
1962	26.061021	80.940632	Uttar Pradesh	Fatehpur/Rae Bareli	Agriculture	292.552237800
1963	26.055877	80.952602	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	9.197042616
1964	26.054908	80.950199	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	2.334723701
1965	26.055136	80.948422	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	0.264473566
1966	26.055011	80.947642	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	0.733152468
1967	26.054800	80.944926	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	5.128276566
1968	26.054280	80.946409	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	0.753296682
1969	26.053436	80.941383	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	0.723112817
1970	26.054393	80.939622	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	6.044794187
1971	26.052662	80.933122	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	1.120637098
1972	26.052019	80.929054	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	5.570585381
1973	26.050306	80.929103	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	0.338654550

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
1974	26.057778	80.969940	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	3.364037279
1975	26.055861	80.922800	Uttar Pradesh	Fatehpur/Rae Bareli	Vegetation/Forest	10.957851680
1976	26.051470	80.926339	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.004366124
1977	26.050720	80.923046	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	12.403554520
1978	26.053348	80.917733	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	20.635310810
1979	26.055697	80.906310	Uttar Pradesh	Fatehpur/Rae Bareli	Barren Land/ Sand Bar	7.258693965
1980	26.056559	80.911647	Uttar Pradesh	Fatehpur/Rae Bareli	Barren Land/ Sand Bar	2.899750713
1981	26.054228	80.901419	Uttar Pradesh	Fatehpur/Rae Bareli	Barren Land/ Sand Bar	5.946437473
1982	26.053722	80.898654	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	2.258222462
1983	26.048930	80.872297	Uttar Pradesh	Rae Bareli	Vegetation/Forest	165.475612800
1984	26.055066	80.869552	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	0.594884299
1985	26.039447	80.854955	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	11.399196520
1986	26.044510	80.851802	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	0.010886261
1987	26.046113	80.852888	Uttar Pradesh	Rae Bareli	Vegetation/Forest	18.001373540
1988	26.031472	80.835805	Uttar Pradesh	Fatehpur/Rae Bareli	Vegetation/Forest	425.861859300
1989	26.022384	80.841337	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	5.819802441
1990	26.020363	80.833921	Uttar	Fatehpur	Barren Land/	7.740918144

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
1991	26.021554	80.837851	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.173135328
1992	26.021323	80.833731	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.468812188
1993	26.025023	80.819541	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.932241039
1994	26.027791	80.816138	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	10.06187249 0
1995	26.044582	80.810647	Uttar Pradesh	Fatehpur/Rae Bareli	Vegetation/Forest	105.0618522 00
1996	26.063073	80.783258	Uttar Pradesh	Fatehpur/Rae Bareli	Vegetation/Forest	626.0688353 00
1997	26.065284	80.772784	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	67.20871596 0
1998	26.078172	80.756682	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	9.674564500
1999	26.075256	80.750728	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	9.366903809
2000	26.075710	80.743885	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	18.21985761 0
2001	26.076551	80.737089	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	11.78865480 0
2002	26.091170	80.704463	Uttar Pradesh	Fatehpur/Rae Bareli	Vegetation/Forest	372.0277830 00
2003	26.102127	80.700834	Uttar Pradesh	Rae Bareli	Agriculture	200.2409694 00
2004	26.108981	80.688305	Uttar Pradesh	Rae Bareli	Agriculture	5.421593905
2005	26.109077	80.693839	Uttar Pradesh	Unnao/Rae Bareli	Agriculture	26.52852062 0
2006	26.093188	80.715649	Uttar Pradesh	Rae Bareli	Vegetation/Forest	54.01975323 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2007	26.079616	80.714285	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	9.323905079
2008	26.078573	80.719985	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	10.637466500
2009	26.085310	80.704238	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	6.669324720
2010	26.084705	80.703936	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	1.112606730
2011	26.091787	80.697730	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	2.209774026
2012	26.093124	80.695864	Uttar Pradesh	Rae Bareli	Vegetation/For est	1.194983190
2013	26.094239	80.694020	Uttar Pradesh	Rae Bareli	Vegetation/For est	0.504082504
2014	26.094758	80.691903	Uttar Pradesh	Rae Bareli	Barren Land/ Sand Bar	1.287781727
2015	26.111297	80.684735	Uttar Pradesh	Unnao/Rae Bareli	Agriculture	15.986756750
2016	26.126447	80.674671	Uttar Pradesh	Fatehpur/U nnao/Rae Bareli	Agriculture	269.236154900
2017	26.120092	80.668780	Uttar Pradesh	Fatehpur	Vegetation/For est	26.378659560
2018	26.115990	80.667208	Uttar Pradesh	Fatehpur	Vegetation/For est	10.274060940
2019	26.109412	80.674084	Uttar Pradesh	Fatehpur/R ae Bareli	Vegetation/For est	125.886418300
2020	26.114308	80.675657	Uttar Pradesh	Fatehpur/R ae Bareli	Vegetation/For est	17.941340990
2021	26.105950	80.683428	Uttar Pradesh	Rae Bareli	Agriculture	3.968437875
2022	26.105441	80.679200	Uttar Pradesh	Rae Bareli	Vegetation/For est	7.588054144

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2023	26.145446	80.656399	Uttar Pradesh	Fatehpur/Unnao	Vegetation/Forest	44.796901530
2024	26.159237	80.654405	Uttar Pradesh	Unnao	Barren Land/Sand Bar	3.157513780
2025	26.156335	80.656635	Uttar Pradesh	Unnao	Barren Land/Sand Bar	0.913289048
2026	26.155671	80.655793	Uttar Pradesh	Unnao	Barren Land/Sand Bar	3.249249876
2027	26.166777	80.643241	Uttar Pradesh	Unnao	Barren Land/Sand Bar	58.278835110
2028	26.174173	80.639006	Uttar Pradesh	Unnao	Barren Land/Sand Bar	51.930940170
2029	26.175820	80.645312	Uttar Pradesh	Unnao	Barren Land/Sand Bar	9.767547565
2030	26.186339	80.631834	Uttar Pradesh	Unnao	Vegetation/Forest	337.279583300
2031	26.192747	80.636954	Uttar Pradesh	Unnao	Barren Land/Sand Bar	11.496774240
2032	26.196284	80.631303	Uttar Pradesh	Unnao	Barren Land/Sand Bar	7.935123976
2033	26.192592	80.631082	Uttar Pradesh	Unnao	Barren Land/Sand Bar	3.191395905
2034	26.206004	80.619115	Uttar Pradesh	Unnao	Barren Land/Sand Bar	49.595267220
2035	26.205595	80.617126	Uttar Pradesh	Unnao	Barren Land/Sand Bar	1.411662410
2036	26.222067	80.588901	Uttar Pradesh	Unnao	Barren Land/Sand Bar	0.007473405
2037	26.221752	80.589881	Uttar Pradesh	Unnao	Barren Land/Sand Bar	0.022254324
2038	26.221709	80.589456	Uttar Pradesh	Unnao	Barren Land/Sand Bar	0.189657539

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2039	26.220170	80.591938	Uttar Pradesh	Fatehpur/U nnao	Barren Land/ Sand Bar	5.413014387
2040	26.213569	80.599786	Uttar Pradesh	Fatehpur/U nnao	Vegetation/For est	116.1348207 00
2041	27.051873	79.989323	Uttar Pradesh	Hardoi/Kan nauj	Vegetation/For est	222.7638065 00
2042	27.058987	79.996044	Uttar Pradesh	Hardoi/Kan nauj	Barren Land/ Sand Bar	36.30866532 0
2043	27.062325	80.001302	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	0.669610816
2044	27.063675	79.997291	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	0.472641976
2045	27.063693	79.999964	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	0.208445945
2046	27.063734	80.001616	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	0.129587612
2047	27.063343	79.999309	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	0.096204557
2048	27.062356	80.000199	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	0.617426011
2049	27.056178	80.000601	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	4.731450378
2050	27.049322	79.997893	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	4.117011994
2051	27.046801	79.998330	Uttar Pradesh	Hardoi/Kan nauj	Barren Land/ Sand Bar	0.164376297
2052	27.048832	79.998875	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	0.835376254
2053	27.043543	79.994501	Uttar Pradesh	Hardoi/Kan nauj	Barren Land/ Sand Bar	6.978989837
2054	27.038413	79.988331	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	2.359617700
2055	27.035265	79.987382	Uttar	Kannauj	Barren Land/	0.410227276

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
2056	27.021472	79.993350	Uttar Pradesh	Hardoi/Kannauj	Vegetation/Forest	2.304852283
2057	27.019687	79.991050	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	1.122112879
2058	27.029188	79.986507	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	0.405231101
2059	27.039737	79.991543	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	1.702256827
2060	27.041203	79.994017	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	0.325873909
2061	27.053104	79.997827	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	2.503974112
2062	27.055837	79.999753	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	1.417184333
2063	27.059352	79.998988	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	0.224187183
2064	27.065950	80.000860	Uttar Pradesh	Hardoi/Kannauj	Barren Land/Sand Bar	8.688655697
2065	27.067997	79.990428	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	0.000003450
2066	27.066166	79.995217	Uttar Pradesh	Hardoi/Kannauj	Barren Land/Sand Bar	9.272822696
2067	27.074317	79.996592	Uttar Pradesh	Hardoi/Kannauj	Vegetation/Forest	132.108235200
2068	27.074388	80.003935	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	1.654662410
2069	27.077080	80.003118	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	0.827171111
2070	27.083262	79.997206	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	4.193333514
2071	27.088265	79.989178	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	6.209811913

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2072	27.093653	79.981430	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	41.68277376 0
2073	27.085941	79.979891	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	23.35803867 0
2074	27.082062	79.985222	Uttar Pradesh	Hardoi/Kan nauj	Barren Land/ Sand Bar	5.947735750
2075	27.081110	79.988669	Uttar Pradesh	Hardoi/Kan nauj	Barren Land/ Sand Bar	77.74803445 0
2076	27.074938	79.986146	Uttar Pradesh	Kannauj	Vegetation/For est	3.738386445
2077	27.073296	79.987047	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	2.056209680
2078	27.071378	79.987552	Uttar Pradesh	Hardoi/Kan nauj	Barren Land/ Sand Bar	3.146008230
2079	27.069660	79.988168	Uttar Pradesh	Hardoi/Kan nauj	Barren Land/ Sand Bar	1.056071811
2080	27.068756	79.989363	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.957777537
2081	27.072580	79.990317	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	1.258663424
2082	27.096959	79.970172	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.006211124
2083	27.094151	79.972918	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	20.25851996 0
2084	27.110606	79.964289	Uttar Pradesh	Hardoi/Kan nauj	Barren Land/ Sand Bar	20.83389072 0
2085	27.113312	79.962278	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	2.050016084
2086	27.106886	79.963690	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.636709671
2087	27.105871	79.965322	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.552641271
2088	27.111159	79.968454	Uttar	Hardoi	Barren Land/	53.90655903

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	0
2089	27.123248	79.964608	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	5.067253000
2090	27.109633	79.959678	Uttar Pradesh	Hardoi/Kannauj	Vegetation/Forest	333.856768700
2091	27.130627	79.961129	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	5.405659901
2092	27.132488	79.960892	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.529447707
2093	27.131658	79.959381	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.162878687
2094	27.132318	79.961824	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.219387798
2095	27.132679	79.958315	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.461670432
2096	27.133743	79.960118	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.814604620
2097	27.133781	79.954498	Uttar Pradesh	Hardoi/Kannauj	Barren Land/ Sand Bar	21.230897950
2098	27.132438	79.952257	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.356195658
2099	27.135743	79.954003	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.798180811
2100	27.137425	79.948873	Uttar Pradesh	Hardoi/Kannauj	Barren Land/ Sand Bar	10.205836650
2101	27.144931	79.931502	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.696057534
2102	27.144008	79.939099	Uttar Pradesh	Hardoi/Kannauj	Agriculture	92.434892780
2103	27.141582	79.926075	Uttar Pradesh	Hardoi/Kannauj	Vegetation/Forest	346.340184000
2104	27.131300	79.923679	Uttar Pradesh	Kannauj	Barren Land/ Sand Bar	2.131878488

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2105	27.131414	79.933164	Uttar Pradesh	Kannauj	Vegetation/Forest	0.000064600
2106	27.134180	79.937551	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	3.720255386
2107	27.136598	79.940715	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	0.996146174
2108	27.140218	79.947997	Uttar Pradesh	Hardoi/Kannauj	Barren Land/Sand Bar	2.328774980
2109	27.138271	79.948151	Uttar Pradesh	Kannauj	Barren Land/Sand Bar	0.450188928
2110	27.141914	79.945777	Uttar Pradesh	Hardoi/Kannauj	Barren Land/Sand Bar	1.703016750
2111	27.148764	79.948053	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	0.575157634
2112	27.146423	79.946938	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	0.392320258
2113	27.153692	79.947929	Uttar Pradesh	Hardoi	Agriculture	0.170431187
2114	27.155851	79.944756	Uttar Pradesh	Hardoi	Agriculture	15.680822470
2115	27.143038	79.937334	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	0.843892583
2116	27.151622	79.937972	Uttar Pradesh	Hardoi/Kannauj	Vegetation/Forest	186.607649200
2117	27.153998	79.920903	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	33.778399540
2118	27.157570	79.923038	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	0.929111602
2119	27.143705	79.907070	Uttar Pradesh	Hardoi/Kannauj	Vegetation/Forest	131.683091400
2120	27.154809	79.888219	Uttar Pradesh	Hardoi	Vegetation/Forest	58.377652460
2121	27.156294	79.877267	Uttar	Hardoi	Barren Land/	25.32465675

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	0
2122	27.151628	79.880393	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	8.255052497
2123	27.149874	79.878787	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.633406753
2124	27.150735	79.878190	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.834760143
2125	27.153941	79.881156	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.815242090
2126	27.152826	79.882994	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.825054915
2127	27.152755	79.881919	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.268426006
2128	27.156314	79.880760	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.518426176
2129	27.159767	79.873447	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.998491350
2130	27.168578	79.865925	Uttar Pradesh	Hardoi/Kan nauj	Barren Land/ Sand Bar	64.88811249 0
2131	27.172105	79.870576	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.050553550
2132	27.174887	79.868485	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	2.381261825
2133	27.174392	79.866007	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.036594383
2134	27.176237	79.864186	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.000000753
2135	27.175795	79.864807	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.269951269
2136	27.173711	79.858966	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	29.84457731 0
2137	27.173584	79.850375	Uttar Pradesh	Hardoi	Vegetation/For est	40.57283128 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2138	27.170349	79.843844	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	2.375448502
2139	27.170300	79.837437	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	2.377656461
2140	27.171045	79.836521	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.286309976
2141	27.169708	79.835551	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	17.10660609 0
2142	27.174187	79.823727	Uttar Pradesh	Hardoi	Vegetation/For est	113.0064321 00
2143	27.172372	79.819816	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	5.112573215
2144	27.169428	79.822222	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.433807882
2145	27.173953	79.814734	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	5.771228470
2146	27.169810	79.810528	Uttar Pradesh	Hardoi/Kan nauj	Agriculture	88.15130213 0
2147	27.175483	79.802149	Uttar Pradesh	Hardoi	Vegetation/For est	49.09234575 0
2148	27.174494	79.796844	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	1.711813382
2149	27.177503	79.793080	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	2.613340570
2150	27.177651	79.803435	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	22.51386927 0
2151	27.182328	79.796390	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	2.900654195
2152	27.190847	79.786940	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	11.67034714 0
2153	27.187030	79.783890	Uttar Pradesh	Hardoi	Vegetation/For est	105.0676992 00
2154	27.193029	79.770893	Uttar	Hardoi	Barren Land/	1.841451962

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
2155	27.212777	79.774818	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	0.001922126
2156	27.213445	79.773151	Uttar Pradesh	Hardoi	Vegetation/Forest	1.355784711
2157	27.203856	79.772155	Uttar Pradesh	Hardoi	Vegetation/Forest	208.498461500
2158	27.280867	79.643543	Uttar Pradesh	Farrukhabad	Vegetation/Forest	8.438021772
2159	27.276067	79.658094	Uttar Pradesh	Farrukhabad	Vegetation/Forest	119.073337500
2160	27.269759	79.664442	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	1.140421100
2161	27.268842	79.663007	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	2.207987463
2162	27.267772	79.656450	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	7.174077743
2163	27.262525	79.683170	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	2.847471232
2164	27.266424	79.684191	Uttar Pradesh	Farrukhabad	Barren Land/ Sand Bar	0.639829631
2165	27.259436	79.690777	Uttar Pradesh	Farrukhabad	Vegetation/Forest	42.894748220
2166	27.247956	79.697398	Uttar Pradesh	Farrukhabad/Hardoi	Barren Land/ Sand Bar	2.263922938
2167	27.243200	79.691134	Uttar Pradesh	Farrukhabad/Hardoi	Barren Land/ Sand Bar	35.262956840
2168	27.233046	79.698971	Uttar Pradesh	Farrukhabad/Hardoi	Vegetation/Forest	68.860866330
2169	27.227389	79.710863	Uttar Pradesh	Hardoi	Vegetation/Forest	1.363970052
2170	27.222788	79.716592	Uttar Pradesh	Hardoi	Barren Land/ Sand Bar	21.798876480

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2171	27.220550	79.732415	Uttar Pradesh	Hardoi	Vegetation/Forest	62.276590350
2172	27.208094	79.751610	Uttar Pradesh	Hardoi	Vegetation/Forest	348.926382900
2173	27.200081	79.766704	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	4.236717673
2174	27.219337	79.742031	Uttar Pradesh	Hardoi	Vegetation/Forest	21.699712400
2175	27.224983	79.742896	Uttar Pradesh	Hardoi	Agriculture	7.028928504
2176	27.223775	79.748875	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	10.961843850
2177	27.220509	79.753176	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	18.434227740
2178	27.214549	79.761361	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	18.796313990
2179	27.204322	79.767332	Uttar Pradesh	Hardoi	Barren Land/Sand Bar	1.458999225
2180	26.709405	80.194174	Uttar Pradesh	Kanpur Nagar/Unnao	Agriculture	1579.529277000
2181	26.729617	80.184635	Uttar Pradesh	Unnao	Barren Land/Sand Bar	22.535303400
2182	26.729582	80.203999	Uttar Pradesh	Unnao	Barren Land/Sand Bar	7.427664928
2183	26.723238	80.210075	Uttar Pradesh	Unnao	Barren Land/Sand Bar	30.520113490
2184	26.702080	80.216435	Uttar Pradesh	Unnao	Agriculture	6.886126919
2185	26.690772	80.192619	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	92.100337350
2186	26.685549	80.201103	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	77.417329490

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2187	26.691455	80.237878	Uttar Pradesh	Unnao	Agriculture	18.624199770
2188	26.678737	80.248050	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar, Sand Mining	152.651995200
2189	26.675674	80.264385	Uttar Pradesh	Kanpur Nagar/Unnao	Agriculture	397.125290000
2190	26.655074	80.271016	Uttar Pradesh	Unnao	Barren Land/Sand Bar	4.900228211
2191	26.649747	80.270347	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	4.923871265
2192	26.645972	80.266954	Uttar Pradesh	Kanpur Nagar	Agriculture	31.184411740
2193	26.645846	80.271945	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	2.400545762
2194	26.639917	80.274226	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	42.267549040
2195	26.624135	80.278801	Uttar Pradesh	Kanpur Nagar/Unnao	Vegetation/Forest	246.079304600
2196	26.632517	80.285047	Uttar Pradesh	Kanpur Nagar/Unnao	Agriculture	23.957204020
2197	26.604703	80.276641	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	25.444565760
2198	26.588590	80.286335	Uttar Pradesh	Kanpur Nagar	Vegetation/Forest	94.644338100
2199	26.582999	80.297452	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	3.597412829
2200	26.585296	80.293997	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	2.444297537

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2201	26.576850	80.297658	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	7.803159111
2202	26.556975	80.299418	Uttar Pradesh	Unnao	Barren Land/Sand Bar	1.914693337
2203	26.555849	80.303930	Uttar Pradesh	Unnao	Barren Land/Sand Bar	6.194044760
2204	26.547238	80.308918	Uttar Pradesh	Unnao	Vegetation/Forest	71.902568440
2205	26.546941	80.302073	Uttar Pradesh	Unnao	Barren Land/Sand Bar	15.618397880
2206	26.534835	80.318985	Uttar Pradesh	Unnao	Barren Land/Sand Bar	17.183836270
2207	26.525711	80.317461	Uttar Pradesh	Unnao	Barren Land/Sand Bar	1.217057444
2208	26.521624	80.315526	Uttar Pradesh	Unnao	Vegetation/Forest	7.424762779
2209	26.518170	80.310461	Uttar Pradesh	Kanpur Nagar/Unnao	Agriculture	6.002160151
2210	26.518319	80.311211	Uttar Pradesh	Kanpur Nagar/Unnao	Agriculture	28.973961610
2211	26.519317	80.313581	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	7.098314168
2212	26.499581	80.330528	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	0.054053185
2213	26.500852	80.329140	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	1.888168384
2214	26.502467	80.325831	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar, Sand Mining	67.849159720
2215	26.503560	80.327385	Uttar	Kanpur	Barren Land/	4.478768512

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh	Nagar	Sand Bar	
2216	26.497479	80.332315	Uttar Pradesh	Kanpur Nagar	Vegetation/Forest	3.098878365
2217	26.477112	80.367510	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	66.838327420
2218	26.482664	80.358297	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	5.276712804
2219	26.480654	80.357209	Uttar Pradesh	Kanpur Nagar	Vegetation/Forest	9.578013383
2220	26.482401	80.352209	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	3.466095884
2221	26.470115	80.380479	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	45.725577200
2222	26.454634	80.393121	Uttar Pradesh	Kanpur Nagar/Unnao	Vegetation/Forest	308.213620800
2223	26.450535	80.388268	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	4.376185276
2224	26.443256	80.396320	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	2.275570962
2225	26.440189	80.402635	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	20.702349200
2226	26.441904	80.403205	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	1.524341491
2227	26.435879	80.412118	Uttar Pradesh	Unnao	Barren Land/Sand Bar	19.203369980
2228	26.426411	80.419181	Uttar Pradesh	Kanpur Nagar/Unnao	Vegetation/Forest	57.324960230
2229	26.411227	80.449427	Uttar	Unnao	Vegetation/For	0.039652766

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		est	
2230	26.418435	80.437558	Uttar Pradesh	Unnao	Vegetation/Forest	138.550659100
2231	26.394851	80.470582	Uttar Pradesh	Kanpur Nagar/Unnao	Agriculture	278.549618900
2232	26.402730	80.453886	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	5.487323738
2233	26.395371	80.463608	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	11.743673470
2234	26.388580	80.488910	Uttar Pradesh	Unnao	Barren Land/Sand Bar	19.505143760
2235	26.366294	80.514114	Uttar Pradesh	Kanpur Nagar/Unnao	Agriculture	621.890907800
2236	26.347692	80.520052	Uttar Pradesh	Kanpur Nagar	Barren Land/Sand Bar	20.660028410
2237	26.324136	80.536507	Uttar Pradesh	Kanpur Nagar/Unnao	Vegetation/Forest	244.562338600
2238	26.315453	80.542935	Uttar Pradesh	Unnao	Barren Land/Sand Bar	11.231542360
2239	26.310572	80.546788	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	60.814927930
2240	26.313087	80.549820	Uttar Pradesh	Unnao	Barren Land/Sand Bar	4.005870634
2241	26.301584	80.550871	Uttar Pradesh	Unnao	Barren Land/Sand Bar	10.773892410
2242	26.298456	80.548900	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	5.621048078
2243	26.295219	80.549487	Uttar	Kanpur Nagar/Unnao	Barren Land/	2.928484816

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh	o	Sand Bar	
2244	26.292648	80.551896	Uttar Pradesh	Kanpur Nagar/Unnao	Barren Land/Sand Bar	3.635896623
2245	26.281620	80.565687	Uttar Pradesh	Unnao	Barren Land/Sand Bar	28.261015010
2246	26.277840	80.564307	Uttar Pradesh	Unnao	Barren Land/Sand Bar	9.714102275
2247	26.275363	80.560623	Uttar Pradesh	Unnao	Barren Land/Sand Bar	2.326183709
2248	26.269304	80.566744	Uttar Pradesh	Unnao	Vegetation/Forest	62.114313770
2249	26.269022	80.575431	Uttar Pradesh	Unnao	Vegetation/Forest	91.207160140
2250	26.264354	80.574476	Uttar Pradesh	Unnao	Barren Land/Sand Bar	7.461863560
2251	26.275550	80.575255	Uttar Pradesh	Unnao	Barren Land/Sand Bar	10.506172230
2252	26.258638	80.585931	Uttar Pradesh	Unnao	Barren Land/Sand Bar	17.661079520
2253	26.245427	80.585278	Uttar Pradesh	Unnao	Vegetation/Forest	56.038165870
2254	26.236182	80.588314	Uttar Pradesh	Unnao	Vegetation/Forest	36.616500040
2255	26.235117	80.592204	Uttar Pradesh	Unnao	Barren Land/Sand Bar	4.957684389
2256	26.249324	80.594636	Uttar Pradesh	Unnao	Barren Land/Sand Bar	0.026265403
2257	26.248312	80.594888	Uttar Pradesh	Unnao	Barren Land/Sand Bar	3.384192760
2258	26.224004	80.591344	Uttar Pradesh	Fatehpur/Unnao	Barren Land/Sand Bar	32.730465250

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2259	26.218690	80.600956	Uttar Pradesh	Fatehpur/U nao	Barren Land/ Sand Bar	28.53746930 0
2260	26.200639	80.610469	Uttar Pradesh	Fatehpur/U nao	Vegetation/For est	268.6882190 00
2261	27.698669	79.277305	Uttar Pradesh	Budaun	Agriculture	552.9358327 00
2262	25.337120	86.445383	Bihar	Munger	Vegetation/For est	441.5042383 00
2263	25.398573	85.944121	Bihar	Patna	Barren Land/ Sand Bar	137.0686445 00
2264	28.888403	78.131927	Uttar Pradesh	Jyotiba Phule Nagar(Amro ha)	Agriculture	769.5171653 00
2265	28.668196	78.192547	Uttar Pradesh	Hapur/Jyoti ba Phule Nagar(Amro ha)	Barren Land/ Sand Bar	1.904166067
2266	28.672996	78.191175	Uttar Pradesh	Jyotiba Phule Nagar(Amro ha)	Barren Land/ Sand Bar	3.306456053
2267	28.614655	78.192420	Uttar Pradesh	Hapur	Barren Land/ Sand Bar	0.014520090
2268	28.621405	78.191770	Uttar Pradesh	Hapur	Barren Land/ Sand Bar	57.42438731 0
2269	28.520643	78.214695	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	7.523716638
2270	28.443096	78.289088	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	0.001622142
2271	28.435575	78.288907	Uttar Pradesh	Bulandshah r	Vegetation/For est	220.4945956 00
2272	28.349978	78.276621	Uttar Pradesh	Bulandshah r	Barren Land/ Sand Bar	36.76758703 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2273	28.010001	78.640367	Uttar Pradesh	Kanshiram Nagar	Barren Land/ Sand Bar	18.49132561 0
2274	27.997013	78.660994	Uttar Pradesh	Aligarh/Bud aun/Kanshir am Nagar	Agriculture	2682.352365 000
2275	28.006579	78.671484	Uttar Pradesh	Budaun/Ka nshiram Nagar	Vegetation/For est	49.74954685 0
2276	27.794187	79.073720	Uttar Pradesh	Kanshiram Nagar	Agriculture	150.4717228 00
2277	27.643889	79.336932	Uttar Pradesh	Farrukhaba d	Vegetation/For est	76.13632060 0
2278	27.629143	79.346841	Uttar Pradesh	Farrukhaba d	Vegetation/For est	75.79833906 0
2279	27.561700	79.483965	Uttar Pradesh	Farrukhaba d	Vegetation/For est	858.9156886 00
2280	26.031035	80.808383	Uttar Pradesh	Fatehpur	Vegetation/For est	137.4169017 00
2281	25.705266	81.385339	Uttar Pradesh	Kaushambi/ Pratapgarh	Agriculture	446.7722090 00
2282	25.632326	81.490620	Uttar Pradesh	Pratapgarh	Vegetation/For est	267.1091733 00
2283	25.485407	81.789502	Uttar Pradesh	Allahabad(P rayagraj)/K aushambi	Agriculture	1188.741872 000
2284	29.911231	78.144604	Uttarakhand	Haridwar	Vegetation/For est	112.0648441 00
2285	29.906788	78.146508	Uttarakhand	Haridwar	Vegetation/For est	15.75892296 0

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2286	29.892321	78.144474	Uttarakhand	Haridwar	Vegetation/Forest	88.723952470
2287	29.913658	78.152326	Uttarakhand	Haridwar	Barren Land/Sand Bar	0.483629298
2288	29.917542	78.160317	Uttarakhand	Haridwar	Barren Land/Sand Bar	2.980679296
2289	29.919210	78.156988	Uttarakhand	Haridwar	Vegetation/Forest	18.199539300
2290	29.906882	78.153756	Uttarakhand	Haridwar	Vegetation/Forest	99.065166090
2291	29.935269	78.162058	Uttarakhand	Haridwar	Vegetation/Forest	270.057357200
2292	29.792961	78.193672	Uttarakhand	Haridwar	Vegetation/Forest	406.147683000
2293	29.752926	78.194762	Uttarakhand	Haridwar	Barren Land/Sand Bar	107.980874600
2294	29.729118	78.186393	Uttarakhand	Haridwar	Barren Land/Sand Bar	30.711313500
2295	29.621894	78.078764	Uttar Pradesh	Bijnor/Haridwar	Agriculture	269.737260900
2296	29.425561	78.051698	Uttar Pradesh	Bijnor/Muzaffarnagar	Barren Land/Sand Bar	174.180402900
2297	29.445524	78.050335	Uttar Pradesh	Bijnor/Muzaffarnagar	Barren Land/Sand Bar	86.448475770
2298	29.400867	78.039539	Uttar Pradesh	Muzaffarnagar	Vegetation/Forest	606.632979300
2299	29.416976	78.041766	Uttar Pradesh	Muzaffarnagar	Barren Land/Sand Bar	70.471511170
2300	29.177338	78.108697	Uttar Pradesh	Meerut	Barren Land/Sand Bar	53.831998010
2301	29.172029	78.103183	Uttar Pradesh	Meerut	Barren Land/Sand Bar	5.096976397

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2302	25.631089	81.458191	Uttar Pradesh	Kaushambi/Pratapgarh	Agriculture	1129.035198000
2303	25.475094	83.337543	Uttar Pradesh	Ghazipur	Barren Land/Sand Bar	527.238481800
2304	25.719203	84.085101	Uttar Pradesh	Ballia	Agriculture	1303.028530000
2305	25.436292	85.958816	Bihar	Begusarai	Vegetation/Forest	2368.287506000
2306	25.708231	84.710045	Bihar	Bhojpur/Saran	Agriculture	2162.301990000
2307	25.418570	86.557079	Bihar	Khagaria/Munger	Agriculture	8431.732859000
2308	25.227605	87.741870	Jharkhand	Sahibganj	Barren Land/Sand Bar	0.012573880
2309	25.221838	87.744183	Jharkhand	Sahibganj	Vegetation/Forest	112.178456200
2310	25.003145	87.935598	West Bengal	Maldah	Agriculture	1369.452314000
2311	24.982814	87.981177	West Bengal	Maldah	Barren Land/Sand Bar	17.128697180
2312	24.915249	87.952507	West Bengal	Maldah	Barren Land/Sand Bar	18.583650250
2313	25.337228	86.112224	Bihar	Begusarai	Vegetation/Forest, Agriculture	1555.111405000
2314	25.319635	86.046793	Bihar	Begusarai/Lakhisarai/Patna	Agriculture	1250.053750000
2315	25.323096	86.151825	Bihar	Begusarai	Vegetation/Forest	520.010188100
2316	25.296341	86.107919	Bihar	Begusarai/Lakhisarai/Patna	Agriculture	4495.195029000
2317	25.475748	83.525364	Uttar Pradesh	Ghazipur	Agriculture	45.407723050

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2318	25.477603	83.520748	Uttar Pradesh	Ghazipur	Agriculture	0.383085992
2319	25.471596	83.522028	Uttar Pradesh	Ghazipur	Barren Land/ Sand Bar	5.755945913
2320	25.358060	86.307207	Bihar	Begusarai	Agriculture	489.7024595 00
2322	23.147719	88.449339	West Bengal	Hugli	Vegetation/For est, Settlements	16.67563667 0
2323	23.353617	88.336420	West Bengal	Nadia	Barren Land/ Sand Bar	6.165685338
2324	23.458851	88.367725	West Bengal	Purba Barddhama n/Nadia	Agriculture	94.48870996 0
2325	23.637032	88.159133	West Bengal	Nadia	Agriculture	14.08136773 0
2327	23.634580	88.169251	West Bengal	Nadia	Agriculture	5.836332006
2328	23.630667	88.168513	West Bengal	Nadia	Agriculture	90.69272671 0
2330	23.827202	88.243607	West Bengal	Murshidaba d	Agriculture	51.41418487 0
2332	23.942991	88.200644	West Bengal	Murshidaba d	Agriculture	57.61716662 0
2333	23.944197	88.203637	West Bengal	Murshidaba d	Barren Land/ Sand Bar	6.283942810
2334	29.605861	78.053251	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.793734723
2335	29.577661	78.049995	Uttar Pradesh	Bijnor	Agriculture	353.8488477 00
2338	29.569520	78.065218	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	2.596549865
2339	29.573307	78.067706	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	5.380026677
2341	29.577826	78.068810	Uttar	Bijnor	Barren Land/	3.200003826

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
			Pradesh		Sand Bar	
2342	29.581277	78.069004	Uttar Pradesh	Bijnor	Barren Land/ Sand Bar	1.445596556
2343	29.592546	78.058944	Uttar Pradesh	Bijnor	Vegetation/Forest	270.524306000
2347	29.634982	78.073484	Uttarakhand	Haridwar	Agriculture	198.420507600
2348	29.337332	78.071850	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	6.334192315
2349	29.344033	78.051282	Uttar Pradesh	Muzaffarnagar	Agriculture	416.801550000
2351	29.338165	78.044273	Uttar Pradesh	Muzaffarnagar	Barren Land/ Sand Bar	62.864731920
2352	28.724292	78.188832	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Barren Land/ Sand Bar	168.820276300
2357	28.694108	78.201594	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Agriculture	485.276183800
2358	28.676430	78.208559	Uttar Pradesh	Jyotiba Phule Nagar(Amroha)	Agriculture	152.735531300
2360	27.916837	78.879211	Uttar Pradesh	Budaun/Kanpur	Barren Land/ Sand Bar	84.359846540
2361	27.904291	78.892419	Uttar Pradesh	Budaun/Kanpur	Barren Land/ Sand Bar, Sand Mining	101.471638400
2362	27.901534	78.897995	Uttar Pradesh	Budaun/Kanpur	Vegetation/Forest	7.738673745

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2363	27.842122	78.969235	Uttar Pradesh	Kanshiram Nagar	Vegetation/Forest	116.716497400
2366	27.759663	79.195058	Uttar Pradesh	Budaun/Kanshiram Nagar	Vegetation/Forest	245.825173200
2370	27.614967	79.358925	Uttar Pradesh	Farrukhabad	Barren Land/Sand Bar	51.166755600
2372	29.239779	78.104246	Uttar Pradesh	Meerut/Muzaffarnagar	Agriculture	914.244224100
2376	27.686222	79.289118	Uttar Pradesh	Budaun	Barren Land/Sand Bar	20.166119040
2377	27.676277	79.302358	Uttar Pradesh	Budaun/Farrukhabad	Vegetation/Forest	216.602520100
2379	27.633086	79.383526	Uttar Pradesh	Budaun/Farrukhabad/Sahjahanpur	Agriculture	2480.379659000
2385	27.527017	79.532310	Uttar Pradesh	Farrukhabad	Agriculture	416.839978500
2386	27.481737	79.599133	Uttar Pradesh	Farrukhabad	Vegetation/Forest	53.143761770
2387	27.479652	79.610656	Uttar Pradesh	Farrukhabad	Agriculture	49.383363210
2388	27.491082	79.586207	Uttar Pradesh	Farrukhabad	Vegetation/Forest	335.165446100
2390	24.856421	87.902736	Jharkhand, West Bengal	Sahibganj/Maldah/Murshidabad	Vegetation/Forest	110.924534400
2391	24.836935	87.909399	Jharkhand, West Bengal	Sahibganj/Maldah/Murshidabad	Vegetation/Forest	168.331649900
2392	25.002903	87.876237	Jharkhand	Sahibganj	Agriculture	127.335762500
2395	24.890120	87.886360	Jharkhand	Sahibganj	Barren Land/	0.002788387

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	
2396	24.928735	87.896286	Jharkhand	Sahibganj/ Maldah	Agriculture	4024.045107 000
2404	25.274840	87.171190	Bihar	Bhagalpur	Agriculture	2865.616279 000
2406	25.281840	86.818633	Bihar	Bhagalpur	Agriculture	2433.988009 000
2408	25.283331	86.593344	Bihar	Munger	Agriculture	542.2143911 00
2412	25.501388	85.780947	Bihar	Patna	Agriculture	334.8533216 00
2413	25.481330	85.617662	Bihar	Patna/Sama stipur	Agriculture	2682.155299 000
2416	25.480463	85.524044	Bihar	Patna/Sama stipur	Agriculture	1540.661433 000
2417	25.467509	81.897498	Uttar Pradesh	Allahabad(P rayagraj)	Vegetation/For est	782.5507604 00
2420	25.467722	81.907501	Uttar Pradesh	Allahabad(P rayagraj)	Agriculture	461.2591152 00
2421	25.828770	81.300964	Uttar Pradesh	Fatehpur	Barren Land/ Sand Bar	0.000402746
2424	25.869947	81.236462	Uttar Pradesh	Fatehpur/R ae Bareli	Agriculture	420.9504329 00
2426	25.891286	81.212129	Uttar Pradesh	Fatehpur	Vegetation/For est	56.24633143 0
2427	25.879964	81.213280	Uttar Pradesh	Fatehpur	Vegetation/For est	23.52854437 0
2428	26.398235	80.480762	Uttar Pradesh	Unnao	Barren Land/ Sand Bar	103.3472304 00
2430	26.369147	80.503693	Uttar Pradesh	Kanpur Nagar/Unna o	Vegetation/For est	125.1497844 00
2432	23.383166	88.363192	West Bengal	Nadia	Barren Land/	15.01416656

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
					Sand Bar	0
2434	23.487900	88.370846	West Bengal	Purba Barddhaman	Barren Land/Sand Bar	13.127578010
2436	23.515270	88.381204	West Bengal	Purba Barddhaman/Nadia	Vegetation/Forest	16.148712660
2437	23.545855	88.301648	West Bengal	Nadia	Agriculture	41.875839840
2439	23.544558	88.302365	West Bengal	Nadia	Barren Land/Sand Bar	2.750547826
2441	23.622136	88.182457	West Bengal	Nadia	Agriculture	5.393873828
2442	24.895338	87.955134	West Bengal	Maldah	Agriculture	722.963897400
2443	24.910093	87.968046	West Bengal	Maldah	Agriculture	1019.575444000
2444	25.002087	87.978324	West Bengal	Maldah	Agriculture	124.805480200
2445	24.989477	87.980257	West Bengal	Maldah	Barren Land/Sand Bar	47.737242100
2446	25.928696	81.211889	Uttar Pradesh	Fatehpur	Vegetation/Forest	27.898388440
2447	25.994486	81.097570	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	52.574320730
2448	25.983828	81.093186	Uttar Pradesh	Fatehpur	Agriculture	153.248239000
2449	26.012147	81.072232	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	26.823238840
2450	26.046007	81.038967	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	27.365241370
2451	26.048942	81.031729	Uttar Pradesh	Fatehpur	Barren Land/Sand Bar	38.640200150

Unique ID	Latitude	Longitude	State	District	Current Uses	Area in Hectare
2452	26.110834	80.699982	Uttar Pradesh	Unnao/Rae Bareli	Agriculture	156.804787300
2455	26.171218	80.614884	Uttar Pradesh	Fatehpur/Unnao	Agriculture	2247.599640000
2456	21.745419	88.109170	West Bengal	South Twenty Four Parganas	Agriculture, Settlements	20235.482850000
2457	21.826718	88.179015	West Bengal	South Twenty Four Parganas	Vegetation/Forest	157.033191400
2458	21.748301	88.197089	West Bengal	South Twenty Four Parganas	Vegetation/Forest	438.043253200
2459	21.662533	88.205890	West Bengal	South Twenty Four Parganas	Agriculture	2296.851192000
2460	21.583087	88.183601	West Bengal	South Twenty Four Parganas	Vegetation/Forest	333.943552200

**ANNEXURE II – LIST OF RIVERINE ISLANDS IN THE RENELL’S
MAP OF GANGA RIVER, 1786**

Sr. No.	Location		Co-ordinates	
	State	District	Latitude	Longitude
1	Uttarakhand	Haridwar	29° 53.740'N	78° 8.895'E
2		Haridwar	29° 51.501'N	78° 9.658'E
3		Haridwar	29° 47.687'N	78° 11.279'E
4	Uttar Pradesh	Bijnor	29° 18.440'N	78° 8.417'E
5		Amroha	29° 3.779'N	78° 8.183'E
6		Kanpur	26° 31.470'N	80° 16.456'E
7		Kanpur	26° 30.571'N	80° 18.763'E
8		Kanpur	26° 21.763'N	80° 30.339'E
9		Kanpur	26° 15.978'N	80° 32.352'E
10		Kanpur- Fatehpur	26° 9.313'N	80° 38.626'E
11		Fatehpur	26° 3.348'N	80° 48.446'E
12		Raebareli	26° 3.462'N	81° 2.873'E
13		Raebareli	26° 0.873'N	81° 5.456'E
14		Fatehpur	25° 52.932'N	81° 14.654'E
15		Pratapgarh	25° 40.508'N	81° 25.586'E
16		Pratapgarh- Prayagraj	25° 33.422'N	81° 37.252'E
17		Prayagraj	25° 31.313'N	81° 44.688'E
18		Prayagraj	25° 21.899'N	81° 55.883'E
19		Mirzapur	25° 13.556'N	82° 23.788'E
20		Mirzapur	25° 10.101'N	82° 39.710'E
21		Varanasi	25° 20.961'N	83° 7.802'E
22		Chandauli	25° 25.858'N	83° 21.362'E
23		Ghazipur	25° 34.199'N	83° 31.088'E
24		Ghazipur	25° 32.412'N	83° 39.227'E
25		Ghazipur	25° 33.113'N	83° 40.436'E
26		Ballia	25° 37.981'N	83° 52.338'E

Sr. No.	Location		Co-ordinates		
	State	District	Latitude	Longitude	
27		Ballia	25° 40.495'N	83° 54.420'E	
28		Ballia	25° 43.130'N	84° 0.654'E	
29		Ballia	25° 40.863'N	84° 2.564'E	
30	Bihar	Saran	25° 40.925'N	85° 2.113'E	
31		Patna	25° 33.433'N	85° 17.402'E	
32		Patna	25° 28.249'N	85° 38.859'E	
33		Lakhisarai	25° 13.016'N	86° 3.261'E	
34		Begusarai	25° 18.009'N	86° 8.916'E	
35		Begusarai	25° 19.726'N	86° 17.287'E	
36		Khagaria	86° 42.387'E	25° 17.292'N	
37		Khagaria	25° 19.665'N	86° 44.403'E	
38		Bhagalpur	25° 17.445'N	86° 53.150'E	
39		Bhagalpur	25° 21.496'N	87° 10.893'E	
40		Bhagalpur	25° 24.961'N	87° 10.717'E	
41		Bihar-Jharkhand	Katihar-Sahibganj	25° 20.365'N	87° 22.849'E
42		Jharkhand	Sahibganj	25° 18.643'N	87° 19.096'E
43	Sahibganj		25° 16.733'N	87° 26.396'E	
44	Sahibganj		25° 16.834'N	87° 32.664'E	
45	Sahibganj		25° 11.495'N	87° 41.749'E	
46	Sahibganj		24° 54.923'N	87° 50.718'E	
47	West Bengal	Malda	24° 56.400'N	88° 0.770'E	
48		Malda	24° 47.158'N	87° 59.328'E	
49		Malda	24° 41.879'N	88° 1.288'E	
50		Murshidabad	24° 20.402'N	88° 7.344'E	
51		Murshidabad	24° 19.252'N	88° 9.680'E	
52		Nadia	23° 5.734'N	88° 31.280'E	

ANNEXURE III – COPY OF THE BENGAL ALLUVION AND DILUVION REGULATION, 1825

2[THE BENGAL ALLUVION AND DILUVION REGULATION, 1825]

[25 th May, 1825.]

A Regulation for declaring the Rules to be observed in determining Claims to land gained by Alluvion, or by Dereliction of a River or the Sea.

Preamble	<p>1. In consequence of the frequent changes which take place in the channel of the principal rivers that intersect the Provinces immediately subject to the Presidency of Fort Willima, and the Shifting of the sands which lie in the beds of those rivers, chars or small islands are often thrown up by alluvion in the midst of the stream or near one of the banks, and large portions of land are carried away by an encroachment of the river on one side, whilst accessions of land are at the same time, or in subsequent years, gained by dereliction of the water on the opposite side; similar instances of alluvion, encroachment and dereliction also sometimes occur on the sea-coast which borders the southern and south –eastern limits of Bengal.</p>
	<p>The land gained from the river or sea by the means abovementioned are a frequent source of contention and affray, and although the law and custom of the country have established rules applicable to such cases, these rules not being generally known, the Courts of Justice have some times found it difficulty to determine the rights of litigant parties claiming chars or other lands gained in the manner above described.</p>
	<p>The Court of Sadr Diwani Adalat, with a view to ascertain the legal provisions of the Muhammadan and Hindu laws on the subject called for reports from their Law – officers, of each persuasion, and on consideration of the repots furnished by the Law – officers in consequences, as well as of the decisions which have been passed by the Court of Sadr Diwani Adalat in cases brought before them in appeal which involved the rights of claimants to lands gained by alluvion, or by dereliction of rivers or the sea, the Governor-General in Council has deemed it proper to enact the following rules for the general information of individuals well as for the guidance of the Courts of Judicature’ to be in force, as soon as promulgated, throughout the whole of the Provinces subject to the Presidency of Fort William.</p>

1. This Regulation has been declared to be in force in the N.W.F.P.S. 4 of the North West Frontier Province Law and Justice Regulation, 1901 (VII of 1901)

2. Short title, "The Bengal Alluvion and Diluvion Regulation 1825," See the Amending Act, 1897 (V of 1897), Pakistan Code, Vol. IV.

1825 Ben. Reg. XI

ALLUVION AND DILUVION.

<p>Claims and disputes as to alluvial lands to be decided by usage when clearly recognised and established.</p>	<p>2. When ever and clear and definite usage of shikast paiwest, respecting the disjunctions and junction of land by the encroachment or recess of a river, may have been immemorially established, for determining the rights of the proprietors of two or more contiguous estates divided by a river (Such as that the main channel of the river dividing the estate shall be the constant boundary between them, whatever changes may take place in the course of the river, by encroachment on one side and accession on the other), the usage so established shall [unless and until a boundary is fixed under the provisions of sections 101-A of the Punjab Land Revenue Act, 1887, as amended by the Punjab Boundaries Act, 1899] govern the decision of all claims and disputes relative to alluvial land between the parties whose estates may be liable to such usage. XVII of Punjab 1899.</p>
<p>Where no usage established, claims how decided.</p>	<p>3. Where [no boundary has been under the provisions of section 101-A of the Punjab Land Revenue Act, 1887, as amended by the Punjab Riverain Boundaries Act, 1899, and] there may be no local usage of the nature referred to in the preceding sections, the general rules declared in the following section shall be applied to the determination of all claims and disputes relatives to lands gained by alluvion or dereliction either of a river or the sea.</p>
<p>Land gained by gradual accession from recess of river or sea.</p>	<p>4. First. __ When land may be gained by gradual accession, whether from the recess of a river or of the sea, it shall be considered an increment to the tenure of the person to whose land or estate it is thus annexed, whether such land or estate be held immediately from [Crown] by a Zamindar or other superior land holder, or as a subordinate tenure, by any description of under tenant whatever:</p>

Extent of interest in increment of person in possession.	Provided that the increment of land thus obtained shall not entitle the person in possession of the estate or tenure to which the land may be annexed to a right of property or permanent interest therein beyond that possessed by him in the estate or tenure to which the land may be annexed, and shall not in any case be understood to exempt the holder of it from the payment to [Crown] of any assessment for the public revenue to which it may be liable under the provisions of Regulation II, 1819, or of any other regulation in force.
When river by sudden change of course intersects estate.	<i>Second.</i> ___ The above rule shall not be considered applicable to cases in which a river, by a sudden change of its course, may break or may by the violence of stream separate a considerable piece of land from one estate, and join it to another estate without destroying the identity, and preventing the recognition, of the land so removed.

1. Ins. By Punjab Act, I of 1899 s 4 (i)
2. Ins. Ibid, s.4 (2)
3. Subs. By the A.O., 1937 for "Government."

ALLUVION AND DILUVION. 1825 Ben. Reg. XI

In such cases the land, on being clearly recognized, shall remain the property of its original owner.

Third. ___ When a char or island may be thrown up in a large navigable river (the bed of which is not the property of an individual), or in the sea and the channel of the river or sea between such island and the shore may not be fordable, it shall according to established usage, be at the disposal of [Crown]	Chars or island thrown up in navigable rivers.
But if the channel between such island and the shore be fordable at any season of the year, it shall be considered an accession to the land, tenure or tenures of the person or persons whose estate or estates may be most contiguous to it, subject to the several provisions specified in the first clause of this section, with respect to increment of land by gradual accession.	Property therein when channel fordable.

<p><i>Fourth.</i> ___ In small and shallow rivers, the beds of which with the jalkar right of fishery, may have been heretofore recognizes ad the property of individuals, any sand bank or chars that may be thrown up shall, as hitherto, belong to the proprietor of the bed of the river, subject to the provisions stated in the first clause of the present section.</p>	<p>Sand banks or chars thrown up in small shallow rivers.</p>
<p><i>Fifth.</i> ___ In all other cases, namely, in all cases of claims and disputes respecting land gained by alluvion or by dereliction of a river or the sea, which are not specifically provided for by the rules contained in this Regulation, the Courts of Justice, in deciding upon such claims and disputes, shall be guided by the best evidence they may be able to obtain of established local usage, if there be any applicable to the case, or , if not, by general principles of equity and justice.</p>	<p>Disputes relatives to lands gained by alluvion or by dereliction not provided for by regulation.</p>
<p>5. Nothing in this Regulation shall be construed to justify any encroachments by individuals on the beds of channels of navigable river, or to prevent Zila, Magistrates, or any other officer of [Grown] who may be duly empowered for that purpose from removing obstacles which appear to interfere with the safe and customary navigation of such rivers, or which shall in any respects obstruct the passage of boats by tracking on the banks of such rivers, or otherwise.</p>	<p>Encroachment or beds of navigable rivers and other obstruction.</p>

- o Sub by the A.O. 1937, for "Government."
- o The Words "and city" were repealed by the Repealing and Amending Act, 1903 (I of 1908)

ANNEXURE IV – COPY OF THE PUNJAB RIVERAIN BOUNDARIES ACT, 1899

THE PUNJAB RIVERAIN BOUNDARIES ACT, 1899.

PUNJAB ACT 1 OF 1899

PASSED BY THE LIEUTENANT GENERAL OF THE PUNJAB IN COUNCIL

Contents

SN	Subject
1.	Short title, extent and commencement
2.	Sections added after section 101 of India Act XVII of 1887. Act XVII of 1887
3.	*****
4.	Effect of fixing a boundary between riverain estates proviso
5.	Clause added to sub-section (2) of Section 158 of India Act XVII of 1887
6.	Regulation XI of 1825 section 2 and 3 Amendment of section 2 and 3 of Bengal Regulation XI of 1825
7.	India Act XVII of 1887 - Punjab Act I
8.	India Act XVII of 1887 - Punjab Act I

[17th May, 1899, 19th June, 1899].

[Received the assent of the Lieutenant-Governor on the 17th May, 1899 and that of the Governor General on the 19th June, 1899, and was first published in the PUNJAB GOVERNMENT'S GAZETTE of the 3rd August, 1899].

1	2	3	4
Year	No.	Short title	Whether repealed or otherwise affected by legislation.
1899	1	The Punjab Riverain Boundaries Act, 1899	Extended to the territories which immediately before the 1 st November, 1956, were comprised in the State of Patiala and East Punjab States Union by Punjab Act 23 of 1957 ³

*An Act to amend the Punjab Land Revenue Act, 1887,
And the law relating to the ascertainment and
Determination, in certain cases of the
Boundaries of riverain estates
In the [Punjab].*

Preamble - Whereas it is expedient to make better provision for the ascertainment and determination of the boundaries between estates which are subject to, or liable to be affected by, the action of a river, and to amend the law relating to the determination of claims to lands gained by alluvion and to prevent disputes as to such boundaries and lands; it is hereby enacted as follows –

1. Short title, extent and commencement - (1) This Act may be called the Punjab Riverain Boundaries Act, 1899.

- (2) It extends to the whole of Punjab; and
- (3) It shall come into force at once.

¹For statement of Objects and Reasons, see Punjab Gazette, 1898, Pt. V-A, page 20; for Report of the select Committee, see *ibid*, Pt.V-A, pages 1 and 4; for Proceedings in Council, see *ibid*, 1898, Pt. VI, page 6; *ibid*, 1899, Pt. VI, pages 2 to 11.

²See Punjab Gazette, 1899, Part IV-A, pages 1-3.

³For statement of Objects and Reasons, see Punjab Government Gazette (Extraordinary), 1937, page 689

2. Sections added after section 101 of India Act XVII of 1887. Act XVII of 1887 - After section 101 if the Punjab Land-revenue Act-1887, the following sections shall be added, namely;-

“101-A. Power to fix boundary between reiverain estates - (1) When any two or more estates are subject to river action and the limits of any such estates are, by any law, custom, decree or order applicable thereto, liable to vary according as variations may from time to time occur in the course of action of such river, the ¹[State Government] may,²[* * * *] order a permanent boundary line to be fixed between any such estates or such portions thereof as are liable to river action.

(2) Upon an order being made under sub-section (1), the Collector shall fix a boundary line between such estates or portions of such estates accordingly, and shall demarcate the same, in accordance with the rules (if any) made under section 100 and the provisions of section 101.

(3) Every such boundary line shall be fixed with due regard to the history of the estates, and the interests of the persons, respectively owning them or possessing rights therein, in such manner as may be just and equitable in the circumstances of each case.

¹*Substituted or the words “ Local Government” by the Government of India (Adaptation of Indian Laws) Order, 1937, and Adaptation of Laws Order, 1950.*

²*The words “in its direction” were omitted by the Government of India (Adaptation of Indian Laws) Order, 1937.*

(4) **Effect of fixing a boundary between reverain estates proviso -** No such boundary line shall be deemed to have been permanently fixed until it has been approved by the Financial Commissioner.”

101-B (1) Every boundary line fixed in accordance with the provisions of section 101-A, shall, notwithstanding any law or custom, or any decree or order of any Court of law, to the contrary, be the fixed and constant boundary between the estates affected thereby, and the proprietary and all other rights in every holding, field or other portion of an estate situate on each side of the boundary line so fixed, shall, subject to the following proviso, vest in the land-owners of the estate which lies on that side of the boundary line on which such holding, field or other portion of an estate is situate:

Provided that if, by the operation of this section, the proprietary or any other rights in any land which at the time a boundary line is fixed is under cultivation or reasonably fit for cultivation or yields any produce of substantial value, would be transferred from the land-owners and other right holders of any one estate to the land owners of any other estate, the Collector shall, by written order direct that the rights in such land shall, subject to the provisions of section 101-C and section 101-D, not be so transferred unless and until the land, in respect of which any such order is made, ceases to be reasonably fit for cultivation, or to yield any produce of substantial value, and, upon any such order being made the transfer of the rights in such land shall be suspended accordingly.

Provided further that when any portion of the land specified in any such order ceases to be reasonably fit for cultivation or to yield any produce of substantial value the order shall, when the Collector, in writing, so directs, cease to operate as to that portion.

(2) The decision of the Collector, as to whether for the purposes of the proviso to sub-section (1) of this section any land is or is not reasonably fit for cultivation or does or does not yield any produce of substantial value, shall be final.”

“101-C. Applications for immediate transfer of rights reserved under the proviso to sub-section (1) of section 101-B upon payment of compensation and procedure thereupon. Award of compensation and extinguishment of rights thereby - (1) When any order has been made under the proviso to sub section(1)of section 101-B, the land-owners(or any of them) in whom, but for such order, the rights in the land specified therein would vest, may apply, in writing to the Collector to forthwith transfer the rights, the transfer of which has been suspended by such order, upon payment of compensation for the same.

(2) When an application under sub-section(1) is made, the collector shall –
(a) fix a day for the hearing of the application :
(b) cause notice of the application, and of the day fixed for the hearing thereof, to be served on, or proclaimed for the information of, all persons recorded as having rights in the land specified in the order made under the proviso

to sub-section (1) of section 101-B, and all other persons interesting or claiming to be interested therein.

- (c) Upon the date so fixed for hearing, or any day to which the hearing may be adjourned, inquire into the rights in the land and award compensation in respect of all rights found established therein, to the persons severally entitled thereto;
- (d) Inform the applicant of the aggregate amount of compensation so awarded and require him to deposit the amount with the collector on or before a day to fixed by him in that behalf.

Provided that notwithstanding anything in this sub section contained, it shall be lawful for the collector, in his description, and at any time before an award of compensation thereon has been made, to reject any application made under sub section(1).

(3) **India Act 1 of 1894**- In awarding compensation under sub section(2), the Collector shall be guided by the provisions of section 23, and section 24 of the Land Acquisition Act, 1894, so far as the same may be applicable to circumstances of the case.

(4) Upon the fifteenth day of May next after the whole amount of compensation so awarded has been deposited with the Collector, the order made under the proviso to sub-section (1) of section 101-B, shall cease to operate and the rights specified therein shall be transferred and vest in the manner prescribed in sub-section (1) of section 101-B, notwithstanding anything in the proviso thereof contained, and the Collector shall proceed to tender the compensation to the persons severally entitled to receive the same under his award. If any such person shall refuse to accept the sum so awarded and tendered to him, it shall be placed to his credit in the public treasury.

(5) When any order made under the proviso to sub section (1) of section 101-B, shall, under the provisions of sub-section (4) of this section, cease to operate and determine, all rights reserved to any person by such order, shall be extinguished.

“101-D. Order under the proviso to sub-section (1) of section 101-B to cease to apply to rights voluntarily transferred to a land owner of the estate to which the land is transferred by fixing boundaries. When any person possessing any rights in any land, in regard to the rights in which an order has been made under the proviso to sub-section (1) of section 101-B, voluntarily transfers such rights to any land-owner of the estate, in the land-owners of which, but for such order, such rights would vest under the operation of sub-section (1) of section 101-B, the rights so transferred shall forthwith cease to be subject to such order.

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“101-E” Rights transferred to be liable to all the incidents of tenure of the estate to which the transfer is made. In every case in which, by the operation of section 101-B, or section 101-C, or section 101-D, proprietary or other rights in land are transferred from the land-owners and other right-holders of any one estate to the land-owners of any other estate, such rights shall be subject to all the incidents of tenure and liabilities, which, under any law or custom for the time being in force, apply to the rights of the land-owners of the estate to which such rights are so transferred.

“101-F. Meaning of the expression Collector in sections 101-A, 101-B and 101-C.For the purposes of sections 101-A, 101-B and 101-C, respectively, the expression “Collector” shall be deemed to include any Revenue Officer appointed by the [State Government] to perform all or any of the functions of a Collector under any of the provisions thereof”

5. Clause added to sub-section (2) of Section 158 of India Act XVII of 1887 - After clause (xviii) of sub-section (2) of section 158, of the Punjab Land-revenue Act, 1887, the following clause shall be added, namely:-

“(xviii-a). Any question connected with or arising out of or relating to any proceedings for the determination of boundaries of estates, subject to river action under sections 101-A, 101-B, 101-C and 101-D, respectively, of Chapter VIII.”

¹Substituted for the words “Provincial Government” by the Adaptation of Laws Order, 1950.

6. Regulation XI of 1825 section 2 and 3 Amendment of section 2 and 3 of Bengal Regulation XI of 1825 - (1) In section 2 of the Bengal Regulation No. XI of 1825¹ (*a Regulation for declaring the rules to be observed in determining claims to lands gained by alluvion or by the dereliction of a river or the sea*) after the words “usage so established shall,” the words following shall be inserted, namely :

7. India Act XVII of 1887 - Punjab Act I of 1899 - “Unless and until a boundary is fixed under the provisions of section 101-A of the Punjab Land Revenue Act, 1887, as amended by The Punjab Riverain Boundaries Act-1899.”

8. India Act XVII of 1887 - Punjab Act I of 1899 - In section 3 of the same Regulation, after the word “Where” the words following shall be inserted, namely:

“no boundary has been fixed under the provisions of section 101-A of the Punjab Land Revenue Act, 1887, as amended by the Punjab Riverain Boundaries Act, 1899, and.”

¹The Bengal Alluvion and Diluvion Regulation, 1825.

ANNEXURE V – COPY OF THE GANGA NOTIFICATION

रजिस्ट्री सं० डी० एल०-33004/99

REGD. NO. D. L.-33004/99



भारत का राजपत्र The Gazette of India

असाधारण

EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)

PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित

PUBLISHED BY AUTHORITY

सं. 2458]

नई दिल्ली, शुक्रवार, अक्तूबर 7, 2016/अश्विन 15, 1938

No. 2458]

NEW DELHI, FRIDAY, OCTOBER 7, 2016/ASVINA 15, 1938

MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT, AND GANGA REJUVENATION

NOTIFICATION

New Delhi, the 7th October, 2016

S.O. 3187(E).—Whereas it is necessary to constitute authorities at Central, State and District levels to take measures for prevention, control and abatement of environmental pollution in River Ganga and to ensure continuous adequate flow of water so as to rejuvenate the River Ganga to its natural and pristine condition and for matters connected therewith or incidental thereto;

And whereas the River Ganga is of unique importance ascribed to reasons that are geographical, historical, socio-cultural and economic giving it the status of a National River;

And whereas the River Ganga has been facing serious threat due to discharge of increasing quantities of sewage, trade effluents and other pollutants on account of rapid urbanisation and industrialisation;

And whereas, the demand for water of River Ganga is growing for irrigation, drinking water supplies, industrial use and hydro-power due to increase in population, urbanisation, industrialisation, infrastructural development and taking into account the need to meet competing demands;

And whereas there is an urgent need-

- (a) to ensure effective abatement of pollution and rejuvenation of the River Ganga by adopting a river basin approach to promote inter-State and inter-sectoral co-ordination for comprehensive planning and management;
- (b) to maintain ecological flows in the River Ganga with the aim of ensuring continuous flows throughout its length so as to restore its ecological integrity that enables it to self rejuvenate;
- (c) for imposing restrictions in areas abutting the River Ganga in which industries, operations or processes, or class of industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards;
- (d) to make provision for inspection of any premises, plants, equipment, machineries, manufacturing or other processes, materials or substances and giving direction to the authorities, officers and persons as may be necessary to take steps, for prevention, control and abatement of environmental pollution in the River Ganga;
- (e) for carrying out and sponsoring investigations and research relating to problems of environmental pollution in the River Ganga and examination of such manufacturing processes, material and substance as are likely to cause environmental pollution;
- (f) for collection and dissemination of information in respect of matters relating to environmental pollution in the River Ganga and preparation of manual, codes or guide relating to the prevention, control and abatement of environmental pollution;

And whereas the State Governments concerned, being equally responsible for Ganga rejuvenation, are required to co-ordinate and implement the river conservation activities at the State level, and to take steps for comprehensive management of the River Ganga in their States;

And whereas it is required to have planning, financing, monitoring and coordinating authorities for strengthening the collective efforts of the Central Government and the State Governments and authorities under this Order for effective abatement of pollution and rejuvenation, protection and management of the River Ganga;

Now, therefore, in exercise of the powers conferred by sub-section (1), read with clauses (i), (ii), (v), (vi), (vii), (viii), (ix), (x), (xii) and (xiii) of sub-section (2) and (3) of section 3 and sections 4,5,9,10,11, 19, 20 and 23 of the Environment (Protection) Act, 1986 (29 of 1986) (hereinafter referred to as the Act) and in supersession of the notifications of the Government of India in the erstwhile Ministry of Environment and Forests numbers S.O.1111(E), dated the 30th September, 2009, S.O. 2493 (E), dated the 30th September, 2009, S.O. 2494 (E), dated the 30th September 2009, S.O. 2495 (E), dated the 30th September 2009, S.O. 287 (E) dated the 8th February, 2010 and in the Ministry of Water Resources, River Development and Ganga Rejuvenation No. S.O. 2539 (E), dated the 29th September 2014, except as respects things done or omitted to be done before such supersession, the Central Government hereby-----

(i)constitutes the authorities by the names mentioned in this Order for the purpose of exercising and performing such of the powers and functions (including the power to issue directions under section 5 of the Act and for taking measures with respect to the matters as mentioned in this Order;

(ii)directs, subject to the supervision and control of the Central Government and the provisions of this Order, such authority or authorities as specified in this Order that shall exercise the powers or perform the functions or take the measures so mentioned in this Order as if such authorities had been empowered by the Act to exercise those powers, perform those functions, or take such measures;

(iii)directs that all its powers and functions (except the power to constitute any authority under sub-section (3) of section 3 and to make rules under the sections 6 and 25 of the Act) under any provision of the Act shall, in relation to River Ganga and matters connected therewith, be exercisable and discharged also by the authorities constituted by this Order and by the officers specified in this Order, subject to such conditions and limitations and to the extent as specified in this Order.

1.Short title and commencement. – (1) This Order may be called the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016.

(2) It shall come into force on the date of its publication in the Official Gazette.

2. Applicability.- This Order shall apply to the States comprising River Ganga Basin, namely, Himanchal Pradesh, Uttarakhand, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, Haryana, Rajasthan, West Bengal and the National Capital Territory of Delhi and such other States, having major tributaries of the River Ganga as the National Council for Rejuvenation, Protection and Management of River Ganga may decide for the purpose of effective abatement of pollution and rejuvenation, protection and management of the River Ganga.

3.Definitions.- (1) In this Order, unless the context otherwise requires, -

(a) "Act" means the Environment (Protection) Act, 1986 (29 of 1986);

(b)"Basin" means the entire catchment of a water body or water course including the soil, water, vegetation and other natural resources in the area and includes land, water, vegetation and other natural resources on a catchment basis;

(c)"Buffer Area" means an area which extends beyond the flood plain of a stream;

(d)"catchment" or "catchment area" includes the entire land area whose runoff from rain, snow or ice drains into a water body or a water course, before the water course joins River Ganga or its tributaries or discharges water into River Ganga or its tributaries;

(e)"commercial fishing" means large scale fishing for commercial purposes by nets, poisoning, or other modern fishing gear or methods in River Ganga or its tributaries;

(f) Competent authority means "Central Government"

(g)"deforestation" means removal or reduction of forest cover, especially when caused by anthropogenic activities or removal of trees and other vegetation of a forest excluding a planned clearance for scientific management of forest in particular in the catchment area of River Ganga;

(h)"degraded forest" means a forest having loss or reduction of native forest cover or vegetation density in the catchment area abutting River Ganga or its tributaries;

(i)"direction" shall mean direction issued under section 5 of the Act and the expression "direct" shall be construed accordingly;

(j) "District Ganga Committee" means the District Ganga Protection Committee mentioned in paragraph 53;

(k)"engineered diversion" means a structure or device constructed or installed to transfer the water of River Ganga or its tributaries into canals or other engineering structures;

(l) "flood plain" means such area of River Ganga or its tributaries which comes under water on either side of it due to floods corresponding to its greatest flow or with a flood of frequency once in hundred years;

(m) "Ghat" means sloping part at Bank of River Ganga or its tributaries with artificially constructed steps or sloping piece of land used for providing easy human access to water of River Ganga or its tributaries and includes usage of such parts for religious or other related purposes;

(n) "local authority" includes Panchayati raj institutions, municipalities, a district board, cantonment board, town planning authority or Zila Parishad or any other body or authority, by whatever name called, for the time being invested by law, for rendering essential services or with the control and management of civic services, within a specified local area;

(o) "National Mission for Clean Ganga" means the authority mentioned in paragraph 31.

(p) "notification" means a notification published in the Official Gazette and the expression 'notifying' shall be construed accordingly;

(q) "offensive matter" consists of solid waste which includes animal carcasses, kitchen or stable refuse, dung, dirt, putrid or putrefying substances and filth of any kind which is not included in the sewage;

(r) "person" include ----

(i) an individual or group or association of individuals whether incorporated or not;

(ii) a company established under the Companies Act, 2013 (18 of 2013);

(iii) any corporation established by or under any Central or State Act;

(iv) a local authority;

(v) every juridical person not falling within any of the preceding sub-clauses;

(s) "River Bed" means the dried portion of the area of River Ganga or its tributaries and includes the place where the River Ganga or its tributaries run its course when it fills with water and includes the land by the side of River Ganga or its tributaries which retains the water in its natural channel, when there is the greatest flow of water;

(t) "River Bed Farming" includes seasonal agriculture or farming on the River Bed of River Ganga or its tributaries during low flows of water;

(u) "River Ganga" means the entire length of six head-streams in the State of Uttarakhand namely, Rivers Alakananda, Dhauli Ganga, Nandakini, Pinder, Mandakini and Bhagirathi starting from their originating glaciers up to their respective confluences at Vishnu Prayag, Nand Prayag, Karn Prayag, Rudra Prayag, and Dev Prayag as also the main stem of the river thereafter up to Ganga Sagar including Prayag Raj and includes all its tributaries;

(v) "rubbish" means ashes, broken brick, mortar, broken glass, dust or refuse of any kind and includes filth;

(w) "sand mining" means large scale removal of river sand from the dried channel belt, flood plain or a part of River Ganga or its tributaries;

(x) "sewage effluent" means effluent from any sewerage system or sewage disposal works and includes sewage from open drains;

(y) "sewerage scheme" means any scheme which a local authority may introduce for removal of sewage by flushing with water through underground closed sewers;

(z) "Schedule" means Schedule appended to this Order;

(za) "specified District" means an area of every District abutting the River Ganga, being within a radius of fifteen kilometers of the Ganga River Bank or its tributaries in the States of Himachal Pradesh, Uttarakhand, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, Haryana, Rajasthan, West Bengal and the National Capital Territory of Delhi and such other States, having major tributaries of the River Ganga as referred to in this Order;

(zb) "State Ganga Committee" means the State Ganga Rejuvenation, Protection and Management Committee constituted under this Order for each of the States mentioned in paragraph 2.

(zc) State Ganga River Conservation Authority means an authority earlier constituted in each State under the Act as follows, namely:-

(i) the Bihar State Ganga River Conservation Authority constituted by the notification of the Government of India in the Ministry of Environment and Forests number S.O287 (E), dated 8th February 2010;

(ii) the Jharkhand State Ganga River Conservation Authority constituted by the notification of the Government of India in the Ministry of Environment and Forests number S.O2495(E), dated 30th September 2009;

- (iii) the Uttarakhand State Ganga River Conservation Authority constituted by the notification of the Government of India in the Ministry of Environment and Forests number S.O 1111 (E), dated 30th September 2009;
- (iv) the Uttar Pradesh State Ganga River Conservation Authority constituted by the notification of the Government of India in the Ministry of Environment and Forests number S.O2493 (E), dated 30th September 2009; and
- (v) the West Bengal State Ganga River Conservation Authority constituted by the notification of the Government of India in the Ministry of Environment and Forests number S.O2494 (E), dated 30th September 2009.

(zd) "stream" includes river, water course (whether flowing or for the time being dry), inland water (whether natural or artificial) and sub-terrain waters;

(ze) "tributaries of River Ganga" means those rivers or streams which flow into River Ganga and includes Yamuna River, Son River, Mahananda River, Kosi River, Gandak River, Ghaghara River and Mahakali River and their tributaries or such other rivers which National Council for Rejuvenation Protection and Management of River Ganga may, by notification, specify for the purposes of this Order.

2. The words and expressions used herein and not defined but defined in the Environment (Protection) Act, 1986 (29 of 1986) shall have the meanings respectively assigned to them in the Act.

4. Principles to be followed for rejuvenation, protection and management of River Ganga. – (1) The following principles shall be followed in taking measures for the rejuvenation, protection and management of River Ganga, namely:-

- (i) the River Ganga shall be managed as a single system;
- (ii) the restoration and maintenance of the chemical, physical, and biological quality of the waters of River Ganga shall be achieved in a time bound manner;
- (iii) the River Ganga shall be managed in an ecologically sustainable manner;
- (iv) the continuity of flow in the River Ganga shall be maintained without altering the natural seasonal variations;
- (v) the longitudinal, lateral and vertical dimensions (connectivities) of River Ganga shall be incorporated into river management processes and practices;
- (vi) the integral relationship between the surface flow and sub-surface water (ground water) shall be restored and maintained;
- (vii) the lost natural vegetation in catchment area shall be regenerated and maintained;
- (viii) the aquatic and riparian biodiversity in River Ganga Basin shall be regenerated and conserved;
- (ix) the bank of River Ganga and its flood plain shall be construction free Zone to reduce pollution sources, pressures and to maintain its natural ground water recharge functions;
- (x) the public participation in rejuvenation, protection and management, revision and enforcement of any regulation, standard, effluent limitation plan, or programme for rejuvenation, protection and management shall be encouraged and made an integral part of processes and practices of

River Ganga rejuvenation, protection and management.

(2) National Mission for Clean Ganga may, having regard to the needs of the people of the country, advances in technology and socio economic conditions of the people and to preserve the rich heritage of national composite culture, specify additional principles in addition to the principles specified under sub-paragraph (1).

5. Ecological flow of water in River Ganga to be maintained. – (1) Every State Government, shall endeavor to ensure that uninterrupted flows of water are maintained at all times in River Ganga as required under clause (iv) of paragraph (4).

(2) Every State Government shall also endeavor to maintain adequate flow of water in River Ganga in different seasons to enable River Ganga to sustain its ecological integrity and to achieve the goal, all concerned authorities shall take suitable actions in a time bound manner.

(3) For the purposes of this paragraph, the average flow of water shall be determined by such Hydrology Observation Stations at such points of the River Ganga, as may be specified by the National Mission for Clean Ganga:

Provided that the average flow of water in River Ganga may, having regard to ecology, be determined by the National Mission for Clean Ganga for different points of River Ganga.

6. Prevention, control and abatement of environmental pollution in River Ganga and its tributaries.- (1) No person shall discharge, directly or indirectly, any untreated or treated sewage or sewage sludge into the River Ganga or its tributaries or its banks:

Provided that where a local authority does not have, on the date of commencement of this Order, sewerage scheme or infrastructure for collection, storage, transportation and disposal of sewage or sewage sludge or such infrastructure is not functional on the said date in an area abutting the River Ganga or its tributaries, every such local authority shall, within a period, specified by National Mission for Clean Ganga from the date of commencement of this Order, develop such infrastructure or make such infrastructure functional, as the case may be, for collection, storage, transportation and disposal of sewage in the territorial area of the local authority.

(2) No person shall discharge, directly or indirectly, any untreated or treated trade effluent and industrial waste, bio-medical waste, or other hazardous substance into the River Ganga or its tributaries or on their banks:

Provided further that where an industry or industrial area management does not have, on the date of commencement of this Order, industrial effluent treatment scheme or infrastructure for collection, storage, transportation and disposal of trade effluents industrial waste, bio-medical waste, or other hazardous substance, etc. or such infrastructure is not functional on the said date in an area abutting the River Ganga or its tributaries, every such industry or industrial area management shall, within a period so specified by the National Mission for Clean Ganga from the date of commencement of this Order, develop such infrastructure or make such infrastructure functional, as the case may be, for collection, storage, transportation and disposal of trade effluent and industrial waste, bio-medical waste, or other hazardous substance in the jurisdiction of the industry or industrial area management.

(3) No person shall construct any structure, whether permanent or temporary for residential or commercial or industrial or any other purposes in the River Ganga, Bank of River Ganga or its tributaries or active flood plain area of River Ganga or its tributaries:

Provided that in exceptional circumstances like natural calamities or religious events at traditional locations, temporary structures can be raised after prior permission of the National Mission for Clean Ganga acting through the State Ganga Committee and the District Ganga Committee:

Provided further that in case any such construction has been completed, before the commencement of this Order, in the River Bank of River Ganga or its tributaries or active flood plain area of River Ganga or its tributaries, the National Mission for Clean Ganga shall review such constructions so as to examine as to whether such constructions are causing interruption in the continuous flow of water or pollution in River Ganga or its tributaries, and if that be so, it shall cause for removing them.

(4) No person shall do any act or carry on any project or process or activity which, notwithstanding whether such act has been mentioned in this Order or not, has the effect of causing pollution in the River Ganga.

(5) It shall be the duty of the National Mission for Clean Ganga, every Specified State Ganga Committee or specified District Ganga Protection Committee, local authority and all other authorities and persons to disseminate widely and bring to public notice, using various means, information captured in reports and the aforesaid measures in the local language in every village, town, city and other areas abutting River Ganga and its tributaries.

7. Emergency measures in case of pollution of River Ganga or its tributaries -- If any poisonous, noxious or polluting matter is present or has entered into the River Ganga due to any accident or other unforeseen act or event, and it is necessary or expedient to take immediate action, the National Mission for Clean Ganga shall take immediate action for carrying out such operations or direct for carrying out such operations by the specified State Ganga Committee or specified District Ganga Committee or local authority or any other authority or Board or Corporation, as it may consider necessary for all or any of the following purposes, namely; -

(a) the manner of removing the matter from River Ganga and disposing it off in such a manner as it may specify, as also, for carrying out such operations as is considered appropriate for mitigation or removal of any pollution caused by such matter;

(b) issuing directions restraining or prohibiting any person concerned from discharging any poisonous, noxious or polluting matter in the River Ganga;

(c) undertaking any additional work or functions as may be necessary to address such emergency.

8. Power to issue directions. - The National Mission for Clean Ganga shall, in the exercise of its powers and performance or its functions under this Order, issue such directions in writing as it may consider necessary for abatement of pollution and rejuvenation, protection and management of the River Ganga to the concerned authority or local authority or other authorities or Board or Corporation or person and they shall be bound to comply with such directions.

9. Ganga safety audit.- Every District Ganga Committee shall cause the Ganga safety audit to be carried out by such Ganga Safety Auditors within such time frame and in accordance with such protocols as may be specified by the

National Mission for Clean Ganga for the area of the River Ganga abutting such district and forward the copy of the report of such safety audit along with remedial action taken thereon to the concerned State Ganga Committee and the National Mission for Clean Ganga, which shall take appropriate action thereon, if required.

10. Pollution in River Ganga and its tributaries to be monitored.- (1) The pollution in River Ganga and its tributaries shall be monitored by the National Mission for Clean Ganga on its own or by directions through various State and Central Government agencies by use of satellite imagery and other remote sensing technologies as well as physical stations, online monitoring and independent agencies at a periodicity to be specified by it.

(2) Notwithstanding the provisions of sub-paragraph (1), the Central Government may assign the function of monitoring of pollution in River Ganga and its tributaries to any other agency or body or direct, having regard to advances in technology, to monitor the aforesaid pollution in River Ganga and its tributaries by adopting any other technique or method, as may be specified in the direction.

11. Constitution of National Council for Rejuvenation, Protection and Management of River Ganga. - With effect from the date of commencement of this Order, there shall be constituted an authority by the name to be called the National Council for Rejuvenation, Protection and Management of River Ganga, (hereinafter in this Order called as the National Ganga Council) for the purposes of the Act and to exercise powers and discharge functions as specified in this Order and the Act.

12. Composition of National Ganga Council.-The National Ganga Council shall consist of the following members, namely:-

(a) Prime Minister	- Chairperson, <i>ex-officio</i>
(b) Union Minister for Water Resources, River Development and Ganga Rejuvenation	- Vice-Chairperson, <i>ex-officio</i>
(c) Union Minister for Environment, Forests and Climate Change	- Member, <i>ex-officio</i> ;
(d) Union Minister for Finance	- Member, <i>ex-officio</i> ;
(e) Union Minister for Urban Development	- Member, <i>ex-officio</i> ;
(f) Union Minister for Power	- Member, <i>ex-officio</i> ;
(g) Union Minister for Science and Technology	- Member, <i>ex-officio</i> ;
(h) Union Minister for Rural Development	- Member, <i>ex-officio</i> ;
(i) Union Minister for Drinking Water and Sanitation	- Member, <i>ex-officio</i> ;
(j) Union Minister for Shipping	- Member, <i>ex-officio</i> ;
(k) Union Minister of State for Tourism	- Member, <i>ex-officio</i> ;
(l) Vice Chairman, NITI Aayog	- Member, <i>ex-officio</i> ;
(m) Chief Minister, Bihar	- Member, <i>ex-officio</i> ;
(n) Chief Minister, Jharkhand	- Member, <i>ex-officio</i> ;
(o) Chief Minister, Uttarakhand	- Member, <i>ex-officio</i> ;
(p) Chief Minister, Uttar Pradesh	- Member, <i>ex-officio</i> ;
(q) Chief Minister, West Bengal	- Member, <i>ex-officio</i> ;
(r) Secretary, Ministry of Water Resources, River Development and Ganga Rejuvenation	- Member, <i>ex-officio</i> ;
(s) Director General, National Mission for Clean Ganga	- Member Secretary, <i>ex-officio</i> .

(2) The National Ganga Council may co-opt one or more Chief Ministers from the States not represented in the National Ganga Council having major tributaries of River Ganga, which are likely to affect the water quality in the River Ganga, as Member.

(3) The National Ganga Council may also co-opt one or more Union Ministers, if it considers necessary, as Member.

(4) The National Ganga Council may consult experts and expert organisations or institutions in the field of river rejuvenation, river ecology and river management, hydrology, environmental engineering, social mobilisation and other relevant fields.

(5) The Headquarter of the National Ganga Council shall be at New Delhi or at such other place as it may decide.

(6) The National Ganga Council shall have its Secretariat in the National Mission for Clean Ganga.

(7) The Central Government in the Ministry of Water Resources, River Development and Ganga Rejuvenation shall serve as the nodal Ministry.

13. Dissolution of National Ganga River Basin Authority --- (1) On and from the date of constitution of the National Ganga Council in paragraph 11, the National Ganga River Basin Authority constituted by Notification of the Ministry of Water Resources, River Development and Ganga Rejuvenation, number S.O 2539 (E), dated the 29th September 2014 shall stand dissolved.

(2) All things done or omitted to be done or actions taken or any money spent or authorised to be spent by the National Ganga River Basin Authority before such dissolution shall be deemed to have been done or taken under the corresponding provisions of this Order.

14. Superintendence, direction and control of management of River Ganga to vest in National Ganga Council.- The National Ganga Council shall, notwithstanding anything contained in this Order, be overall responsible for the superintendence, direction, development and control of River Ganga and the entire River Basin (including financial and administrative matters) for the protection, prevention, control and abatement of environmental pollution in River Ganga and its rejuvenation to its natural and pristine condition and to ensure continuous adequate flow of water in the River Ganga and for matters connected therewith.

15. Jurisdiction of National Ganga Council.- The jurisdiction of the National Ganga Council shall extend to the areas mentioned in paragraph 2.

16. Meetings of National Ganga Council.- (1) National Ganga Council may regulate its own procedure for transacting its business including its meetings.

(2) The Chairperson of the National Ganga Council shall preside over its meetings and in his absence, its Vice-Chairperson shall, preside over the meetings of the National Ganga Council and conduct its business.

(3) The Vice-Chairperson shall have the power to take decisions necessary for the National Ganga Council to achieve its objectives, in between the conduct of the two meetings of the Council subject to ratification in the next meeting.

(4) The National Ganga Council shall meet at least once every year or more as it may deem necessary.

17. Constitution of Empowered Task Force on River Ganga as authority.- (1) With effect from the date of commencement of this Order, there shall be constituted an authority by the name to be called the Empowered Task Force on River Ganga for the purposes of the Act and to exercise powers and discharge functions as specified in this Order and the Act.

(2) The Empowered Task Force on River Ganga shall consist of the following members, namely:-

(a) Union Minister for Water Resources, River Development and Ganga Rejuvenation	- Chairperson, <i>ex-officio</i> ;
(b) Union Minister of State for Water Resources, River Development and Ganga Rejuvenation	- Vice-Chairperson, <i>ex-officio</i> ;
(c) Secretary in the Ministry of Water Resources, River Development and Ganga Rejuvenation	- Member, <i>ex-officio</i>
(d) Secretary in the Ministry of Finance (Department of Expenditure)	- Member, <i>ex-officio</i> ;
(e) Chief Executive Officer, Niti Ayog	- Member, <i>ex-officio</i> ;
(f) Chief Secretary, State of Uttarakhand	- Member, <i>ex-officio</i> ;
(g) Chief Secretary, State of Uttar Pradesh	- Member, <i>ex-officio</i> ;
(h) Chief Secretary, State of Bihar	- Member, <i>ex-officio</i> ;
(i) Chief Secretary, State of Jharkhand	- Member, <i>ex-officio</i> ;
(j) Chief Secretary, State of West Bengal	- Member, <i>ex-officio</i> ;
(k) Director General, National Mission for Clean Ganga	- Member-Secretary

(3) The Empowered Task Force on River Ganga may also co-opt one or more Secretary in the Union Ministries or the Chief Secretary of any other State concerned, if it considers necessary, as member

(4) The Empowered Task Force on River Ganga shall meet at least once every three months or more as it may deem necessary.

(5) The administrative and technical support to the Empowered Task Force on River Ganga shall be provided by the Central Government in the Ministry of Water Resources, River Development and Ganga Rejuvenation which shall be the nodal Ministry for the purposes of such administrative and technical support.

18. Functions and powers of Empowered Task Force on River Ganga. –

(1) The Empowered Task Force on River Ganga shall co-ordinate and advise on matters relating to rejuvenation, protection and management of River Ganga and its tributaries.

(2) In particular and without prejudice to the generality of the provisions of sub-paragraph (1), the functions and powers of the Empowered Task Force on River Ganga may include measures with respect to all or any of the following matters in rejuvenation, protection and management of River Ganga, namely:-

(a) ensuring that the Ministries, Departments and State Governments concerned have -

- (i) an action plan with specific activities, milestones, and timelines for achievement of the objective of rejuvenation and protection of River Ganga;
- (ii) a mechanism for monitoring implementation of its action plans;

(b) co-ordination amongst the Ministries and Departments and State Governments concerned for implementation of its action plans in a time bound manner;

(c) to monitor the implementation process, address bottlenecks, suggest and take such decisions as may be necessary to ensure speedy implementation;

(d) all projects under the ambit of Namami Gange including ongoing projects funded domestically and through external assistance;

(e) discharge of such other functions or exercise of such powers as may be considered necessary for achievement of the objective of rejuvenation, protection and management of River Ganga or as may be assigned to it by the Central Government or specified by the National Ganga Council;

19. Approval for projects exceeding value of rupees one thousand crore.-

(1) The Empowered Task Force on River Ganga shall be responsible for the approval of every project exceeding a value of rupees one thousand crore, as amended from time to time.

(2) The Empowered Task Force on River Ganga may constitute a sub-committee of officials amongst its members for the purpose of sub-paragraph (1)

20. Constitution and Composition of Specified State Ganga Rejuvenation, Protection and Management Committees as authorities.- With effect from the date of commencement of this Order, these shall be constituted, in each State as specified in paragraph 2, an authority to be called the State Ganga Rejuvenation, Protection and Management Committee, which shall consist of a Chairperson and other members as specified in the Schedule to exercise powers and discharge functions as specified in this Order and the Act.

21. Meetings of State Ganga Committee. – (1) Every State Ganga Committee may regulate its own procedure for transacting its business including its meetings.

(2) Every State Ganga Committee shall convene its meetings at least once in every three months' time.

(3) The Chairperson of the State Ganga Committee shall preside over its meetings and in his absence, the said Committee shall elect its Vice-Chairperson who shall, preside over the meetings of the State Ganga Committee and conduct its business.

22. Superintendence, direction and control over Committee.- The superintendence, direction and control of the District Ganga Committees shall, notwithstanding anything contained in this Order, vest in the State Ganga Committee, for the purposes of rejuvenation, protection, prevention, control and abatement of environmental pollution in River Ganga and its tributaries so as to rejuvenate the River Ganga to its natural and pristine condition and ensure continuous and adequate flow of water in River Ganga and for protection and management of River Ganga in the States concerned.

23. Decisions of State Ganga Committee to be binding.- The decision taken at the meetings of the State Ganga Committee shall, notwithstanding anything contained in this Order, be binding upon every District Ganga Committee and every local authority or other authority or Board or person referred to in such decision and they shall comply with the decisions of the State Ganga Committee.

24. Powers, duties and functions of State Ganga Committees.- (1) Every State Ganga Committee shall, subject to the provisions of the Act and rules made or directions issued thereunder, have the power to take all such measures, including those in paragraphs 6, 7 and 8, as it deems necessary or expedient for effective abatement of pollution and conservation

of the River Ganga and for implementing the decisions or directions of the National Ganga Council and National Mission for Clean Ganga.

(2) The State Ganga Committee shall implement various programmes and projects of the National Ganga Council and National Mission for Clean Ganga.

(3) In particular and without prejudice to the generality of the provisions of sub-paragraphs (1) and (2), such measures may include all or any of the following matters, namely:-

(a) coordination and implementation of the conservation activities relating to River Ganga including augmentation of sewerage infrastructure, catchment area treatment, protection of flood plains, creating public awareness and such other measures at the State level and regulation of activities aimed at the prevention, control and abatement of pollution in the River Ganga to maintain its water quality, and to take such other measures relevant to river ecology and management in the State concerned;

(b) implementation of the river basin management plan in the concerned State;

(c) maintenance of minimum ecological flows in the River Ganga in the concerned State and actions thereon;

(d) entry and inspection under section 10 and power to take sample under section 11 of the Act for the purpose of exercising and performing its functions under this Order.

(4) The State Ganga Committee shall undertake all the emergency measures mentioned in paragraph 7.

(5) The State Ganga Committee shall have the powers to issue directions under section 5 of the Act.

(6) The powers and functions of the State Ganga Committee shall be without prejudice to any of the powers conferred upon the State Government under any Central or State Act, being not inconsistent with the provisions of the Act.

25. Monitoring execution of plans and programmes of District Ganga Committees.- Every State Ganga Committee shall monitor the execution of plans, programmes, and projects of all their District Ganga Protection Committees and those of other authorities and submit progress in respect thereof to the National Mission for Clean Ganga.

26. Preparation of consolidated reports of all District Ganga Committees and taking remedial measures in respect thereof.- (1) Every State Ganga Committee shall prepare a consolidated report of all District Ganga Protection Committees, local authorities or other authorities or Board or Corporation or person for every quarter indicating therein in respect of each specified District abutting River Ganga and its tributaries, ----

(a) the status of the plans being executed and measures taken by them and any other activity relating to the health of River Ganga and its tributaries;

(b) the quality of water in River Ganga and its tributaries in each specified District and remedial action in respect thereof;

(c) any interruption of flow in the River Ganga in each specified District and reasons therefor;

(d) remedial measures taken on the complaints made to the District Ganga Committee or local authorities or other authorities;

(e) adverse report as reported by Ganga safety auditors in each specified District;

(f) any other information relevant to the health of River Ganga and its tributaries.

(2) The report referred to in sub-paragraph (1) shall be submitted within one month at the end of each year to the State Ganga Committee and National Mission for Clean Ganga along with remedial action thereof.

27. Conducting of Ganga safety audit and submission of such audit reports by State Ganga Committees.- (1) It shall be the duty of the State Ganga Committees to conduct or causes to be conducted, through the District Ganga Committees, the Ganga safety audit and submit report of the Ganga safety audit to the National Mission for Clean Ganga along with the remedial action taken thereon and also make available the same in public domain and exhibit the same at its website.

(2) The Ganga safety audit shall include such particulars and be done at such intervals (save as otherwise provided in this Order) and in such manner as may be specified, by notification, by the National Mission for Clean Ganga.

28. State Ganga Committee to be nodal agency.- The State Ganga Committee shall be the State-wide nodal agency in the State for the implementation of the provisions of this Order and for effective abatement of pollution and rejuvenation, protection and management of the River Ganga and its tributaries.

29. State Ganga Committees to be bound by direction of National Ganga Council and National Mission for Clean Ganga.- Every State Ganga Committee, without prejudice to the foregoing provisions of this Order, shall, in exercise of its powers or the performance of its functions under this Order, be bound by the decisions or such directions (including those relating to technical and administrative matters) as the National Ganga Council and the National Mission for Clean

Ganga may give in writing to it from time to time for abatement of pollution and rejuvenation, protection and management of the River Ganga.

30. Dissolution of State Ganga River Conservation Authorities and State Executive Committees.- (1) With effect from the date of constitution of the State Ganga Committees, the respective State Ganga River Conservation Authorities and the respective State Executive Committees constituted before the commencement of this Order shall stand dissolved.

(2) All things done or omitted to be done or actions taken or any money spent or authorised to be spent by the authorities and committees under sub-paragraph (1) before such dissolution shall be deemed to have been done or taken under the corresponding provisions of this Order.

31. Constitution of National Mission for Clean Ganga as an authority.-(1) With effect from the date of commencement of this Order, the National Mission for Clean Ganga, a society registered under the Societies Registration Act, 1860 (21 of 1860), shall be an authority constituted under the Act, by the same name for the purposes of the Act and to exercise powers and discharge functions as specified under this Order and the Act and the rules made or directions issued thereunder.

(2) The composition of the National Mission for Clean Ganga shall be as specified in paragraph 35.

32. Area of operation of National Mission for Clean Ganga.- The area of operation of the National Mission for Clean Ganga shall be the areas mentioned in paragraph 2.

33. National Mission for Clean Ganga to be nodal agency.- The National Mission for Clean Ganga shall be the nodal agency for the nationwide implementation of the provisions of this Order and for effective abatement of pollution and rejuvenation, protection and management of the River Ganga and its tributaries.

34. National Mission for Clean Ganga to be an empowered organization.- The National Mission for Clean Ganga shall be an empowered organisation with two tier management having administrative, appraisal and approval powers and duties, functions and powers as specified in this Order.

35. Composition of National Mission for Clean Ganga.- The National Mission for Clean Ganga shall have a two-tier management structure and it shall comprise of the Governing Council and the Executive Committee.

(1) The Governing Council shall consist of the following members, namely:-

(a)	Director General of National Mission for Clean Ganga	Chairman, <i>ex-officio</i>
(b)	Joint Secretary, Ministry of Water Resources, River Development and Ganga Rejuvenation	Member, <i>ex-officio</i>
(c)	Joint Secretary, Ministry of Urban Development	Member, <i>ex-officio</i>
(d)	Joint Secretary, Ministry of Environment, Forests and Climate Change	Member, <i>ex-officio</i>
(e)	Joint Secretary, Department of Expenditure	Member, <i>ex-officio</i>
(f)	Representative of NITI Aayog (not below Joint Secretary)	Member, <i>ex-officio</i>
(g)	Chairman, Central Pollution Control Board	Member, <i>ex-officio</i>
(h)	Principal Secretary, Urban Development, Government of Bihar	Member, <i>ex-officio</i>
(i)	Principal Secretary, Urban Development, Government of Jharkhand	Member, <i>ex-officio</i>
(j)	Principal Secretary, Urban Development, Government of Uttar Pradesh	Member, <i>ex-officio</i>
(k)	Principal Secretary, Pwajal, Government of Uttarakhand	Member, <i>ex-officio</i>
(l)	Principal Secretary, Urban Development, Government of West Bengal	Member, <i>ex-officio</i>
(m)	Executive Director(Deputy Director General), National Mission for Clean Ganga	Member, <i>ex-officio</i>
(n)	Executive Director (Technical),National Mission for Clean Ganga	Member, <i>ex-officio</i>

(o)	Executive Director (Finance), National Mission for Clean Ganga	Member, <i>ex-officio</i>
(p)	Executive Director (Projects), National Mission for Clean Ganga	Member, <i>ex-officio</i>
(q)	Executive Director(Administration), National Mission for Clean Ganga	Member- Secretary.

(2) The Executive Committee constituted out of the Governing Council, shall consist of the following members, namely:-

- (a) Director General, National Mission for Clean Ganga – Chairperson, *ex-officio*;
- (b) Joint Secretary, Department of Expenditure – Member, *ex-officio*;
- (c) Representative of NITI Aayog (not below Joint Secretary) – Member, *ex-officio*;
- (d) Principal Secretary of the State concerned – Member, *ex-officio*;
- (e) Executive Director (Deputy Director General)
National Mission for Clean Ganga – Member, *ex-officio*;
- (f) Executive Director (Finance)
National Mission for Clean Ganga – Member, *ex-officio*;
- (g) Executive Director (Technical)
National Mission for Clean Ganga – Member, *ex-officio*;
- (h) Executive Director (Projects)
National Mission for Clean Ganga – Member, *ex-officio*;
- (i) Executive Director (Administration)
National Mission for Clean Ganga – Member, *ex-officio*;

(3) The Director General, National Mission for Clean Ganga may, if he considers necessary, may associate with the Executive Committee, any other member from the Governing Council.

(4) The Governing Council may constitute a sub-committee from out of its members and also by associating some technical experts for appraisal of the projects.

(5) The representative of the State concerned shall also be one of the members of sub-committee.

(6) Half of the members of the Governing Council shall form the quorum.

36. (1) All approvals up to one thousand crores rupees shall be granted by the Executive Committee and it shall report to the Governing Council at least once in three months.

(2) The Sub-Committee of the Governing Council shall appraise the project only after completion of Third Party Appraisal of the project by technical experts or consortium of recognized institutes or Indian Institutes of Technology, as the case may be.

(3) The Third Party Appraisal shall be for all projects irrespective of their value.

37. Appointment of Director General and Executive Directors of National Mission for Clean Ganga.-

- (1) Director General, National Mission for Clean Ganga shall be appointed by the Central Government who shall be equivalent to the rank of Additional Secretary or Secretary to the Government of India and his terms and conditions of services shall be determined by Central Government.
- (2) The Executive Director (Finance) shall be appointed on deputation from any of the organised accounts services in the Central Government in the rank equivalent to Joint Secretary to Government of India in accordance with the recruitment rules of the said services.
- (3) National Mission for Clean Ganga shall have at least one position for each of the Executive Directors in the rank of Joint Secretary to Government of India.
- (4) One of the Executive Directors shall be designated as Deputy Director General of the National Mission for Clean Ganga and he shall be appointed by the Central Government.
- (5) None of the nominated members of the Executive Committee shall be below the rank of Joint Secretary in Government of India.

38. **Duty of National Mission for Clean Ganga.-** It shall be the duty of the National Mission for Clean Ganga to -

- (i) follow the principles laid down in paragraph 4

(ii) comply with the decisions and directions of the National Ganga Council and implement the Ganga Basin Management Plan approved by it;

(iii) co-ordinate all activities for rejuvenation and protection of River Ganga in a time bound manner as directed by the National Ganga Council;

(iv) do all other acts or abstain from doing certain act which may be necessary for rejuvenation and protection of River Ganga and its tributaries.

39. Functions of National Mission for Clean Ganga.- (1) Without prejudice to the provisions of this Order, the National Mission for Clean Ganga shall identify or cause to be identified -

- (a) the specific threats to the River Ganga in areas in each village and town of such specified District abutting River Ganga and its tributaries, including sewerage and industrial waste, cremation and burial of corpses and disposal of animal carcasses, and threats from commercial, recreational and religious activities;
- (b) the type of measures required to address such threat in each village and town of all districts abutting River Ganga and its tributaries;
- (c) the specific areas where such remedial actions are required to be taken for rejuvenation and protection of River Ganga and its tributaries.
- (d) the measures which may be necessary for reuse of treated water and enter in to Memorandum of Understanding in this regard with the Ministries of the Central Government like Railways, Power, Petroleum and Natural Gas etc., State Governments, autonomous bodies at the Central and State level, recognized Institutes and organizations which the National Mission for Clean Ganga may deem fit.

(2) The National Mission for Clean Ganga shall make or cause to make the River Ganga Basin Management Plan along with cost, timelines and allocation of responsibilities, among other things, for rejuvenation and protection of River Ganga and its tributaries in each village and town of specified District abutting River Ganga and its tributaries and execute projects there for.

(3) The National Mission for Clean Ganga shall -----

- (a) cause to be determined the magnitude of ecological flows in the River Ganga and its tributaries required to be maintained at different points in different areas at all times with the aim of ensuring water quality and environmentally sustainable rejuvenation, protection and management of River Ganga and its tributaries and notifying the same and take or direct all such measures necessary to maintain adequate ecological flows;
- (b) cause to be identified places where the environmental flow of water of River Ganga has been modified and take measures for correction thereof to maintain the continuous flow of water for rejuvenation, protection and management of River Ganga and its tributaries;
- (c) identify places of discontinuity of water in River Ganga and its tributaries due to engineered diversion of water or storage of water or by any other means and execute plans in respect thereof or take remedial action therefor;
- (d) devise a system to be put in place for continuous monitoring of flow of water and pollution levels in River Ganga and its tributaries;
- (e) take all such measures which may be necessary to give effect to the decisions of the National Ganga Council so as to maintain adequate ecological flows in the River Ganga and tributaries;
- (f) render assistance or cause them to be rendered by any agency for preparation of detailed project reports or execution of projects for abatement of pollution and rejuvenation, protection and management of the River Ganga and its tributaries to the State Governments, the State Ganga Committees, District Ganga Committees or local authorities or any person or body, any authority, Board or Corporation;
- (g) set up or facilitate setting up or designate and direct one or more existing centers to research, develop and disseminate knowledge base and analytical tools on abatement of pollution and rejuvenation, protection and management of River Ganga and its tributaries;
- (h) take any other measures which may be necessary for continuous flow of water and abatement of pollution in River Ganga and its tributaries

(4) The National Mission for Clean Ganga shall take all such other emergency measures as outlined in paragraph 7.

40. Establishment of River Ganga Monitoring Centres at suitable locations along River Ganga and its tributaries.- The National Mission for Clean Ganga may identify the places in the River Ganga Basin and establish at such places or designate any existing laboratory or station or institute as Centres to be called the "River Ganga

Monitoring Centre” for monitoring amongst other things, continuous flow of water and pollution levels as required under this Order and such Centre shall report immediately to the National Mission for Clean Ganga for taking remedial action therefor.

41. Powers of National Mission for Clean Ganga.- (1) The National Mission for Clean Ganga being the national agency charged with the role, responsibility and powers to facilitate the task of rejuvenation, protection and management of River Ganga and its tributaries, under the supervision and direction of the National Ganga Council, shall recommend to the National Ganga Council or Central Government for issuing directions or issue directions itself, to the State Ganga Committees or District Ganga Committees or local authority or any other authority or any person, institution, consortium or agency, as it may decide, for the rejuvenation, protection and management of River Ganga and have the power to take all such measures and discharge such functions as it may deem necessary or expedient for prevention, control and abatement of environmental pollution in River Ganga and its tributaries so as to rejuvenate the River Ganga to its natural and pristine condition and ensure continuous and adequate flow of water in River Ganga and for protection and management of River Ganga and for matters connected therewith.

(2) In particular and without prejudice to the generality of the provisions of sub-paragraph (1), and save as otherwise provided in this Order, such directions may include all or any of the following matters in the management of River Ganga, namely:-

- (a) fulfillment of the functions mentioned in paragraph 55 in accordance with the principles in paragraph 4;
 - (b) formulate, with the approval of the Central Government, the National policy for effective abatement of pollution and rejuvenation, protection and management of River Ganga;
 - (c) enter into memorandum of understanding, with the approval of the Central Government, with any country or foreign agency for effective implementation of the River Ganga Basin Management Plan for rejuvenation, protection, prevention, control and abatement of pollution in the River Ganga and its tributaries;
 - (d) approve, with or without modifications, the River Ganga Basin Management Plan and direct amendments, if any, to be made therein;
 - (e) supervise and review the progress reports, and issue directions to the State Ganga Committees, District Ganga Committees or local authorities and other authorities in the implementation of the River Ganga Basin Management Plan and any other matter connected with affairs of the River Ganga and its tributaries;
 - (f) approve the planning, financing and execution of programmes for abatement of pollution in the River Ganga including augmentation of sewerage and effluent treatment infrastructure, catchment area treatment, protection of flood plains, creating public awareness, conservation of aquatic and riparian life and biodiversity and such other measures for promoting environmentally sustainable river rejuvenation;
 - (g) coordination, monitoring and review of the implementation of various programmes or activities taken up for prevention, control and abatement of pollution and protection and management in the River Ganga and its tributaries;
 - (h) direct any person or authority to take measures for restoration of river ecology and management in the River Ganga Basin States;
 - (i) recommend to the Central Government, for creation of special purpose vehicles (whether as a company under the companies Act, 2013(18 of 2013) or Societies Registration Act, 1860 (21 of 1860) or a Trust under the Indian Trust Act, 1882 (2 of 1882)), as may be considered appropriate, for implementation of this Order and for the purposes of the Act;
 - (j) take such measures as may be necessary for the better co-ordination of policy and action to ensure effective prevention, control and abatement of pollution, rejuvenation and protection and management in the River Ganga and its tributaries;
 - (k) issue such directions to any person or authority, as it may consider necessary, for proper or prompt execution of the projects or cancel such projects or stop release of funds or direct refund of amount already released and assign the same to any other person or authority or Board or Corporation for prompt execution thereof;
 - (l) direct any person or authority to maintain such books of account or other documents, without prejudice to any law for the time being in force, as may be specified by the National Mission for Clean Ganga;
 - (m) take such other measures which may be necessary for achievement of prevention, control and abatement of pollution, rejuvenation and protection and management in the River Ganga and its tributaries;
- (3) The National Mission for Clean Ganga shall have the power to issue directions mentioned under section 5 of the Act.
- (4) The National Mission for Clean Ganga may evolve an appropriate mechanism for implementation of its decisions and the decisions of the National Ganga Council.

42. Giving of prior approval in certain matters.— Every person, the State Ganga Committees, District Ganga Protection Committees, local authorities and other authorities shall obtain prior approval of the National Mission for Clean Ganga, on the following matters, relating to River Ganga and any area abutting River Ganga or its tributaries, if required to implement the decisions of the National Ganga Council, namely:—

- (a) engineered diversion and storage of water in River Ganga without affecting the flow of water downstream of the River Ganga;
- (b) construction of bridges and associated roads and embankments over the River Ganga or at its River Bank or its flood plain area;
- (c) construction of Ghats or extension of any existing Ghat;
- (d) construction of jetties;
- (e) construction of permanent hydraulic structures for storage or diversion or control of waters or channelisation of River Ganga or its tributaries;
- (f) deforestation of hill slopes and notified forest and other eco-sensitive areas;
- (g) any other activity which contravenes the principles laid out in paragraph 4 which the National Mission for Clean Ganga may specify.

43. Financial framework.— (1) The budgetary allocation shall be utilised by the National Mission for Clean Ganga for meeting expenses in connection with the discharge of its functions, objects and purposes and establishment expenditure: Provided that the money received by way of grants, loans and borrowings shall be expended for the specific purpose for which such grants, loans and borrowings have been received.

(2) The National Mission for Clean Ganga shall maintain proper accounts and other relevant records and prepare an annual expenditure statement.

(3) The audit of National Mission for Clean Ganga accounts shall be done by the Comptroller and Auditor-General of India and after completion of annual audit, the audit agency shall furnish annual audit certificate.

(4) The affairs of National Mission for Clean Ganga shall be subject to the control of Central Vigilance Commission and there shall be a Vigilance Officer to look after vigilance related matters.

(5) The annual expenditure statement with the audit report shall be forwarded annually to the Empowered Task Force, and the Central Government for being laid before each House of Parliament.

44. Engagement of legal experts.— The National Mission for Clean Ganga shall have proper legal set up for which it may engage legal experts, consultants and legal firms as may be necessary for advising it on legal matters and providing support for discharging its duties.

45. Scrutiny of reports.— All the reports relating to its activities and reports received from the State Ganga Committees, District Ganga Committees, local authority, Board, Corporation or any person shall be scrutinised by the National Mission for Clean Ganga and placed by it along with its views on the matters mentioned in such report before the National Ganga Council for soliciting its guidance thereon, if required.

46. Consolidated report of Ganga Safety audit.— The National Mission for Clean Ganga shall prepare and submit a consolidated report of the Ganga safety audits of River Ganga to the National Ganga Council along with the remedial action taken thereon and also make available the same in public domain and exhibit the same at its website.

47. Powers of National Mission for Clean Ganga to call for information, conduct inspection, publish reports, etc.— (1) Where the National Mission for Clean Ganga considers it expedient so to do under section 5 of the Act, it may, by order in writing, —

(a) call upon any State Ganga Committees, District Ganga Protection Committees, local authority, other authority, Board, Corporation or person, who has been allotted any project for execution or connected with such project or utilisation of funds, at any time, to furnish in writing or make public for dissemination such information or explanation relating to such project allotted for execution or executed or utilisation of fund allotted as the National Mission for Clean Ganga may require; or

(b) appoint one or more persons or any authority to make an inquiry in relation to project allotted for execution or executed or utilisation of fund allotted; or

(c) direct any of its officers or employees or the officers or employees of the Central Government or State Government or any other authority to inspect the books of account or other documents of the State Ganga Committees, District Ganga

Committees, local authority, other authority, Board, Corporation or person related to any project allotted for execution or executed or utilisation of funds; or

(d) require any person, officer, State Government or authority to furnish to it any reports, returns, statistics, accounts and other information and such person, officer, State Government or other authority shall be bound to do so.

48. Financing and implementation model.— The National Mission for Clean Ganga shall develop and constantly refine financial models that would improve the performance and sustainability of projects, and which can be adopted by the State Ganga Committees, District Ganga Committees, local authority, other authority or person for abatement of pollution and rejuvenation, protection and management of the River Ganga.

49. Preparation of consolidated reports.— (1) The National Mission for Clean Ganga shall, on the basis of the reports and other information forwarded by the State Ganga Committees, District Ganga Committees, local authorities, other authorities, Board, Corporation or person, prepare a consolidated report every year indicating therein in respect of each specified District abutting River Ganga and its tributaries.—

(a) the status of the plans being executed and measures taken by them and any other activity relating to the health of River Ganga and its tributaries;

(b) the quality of water in River Ganga and its tributaries and remedial action in respect thereof;

(c) any interruption of water in the River Ganga and reasons therefor;

(d) condition of River Bed and flood plains and habitat in the specified District;

(e) remedial measures taken on the complaints received from public by the District Ganga Committee or local authorities;

(f) threats remaining to be addressed by them with remedial action proposed therefor;

(g) report if any as reported by Ganga safety auditors;

(h) all other information relevant about the health of River Ganga and its tributaries.

(2) The National Mission for Clean Ganga shall submit a consolidated report referred to in sub-paragraph (1) after review thereof to the Empowered Task Force along with remedial action thereof.

50. Annual report.— (1) The National Mission for Clean Ganga shall, within three months of the end of every year, prepare an annual report of all work undertaken by it and by the Empowered Task Force on River Ganga, the State Ganga Committees, District Ganga Committees, concerned local authorities, other authorities, Board, Corporation or persons during the immediately preceding year.

(2) The National Mission for Clean Ganga shall include under separate parts in its annual report referred to in sub-paragraph (1), all works undertaken by it and the Empowered Task Force on River Ganga, the State Governments, the State Ganga Committees, District Ganga Committees, concerned local authorities, other authorities, Board, Corporation or person, and forward the said annual report to the National Ganga Council and the Central Government and also make available in public domain and exhibit at its website.

51. Constitution of Committees.— The National Mission for Clean Ganga may, constitute one or more River Ganga Management Committees from amongst its members and such experts in the field of rivers or water as it may consider appropriate for the efficient discharge of its functions under this Order.

52. Soliciting guidance.— In case any difficulty arises in implementing decisions of the National Ganga Council or the provisions of this Order, it shall be duty of the National Mission for Clean Ganga to solicit the guidance of the National Ganga Council and take appropriate action accordingly.

53. Constitution of District Ganga Protection Committees.— (1) The Central Government shall immediately after the commencement of this Order, in consultation with concerned State Ganga Committee, by notification constitute, in every specified District abutting River Ganga and its tributaries in the States mentioned in paragraph 2, the "District Ganga Committees" for the prevention, control and abatement of environmental pollution in the River Ganga.

(2) Every District Ganga Committee in each specified District shall consist of the following members, namely:—

(a) the District Collector in the specified District; - Chairperson, ex-officio;

(b) not more than two nominated representatives from Municipalities and Gram Panchayats of the specified District nominated by the State Government. - Members;

(c) one representative each of the Public Works, Irrigation, Public Health Engineering, and Rural Drinking Water Departments, and State Pollution Control Board working in the specified District abutting River Ganga to be nominated by the District Collector	- Member, ex-officio;
(d) two environmentalists associated with River Ganga protection activities and one representative of local industry association in the specified District to be nominated by the District Collector	- Members,;
(e) one Divisional Forest Officer of the specified District	- Member, ex-officio
(f) one District official to be nominated by the District Collector.	- Member;

(2) The District Collector shall be the Chairperson of the District Ganga Committee and the Divisional Forest Officer shall be the Convener of the District Ganga Committee.

(3) The District Ganga Committees shall meet at such times and at such places as the Chairperson of that Committee may decide and exercise such powers and functions as may be conferred under this Order:

Provided that at least one meeting of the District Ganga Committee shall be held every three months.

(4) A non ex-officio member may resign his office by giving notice in writing thereof to the Central Government or to the District Collector concerned, as the case may be, and shall cease to be a member on his resignation being accepted by the Government or the District Collector concerned, as the case may be.

54. Superintendence, direction and control of District Ganga Committee.- The superintendence, direction and control of the management of the District Ganga Committee (including financial and administrative matters) shall, notwithstanding anything contained in this Order, vest in the National Mission for Clean Ganga which may be exercised by it either directly or through the State Ganga Committee or any of its officer or any other authority specified by it.

55. Functions and powers of District Ganga Committees.- (1) Every District Ganga Committee shall discharge functions and exercise powers for rejuvenation, protection, restoration and rehabilitation of River Ganga and its tributaries in each specified District as laid out in paragraph 6 and 7 as per the principles specified in paragraph 4.

(2) In particular, and without prejudice to the generality of the provisions of sub-paragraph (1) for rejuvenation and protection and restoration or rehabilitation of degraded areas abutting River Ganga and its tributaries and subject to other provisions of this Order and rules made thereunder, every District Ganga Committee shall have the following powers and functions in relation to River Ganga and its tributaries abutting in the area in specified District, namely:-

(a) identifying activities which may be threats in the area of specified District abutting the River Ganga for protection of River Ganga and its tributaries or its River bed and making a plan for remedial action and take remedial action in respect thereof;

(b) taking remedial action at its own end for protection of River Ganga and its tributaries or its River bed abutting in the specified District (excluding enforcement of the provisions of this Order)

(c) in the event of its inability to take remedial action, reporting (electronically as well as by sending written communication in hard copy) to the National Mission for Clean Ganga and concerned State Government, the State Ganga Committee, as the case may be, for issue of direction for protection of River Ganga and to formulate appropriate management or remedial actions.

(d) taking suitable administrative and other measures, to give effect to the provisions of this Order so as to prevent the environmental pollution in the River Ganga and its tributaries, not being inconsistent with the provisions of this Order, or any law for the time being in force.

(3) In case, the District Ganga Committee is of the opinion that any contravention has been made of any other law for the time being in force or in respect of provisions of this Order, it shall take appropriate action in accordance with the law for the time being in force.

(4) The District Ganga Committee shall take all such emergency measures as specified in paragraph 7.

56. Designation of Nodal Officer.- (1) Every District Ganga Committee shall nominate as Nodal Officer for the purposes of this Order -

(a) the Sarpanch of Gram Sabha of every village in the areas abutting the River Ganga and its tributaries;

(b) in case of an area, not being village abutting the River Ganga, the Chairperson of Municipality Planning Committee or Metropolitan Planning Committee or Chairperson of any local authority, as the Chairperson of the District Ganga Committee.

(2) Every Nodal Officer nominated under sub-paragraph (1) shall take measures to prevent the pollution of River Ganga and its tributaries and take remedial action for protection of River Ganga and its tributaries or their River bed abutting in such village or other area, as the case may be, of which he is the Nodal Officer and in case of his failure to do so, he shall report the violation of this Order to the Chairperson of the District Ganga Committee for remedial action.

(3) After receipt of the report under sub-paragraph (2), the Chairperson of the District Ganga Committee shall take remedial action for protection of River Ganga or its River bed abutting the specified District.

57. Preparation of plans.- (1) Every District Ganga Committee shall prepare its plan for protection of River Ganga and its tributaries and their River bed abutting the specified District and submit the same to the National Mission for Clean Ganga for its approval.

(2) The plan under sub-paragraph (1) shall include the activities to be undertaken by the District Ganga Committee for protection, control and abatement of environmental pollution in River Ganga and its tributaries and their River Bed area abutting the specified District which may be recommended by the State Government, State Ganga Committees, the National Mission for Clean Ganga, any other authority or Board and the expenditure involved for such plan and time within which such activities shall be completed.

58. Preparation of budget and maintenance of accounts.- Every District Ganga Committee shall prepare its budget for every financial year indicating therein the funds required and purposes for which such funds shall be spent and the time limit within which the activity mentioned in the budget shall be completed and submit to concerned State Ganga Committee under intimation to National Mission for Clean Ganga and such Committee shall ensure proper maintenance of accounts as directed by National Mission for Clean Ganga, for audit by the Comptroller and Auditor-General of India or any other agency appointed by the Comptroller and Auditor-General of India and such accounts shall be subject to inspection by National Ganga Council, National Mission for Clean Ganga, State Ganga Committee or any of their appointed entities.

59. Monthly and annual reports.- (1) Every District Ganga Committee shall, submit monthly and annual reports to the National Ganga Council, National Mission for Clean Ganga and State Ganga Committee as directed by National Mission for Clean Ganga within specified timelines.

(2) In addition to the annual report referred to in sub-paragraph (1), the District Ganga Committee shall furnish to the National Mission for Clean Ganga at such time and in such form and manner it may direct to furnish such other returns, statements and other particulars in regard to any proposed or existing programme for the River Ganga Basin Plan for the abutting area in the specified District.

60. Budget allocation.- The National Mission for Clean Ganga shall consolidate and prepare the budget requirement and submit the same to the Ministry of Water Resources, River Development and Ganga Rejuvenation.

61. Direction by Central Government.- Notwithstanding anything contained in this Order, it shall be lawful for the Central Government to issue directions in writing to the Ministries or Departments of the Government of India, or the State Government or the State Ganga Committees, the National Mission for Clean Ganga or District Ganga Committees, or local authority or other authority or statutory bodies or any of its officers or employees, as the case may be, to facilitate or assist in the rejuvenation, protection and management of River Ganga and its tributaries in such manner as it may direct, and such Ministry or Department or Authority or Mission or Board, Committee or Government or statutory body, officer or employee shall be bound to comply with such directions.

62. Making of complaint under section 19 of the Act.- All the authorities constituted under this Order or their officers authorised by such authorities may make complaint before the court under section 19 of the Act for taking cognizance of any offence under the said section.

63. Order to be in addition to other laws.- The provisions of this Order are without prejudice to the discharge of functions by any local authority or other authority or Board or corporation or any person for taking measures for the purposes of effective abatement of pollution and rejuvenation of the River Ganga and its protection and management and any other law for the time being in force.

SCHEDULE

[See paragraph 20]

COMPOSITION OF STATE GANGA COMMITTEES

Serial No.	Name of the State Ganga Committee	Composition of the State Ganga Committees
(1)	(2)	(3)
1.	(Name) State Ganga Protection and Management Committee	(a) Chief Secretary, Government of State of (Name) - Chairperson, ex-officio;
		(b) Principal Secretary, Department of Finance, Government of State of (Name) - Member, ex-officio;
		(c) Principal Secretary, Department of Urban Development and Housing, Government of (Name) - Member, ex-officio;
		(d) Principal Secretary, Department of Environment and Forests, Government of State of (Name) - Member, ex-officio
		(e) Principal Secretary, Department of Water Resources, Government of State of (Name) - Member, ex-officio;
		(f) Principal Secretary, Department of Public Health Engineering, Government of State of (Name) - Member, ex-officio
		(g) Chairman, (Name) State Pollution Control Board - Member, ex-officio;
		(h) Chief Executive Officer of executing agency in the State of (Name) - Member, ex-officio;
		(i) Principal Chief Conservator of Forests, Government of State of (Name) - Member, ex-officio;
		(j) not more than five experts from relevant fields to be nominated by the Government of (Name) - Members


[F. No. Estt-01/2016-17/111/NMCG]

SANJAY KUNDU, Jr. Secy.

**ANNEXURE VI – COPY OF THE NATIONAL WATERWAY ACT,
1982**

12/83 (90)

रजिस्ट्री सं० डी- (डी)-72 REGISTERED No. D-(D)-72


भारत का राजपत्र
The Gazette of India

असाधारण
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सं० 47] नई दिल्ली, मंगलवार, अक्टूबर 19, 1982/अश्विन 27, 1904
 No. 47] NEW DELHI, TUESDAY, OCTOBER 19, 1982/ASVINA 27, 1904

इस भाग में भिन्न पृष्ठ रूपों की जाती हैं जिससे कि यह अल्प संकलन
 के रूप में रखा जा सके।
 Separate paging is given to this Part in order that it may be filed
 as a separate compilation

MINISTRY OF LAW, JUSTICE AND COMPANY AFFAIRS
 (Legislative Department)
New Delhi, the 19th October, 1982/Asvina 27, 1904 (Saka)

The following Act of Parliament received the assent of the Vice-President discharging the functions of the President on the 18th October, 1982 and is hereby published for general information:—

**THE NATIONAL WATERWAY (ALLAHABAD-HALDIA
 STRETCH OF THE GANGA-BHAGIRATHI-HOOGHLY
 RIVER) ACT, 1982**
 No. 49 of 1982

[18th October, 1982.]

An Act to provide for the declaration of the Allahabad-Haldia Stretch of the Ganga-Bhagirathi-Hooghly river to be a national waterway and also to provide for the regulation and development of that river for purposes of shipping and navigation on the said waterway and for matters connected therewith or incidental thereto.

Enacted by Parliament in the Thirty-third Year of the Republic of India as follows:—

<p>1. (1) This Act may be called the National Waterway (Allahabad-Haldia Stretch of the Ganga-Bhagirathi-Hooghly River) Act, 1982.</p> <p>(2) It shall come into force on such date as the Central Government may, by notification in the Official Gazette, appoint.</p> <p>2. The Allahabad-Haldia Stretch of the Ganga-Bhagirathi-Hooghly river, the limits of which are specified in the Schedule, is hereby declared to be a national waterway.</p>	<p>Short title and commencement.</p> <p>Declara- tion of a certain stretch of Ganga- Bhagirathi- Hooghly river to be national waterway.</p>
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(1)

(d) provide or permit setting up of infrastructural facilities;

(e) carry out conservancy measures and training works and do all other acts necessary for the safety and convenience of shipping and navigation and improvement of the national waterway;

(f) control activities such as throwing rubbish, dumping or removal of material, in or from the bed of the national waterway and appurtenant land, in so far as they may affect, safe and efficient shipping and navigation, maintenance of navigable channels, river training and conservancy measures;

(g) remove or alter any obstruction or impediment in the national waterway and the appurtenant land which may impede the safe navigation or endanger safety of infrastructural facilities or conservancy measures where such obstruction or impediment has been lawfully made or has become lawful by reason of long continuance of such obstruction or impediment or otherwise, after making compensation to person suffering damage by such removal or alteration;

(h) provide for the regulation of navigation and traffic (including the rule of the road) on the national waterway;

(i) regulate the construction or alteration of structures on, across or under the national waterway;

(j) perform such other functions as may be necessary to carry out the purposes of this Act.

(3) Any dispute arising out of or concerning the compensation referred to in clause (g) of sub-section (2) shall be determined according to the law relating to like disputes in the case of land required for public purposes.

6. (1) The Central Government may, if it considers it necessary or expedient so to do for the purposes of this Act, particularly for the purpose of discharging its responsibility under section 5, exercise any jurisdiction, right or power with respect to the national waterway or any lands or infrastructure appurtenant thereto which it could have exercised if the national waterway and the lands and infrastructure appurtenant thereto had been vested in that Government by this sub-section.

(2) If any dispute arises as to whether any land or structure is a land or infrastructure appurtenant to the national waterway, the Central Government and the other party or parties to the dispute shall endeavour to resolve the dispute by negotiations or conciliation in such manner as may be prescribed.

(3) Notwithstanding anything contained in sub-section (2), if the Central Government considers whether before initiating action for resolving a dispute by negotiations or conciliation or at any stage after initiating such action, that the dispute is of such a nature that it is necessary or expedient to refer it to arbitration, the Central Government shall, in such form and in such manner as may be prescribed, refer the matter in dispute to an arbitrator who shall be appointed by the Chief Justice of India.

(4) The arbitrator may appoint two or more persons as assessors to assist him in the proceedings before him.

Rights,
etc., of
Central
Govern-
ment with
respect
to national
water-
way, lands
and in-
frastuc-
ture ap-
purtenant
thereto.

(5) The decision of the arbitrator shall be final and binding on the parties to the dispute and shall be given effect to by them.

(6) Nothing in the Arbitration Act, 1940 shall apply to any arbitration under this section.

10 of 1940.

Applica-
tion, etc.,
of
certain
laws.

7. (1) The provisions of this Act shall be in addition to the provisions of the Major Port Trusts Act, 1963 and in particular nothing in this Act shall affect any jurisdiction, functions, powers or duties required to be exercised, performed or discharged under the Major Port Trusts Act, 1963 by the Board of Trustees for the major port of Calcutta or by any officer or authority in, or in relation to, the portion of the national waterway falling within the limits of the said port.

38 of 1963.

(2) Nothing in this Act shall affect the operation of the Inland Vessels Act, 1917 or any other Central Act (other than the Major Port Trusts Act, 1963) or any State or Provincial Act in force immediately before the commencement of this Act with respect to shipping and navigation on the waterway declared by section 2 to be a national waterway but any jurisdiction, functions, powers or duties required to be exercised, performed or discharged by a State Government or any officer or authority subordinate to a State Government under any such Act in so far as such jurisdiction, functions, powers or duties relates or relate to shipping and navigation on the said waterway or any matter incidental thereto or otherwise connected therewith, shall after such commencement be exercised, performed or discharged by the Central Government.

1 of 1917.
38 of 1963.

(3) The Central Government may, by notification in the Official Gazette, direct that any jurisdiction, functions, powers or duties which it may exercise, perform or discharge by virtue of the provisions of sub-section (2) under any Act referred to in that sub-section shall, subject to such conditions, if any, as may be specified in the notification, be exercised, performed or discharged also by—

(a) such officer or authority subordinate to the Central Government, or

(b) such State Government or officer or authority subordinate to a State Government,

as may be specified in the notification.

Advisory
Commit-
tees.

8. (1) Subject to any rules made in this behalf, the Central Government may from time to time constitute one or more Advisory Committees to advise the Central Government on matters concerning the administration of this Act.

(2) The Advisory Committee or the Advisory Committees referred to in sub-section (1) shall consist of such number of persons to represent the interests connected with shipping and navigation and allied aspects as the Central Government may deem fit.

Fees for
services
or bene-
fits ren-
dered in
the nation-
al water-
way.

9. (1) The Central Government may, by notification in the Official Gazette, levy fees at such rates as may be laid down by rules made in this behalf for services or benefits rendered in relation to the use of the national waterway for the purposes of navigation, infrastructural facilities, including facilities for passengers and facilities relating to berthing of vessels, handling of cargoes and storage of cargoes.

(2) The fees levied under sub-section (1) shall be collected in such manner as may be prescribed.

10. Subject to any rules made in this behalf, any officer subordinate to the Central Government or to a State Government or to any authority subordinate to the Central Government or a State Government who is authorised in this behalf by the Central Government by notification in the Official Gazette may, whenever it is necessary so to do for any of the purposes of this Act, at all reasonable times, enter upon any land or premises and—

Power to enter.

- (a) make any inspection, survey, measurement, valuation or inquiry,
- (b) take levels,
- (c) dig or bore into sub-soil,
- (d) set out boundaries and intended lines of work,
- (e) mark such level boundaries and lines by placing marks and cutting trenches, or
- (f) do such other acts or things as may be prescribed:

Provided that no such officer shall enter any building or any enclosed court or garden attached to a dwelling-house (unless with the consent of the occupier thereof) without previously giving such occupier at least twenty-four hours' notice in writing of his intention to do so.

11. Whoever—

Penalties.

- (a) destroys, pulls down, removes, injures or defaces any pillar, post or stake or marks fixed on the national waterway and the appurtenant land, or any notice or other matter put up, inscribed or placed under this Act, or
- (b) obstructs any person from exercising his powers and performing his functions under this Act, or
- (c) damages any works or property belonging to the Central Government, or
- (d) fails to furnish any information required for the purposes of this Act,

shall be punishable with imprisonment for a term which may extend to six months or with fine which may extend to one thousand rupees or with both.

12. The Central Government may, by notification in the Official Gazette, direct that any function, power (except the powers under sections 14 and 15) or duty which it may perform, exercise or discharge under this Act shall, subject to such conditions, if any, as may be specified in the notification, be performed, exercised or discharged also by—

Power to delegate.

- (a) such officer or authority subordinate to the Central Government, or
 - (b) such State Government or officer or authority subordinate to a State Government,
- as may be specified in the notification.

13. No suit, prosecution or other legal proceeding shall lie against the Central Government or a State Government or an authority subordinate to such Government or an officer subordinate to such Government or authority for anything which is in good faith done or intended to be done in pursuance of the provisions of this Act.

Protection of action taken in good faith.

Power
to make
rules.

14. (1) The Central Government may, by notification in the Official Gazette, make rules for carrying out the purposes of this Act.

(2) In particular and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:—

(a) the manner in which, and the conditions subject to which, any function in relation to the matters referred to in section 5 may be performed;

(b) the rule of the road on the national waterway;

(c) the safe, efficient and convenient use, management and control of the infrastructures and infrastructural facilities;

(d) the reception, portage, storage and removal of goods brought on the national waterway, and the procedure to be followed for taking charge of goods which may have been damaged before landing, or may be alleged to have been so damaged;

(e) regulating, declaring and defining the docks, wharves, jetties, landing stages on which goods shall be landed from vessels and shipped on board vessels;

(f) regulating the manner in which, and the conditions under which, the loading and unloading of vessels on the national waterway shall be carried out;

(g) the exclusion from the national waterway of disorderly or other undesirable persons and of trespassers;

(h) the manner in which the Central Government shall endeavour to resolve, under sub-section (2) of section 6, the disputes referred to therein, the form and manner in which such disputes may be referred, under sub-section (3) of that section to arbitration and the procedure to be followed in such arbitration proceedings;

(i) the composition of the Advisory Committees, the term of office of members of such committees, the allowances, if any, payable to them, and the manner in which the Advisory Committees shall conduct their business;

(j) the rates at which fees for services and benefits referred to in section 9 may be levied and the manner in which such fees shall be collected;

(k) the conditions and restrictions with respect to the exercise of the power to enter under section 10 and the matters referred to in clause (f) of that section;

(l) the periodical inspection of the national waterway and the submission of the inspection reports to the Central Government;

(m) the reports on works carried out on the national waterway;

(n) any other matter which is to be, or may be, prescribed or in respect of which provision is to be, or may be, made by rules.

(3) Any rules made under this Act may provide that a breach thereof shall be punishable with fine which may extend to one thousand rupees and where the breach is a continuing one with further fine which may extend to one hundred rupees for every day after the first during which such breach continues.

(4) Every rule made under this Act shall be laid, as soon as may be after it is made, before each House of Parliament while it is in session, for a total period of thirty days which may be comprised in one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or both Houses agree that the rule should not be made, the rule shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule.

15. (1) If any difficulty arises in giving effect to the provisions of this Act, the Central Government may, by order published in the Official Gazette, make such provisions not inconsistent with the provisions of this Act as may appear to it to be necessary for removing the difficulty:

Removal
of diffi-
culties.

Provided that no order shall be made under this section after the expiry of three years from the commencement of this Act.

(2) Every order made under this section shall be laid, as soon as may be after it is made, before each House of Parliament.

THE SCHEDULE

(See section 2)

LIMITS OF THE NATIONAL WATERWAY (ALLAHABAD-HALDIA STRETCH OF THE GANGA-BHAGIRATHI-HOOGHLY RIVER)

From road bridge at Allahabad across the river Ganga, about 2 kms. upstream of the confluence of the rivers Ganga and Yamuna at Triveni to the inland waterway limit on the tidal waters of the river Hooghly from a line drawn between No. 1 Refuge house at the entrance to Baratola river commonly called channel creek, to a position 2.5 kms. due south of Saugor lighthouse, and then connected to the right or south bank at the entrance to the Hijli or Russulpore river, through river Ganga, lock canal and feeder canal at Farakka, river Bhagirathi and river Hooghly.

R. V. S. PERI SASTRI,
Secy. to the Govt. of India.

ANNEXURE VII – DETAILS OF THE 1ST STAKEHOLDER WORKSHOP ON ADMINISTRATIVE ISSUES

As part of the ongoing study of INTACH on riverine islands supported by National Mission for Clean Ganga (NMCG), an online workshop including consultations cum discussions on various administrative issues pertaining to riverine islands with concerned stakeholders was conducted on 6th September, 2022 from 3.00 – 5.30 PM. Representatives from INTACH & NMCG along with other invited officials/speakers participated in the discussions during this workshop. Following are the details of the participants along with a brief summary of their inputs:

- **Mr. Manu Bhatnagar, Principal Director, Natural Heritage Division, INTACH:** Mr. Bhatnagar initiated the workshop by welcoming the participants following which he introduced the topic of riverine islands and how, despite so much attention to the Ganga, they had somehow been completely neglected in the debates about the river. During his talk, he highlighted how crucial the riverine islands are for the river ecosystem and their increasing significance as biodiversity refuge especially owing to the balding of river banks. Various administrative and legal issues and lacunae pertaining to riverine islands of the Ganga River along with growing pressures for colonization were touched upon. The example of Raghapur Diara in Patna District, which had become an urban block in the middle of the river, was highlighted. He further emphasized on the urgent need of the hour to fill in these gaps and prepare an appropriate policy for conservation and management of these lands before they were overrun by anthropogenic pressure.
- **Mr. Rajiv Ranjan Mishra (Former DG, NMCG) & Chief Technical Officer, NIUA:** Mr. Mishra initiated his talk by underlining the lack of attention and work on riverine islands especially in Ganga ecosystem. He described briefly the mandate and background of Namami Gange program and stressed upon considering the Ganga River as a single ecosystem which needs to be managed

in an ecologically sustainable manner. He spoke about the importance of riverine islands as important corridors that can play a crucial role in the conservation and rejuvenation of aquatic and riparian biodiversity. Riverine islands are known by different names such as 'Diaras' in Bihar & Jharkhand; 'Chars' in West Bengal & Bangladesh; 'Lanka' in Andhra Pradesh & Telangana and in most places, they are exploited mainly for agriculture. He emphasized the lack of appropriate provisions for riverine islands as a key challenge which could be overcome by this study that would have a larger impact pan India. He pointed out the strategic importance of riverine islands that can be crucial for various purposes such as serving as sites for some installations in national interest or serving as corridors for urban biodiversity vis-à-vis eco-tourism sites.

- **Dr. Sumesh Dudani, Natural Heritage Division, INTACH:** Dr. Dudani delivered a presentation which highlighted some key observations in the Indian and International context of riverine islands based on the exhaustive literature survey carried out. He also shared some field observations pertaining to riverine islands in Uttar Pradesh & Bihar states providing a mix of land use types and on-ground challenges. He further explained some key ecosystem goods and services associated with riverine islands. In continuation to this, Mr. Abhishek provided details about the mapping exercise with respect to the riverine islands in the Ganga River and some key takeaways.
- **Mr. Gopalkrishna (IAS), Retd. Chief Secretary & INTACH Telangana Chapter Convener:** Mr. Gopalkrishna began his talk by highlighting the differences in the riverine islands of the Brahmaputra River in Assam and the Godavari/Krishna Rivers of Andhra Pradesh. He pointed out that after the construction of Dowleshwaram barrage some islands in Godavari have stabilized and are inhabited with agricultural lands leased to them. He also mentioned that the Godavari River has been pushing an enormous amount of sand towards its confluence with the sea which has led to formation of the Hope

Island. With respect to administrative issues, he clarified that in case the island is submerged under water, two different cases arise – if the water is completely covering the island and is navigable, it is considered as govt. land and otherwise it is leased land (*Patta*). According to him, some State Govt. officials also carry out surveys once in 5-10 years to check the ground situation of riverine islands in the Godavari River. He also signified the importance of ongoing INTACH study on riverine islands as something similar hasn't been attempted thus far.

- **Mr. Puskal Upadhyay, Financial Advisor, NDMC:** Mr. Upadhyay lauded the ongoing riverine island study and emphasized its inclusion similar to coastal islands in the discussions on the blue economy. He shared that the Island Development Authority has been going forward methodically for coastal island development but no such efforts are in place for riverine islands. Unlike coastal islands which are mostly far from the mainland, the majority of riverine islands are in close proximity to urban towns and cities. While tourism is the chief scenario in coastal islands, fishing, agriculture and tourism (FAT) are the chief scenarios in riverine islands. He emphasized the need for a balanced approach in order to gain commercial benefits and at the same time safeguard the biodiversity & ecology of riverine islands in India. He also briefly touched upon various forms of tourism developing in the country which can be applied with proper planning to riverine islands for which he cited some relevant examples as well. Lastly, he opined that overcoming challenges of ownership, jurisdiction and legal aspects if any would go a long way in achieving desirable goals in this area.
- **Mr. Lallan Kumar Chaudhary, Block Development Officer, Raghapur Block:** Mr. Chaudhary laid out the administrative details of Raghapur Diara which is the largest riverine island in Ganga River and a designated independent block within Vaishali District. This block comprises about 20 different villages and more than 2.5 lakh residents. He highlighted that this island has an old history

with associated beliefs of Lord Buddha visiting this region and evidence of Harappan bricks being found here during excavation. Most of the landmass of this island gets inundated during floods impacting agriculture and settlements, with the residents as well as administration retiring to the banks for the flood duration. During the discussion, he also mentioned that a permanent highway bridge is planned with a bypass connecting Raghapur Diara thereby providing round the year connectivity with the mainland. He also briefly touched upon some Govt. programs/schemes. regarding waste management and other issues which are being implemented on the diara. He opined that as most lands are privately owned here, there are no specific regulations to prohibit any kind of construction and the residents can freely construct any house or settlement here.

- **Dr. Amit Ray, Chairman, Hoogly-Chinsura Municipality:** In the absence of Dr. Ray, Ms. Bernika represented this Municipality and shared some plans for developing recreational areas and associated facilities on a riverine island in Hoogly River falling under their jurisdiction with the objective to boost tourism revenues for the Municipality. However, in the absence of expertise, the plan has made no headway.
- **Dr. Jayanata & Swarnalli Chattopadhyay, RsGIS, Kolkata:** They presented the field observations on Hoogly riverine islands including Nayachar Island. Nayachar Island is located close to Hoogly River's confluence with the sea and is the second largest in size after Sagar Island with an area of about 57.8 sq. km. and a population of about 10,000 people. The presentation depicted changes in Nayachar Island and explained the development of aquaculture on the island by the state fisheries department from 1987 onwards. Post that, several residents from neighboring districts migrated to this island and created aquaculture ponds by clearing all native vegetation including mangroves. The presentation also highlighted the ecological sensitivity of this island as it is under constant

influence of heavy rainfall, cyclonic storms and erosional processes which have been aggravated by human encroachments. Even though this island has been brought under Purba Mednipur District, there have been no efforts to control illegal human interventions and restore the biodiversity of this island.

- **Dr. Jayendra Lakhmapurkar, Acting Director, Gujarat Ecology Society, Vadodara:** Dr. Lakhmapurkar initiated his presentation by highlighting Kabirvad which is an important island in the Narmada River. It houses an ancient temple along with an old and sacred Banyan Tree which is specially worshipped by fishermen communities in this region. This island is an important tourism site and has some temporary shelters with villagers practising agriculture and rearing cattle. There is a lack of basic facilities on this island and during floods, it is abandoned by people only to return when water levels recede in the Narmada River.
- **Mr. Bharat Bagla, Legal Expert:** In the absence of Mr. Bharat Bagla who is providing legal inputs in this ongoing study, Dr. Sumesh Dudani read out some excerpts from laws/regulations pertaining to riverine islands in India. It is important to note that for the first time, riverine islands were given statutory recognition by British India Govt. in the early 1800s through the '**Bengal Alluvion and Diluvion Regulation of 1825**'. The chief aim of this regulation was to regularize the rights of ownership on the land gained by river action that become a frequent source of contention and affray. The regulation made it clear that any land gained by accession from the recess of river or sea was to be considered as an increment to the tenure of a person to whose land it so annexed and that person would not have any rights on the land so gained. The regulation also established that when an island is thrown up in a navigable river channel not belonging to any person, it would come under the disposal of the concerned government. This regulation was however repealed with coming in force of Section 59(1) of the West Bengal Land Reforms Act (1955). Certain

provisions regarding land gained by rivers are also present in other states such as the Punjab Land Revenue Act 1887 under Sections 101A and 101B. Shri Bagla is also examining pertinent laws elsewhere as well as case studies.

- **Dr. Sandeep Behera, Consultant, NMCG:** Dr. Behera commended the topics and issues covered in this workshop. He also aptly compared the scenario of forest habitats getting impacted by human interventions with interventions in Nayachar island of Hooghly and other riverine islands in Ganga that have adversely affected the wildlife and other biodiversity. He also emphasized taking into account the economic aspects of riverine island development in conjunction with biodiversity conservation. He further pressed on the urgent need for developing appropriate policies in this area.
- **Mr. Sumit Chakraborty, KPMG:** Mr. Chakraborty emphasized that river should take priority and the development of riverine islands should be in harmony with river ecology.
- **Mr. Manu Bhatnagar, Principal Director, Natural Heritage Division, INTACH:** Mr. Bhatnagar underlined the need for an urgent policy intervention that needs to catch up with runaway situations such as in the case of riverine islands of India. Although, farming is the primary sector on these lands, should it be kept that way or should we include new activities? He opined that our rivers have the first claim over these islands. He ended the workshop with a vote of thanks to all participants.

*Three of our invited speakers – Shri Ramniwas Yadav (DC, Sahibganj District), Mr. Bharat Chintapalli (DFO, Bhagalpur Forest Division) and Dr. A.P. Singh (APCCF, Gujarat) could not participate due to last minute urgent engagements.

ANNEXURE VIII- DETAILS OF THE 2nd STAKEHOLDER WORKSHOP ON COMMUNITY PERSPECTIVES

As part of the ongoing study of INTACH on riverine islands supported by National Mission for Clean Ganga (NMCG), the 2nd workshop including consultations cum discussions on various island & riparian community issues and perspectives was conducted on 24th March, 2023 from 2.30 - 5.00 PM at the conference hall of INTACH, New Delhi. Representatives from riparian and island communities from different parts of the country along with officials of NMCG and INTACH and other invited speakers participated in the discussions pertaining to issues such as land ownership on riverine islands, erosion issues, jurisdictional conflicts, agriculture and other livelihoods, tourism potential and biodiversity. Following are the details of the participants along with a brief summary of their inputs:

- 1. Mr. Manu Bhatnagar, Principal Director, Natural Heritage Division, INTACH:** Mr. Bhatnagar initiated the workshop by welcoming the participants following which he introduced the topic of riverine islands and how, despite so much attention to the Ganga, they had somehow been completely neglected in the debates about the river. He laid out the outline for this workshop and emphasized the importance of this study in the current scenarios. Following the introduction of participants, he touched upon several key topics such as land ownership conflicts on islands, challenges for conservation of new sandbars/islands, threats to native vegetation and associated biodiversity, unprecedented and unplanned development of islands such as Raghapur diara & Ramchandipur diara, weakness in legal perspectives pertaining to riverine islands and the need for balancing tourism on islands vis-à-vis safeguarding the island ecosystem services.
- 2. Dr. Sumesh Dudani, Scientific Officer, Natural Heritage Division, INTACH:** Dr. Dudani delivered a presentation highlighting the concept of riverine islands, sharing some inputs from field studies on various islands in Ganga and other rivers, laying out the issues and challenges identified based on the current study and touching

upon few points of discussion for the current workshop. Some examples from the mapping exercise of riverine islands in the Ganga River were also shared in the presentation.

3. **Shri Khila Ram, Resident of Rampur Raighati Island in Haridwar Distt.:** Shri Khila Ram provided a background of the island on which he resides. This island is located downstream of the Haridwar city, is connected only by boats and is inundated every year during the monsoon floods. No compensation of any kind is provided for the flood damages and people have to wait for the waters to recede before they initiate cultivation on this island. Agriculture is the chief source of livelihood for several residents such as himself but is often suffering huge losses due to wildlife depredations prevalent in this region. As this island is located near the Rajaji National Park, the movement of elephants is frequent on this island and they trample upon any kind of boundary set up by the farmers for protecting their agriculture fields. Following the elephants several other wild animals forage and trample upon the crops which leads to huge losses, however, there is no violent retaliation of any kind from them. He also informed that owing to new sediment deposition every year the land was highly fertile and productive.

4. **Shri Anant Prakash, Resident of Bidupur (Raghopur constituency), Bihar:** He shared an introduction about the Raghopur Block and highlighted that this is a very old riverine island which has been employed for agriculture since colonial times. With more than 2 lakh residents in about 20 villages under this block, this is the largest riverine island in the Ganga River and the only one to have such an autonomous status. He further reiterated that in recent times, several residents have started construction on their land holdings on this island and that with a new permanent bridge aimed at providing round the year connectivity, more such development is possible here. According to him most of the land on this island is privately owned with proper records available in the Block office situated in Fatehpur village on this island. Agriculture is the chief source of livelihood which is carried out throughout the year barring monsoon months when substantial parts of

this *diara* are inundated in water. The last full submergence was in the floods of 1978. With the land pressure and costs increasing in Patna and other towns situated close to this island, land buying and selling has increased in Raghapur due to the lower prices while retaining the accessibility to Patna. He further emphasized that tourism potential is very high in this region and that it might be boosted with better connectivity and infrastructure in coming time.

5. **Shri Tanmay Kishore, Resident of Prayagraj [tourism entrepreneur]:** Mr. Kishore introduced himself by mentioning about his ancestral connection with Prayagraj city and giving a glimpse about how they have been intrinsically connected with Ganga River in the region. He emphasized that although Prayagraj has always been a centre for pilgrimage owing to the famous Kumbha Mela held at Triveni Sangam, it has also been increasingly promoted for heritage tourism with domestic as well as international visitors. Taking cue from this potential, Mr. Kishore has proposed to the UP-State Govt. to establish riverine island-based tourism on the Lavayan island in this region to provide new experiences for visitors involving local cultural heritage and close association with the Ganga River. According to him, this move will also help boost local livelihoods. He, however, agreed that it is imperative to keep in mind the ecological sensitivity of the river ecosystem and biodiversity conservation while developing such tourism. He reiterated that most of the lands on the island are privately owned but have not been utilized for agriculture for a couple of years thereby leading to the growth of dense riparian vegetation.

6. **Dr. Jayendra Lakhmapurkar, Acting Director, Gujarat Ecology Society, Vadodara:** Dr. Lakhmapurkar delivered a brief presentation highlighting some important observations on the riverine islands of the Narmada and Mahi Rivers. The Kabirvad Island in Narmada is a famous tourism site owing to an old Banyan tree (Vad) believed to have been planted by Sant Kabir. Barring that site, the rest of the island is under agriculture with cultivators coming here from nearby villages. The Govali Bet island situated a little downstream of Kabirvad is known to be a privately

owned island with recreational facilities such as a cricket ground being present on this. The remaining island is under agriculture although the cultivators come and go daily. The Khadol island observed in the Mahi River is totally vegetated with wildlife such as nilgai, monkeys and various birds present. An old well structure believed to be from British times was also recorded on this island. Dr. Lakhmapurkar highlighted that most lands on the islands in Gujarat are privatized with plans for resorts, theme parks and other developments planned in the coming future.

7. **Dr. Jayanta & Ms. Swarnali Chattopadhyay, RsGIS, Kolkata:** They delivered a brief presentation highlighting two major islands in Hooghly – Char Mohammadpur island in Murshidabad District and Nayachar island in Hooghly estuary. The former island has been developing and shifting its place in the river during the last few decades. Based on interactions with interlocutors during the survey, Char Mahammadpur was found to be part of the land acquired by Khaitan Group for cultivating sugarcane in this region. However, due to the decreasing quality of the crop and subsequent decline in its usage, these lands were abandoned by Khaitan's and ultimately taken over by local residents who claimed to be working for the company. Currently, a patch of planted forest along with agriculture could be observed on this island. No settlements of any kind are present here. In the case of Nayachar Island, it has been severely exploited by destroying the native mangrove vegetation and developing aquaculture farms most of which operate without any legal status or records. Even though this island has been brought under Purba Mednipur District, there have been no efforts to control illegal human interventions and restore the biodiversity of this island.
8. **Ms. Shruti, Consultant, IWAI:** Ms. Shruti highlighted the need for identifying which islands in the Ganga River are permanent and which are temporary shoals as this feature was crucial for maintaining a navigable corridor. She also apprised the gathering about ongoing terminal development and route planning for boosting inland navigation connectivity.

9. **Dr. Sandeep Behera, Consultant, NMCG:** Dr. Behera emphasized the importance of riverine islands as habitats and movement corridors for numerous wildlife and as a storehouse of bioresources. He reiterated that whilst there has been no attention paid to such islands thus far, this study comes at a crucial time where a policy that is pro-environment can be developed for them. Furthermore, he agreed that tourism on such islands would be an important challenge in the coming times. Therefore, there should be some mechanism to keep a check so that tourism activity blends and balances well with the environment. However, this should be only done with those islands that are closer to big cities and are already inhabited. For the new sandbars and islands that are still safe from significant anthropogenic pressures, they should be conserved and protected along with their native biota. He maintained that lands within the river were government lands and also tabled the suggestion that river islands could be acquired if necessary so as to keep them safe for the natural river ecosystem.
10. **Shri Brijesh Sikka, Sr. Consultant, NMCG:** Shri Sikka commended the discussion in this workshop and highlighted the need for a balanced approach towards developing tourism and safeguarding ecology on the riverine islands of Ganga River. He suggested to look at all appropriate regulations and different case studies within India so that the draft position paper emerging out of this study could be practically applicable. He recommended speedy completion of this position paper that would be shared with various State Ganga Committees and concerned District Administrations for their feedback and comments.
11. **Mr. Sumit Chakraborty, KPMG & Mr. Ashwini, NMCG-PMC:** They also reiterated the importance of a policy pertaining to riverine islands especially since the results stemming from this study would have wider impact especially as the pressure on islands in various rivers was bound to grow in the near future.

*Two of our invited participants – Shri Badri Narayan of Ramchandipur Diara in Varanasi and Mr. Bharat Bagla, Legal Expert could not participate due to last minute urgent engagements. However, individual discussions with them have been recorded for adding in the final project report.

ANNEXURE IX- DETAILS OF THE 3rd STAKEHOLDER WORKSHOP ON RIVERINE ISLAND DRAFT POSITION PAPER

As part of the ongoing study of INTACH on the Riverine Islands of the Ganga, supported by National Mission for Clean Ganga (NMCG), **the 3rd workshop including consultations cum discussions on Draft Position Paper** was organized on **21st July, 2023 from 2.30 – 5.30 PM at INTACH, New Delhi.**

Subject experts, experienced administrators, environmental law specialists, NMCG staff and experts from NH Division of INTACH participated in this workshop. Following are the details of the participants along with a brief summary of their inputs:

- 1. Mr. Manu Bhatnagar, Principal Director, Natural Heritage Division, INTACH:** Mr. Bhatnagar welcomed the participants of this workshop and apprised the gathering about the background of riverine islands and emphasized the need for such a study. He highlighted that despite there being considerable work on the Ganga River, the islands have till now not been a focal point of any major study or discussions. Following this, he laid out the outline for this workshop, introducing the participants and mediated the discussions upon several key topics such as land ownership conflicts on islands, challenges in the conservation of riverine islands, unprecedented and unplanned development of islands such as Raghapur diara, weakness in legal perspectives pertaining to riverine islands, the need to safeguard the island ecosystem services.
- 2. Dr. Sumesh Dudani, Scientific Officer, Natural Heritage Division, INTACH:** Dr. Dudani delivered a presentation highlighting some important observations emanating from the field survey and mapping analysis of Ganga Riverine islands along with a comparative survey on other major riverine islands in India. He highlighted the lack of identification/classification methodology for thousands of riverine islands in the Ganga River which has led to their obscurity thus far. While presenting the key highlights of the policy position paper, he touched upon the need

for defining riverine islands with a rationale, proposed a matrix for identifying and demarcating the islands/sandbars and discussed mitigation strategies for some key issues as recorded during the surveys.

3. **Shri G. Asok Kumar, Director General, NMCG:** Hon. DG, NMCG expressed satisfaction that riverine islands, a neglected factor thus far, were gaining attention. He highlighted that islands and sandbars were so far not being addressed by the district administration. He emphasised the urgency of strengthening the position paper with inputs from NITI Aayog and other stakeholders. He also proposed the idea of floating this policy position paper along with other necessary details on the NMCG website for feedback/suggestions from a larger audience.

4. **Shri Shawahiq Siddiqui, Environment Law Expert:** Shawahiq delivered the presentation reflecting the legal analysis of fluvial landforms in the Ganga. While highlighting the limited legal guidance available with regards to rivers and their governance, he emphasized the significance of developing national & state-specific legislation encompassing the fluvial landforms which are key components of most major rivers in India. He mentioned the Bengal Aluvion & Diluvion Regulation of 1825 which has had its applicability in different ways in the states of West Bengal, Bihar, Jharkhand, Uttar Pradesh and even in Bangladesh. He also presented some case studies which highlighted that even courts relied on these acts and regulations till date for giving judgements on matters pertaining to riverine lands. He also touched upon the interlinkages between the National Waterways Act, 1985; Environmental Protection Act, 1986 and the Ganga Notification, 2016 highlighting various anomalies which should be resolved. He also brought out that there were several variations and types of ownership recognized in different zones which would have to be progressively unravelled to align with the proposed policy.

5. **Shri Rajiv Ranjan Mishra, Former Director General, NMCG:** Shri Mishra highlighted that in earlier times, rivers were considered as an economic resource whereas emerging thought emphasizes ecological and environmental aspects as

primary. Realizing the potential of riverine islands in the Ganga River ecosystem, he reiterated the crucial points this study has brought out and acknowledged the idea of developing a mechanism for identifying and nomenclating islands/sandbars. He also pointed out the need for potential regulation for the sustainable development of the islands as well as the concept of organic farming around the river belt that could be encouraged. He also emphasized the need to step up research on various fronts of riverine island ecology, hydrology and sedimentology. He also expressed the need to develop regulations pertaining to biodiversity conservation, construction activities, pollution issues, agriculture and other major issues pertaining to the islands/sandbars. Lastly, he suggested expediting the completion of this position paper and bringing it out in public domain with a view to safeguard as many islands as possible. He expected that this paper would be the beginning of the policy process which could be time consuming.

6. **Prof. Rajiv Sinha, Professor, IIT Kanpur:** Prof. Sinha presented the riverine island classification schemes and distinguishing characteristics of riverine islands based on some significant studies carried out globally. He also highlighted the importance of studying riverine islands in great details as they play key role in river hydrology and ecology. As examples, he presented some studies carried out on riverine islands in the Lower Ganga River stretch which highlighted changes in the island geomorphologies. Despite the growing significance of such studies, there are some major research gaps on formation of riverine islands, their interrelationships with river ecology, conservation studies and changing hydrological patterns that still need to be addressed. He emphasized the need to inventorize the riverine islands along with their spatio-temporal dynamics to inform policy options. He appreciated the current study carried out by INTACH as a first holistic approach towards riverine island study in India and suggested the need for sedimentological and morphological studies in the future to strengthen policy work.

7. **Prof. A. K. Gosain, Professor, IIT Delhi:** Prof. Gosain highlighted the importance of local stakeholder participation, EIA assessment, biodiversity analysis and impact of

pollution on riverine islands to be studied in long run. While providing feedback on the position paper, he pressed upon strengthening the need and objectives while incorporating pollution regulations, climate change impacts, sand mining issues and tracing out the morphological features through remote sensing. The issue of the stability of islands should be considered in all interventions

8. **Shri Pushkal Upadhyay, Financial Advisor, NDMC:** Mr. Upadhyay emphasized safety concerns in view of the dynamic nature of these islands. Unbridled economic development could damage ecology and even alter the course of the river. Where islands are under usage the policy prescriptions to regulate them must be followed. Where islands are in virgin condition they must be maintained as natural. He appreciated that the policy allowed for limited eco-tourism. While environment conservation needs to be a priority, he suggested involvement of local residents/cultivators on islands in furthering the policy and also enable possible economic/eco-tourism activities on islands in upcoming years specially on those close to urban settlements.
9. **Prof. Sunil Kumar Choudhary, Retd. Professor, Bhagalpur University & MoEF Expert:** Prof. Choudhary reiterated the importance of riverine island study carried out by INTACH. While presenting the rich biodiversity and ecological significance of Vikramshila Gangetic Dolphin Sanctuary, he highlighted that the sandbars and islands here serve as habitats and nesting sites for several valuable wildlife including turtles, otters and numerous birds. He recommended that agriculture should be discouraged specially in this protected area as that leads to increased human footprint and cattle movements. Furthermore, he emphasized the challenges associated with eco-tourism on islands and sand bars while reiterating the need for creating more awareness in this subject. He endorsed the policy guidelines in this regard but also hoped for more inputs from riparian communities in due course.
10. **Dr. Sandeep Behera, Consultant, NMCG:** Dr. Behera emphasized on the importance of riverine islands as habitats and movement corridors for numerous

wildlife and as storehouse of bioresources. He suggested prioritizing conservation of the same as provided in the position paper and going further to establish bio-inventories of major islands.

11.Mr. Sumit Chakraborty, NMCG: Mr. Chakraborty aligned with other participants' suggestions and reiterated the impacts this study would have not only on Ganga River but on other major rivers of the country too.

*Six of our invited participants – Shri Avinash Mishra of NITI Aayog, Govt. of India; Shri Jayant Singh, Vice-Chairman of IWAI; Dr. Mitul Baruah, Professor, Ashoka University; Dr. Jayendra Lakhmapurkar, Director, Gujarat Ecology Society; Shri Umesh Mishra, District Magistrate of Bijnor District and Shri P.K. Srivastava, Divisional Forest Officer at Gautam Buddh Nagar could not participate due to last minute urgent engagements.



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