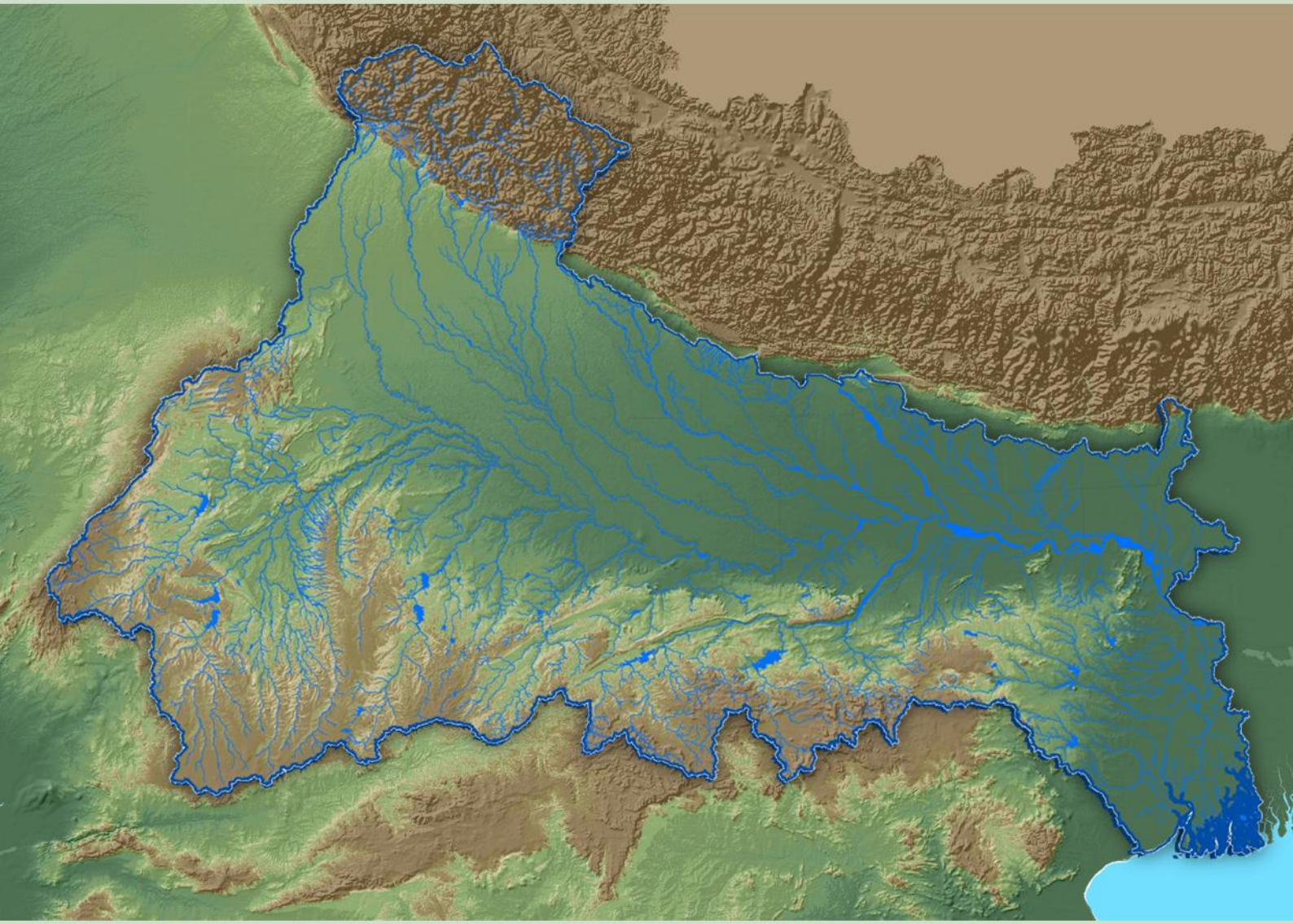
Version 2.0

Government of India
Ministry of Water Resources

GANGA BASIN



March, 2014

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Preface

Optimal management of water resources is the necessity of time in the wake of development and growing need of population of India. The National Water Policy of India (2002) recognizes that development and management of water resources need to be governed by national perspectives in order to develop and conserve the scarce water resources in an integrated and environmentally sound basis. The policy emphasizes the need for effective management of water resources by intensifying research efforts in use of remote sensing technology and developing an information system. In this reference a Memorandum of Understanding (MoU) was signed on December 3, 2008 between the Central Water Commission (CWC) and National Remote Sensing Centre (NRSC), Indian Space Research Organisation (ISRO) to execute the project "Generation of Database and Implementation of Web enabled Water resources Information System in the Country" short named as India-WRIS WebGIS.

India-WRIS WebGIS has been developed and is in public domain since December 2010 (www.india-wris.nrsc.gov.in). It provides a 'Single Window solution' for all water resources data and information in a standardized national GIS framework and allow users to search, access, visualize, understand and analyze comprehensive and contextual water resources data and information for planning, development and Integrated Water Resources Management (IWRM).

Basin is recognized as the ideal and practical unit of water resources management because it allows the holistic understanding of upstream-downstream hydrological interactions and solutions for management for all competing sectors of water demand. The practice of basin planning has developed due to the changing demands on river systems and the changing conditions of rivers by human interventions. The multiple uses of water and varying demands on a river basin require an integrated approach to managing river basin.

Basin wise report generation is one the important deliverables of India-WRIS project. Report of Ganga basin describes systematically the present status of water resources: major water resources projects, hydro-meteorological observations, surface and ground water development scenario, topographic characteristics, climatic variability, land use / land cover pattern & allied natural resources along with socio-economic profile of the basin. The report contains valuable latest information of the basin on all aspects of water resources and allied sectors and will be useful as baseline information for the irrigation officials, hydrologists, agriculturalists, conservationists, research organizations and all those involved in the development of Ganga basin.

Acknowledgement

The Ganga basin report is an outcome of the project "Generation of Database and Implementation of Web enabled Water resources Information System in the Country" short named as India-WRIS WebGIS jointly executed by the Central Water Commission (CWC) and National Remote Sensing Centre (NRSC), Indian Space Research Organization (ISRO). This comprehensive publication gives the present status of water resources assets, topographic features, climatic variability, land use / land cover pattern & allied natural resources along with socio-economic information of the basin.

We, on behalf of the authors and India-WRIS project team acknowledge; Shri Alok Rawat, Secretary, Ministry of Water Resources; Mrs. Sudha Midha, Additional Secretary, Ministry of Water Resources; Er. A. B. Pandya, Chairman, Central Water Commission; Dr. K. Radhakrishnan, Chairman, Indian Space Research Organization and Secretary, Department of Space; Shri Sudarsanam Srinivasan, Secretary to GOI and Member- Finance, Department of Space; Shri A. Vijay Anand, Additional Secretary, Department of Space; Dr. V. Koteswara Rao, Scientific Secretary, ISRO; Dr. V. Jayaraman, Ex-Director, NRSC for constant encouragement and guidance, technical discussions and for evincing keen interest in India-WRIS project and this report.

Our foremost acknowledgement is towards India-WRIS project team who created and organized large number of data sets and information in GIS format as seamless layers and attribute data for the entire country which served as base for this report. Thanks are also due to all CWC and NRSC / ISRO officials who carried out the quality assurance and shown their enthusiastic involvement. Finally, our sincere thanks are to all divisions and officials of NRSC and CWC for their valuable support during the preparation of this report.

The basin report includes the results generated through interpretation of latest satellite imageries as well as compilation of huge information from voluminous records. This would not have been possible without the countrywide support. We would like to thank all the organizations, institutes and individuals who contributed either directly or indirectly in bringing out this publication.

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Executive Summary

India is endowed with rich water resources with approximately 45,000 km long riverine systems criss-cross the length and breadth of the country. The Ganga river basin is the largest of the basins of India with an area of 8,61,452 Sq.km in India, draining into the 11 states of the country, Uttarakhand, Uttar Pradesh, Haryana, Himachal Pradesh, Delhi, Bihar, Jharkhand, Rajasthan, Madhya Pradesh, Chhattisgarh and West Bengal. The Ganga river has many tributaries, both in the Himalayan region before it enters the plains at Haridwar and further downstream before its confluence with the Bay of Bengal. The basin has a total drainage length of about 624235.73 Sq.km. The Ganga basin lies between east longitudes 73°2' to 89°5' and north latitudes 21°6' to 31°21' having maximum length and width of approx. 1,543 km and 1024 km. The average water resource potential of the basin has been assessed as 525020 Million Cubic Meters (MCM).

The basin spreads over 239 parliamentary constituencies (2009) and 2,86,557 villages fall in the Ganga basin. Average population density in the Ganga basin is 520 persons per Sq.km as against 312 for the entire country (2001 census). The cities in the basin have large and growing populations and a rapidly expanding industrial base. According to India-WRIS the basin has 386249 settlement extents. The basin has a good network of road and rail with a total length 1087488.76 Sq.km and 24687.34 Sq.km respectively.

The Ganga basin has vast water resources in form of Surface Water and Ground Water resources. In the basin there are 276947 surface water bodies in form of Lakes/Pond, Reservoir, Tanks etc. There are 784 dams situated in the Ganga basin, out of which 158 dams are included in National Register of Large Dam (NRLD) and 66 barrages, 92 weir and 45 lift schemes are also constructed the basin. The water resource assets especially dams in Ganga basin are used for varied purpose like Irrigation, Water Supply, Hydro-Electric, and Drinking Water where 92.83% of total assets are used for irrigation purpose. The Ganga basin also contains one Inland National Waterways (NW-1) and 12 Inter Basin Transfer Links are proposed by National Waterways Development Authority of India.

In the Ganga basin, there are several major systems of canals which cater to almost 28 percent of the net irrigated area. There are 478 major and medium irrigation projects that represent a command area of about 36.12 percent of the basin. The 39 hydro-electric projects and 56 powerhouse of Ganga basin are a testament to the regions importance to India's overall hydroelectricity portfolio. In Ganga basin groundwater is a worthy source and easily accessible especially from the aquifers in the alluvial zone. The groundwater usage for irrigation in the states falling under Ganga basin accounted for nearly 50 percent of the groundwater irrigated area of the entire country.

Climate is not uniform over the Ganga basin; it varies from alpine, temperate, sub-tropical and tropical. Snowfall at higher altitudes accounts for most of the river run-off. With the varied climate, the Ganga basin has an attraction for tourists also from all around the world which includes glaciers, hill stations, pilgrimages, mountains, peaks, wild life sanctuaries etc.

For effective utilization and management of water resources this report has been generated for Ganga basin to provide an overview on the water statistics and its critical parameters. In order to utilize the water efficiently the common people should know about the availability of the current water resources present in the country.

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1. Introduction

1.1. Overview of basin

The Ganga basin outspreads in India, Tibet (China), Nepal and Bangladesh over the total area of 10,86,000 Sq.km. The major part of the geographical area of the Ganga basin lies in India and it is the biggest river basin in the country draining an area of 8,61,452 Sq.km which is slightly more than one-fourth (26.3 %) of the total geographical area of the country. In India, it covers states of Uttar Pradesh, Madhya Pradesh, Rajasthan, Bihar, West Bengal, Uttarakhand, Jharkhand, Haryana, Chhattisgarh, Himachal Pradesh and Delhi. However the GIS calculated area of the basin is 808337.11 Sq. km. The basin lies between east longitudes 73°2' to 89°5' and north latitudes 21°6' to 31°21' having maximum length and width of approximately 1,543 km and 1024 km respectively. The geographical extent of the Ganga basin is shown in Map 1. The basin is bounded by the Himalayas on the north, by the Aravalli on the west, by the Vindhyas and Chottanagpur plateau on the south and by the Brahmaputra Ridge on the east. The Great Desert of Rajasthan and the Aravalli hills form the ridge between the Indus and Ganga drainage system. The delta of the greater Ganga basin is one of the largest in the world and is known by the name Sundarbans after the Sundari trees covering an area of 60,000 Sq.km. The salient features for the basin are listed in Table 1.

The Ganga is the 20th longest river in the Asia and the 41st longest in the world (*Source: Philips World Atlas*). The headwaters region of Ganga is the Himalayas dotted by number of mighty tributaries. The Bhagirathi river that rises from the Gangotri glacier near Gomukh at an elevation of about 7,010 m above mean sea level in the Uttarkashi district of Uttarakhand is considered as the source of Ganga river. It descends down the valley up to Devprayag where after joining another hill stream Alaknanda, it is called Ganga. Flowing downhill the river is joined by a number of streams, such as the Mandakini, the Dhuli Ganga and the Pindar. The total length of river Ganga (measured along the Bhagirathi and the Hooghly) up to its outfall into Bay of Bengal is 2,525 km with 631 km navigable length.

From a hydrological point of view, the entire length of Ganga river in India can be divided in three stretches. The Upper Ganga reach, that extends from the origin to Narora Barrage in Bulandshahar district of Uttar Pradesh; the Middle Ganga reach from Narora Barrage to Ballia district in Uttar Pradesh, and the lower Ganga reach from Ballia to its delta. The principal tributaries joining the river from right are the Yamuna and the Sone. The Ramganga, the Ghaghara, the Gandak, the Kosi and the Mahananda join the river from left. The Chambal and the Betwa are the two important sub-tributaries join the river from left. The Ganga basin map with major drainage and location of hydro observation sites are shown in Map 3 and their corresponding details of hydro observation sites are given in Table 2.

Ganga has been a cradle of human civilization since time immemorial. It is one of the most sacred rivers in the world and is deeply revered by the people of this country. The Ganga drains a basin of extraordinary variation in altitude, climate, land use and cropping pattern. The Ganga basin has large number of water resource assets and surface water bodies which is covered by 11 states and most of its area is covered by Uttar Pradesh (28.02%) and Madhya Pradesh (21.02%) of the total basin area. The other states in embraces of Ganga basin are Rajasthan, Bihar, Jharkhand, Chhattisgarh, West Bengal, Uttarakhand, Haryana, Himachal Pradesh and Delhi. The state wise distribution of the drainage area of the basin is shown in Figure-1.

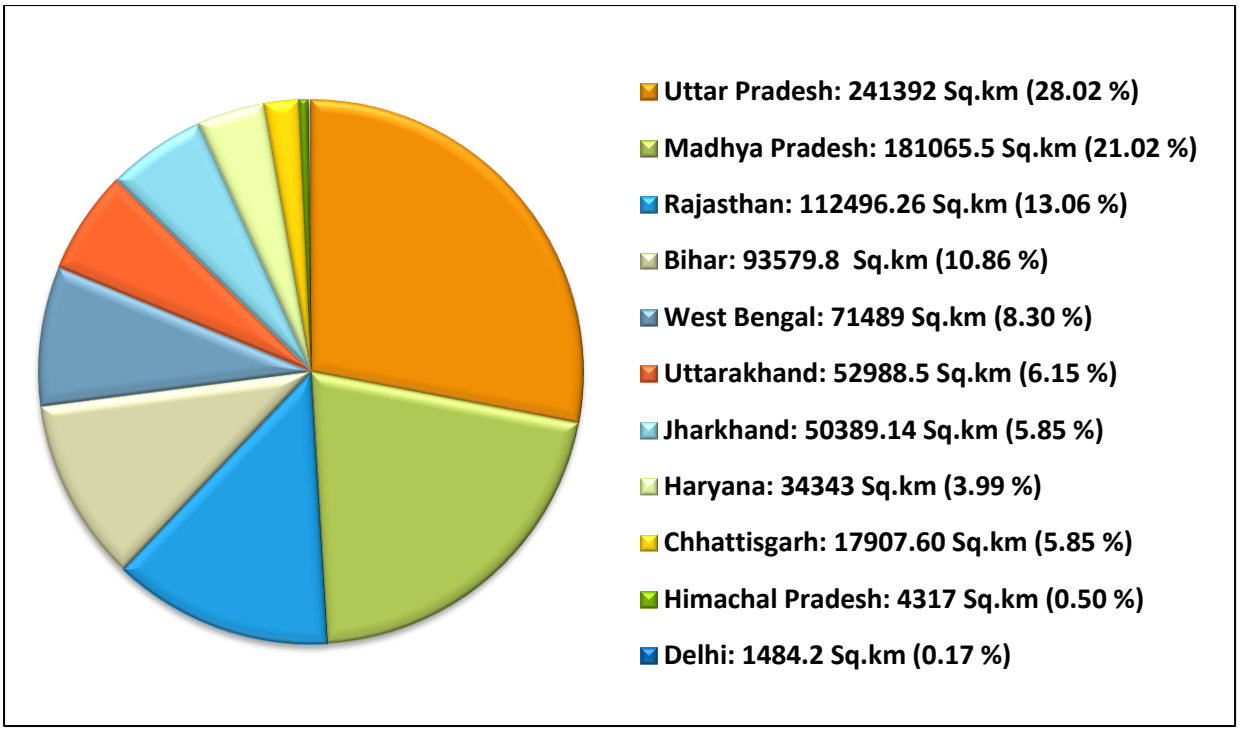


Figure 1. State wise drainage area of Ganga basin (In Indian Territory)

According to Census 2001, 242 districts fall in Ganga basin among these five states completely fall in the basin are Uttar Pradesh (70 districts), Bihar (37 districts), Delhi (9 districts), Jharkhand (18 districts) and Uttarakhand (13 districts). Other six states have only few districts that are part of Ganga basin. They are 17 out of 18 districts of West Bengal, 35 out of 45 districts of Madhya Pradesh, 12 out of 19 districts of Haryana, 19 out of 32 districts of Rajasthan, 4 out of 12 districts of Himachal Pradesh and 6 out of 16 districts Chhattisgarh. The basin spreads over 239 parliamentary constituencies (2009) comprising 80 of Uttar Pradesh, 40 of Bihar, 40 of West Bengal, 25 of Madhya Pradesh, 16 of Rajasthan, 12 of Jharkhand, 8 of Haryana, 5 of Uttarakhand, 4 of Chhattisgarh, 2 of Himachal Pradesh and 7 of Delhi. The major cities along the Ganga are Haridwar, Moradabad, Rampur, Allahabad, Kanpur, Patna, Varanasi and Rajshahi.

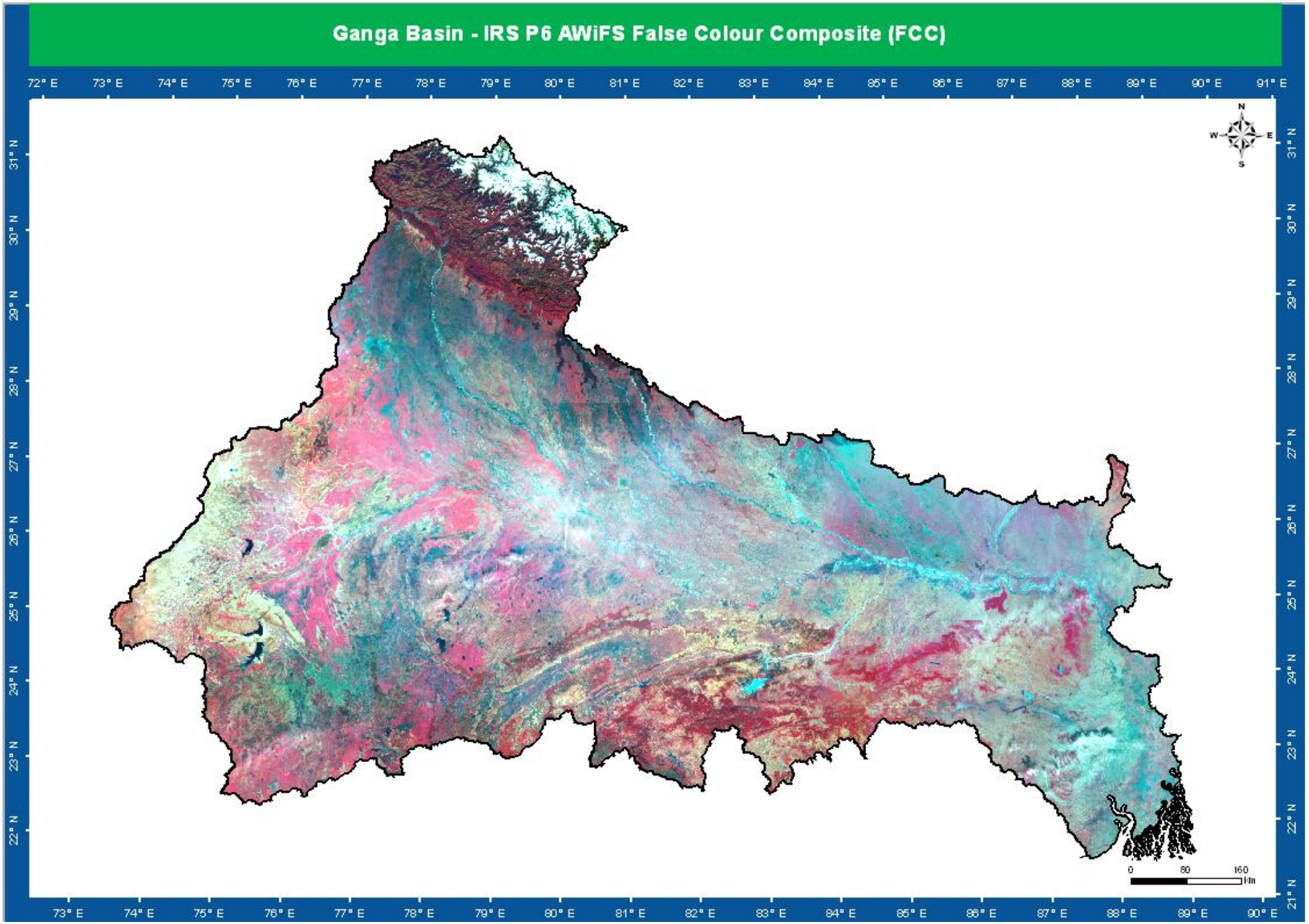
The Ganga and its tributaries have formed a large flat and fertile plain in North India. The availability of abundant water resources, fertile soil, and suitable climate have given rise to a highly developed agriculture based civilization and one of the most densely populated regions of the world. The major part of basin in Indian territory is covered with agricultural land accounting to 65.57 percent of the total basin area and 3.47 percent of the basin is covered by water bodies; supporting about 43 percent of its population (448.3 million as per 2001 census). Also the Ganga delta is inhabited by many wild animals and significantly the Royal Bengal Tiger found in Indian sub-continent. The fish population in the rivers is high and the bird life in the basin is also prolific.

The climate in the basin is varying from sub-humid to hot and humid monsoonal region and rainfall mostly occurs in the monsoon period from June to September. The seasonality of flow in rivers in the basin is so acute and it causes floods, particularly in the portions of Bihar and West Bengal and led to the annual flood hazards and river bank erosion. Also the Himalayas in Uttarakhand and part of Himachal Pradesh falling in the basin experience snow falls.

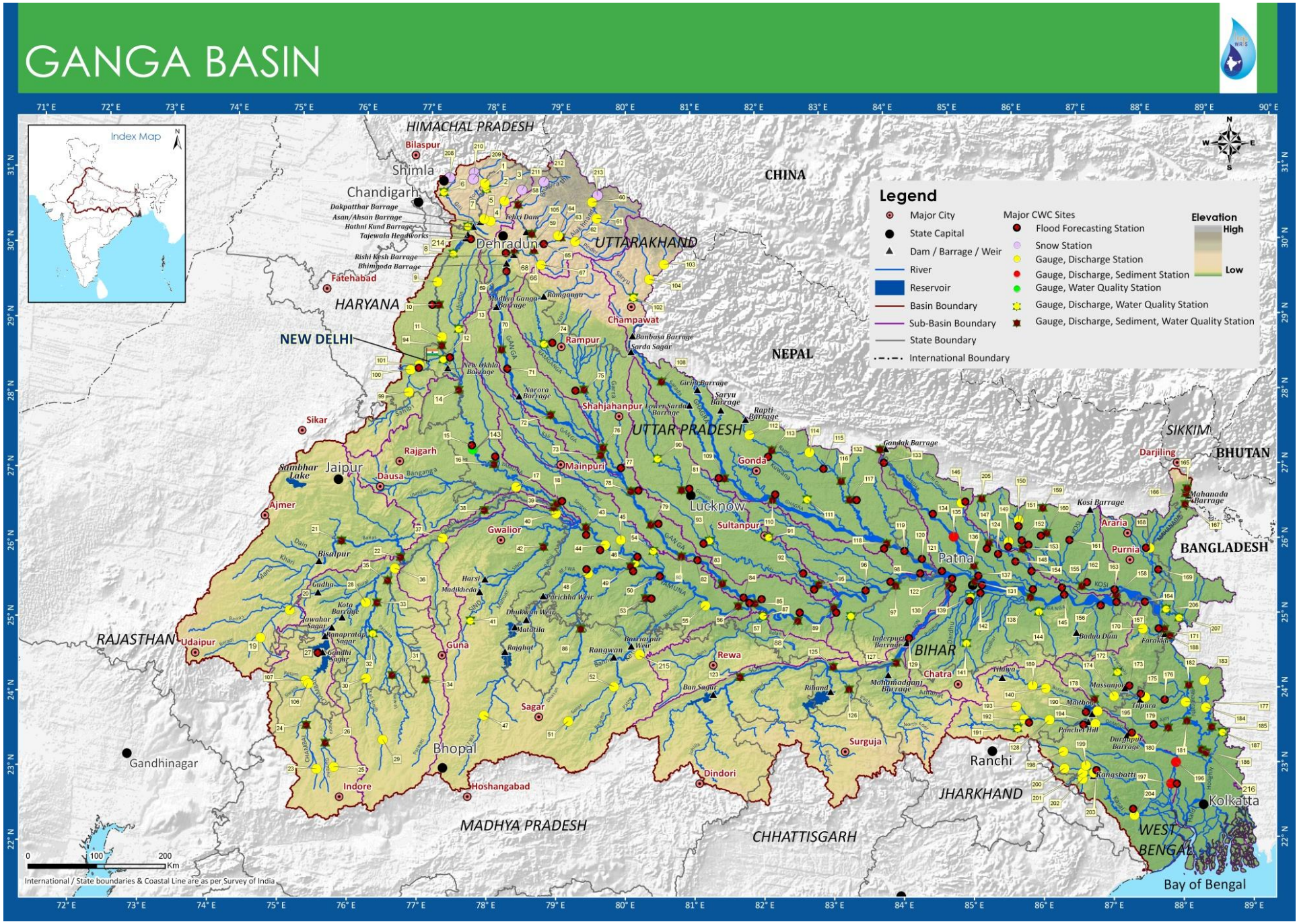
Map 1. Index map

Table 1. Salient features of the basin

Salient Features of the Basin		
1	Basin Extent	73° 2’ to 89° 5’ E 21° 6’ to 31° 21’ N
2	Area (Sq.km)	10,86,000 (Total) 8,61,452 (With in India)
3	Length of Ganga river (km)	2525
4	States in the basin	Uttar Pradesh (28.02 %) Madhya Pradesh (21.02 %) Rajasthan (13.06 %) Bihar (10.86%) West Bengal (8.3 %) Uttarakhand (6.15 %) Jharkhand (5.85 %) Haryana (3.99 %) Chhattisgarh (2.08 %) Himachal Pradesh (0.5 %) Delhi (0.17 %)
5	Districts (Census 2011)	252
6	Parliamentary Constituencies (2009)	239
7	Average Annual Rainfall (mm)	1059.74
8	Average Maximum Temperature (^{o} C)	32.05
9	Average Minimum Temperature (^{o} C)	18.44°
10	Total Population	32,91,55,760
11	Number of villages	2,86,557
12	Highest Elevation (m)	7512
13	Average Annual Water Potential (BCM)	525.02
14	Live Storage Capacity of Completed Projects (MCM)	42060.2
15	Live Storage Capacity of Projects Under Construction (MCM)	18600.18
16	Total Live Storage Capacity of Projects (MCM)	60660.38
17	Utilizable Surface Water (BCM)	250
18	Number of Sub Basins	19
19	Number of Watersheds	980
20	Number of Water Resources Structures	Dams - 784 Barrages - 66 Weirs - 92 Anicuts - 1 Lifts - 45 Power Houses - 56
21	Highest Dam	Tehri dam - 260.5 m
22	Longest Dam	Nanak Sagar Dam (Uttar Pradesh) - 19.2 km
23	Highest Barrage	Banbassa Barrage (Uttarakhand) - 603.5 m
24	Longest Barrage	Giri Barrage (Himachal Pradesh) - 619.35 m
25	Number of Irrigation projects	Major - 144 Medium - 334 ERM - 63
26	Number of HE projects	39
27	Number of Ground Water Observation wells	5745
28	Number of Hydro-Observation Sites	318
29	Number of Flood Forecasting Sites	87
30	Water tourism sites	336



Map 2a. Satellite Imagery of Ganga Basin



Map 2b. Ganga Basin- Drainage & Sub-basin

Table 2. Ganga basin Hydro Observation Sites

S. No.	Site Name	S. No.	Site Name	S. No.	Site Name
1	Tuini (P)(GD)	73	Fatehgarh (GDSQ)	145	Munger (FF)
2	Tuini(T) (GDQ)	74	Moradabad (GDQ & FF)	146	Lalbegia ghat (GD & FF)
3	Naugaon (GD)	75	Bareilly (GDSQ & FF)	147	Sikanderpur (GDSQ & FF)
4	Bausan (GD)	76	Dabri (GDSQ)	148	Samastipur (FF)
5	Haripur (GD)	77	Kannauj (FF)	149	Benibad (GD & FF)
6	Yashwant Nagar (GDQ)	78	Ankinghat (GDSQ & FF)	150	Saulighat (GD)
7	Paonta (GDQ)	79	Kanpur (GDSQ & FF)	151	Kamtaul (FF)
8	Kalanaur (GDQ)	80	Bhitaura (GDSQ)	152	Ekmighat (GDSQ & FF)
9	Karnal (GD)	81	Lucknow (GDSQ & FF)	153	Hayaghat (GDSQ & FF)
10	Mawi (GDSQ & FF)	82	Dalmau (FF)	154	Rosera (FF)
11	Baghpat (GD)	83	Shahjadpur (GDSQ)	155	Khagaria (FF)
12	Delhi Rly Bridge (GDSQ & FF)	84	Phaphamau (FF)	156	Bhagalpur (FF)
13	Galeta (GDQ)	85	Chhatnag (GDSQ & FF)	157	Colgong/ Kahalgaon (FF)
14	Mohana (GDSQ)	86	Garrauli (GDSQ)	158	Azmabad (GDSQ)
15	Mathura (FF)	87	Mejja Road (GDQ)	159	Jainagar (GDSQ)
16	Agra (GDSQ & FF)	88	Mirzapur (GDSQ & FF)	160	Jhanjharpur (GDSQ & FF)
17	Arnota (GD)	89	Varanasi (GDSQ & FF)	161	Basua (FF)
18	Etawah (GDSQ & FF)	90	Neemsar (GDQ)	162	Baltara (GDSQ & FF)
19	Chittorgarh (GD)	91	Sultanpur (GDQ)	163	Kursela (FF)
20	Bigod (GD)	92	Jaunpur (G & FF)	164	Sahibganj (FF)
21	Tonk (GDSQ)	93	Raibareli (GDQ & FF)	165	Siliguri (GDSQ)
22	Baranwada (GDSQ)	94	Palla (GDQ)	166	Matigara (GDSQ)
23	Dhareri (GD)	95	Maighat (GDSQ)	167	Sonapur (GDSQ)
24	Tal (GDSQ)	96	Ghazipur (FF)	168	Dhengra ghat (GD & FF)
25	Ujjain (GD)	97	Buxar (GDSQ & FF)	169	Jhawa (FF)
26	Mahidpur (GDSQ)	98	Ballia (FF)	170	Barhait (GD)
27	Gandhi Sagar (FF)	99	Masani (GD)	171	Farakka (GDSQ & IF)
28	Mandawara (GD)	100	Dadri (GD)	172	Maharo (GDQ)
29	Sarangpur (GD)	101	Dhansa (GD & FF)	173	Massanjore Dam (GD & IF)
30	Salavad (GD)	102	Ghat (GDQ)	174	Tantloi (GD)
31	Aklera (GDSQ)	103	Tawaghat (GD)	175	Tilpara Barrage (GD & IF)
32	Sangod (GDQ)	104	Jauljibi (GD)	176	Narayanpur (FF)
33	Barod (GDSQ)	105	Zero Point (GDSQ)	177	Bazarsaw(GD)
34	A.B. Road X-ing (GDSQ)	106	Nahargarh (GD)	178	Jamtara (GDSQ)
35	Khatoli (GDSQ)	107	Tumri (GD)	179	Gheropara (FF)
36	Pali (GD)	108	Paliakalan (GDSQ)	180	Nutanhat (GDSQ)
37	Manderial (GD)	109	Elginbridge (GDSQ & FF)	181	Katwa (Purbast hali) (GDSQ)
38	Dholpur (GDSQ)	110	Ayodhya (GDSQ & FF)	182	Berhampore (GDSQ)
39	Udi (GDSQ)	111	Basti (GDQ)	183	Islampur (GD)
40	Bhind (GD)	112	Bhinga (GD)	184	Palashi para (GD)
41	Pachauli (GDQ)	113	Balrampur (GDSQ & FF)	185	Chapra (GDSQ)
42	Seondha (GDSQ)	114	Kakarahi(GD)	186	Kalna (Ebb) (GDSQ)
43	Auraiya (GDSQ & FF)	115	Bansi (G & FF)	187	Hanskhali (GDQ)
44	Kalpi (GD & FF)	116	Regauli (GDSQ)	188	H/R Farraka (GDSQ)
45	Lalpur (GD)	117	Birdghat (GDSQ & FF)	189	Barkisuriya (GD)
46	Hamirpur (GDQ & FF)	118	Turtipar (GDSQ & FF)	190	Maithon Dam (GD & IF)
47	Basoda (GD)	119	Darauli (FF)	191	Ramgarh (GDQ)
48	Mohana (GD & FF)	120	Gangpur Siswan (FF)	192	Tenughat Dam (GD & IF)
49	Shahijina (GDSQ & FF)	121	Chhapra (FF)	193	Konar Dam (GD)
50	Chillaghat (FF)	122	Maner (FF)	194	Panchet Dam (GD & IF)
51	Garhakota (GD)	123	Kuldah Bridge (GDSQ)	195	Durgapur Barrage (GD & IF)
52	Gaisabad (GD)	124	Rewaghat (FF)	196	Jamalpur (GDS)
53	Banda (GDSQ & FF)	125	Chopan (GDSQ)	197	Harinkhola (GDS & FF)
54	Kora (GDQ)	126	Duddhi (GDSQ)	198	Simulia (GD)
55	Rajapur (GD)	127	Japla (GDSQ)	199	Tusuma (GD)
56	Pratappur (GDSQ)	128	Pupunki (GD)	200	Rangagora (GD)
57	Naini (FF)	129	Inderpuri (FF)	201	Kharidwar (GD)
58	Uttarkashi (GDSQ)	130	Koelwar (GDSQ & FF)	202	Phulberia (GD)
59	Deoprayag (GD)	131	Gandhi ghat (GDSQ)	203	Kangsabati Dam (GD & IF)
60	Badrinath (GD)	132	Tribeni (GDSQ)	204	Mohanpur (GD & FF)
61	Joshimath (GD)	133	Khadda (FF)	205	Dheng Bridge (GDSQ)
62	Karanprayag (GD)	134	Chatia (FF)	206	Labha (GDQ)
63	Rudraprayag (GDSQ)	135	Dumariaghat(GDS)	207	English Bazar (GDQ)
64	Rudraprayag (GD)	136	Lalganj (GDSQ)	208	Kufri SHO
65	Srinagar (FF)	137	Hazipur (FF)	209	Jubbal SHO-II
66	Deoprayag (GDSQ)	138	Hathidah (GDSQ & FF)	210	Jubbal SHO-I
67	Marora (D/S) (GD)	139	Sripalpur (GDQ & FF)	211	Hanuman Chetty SHO
68	Rishikesh (GDSQ & FF)	140	Nandadih (GD)	212	Harsil SHO
69	Haridwar (FF)	141	Gaya (GDQ)	213	Auli SHO
70	Garhamukteshwar (GDSQ)	142	Patna (Dighaghat) (FF)	214	Tajewala Weir (Hathnikund) (FF)
71	Narora Barrage (U/S)(FF)	143	Gokul Barrage (GQ)	215	Madla (GD)
72	Kachlabridge (GDSQ)	144	Lakhisarai (GDQ)	216	Kalna (Flow) (GDSQ)

1.2. Topography

The Ganga basin comprises of three large topographic divisions of the Indian subcontinent, namely the Himalayan Young Fold Mountains, the Gangetic Plain, and the Central Indian highlands. The Himalayan Fold Mountains comprises the Himalayan ranges including their foot hills with numerous snow peaks rising above 7000m. Each of these peaks is surrounded by snow fields and glaciers. All the tributaries are characterized by well regulated flows and assured supply of water throughout the year by these glaciers. The Gangetic plains, in which the main stem of Ganga lies, situated between the Himalayas and the Deccan plateau, constitute the most of the sub-basin ideally suited for intensive cultivation. It consists of alluvial formation and is a vast flat depositional surface at an elevation below 300m. The Central highlands lying to the south of the Great Plains consists of mountains, hills and plateaus intersected by valleys and river plains. They are largely covered by forests. Aravali uplands, Bundelkhand upland, Malwa plateau, Vindhyan ranges and Narmada valley lies in this region.

The Gangetic plains are mostly divided into three parts, Upper Ganga plains, Middle Ganga plains and Lower Ganga plains. The Upper Ganga plain is the part of the Great Plains lying approximately between the Yamuna in the west covering the parts of Uttarakhand and Uttar Pradesh. The region is delimited in the north by 300m contour which separates it from the Garh - Kum Himalaya west of Sarda while the International boundary of Nepal marks the limit towards the east. In the south the Yamuna demarcates its border with the Bundelkhand. The axis of the topographic trough paradoxically lies nearer the peninsular block or along the Ganga which traverses the area in a south-southeasterly direction. Thus there is, though not perceptible, a tract adjacent to the foot hills where the slope is higher and has resulted in the preponderance of numerous small streams, assigning a somewhat medium to fine texture to this part. The southern counterparts, particularly north of the Ganga are characterized by the sluggishly-flowing streams like the Ramganga and the Ghaghara studded with ox-bows, sandy stretches (the Bhurs) etc. The topographic diversities produced by the changing river courses are predominantly observed in the Ramganga and the Ghaghara valleys, particularly in their flood plains.

The streams such as the Kali, the Hindan, and the Pandu etc. have to go a long way parallel to their master streams to empty themselves. Distinct, though areally insignificant, in topographic expressions is the Yamunapar or the Yamuna-lower Chambal tract. The deep valley separated by sharp spurs and buttresses are the main features of Upper Ganga Plain. Topographically most significant and complex part of the region is the submontane belt, running at the foot of the Siwaliks from west to east across the area on the northern border consisting of the two parallel strips – the piedmont zone, the Bhabar (the Doab region) and the adjoining relatively gently sloping Tarai belt.

The Middle Ganga Plain is the largest among the three plains of the Ganga. It covers the Bihar plains and the Eastern Uttar Pradesh lying on the entire side of the Ganga and the Ghaghara within the Himalayan and the peninsular ramparts on the north and the south respectively. Structurally the region is the segment of the great Indo-Ganga trough; however it has some marginal portions of the other two major formations that are Siwaliks in the northern part of the Champaran district and the fringes and the projections of the peninsular block in the south. In general, it is below 100m above the sea level, except that is gradually rises from Domariaganj in Basti up to 130m in the North West and up to 150m in the south in cooperating the projections of the southern uplands; in the east the Kosi plain ranges between 30m in the south to 75m in the extreme north. A more pronounced relief is occasioned when the plain meets the hilly area in the north bearing the stamp of their loosely-set gravelly nature, particularly in the extreme north, where the surface appears to be broken by large

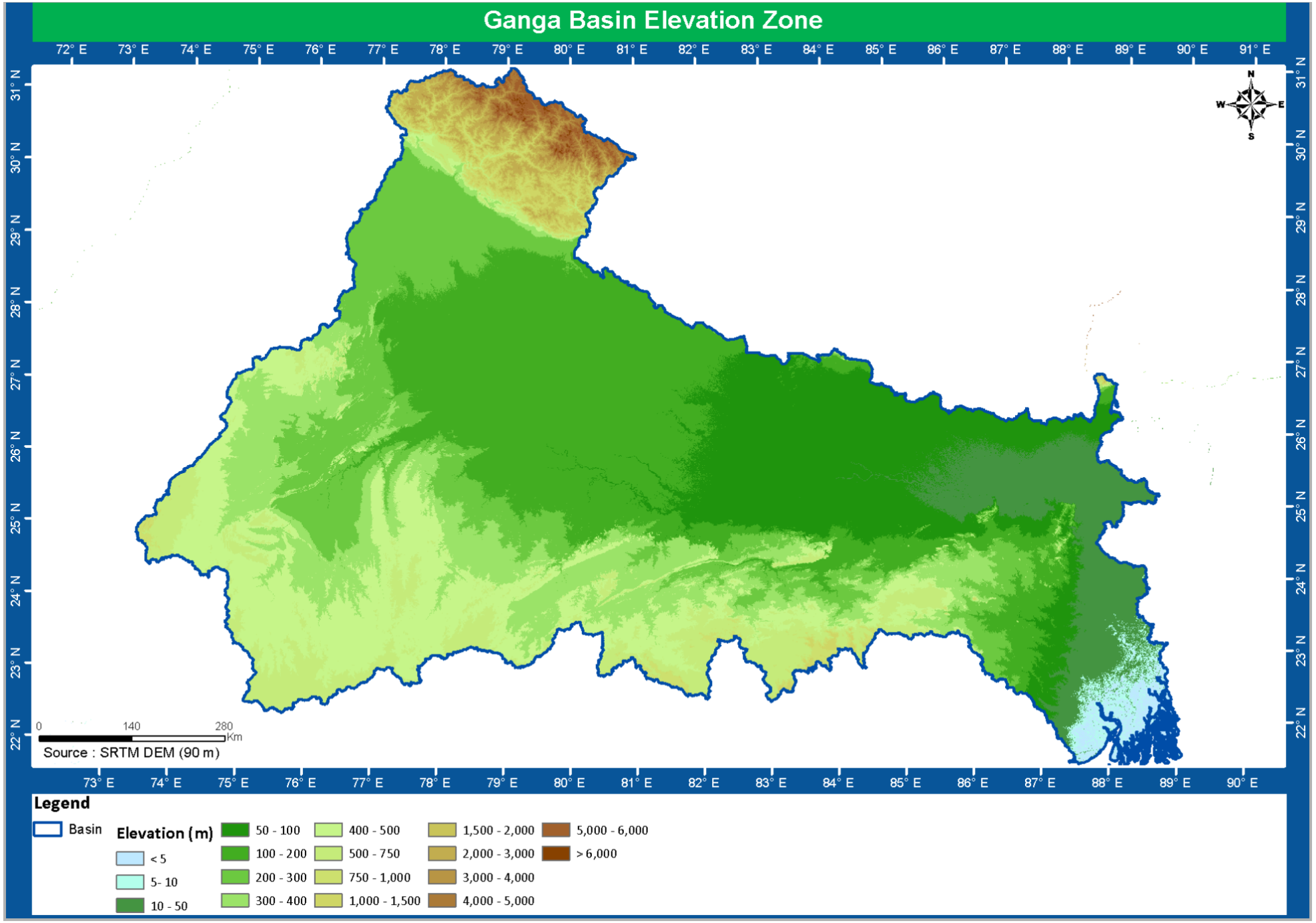
rivers like the Ghaghara, the Rapti, the Gandak, the Bagmati, the Kosi etc., which comb the region with their affluents in an intricate pattern.

The Lower Ganga Plain includes the Kishanganj district of Bihar, whole of West Bengal excluding the Purulia district and the mountainous parts of Darjeeling district and most of the parts of Bangladesh. The region embraces the area from the foot of the Darjeeling Himalayas in the north to the Bay of Bengal in the south and from the edge of the Chottanagpur Highlands in the west to the border of Bangladesh and Assam in the east. Topographic expressions in the region hardly speak of any well-defined stage of their evolution. The monotonous surface is dissected frequently by the channels of the tributaries or distributaries of the main stream, the Ganga. There are (*i*) the Malda west Dinajpur tract where the inliers of the lateritic alluvium are sufficient to break the general monotony of the plain, (*ii*) the tract bordering the Chottanagpur Highlands, (*iii*) the Midnapore Coast where the sand dunes on the terraces appear to be more significant element of landforms, (*iv*) the Duars of Jalpaigurl and Darjeeling. To the east of the shoreline lies bulge of the Ganga (Sundarbans) where the depositional activity of the stream is prominent and new surface is being continuosly added.

As per Digital Elevation Model (DEM) obtained from Shuttle Radar Topographic Mission (SRTM 90m), the elevation of Ganga basin ranges from 8000 m to 0 m (near Coast) and its variations are shown in Map 4. The terrain of the basin is very rugged in the north-eastern part and flat towards downstream side. The Himalayan region of the basin contains nine of the fourteen highest peaks in the world over 8,000m in height, including Mount Everest which is the highest point of the basin. The other peaks over 8,000m in the basin are Kangchenjunga, Lhotse, Makalu, Cho Oyu, Dhaulagiri, Manaslu, Annapurna and Shishapangma. The Himalayan portion of the basin includes the south-eastern portion of the state of Himachal Pradesh, the entire state of Uttarakhand and the extreme north-western portion of the state of West Bengal. Major area of the basin falls within 300-500 m elevation zone. The elevation variation the basin is depicted in Table 3.

Table 3. Elevation zones

Sl. no.	Elevation (m)	Area (Sq.km.)	% of Total Area
1	< 5	10441.16	1.21
2	5-10	8320.58	0.97
3	10-50	58940.57	6.84
4	50-100	122902.46	14.27
5	100-200	200790.42	23.31
6	200-300	123124.65	14.29
7	300-400	105002.90	12.19
8	400-500	114920.62	13.34
9	500-750	59722.04	6.93
10	750-1000	8741.36	1.01
11	1000-1500	11636.73	1.35
12	1500-2000	10699.95	1.24
13	2000-3000	9540.63	1.11
14	3000-4000	4886.73	0.57
15	4000-5000	6320.05	0.73
16	5000-6000	5096.32	0.59
17	> 6000	364.8297	0.042351



Map 3. Elevation zones

1.3 Climate

In India, four distinguishable temperature zones: tropical, sub-tropical, temperate and alpine. Among these, the tropical zones and subtropical temperature zones are most predominant in the entire Ganga basin. The tropical zone in the basin has a mean annual temperature over 24°C and mean temperature of January over 18°C and subtropical temperature zone has a mean annual temperature over 17°C - 24°C and mean temperature of January over 10°C - 18°C. The hydrologic cycle in the Ganga basin is governed by the southwest monsoon. About 84 percent of the total rainfall occurs in the monsoon from June to September. Consequently, stream flow in the Ganga is highly seasonal and the seasonality of flow is so acute that it even causes flood condition in the plains.

The proximity of the Bay of Bengal on the south and the alignment of the Himalayas in the north determine largely the climatic character of the basin. The Upper plains of Ganga is a sub-humid region and has an average weather conditions emerging out of the combined effect of the various elements lead to the four seasons like the hot summer, the wet winter, the pre-winter transition and the winter. The higher elevation zones of the Himalayan ranges especially the Uttarakhand and Himachal Pradesh parts experience lower temperatures than the other parts of the basin. These parts also experiences snowfall. The Middle Ganga plains lay between the Himalayas on the north and the peninsular foreland in the south make the region transitional in climate character. The winter cyclones with occasional cold waves and the hot summer winds from the west sweep the entire middle region. The lower Ganga plain usually experiences a hot and humid monsoonal climate.

1.3.1. Temperature

The Ganga basin forms an extensive bowl of warm air, especially during the day-time. The mean maximum daily temperature even in the coldest month (January) does not fall below 21°C, except in the higher hills, whereas the air temperature starts rapidly rising all over Ganga basin from March onwards, beginning a hot season that prevails from April to June. Usually, May is the hottest month in most part of the basin, except in lower Bengal. In the Gangetic plains, the daily mean maximum temperature in May shoots up as high as 40°C in westwards of Gaya and 42.3°C in Kota in the Central Indian upland region. The minimum temperature is usually higher than 8°C mainly because of the lower plains of the basin. Low temperatures in the basin are often associated with the intrusion of cold air from across the Gangetic plain in the months of December and January.

The air temperature starts falling with the onset of the monsoon from June onwards, making the weather more humid and equable. The diurnal range between the daily mean minimum and the daily mean maximum temperature reduces progressively as the monsoon advances. Eventually, the lowest diurnal range of temperature occurs at the peak of the monsoon, which is usually in August, though sometimes in July. Due to its proximity to the coast, Kolkata stands as an exception, with its highest diurnal range occurring during the coldest month (January). On account of high population density and a heavy concentration of industrial units in the Metropolitan Districts, the effect of temperature is very pronounced, with frequent episodes of smog in the winter evenings followed by mist in the colder morning hours. As per IMD grid data analyzed under this project, the average annual mean temperature of Ganga basin of 35 years (1969-2004) is 24.82°C. The average annual maximum temperature of Ganga basin of 35 years (1969-2004) is 31.22°C and annual maximum temperature was noted on 1987 is 32.05°C. The average annual minimum temperature of Ganga basin of 35 years (1969-2004) is 18.44°C and annual minimum temperature was noted on 1971 is 17.68°C. The average minimum, maximum and mean temperature from January to December of 35

years is shown in the Figure-2. The detailed monthly average temperature for the period of 1969 to 2004 is given in Annexure-II-B.

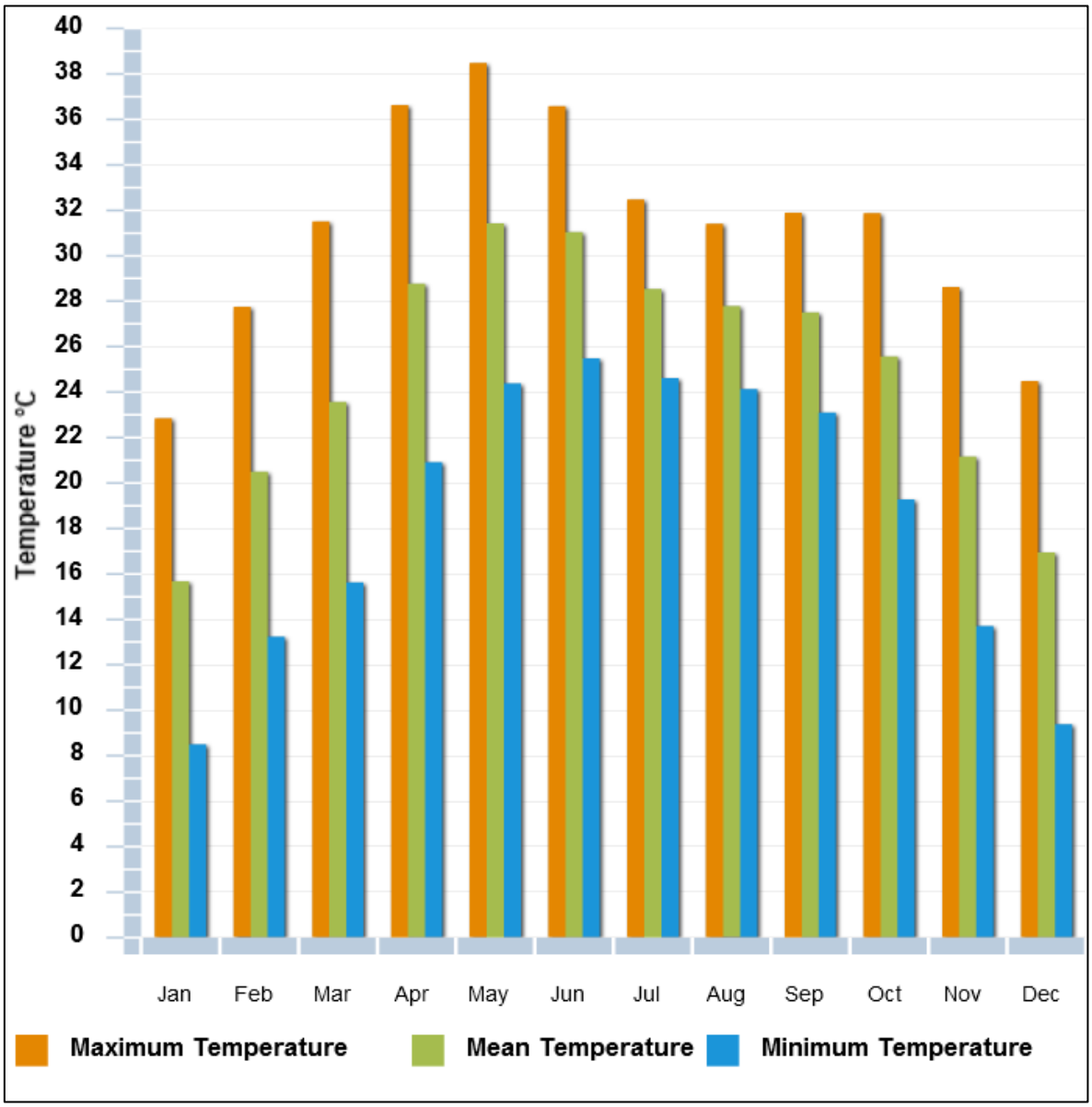


Figure 2. Monthly average temperature (1969-2004)

1.3.2. Rainfall

The weather in the Ganga basin is characterized by a distinct wet season during the period of south west monsoon (June to September). The southwest monsoon makes landfall at the mouth of the Ganga around the first week of June and advances upstream. By the end of July the monsoon reaches the western end of the Ganga basin. In the majority of the basin, the rainy season spreads over three months (July, August and September) and usually 70 to 80 percent of the total annual rainfall occurs during this period. In the eastern part of the basin, such as in West Bengal and Bihar, the wet season is longer, usually starting in June and continuing until the end of September or early October.

The average annual rainfall for Ganga basin varies from 400 - 2000 mm as is depicted in the Map 5. The value of rainfall for 34 years (1971-2005) the Ganga basin can be broadly is classified into 11 zones based on the rainfall received in that area. About 27.31 percent of total area of Ganga basin receives a rainfall of 1000-1200mm, 23.14 percent area receives 800-1000mm, 15.51 percent area of the basin receives 600-800mm and 14.29 percent of basin area receives 1200-1400mm. The detailed sub-basin wise annual rainfall from 1971 to 2004 is given in Annexure-II-A.

Ministry of Rural Development (MoRD), in 2002, has identified the districts and blocks that are affected by drought and declared them as drought prone under Drought Prone Area Programme (DPAP). As per DPAP scheme, the Ganga basin has 76 districts of 9 states are affected by drought (Bihar- 6 districts, Chhattisgarh- 3 districts, Himachal Pradesh- 1 districts, Jharkhand- 14 districts, Madhya Pradesh- 16 districts, Rajasthan- 8 districts, Uttarakhand- 7 districts, Uttar Pradesh- 16 districts, West Bengal - 5 districts).

1.3.3. Trend and Variability of Rainfall

The annual average rainfall in the basin varies between 400 - 2000 mm. Eighty percent of the rainfall occurs during the monsoon months i.e. between June and October. Because of large temporal variations in precipitation over the year, there is wide fluctuation in the flow characteristics of the river. The highest rainfall of 1441.26 mm is observed in 1971 and lowest rainfall of 786.57 mm is observed in 1979. The trend line of monthly average rainfall (1971-2004) in Figure -3 shows that there is a marginal decrease in average annual rainfall. The average annual rainfall for the basin is estimated as 1059.74 mm.

Within the Ganga basin, every square kilometer of land surface area receives an average of 1 MCM of water annually through rainfall. However, less than half of this is actually available, after accounting for water lost through evapo-transpiration (30 %) and seepage into the ground (20 %). Since the vast majority is concentrated in a three month span in most of the basin, the water available from rainfall usually exceeds what is lost through evaporation during this period, allowing some surplus water to flow down the Ganga and its tributaries.

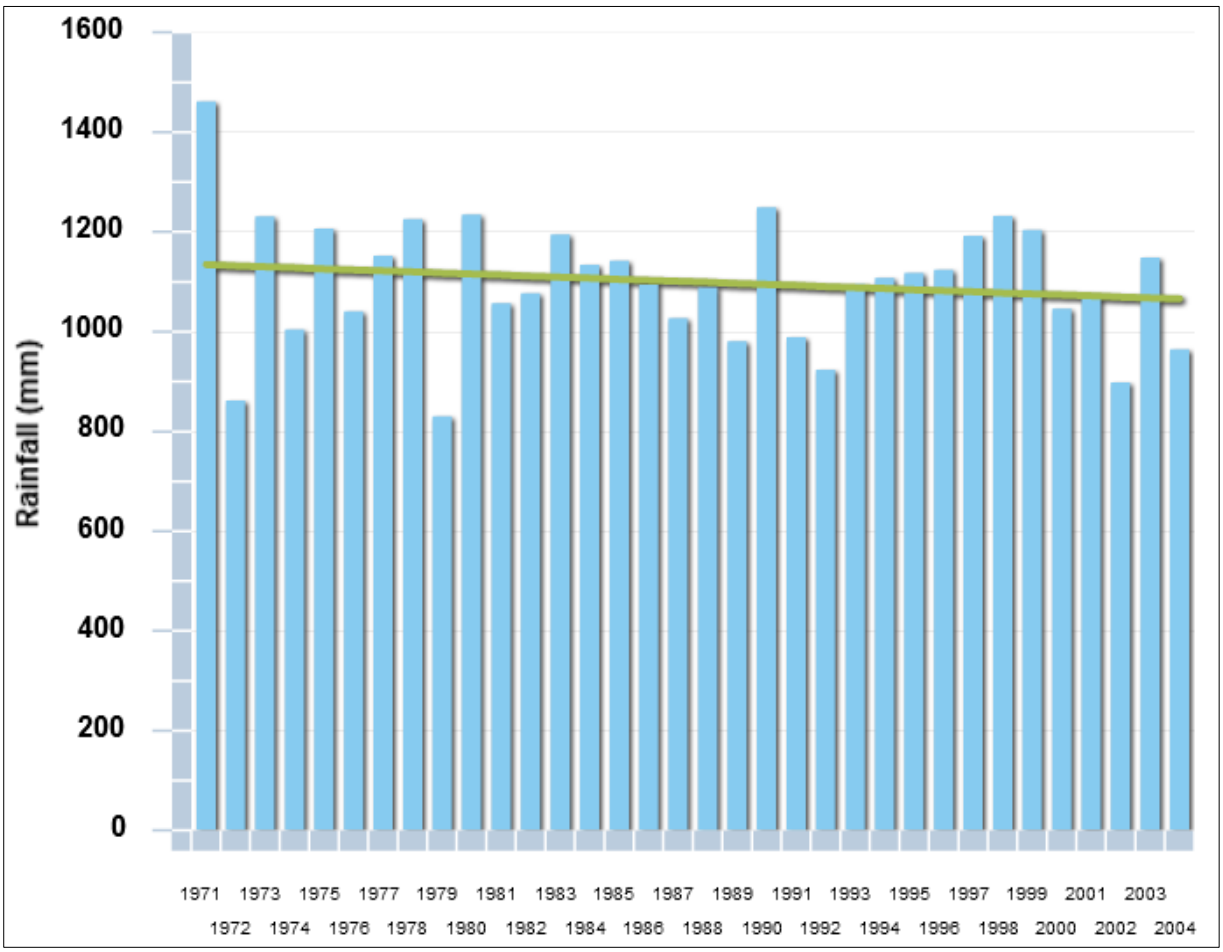
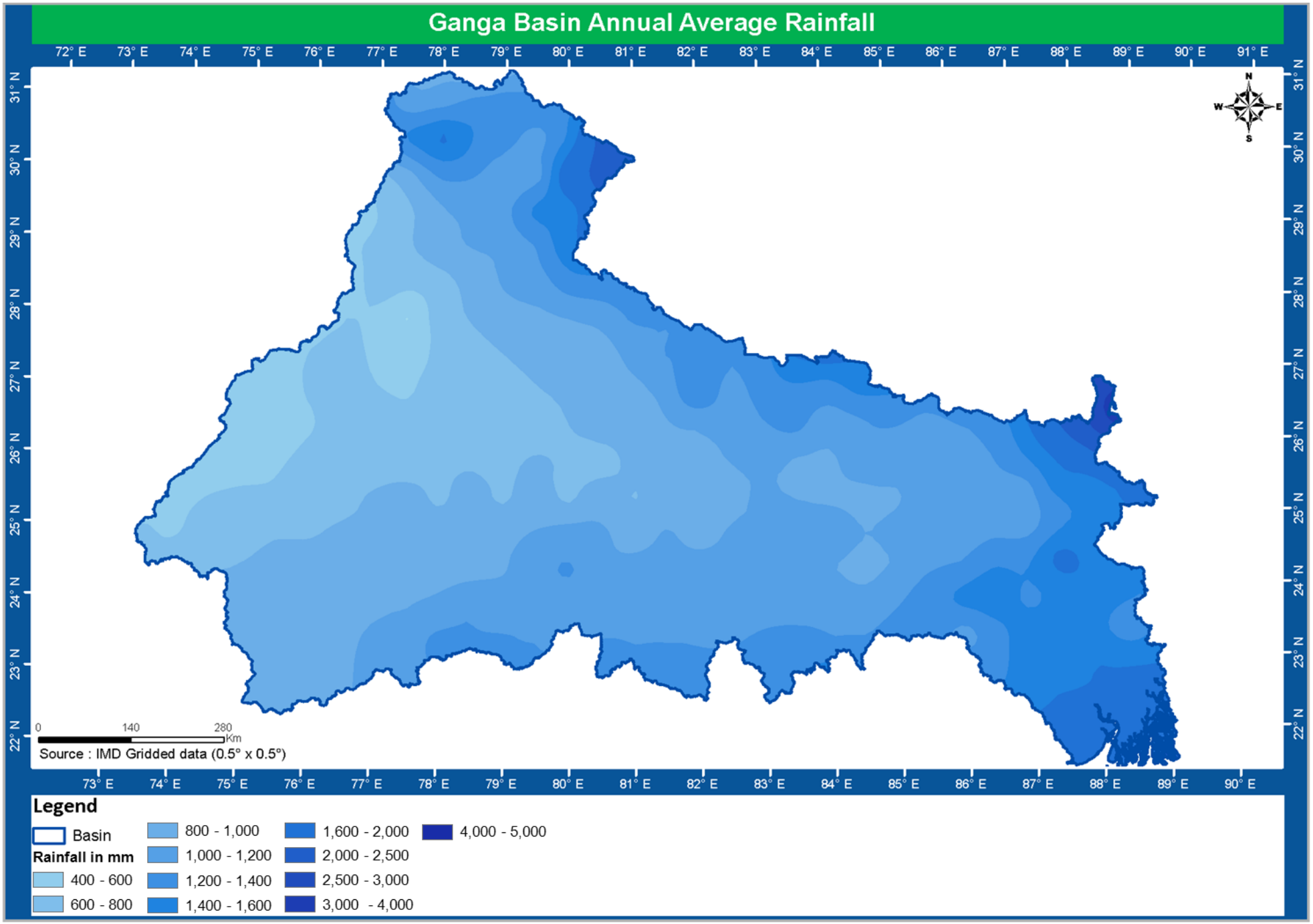


Figure 3. Trend of monthly average rainfall (1971-2004)



Map 4. Annual average rainfall

1.4. Major River

The river network or drainage channels flows from higher reaches to lower levels often following the topography and slope of the terrain and flows towards the sea. The basin in general is well-integrated drainage system of the Ganga. In the Upper Ganga, almost all the streams follow a NW-SE course concomitant with the lie of the land. The region has a pinnate drainage, an extreme case of the dendritic pattern on macro level. Braiding of the Yamuna, the Ganga, the Ramganga and the Ghaghara, the sandy shoals often liable to inundation during monsoons, and the frequent meandering are also common features. The Ganga and its major tributaries, the Yamuna, the Ramganga and the Ghaghara are the only Himalayan rivers which carry sufficient water all over the year round. Wide flood plains and high banks are the common features in the course of the Ganga and the Yamuna along with slit and clay deposits. The Kali, the Sukhata, the Gomti etc., mark the next zone of rivers with source in the Bhabar and the Tarai. Most of the streams are perennial with more defined course. Yet another group of the streams, the Kali East, the Sot, the Sai, the Kalyan etc., are entirely the plain rivers originating from the depressions or Tals in the bhangar tracts. From the south the Chambal is the only major tributary joining the main stream, the Ganga. The length and origin of major rivers and tributaries are given in Table 4.

In Middle Ganga plains, the drainage lines hold particular significant in governing the human occupancy of land, particularly the agricultural land and settlements. The drainage pattern is dendritic in general, and the general characteristic feature is that the rivers meet at acute angles and several tributaries form parallel or sub-parallel lines to the main stream. The major rivers that meet the main stream in the middle plain are the Gandak, the Kosi, the Sone and other small tributaries of Ganga like the Tons, the Karmansa, the Chatar, the Jargo, the Karnauti, the Khejuri on the west of the Sone and those on the east of the Sone are the Punpun, the Mohini and the Chandan. The floods are recurring feature in this region particularly in the North Ganga plains. Almost all rivers in this middle plain develop a capacity to spill over in the monsoon period and notoriously dynamic in their character, particularly the great masters, the Rapti, the Ghaghara, the Gandak, the Kosi, the Sone and the main Ganga itself.

The Lower Ganga plain drainage system is constituted by the tributaries and distributaries of the main Ganga where Padma and Bhagirathi being the most important distributaries of Ganga. A host of streams such as the Mahananda, the Mayurakshi, the Damodar, and the Dwarkeswar are notable among them decends from Himalaya and rush into their main stream. The Hoogly-Bhagirathi act as the main stream in the lower Ganga plain which joins the Bay of Bengal near the Sagar Island. The shifting courses of the rivers with the voluminous discharge and shorter course in this plain had made a significant impact on the human occupancy in this region. The details of each major river flowing in the Ganga basin are given below:

Ganga: The Ganga river is one of the prime rivers of India and it flows east through the Gangetic plains of Northern India into the country of Bangladesh. The Ganga originates as Bhagirathi from the Gangotri glaciers in the Himalayas at an elevation of about 7,010 m in Uttarkashi district of Uttarakhand. After its confluence with the Alaknanda at Devprayag, the river assumes the name of ‘Ganga’ and flows for a total length of about 2525 km (Uttar Pradesh 1,450 km, Bihar 445 km, West Bengal 520 km) up to its outfall into the Bay of Bengal through the former main course of Bhagirathi-Hooghly. Although many small streams comprise the headwaters of the Ganga, the six longest are the Alaknanda, Dhauliganga, Nandakini, Pindar, Mandakini, and Bhagirathi rivers. The five confluences of these rivers are considered important and sacred in Hindu mythology, known as the

Panch Prayag, are all along the Alaknanda. They are, in downstream order, Vishnuprayag, where the Dhauliganga joins the Alaknanda; Nandprayag, where the Nandakini joins; Karnaprayag, where the Pindar joins, Rudraprayag, where the Mandakini joins; and finally, Devprayag, where the Bhagirathi joins the Alaknanda to form the Ganga river.After running some 250 km from its source, the Ganga pierces through the Himalayas at Sukhi (near Rishikesh), before turning southwestwards for another 30 km where it finally descends into the vast Indo-Gangetic plain at Haridwar (elevation 283 m). At this point, the river swells into a mighty stream of 750 m width. The Ganga does not receive any major tributary until the Ramganga joins at Kannauj adding about 17.79 billion cum/annum of water. From Haridwar down to Allahabad, a distance of about 720 km it flows in south/south-easterly direction. At Allahabad (1020 km from the source), the Ganga is joined on the right by the Yamuna river, which actually contributes more water (57.24 billion cum / annum) than the main river itself, augmenting the flow volume of the Ganga significantly. Lower down, the river bears eastwards and flow past Varanasi to enter Bihar just below Ballia.

Entering West Bengal, the river swings round the Rajmahal hill range opposite Manihari Ghat and flows almost due south. The delta of the Ganga can be said to start from Farakka, in the state of West Bengal, having increased its flow volume at each confluence. In addition to flow volume, water quality and sediment load also fluctuate depending on the composition of the contributing stream. The river divides into two arms about 40km. below Farakka. The left arm known as the Padma flows eastwards into Bangladesh while the right arm, known as Bhagirathi continues to flow in a southerly direction. After Nabadwip it is known as the Hooghly. The river ultimately flows into the Bay of Bengal downstream of Calcutta. Important tributaries to join the river in West Bengal are the Ajay, the Dwarka, the Damodar, the Rupnarayan and the Haldi. The river line diagram of the Ganga river and its major tributaries and distributaries is shown in Figure 4.

The principal tributaries joining the main river are the Yamuna, the Ramganga, the Ghaghara, the Gandak, the Burhi Gandak, the Kosi, the Mahananda and the Sone and the Chambal and the Betwa being important sub-tributaries. In Uttar Pradesh the Ganga receives a number of tributaries on both the banks. Of the left bank tributaries, the Ramganga and the Gomti are the most important. The Yamuna river joins the Ganga river on its right bank at Allahabad. The Tons and the Karamnasa are the other right bank tributaries in Uttar Pradesh. After leaving UP, the Ghaghara joins the Ganga river near Chapra. During its course in Bihar the river flowing eastwards receives a number of major tributaries on both banks. The Great Gandak, the Burhi Gandak, the Bagmati and the Kosi are the major rivers that join it on the left bank and the Sone, the Pun Pun, the Kiul, the Chandan, the Gerua and others on the right bank.

Yamuna: The Yamuna river is the biggest tributary of the Ganga river. It is also considered as sacred river in India. The Yamuna river originates in the Tehri Garhwal district of Uttarakhand from the Yamunotri glacier near Banderpoonch peaks (38° 59'N 78° 27'E) at the elevation of about 6,320m above the sea level in the Mussoorie range of lower Himalayas. Arising from the source, the Yamuna river flows through a series of valleys for about 200 km in lower Himalayas and then emerges into Indo-Gangetic plains. In the upper reaches, the gradient of the river is steep and the entire geomorphology of the valley has been carved by the erosive action of the river water. In the headwater reach of 200 km, the Yamuna draws water from several major streams. The combined stream flows through the Shivalik range of hills of Himachal Pradesh and Uttarakhand states and enters into the plains at Dak Pathar in Uttarakhand. From Dak Pathar, the Yamuna flows through the famous Sikh religious shrine of Poanta Sahib. Flowing through the Poanta Sahib, it emerges from the

foothills of Kalesan, north of Hathnikund/Tajewala where the river water get diverted into Western Yamuna Canal and Eastern Yamuna Canal for irrigation.

The Yamuna river enters Delhi near Palla village after traversing for about 224 km. Further downstream, Yamuna flows through the Agra city which is famous for Taj Mahal. Shortly afterwards, it passes through another historical city, Mathura. The total length of Yamuna from its origin to Allahabad (confluence with Ganga) is 1,376 km and the drainage area is 3,66,223 Sq.km. The Yamuna is a mighty river in itself and has a number of tributaries. In its first 170 km stretch, the tributaries the Risiganga, Hanumanganga, Tons and Giri join the main river. Later big rivers, such as the Chambal, the Sind, the Betwa and the Ken join it. The catchment of the Yamuna river system covers the parts of Uttar Pradesh, Uttarakhand, Himachal Pradesh, Haryana, Rajasthan, Madhya Pradesh and Delhi.

Tributaries of the Yamuna

The tributaries of Yamuna account for 70.9 percent of the catchment area; the balance of 29.1 percent area is directly drained by the Yamuna. Further the catchment area of Yamuna amounts to 40.2 percent of the area of the Ganga basin and 10.7 percent of the land in our country. The important tributaries of Yamuna river are the Tons, the Chambal, the Hindon, the Sarda, the Betwa and the Ken. The main Yamuna and Tons are fed by glaciers, viz., the Banderpoonch glacier and its branches originate from the Great Himalayas. Other small tributaries include the Risiganga, the Hanumanganga, the Unta, the Karan, the Rind and the Giri. The Risiganga a tributary of the Yamuna rises 3 km further north-west and joins the Yamunotri stream on its right bank near Banas while other two streams the Unta and the Hanumanganga rising from the Jakhal glacier and the Chhaian Barmak glacier respectively to the south of Banderpoonch meet the main stream on its left bank. A brief description of important tributaries of the Yamuna is given in the following sections:

i. **Tons**: The Tons is the largest Himalayan tributary of the Yamuna, rises from the north-eastern slope of Banderpoonch at an elevation of 3900 m and flowing in a valley north-west of Yamuna, meets it below Kalsi on the south-west fringe of the Mussoorie range. At the confluence of the two rivers, the Tons carry almost twice the volume of waters as the Yamuna and are considered as the principal source of the river. Another important tributary, the Giri rise further north-west of the Tons draining areas in Himachal Pradesh.
ii. **Kali:** The Kali river originates from the Doon valley in the western part of Uttarakhand. The river is named Kali possibly because of the color of the river water that is black in color. From its origin up to the confluence with Hindon river, a tributary of Yamuna travels a distance of about 150 km through Saharanpur, Muzaffarnagar, Meerut and Ghaziabad districts. Despite a significant drainage area of about 750 Sq.km, mostly laying in plains the river does not carry any significant flow.
iii. **Hindon:** Hindon is an important tributary of Yamuna river, which is sandwiched between two major rivers: Ganga on the left and Yamuna on the right. Hindon originates from upper Shivalik (lower Himalayas). It is purely rainfed river with a catchment area of about 7,083 Sq.km and this river has a total run of about 400 km.
iv. **Banganga**: The Banganga originates in the Aravalli hills near Arnasar and Bairath in Jaipur district. It flows towards south up to the village of Ghat, then east through partly hilly and partly plain terrain. The length of the river is 240 km. The main tributaries of the Banganga are the Gumti Nala, the Suri, the Sanwan and the Palasan rivers.
v. **Chambal**: The most important tributary of the Yamuna is the Chambal river also known as Charmanvati in ancient times is the largest river flowing through Rajasthan state. It rises in the

Vindhya range near Mhow in the Indore district of Madhya Pradesh at an elevation of 854 m and flows generally northerly direction up to the Madhya Pradesh-Rajasthan border. In this reach, the Chamla, the Siwana and the Retam join the river from the left and the Shipra and the Chhoti Kali Sindh from the right. It receives a major tributary from the right near the village of Laban, the Kali Sindh and another tributary the Kural from the left. The Banas the major left bank tributary of Chambal, joins the Chambal near the village of Rameshwar and other major right bank tributary, the Parbati joins the river near the village of Pali district. The river is mainly a rainfed river.

vi. **Betwa**: The Betwa river tributary of the Yamuna rises in the Bhopal district of Madhya Pradesh at an elevation of about 475 m above the mean sea level. After flowing in a generally north-eastern direction through Madhya Pradesh, it enters the Jhansi district of Uttar Pradesh. After traversing a distance of 590 km, the river joins the Yamuna near Hamirpur in Uttar Pradesh. One of the important tributaries of the Betwa river is the Dhasan river. The river has 14 principal tributaries out of which 11 are completely in Madhya Pradesh. The Halali and Dhasan rivers are the important tributaries of the Betwa river, the Halali being the largest tributary with a length of 180 km.

vii. **Ken**: The Ken, one of the tributary of Yamuna flows through the Madhya Pradesh and Uttar Pradesh states. The Ken river has its origin on the north-west slopes of the Kaimur hills in the Satna district of Madhya Pradesh. It generally flows in a north-easterly direction and joins the Yamuna near Chilla. The river has a total length of 357 km and forms a state boundary between Chhattarpur district of Madhya Pradesh and Banda district of Uttar Pradesh. The tributaries of Ken are the Sonar, the Bearma, the Kopra, the Bewas, the Urmil, the Mirhasan, the Kutni, the Kail, the Gurne, the Patan, the Siameri, the Chandrawal, the Banne etc. The longest tributary is Sonar which is 227 km in length and wholly lies in Madhya Pradesh.

viii. **Sindh**: The Sindh river is one of the longest rivers of the Central India to join the Yamuna river on its right bank. It rises in a tank 543m above the sea level near a village in Vidisha district of Madhya Pradesh. It generally flows in north-eastern direction joins Yamuna in Uttar Pradesh, slightly downstream of the confluence of the Chambal with the Yamuna. The river receives number of tributaries; the more important of them are the Parbati and the Kunwari on its left bank and the Pahuj on its right.

Ramganga: The Ramganga river is the first major tributary to join the Ganga at its left bank. It rises in the lower Himalayas at an altitude of about 3110 m above the mean sea level near the village of Lohba in the Garhwal district of Uttarakhand. The total length of the river from the source to its outfall into the Ganga is 596 km and the entire length lies in the Uttarakhand and Uttar Pradesh. A number of tributaries join the river mostly from the left. The river enters the plains at Kalagarh near the border of the Garhwal district, where the famous Ramganga dam has been constructed. Beyond Kalagarh, the river flows in a southeasterly direction and finally joins the Ganga on its left bank near Kannauj in the Fategarh district. The most important tributaries are the Khoh, the Gangan, the Aril, the Kosi and the Deoha (Gorra) rivers.

Gomti: The Gomti river originates near Manikot in the Pillibhit district of Uttar Pradesh at an elevation of 200 m and drains the area between the Ramganga and the Sarda, in the upper reach and the area between the Ganga and the Ghaghara, in the lower reach. The total length of the river is about 940 km. From the origin to its confluence with Ganga, the river flows entirely in the State of Uttar Pradesh. Lucknow the capital city of Uttar Pradesh is situated on the banks of Gomti and it joins the Ganga in Audihar in Jaunpur district of Uttar Pradesh. The main tributaries of the Gomti are the Gachai, the Sai, the Jomkai, the Barna, the Chuha and the Saryu. Major cities situated on its banks are Lucknow, Sitapur, Hardoi, Barabanki, Rae Bareli, Pratapgarh, Sultanpur and Jaunpur.

Ghaghara: The Ghaghara river known variously as the Sarju or the Dehwa contains the combined waters of the Chauka or Sarda and the Kauriala which unite near Bahramghat in the Baranki district in the Uttar Pradesh. The Ghaghara is a mighty river with a considerable Himalayan catchment. The Ghaghara (Karnali or Kauriala) rises in the glaciers of Mapchachungo in Nepal, north-west of Taklakot and collecting the waters of the Tila, the Seti and the Beri rivers carves out a deep 600 m gorge at Shishapani. In the plains it is joined by the Sarda (Kali or Kaliganga) and flows south-eastward so as to meet the Ganga at Chapra. Ghaghara enters into India at Kotia Ghat near Royal Bardia National Park, Nepal Ganj, where it is known as Girwa for about 25 km. A barrage called Girijapuri barrage is constructed and below the barrage the river Girwa attains the name of the Ghaghara. Out of the total catchment of the Ghaghara only 45 percent lies in India. The Sarda river is the important tributary of the Ghaghara, which forms the boundary between India and Nepal for some distance. The total length of the Ghaghara before its confluence with Ganga river at Doriganj downstream of Chapra town in Bihar is 1,080 km. The Ghaghara river carries more water than Ganga before its confluence. The Sarju, the Rapti and the Little Gandak are other important tributaries of the Ghaghara.

Karamnasa: The Karamnasa**,** tributary of the Ganga, originates at an elevation of 350 m near Sarodag on the northern face of the Kaimur range in the Mirzapur district of Uttar Pradesh. It flows in a north-westerly direction through the plains of Mirzapur and joins the Ganga river near Chanusa. The tributaries are the Durgawati and the Chandraprabha, the Karnauti, the Nadi and the Khajuri.

Sone: The Sone river (Swarna Nadi) is the principal right bank tributary of the Ganga, rises at Sonbhadra in the Maikala range of hills in Madhya Pradesh at an elevation of 600 m in Amarkantak plateau not far off from the source of the Narmada river. It is a large river with a length 780 km and a drainage area of 71,900 Sq.km. It first flows in north-westerly direction and then takes a north-easterly course to meet the Ganga near Arrah (west of the Patna). In the plains of Bihar it has wide bed (4.8 km) and assumes huge size during rains. The important tributaries of the Sone are the Mahanadi, the Banas, the Gopat, the Rihand, the Kanhar and the North Koel.

Punpun: The Punpun river is an important river bank tributary of the Ganga river in lower reaches. The Punpun river originates from the Chottanagpur hills of Palamau district at an elevation of 300 m in Bihar. The river mostly flows in a northeast direction and finally joins the Ganga river at Fatawh, about 25 km downstream of Patna. The river is 200 km long and is mostly rainfed and carries little discharge during non-monsoon period. It meets a number of tributaries namely the Butane, the Madar and the Morhar while flowing through the Chottanagpur plateau. The Punpun often causes heavy flood damages on the eastern side of Patna city.

Gandak: The Gandak river (Sadanira, Saligrami in Nepal, or Narayani in the plains), known as the Kali or Krishna Gandak in the upper reaches rises at the altitude of 7620 m in Tibet near Nepal border. After receiving number of tributaries, like the Mayangundi, the Bari and the Trisuli, the Gandak debouches into the plains of the Champaran district of Bihar at Tribeni. At this point two more tributaries namely the Panchnad and the Sonhad join the river. The Gandak comprises two streams-the Kali Gandak rising close to Photu Pass near Muktinath and the Trisulganga originating north of Gosainthan (8013 m). It cuts through the Mahabharat Range and covering a distance of 425 km joins the Ganga near Patna. Its total catchment area is 48,500 Sq.km, of which 9,540 Sq.km lies in India. The total length of the river from its source to outfall into the Ganga is 630 km of which 255 km falls in India.

Kosi: The Kosi (Kausika) is the largest of the tributaries of the Ganga is formed by the confluence of three streams namely the Sun Kosi, the Arun Kosi and the Tamur Kosi, all taking their origin in the Himalayan region of Nepal and Tibet. The Arun Kosi (Phungchu in Tibet) rises to the north of Gosainthan is the biggest of the three streams and has two of the highest peaks in the world namely Mount Everest and Mount Kanchenjunga in its catchment. It has a total length of 730 km with a drainage area of 86,900 Sq.km (in India 21,500 Sq.km). The Kosi is notorious for its frequent and disastrous floods and shifting of courses. It is also called as 'the sorrow of Bihar' and meets the Ganga 32 km west of Manihari. The main tributaries of Kosi river are Bagmati and the Kamala rivers.

Mahananda: The Mahananda river originates in the hills of the Himalayas in the Darjeeling district of West Bengal at an elevation of 2100 m. The first 20 km of its course lies in the hills of Darjeeling and thereafter it flows in a south-westerly direction forming the boundary between India and Bangladesh. The Balsan, the Mechi, the Ratwa and the Kankai are the main tributaries of the Mahananda river.

Mayurakshi: The river has its origin on the slopes of Trikut hills about 43 km upstream from Dumka in Bihar. At its origin it is known as Matihara. The prominent among its tributaries are the Bhurburi, the Dhobai, the Pusaro, the Tepra, the Bhamri, the Dauna and the Sidheswari rivers.

Damodar: The Damodar river also known as the Deonadi in its initial reaches is one of the most important rivers to join the Ganga on its right bank, east of the Sone. The Damodar rises in the south-east corner in the hills of the Chottanagpur Plateau of the Palamau district of Bihar at an elevation of 1366m. It joins the Hugli river 48 km south of Kolkata with the length of 541 km and drainage area of 22,000 Sq.km. The river has been tamed through DVC multi-purpose project which is providing significant contribution in the economic development of the area.

Ajay: The Ajay river originates in the low hills near Deoghar in the Santhal Parganas district of Jharkhand and flows in a south-easterly direction passing through the Monghyr, Birbhum and Burdwan districts of West Bengal. Ultimately the river falls into the Bhagirathi river at Katwa about 216 km above Calcutta. The Ajay river system lies between the Mayurakshi on the north and Damodar and the Banka/Khari river system on the south. The Ajay river traverses a total length of 299 km, 24 km being in Monghyr, 102 km in District Santhal Parganas, 22 km along the boundary of Santhal Parganas and Burdwan, 115 km along the boundary between Singhbhum and Burdwan and the rest of the total length falls in the Burdwan district of West Bengal. It meets the Bhagirathi near Katwa. The river has a catchment area of 6,050 Sq.km. The various tributaries of the Ajay river are Darua, Pathro, Jainti, Hinglo, Tumuni, Kane, Kanur and Kundur rivers.

Table 4. Length of major rivers

Sl. No.	River	Length (km)	Origin
1	Ganga	2525	Gangotri glaciers in Himalayas
2	Yamuna	1376	Tehri Garhwal district of Uttarakhand from the Yamunotri glacier
3	Ghaghara(Sarju)	1080	Combined water of Sarda and Kauriala
4	Chambal	960	Vindhya range near Mhow in the Indore district of Madhya Pradesh
5	Gomti	940	near Manikot east of Pillibhit district of Uttar Pradesh
6	Betwa	789	Bhopal district of Madhya Pradesh
7	Sone	780	Sonbhadra in the Maikala ranges of hills in Madhya Pradesh
8	Damodar	575	Hills of the Chottanagpur Plateau, Bihar
9	Ramganga	542	Lower Himalayas near the village of Lohba in the Garhwal district of Uttarakhand
10	Parwati	430	Man Talai Glacier below the Pin Parbati pass
11	Rapti	420	Lower ranges of Himalayas in Nepal
12	Sindh	415	near a village in the Vidisha district of Madhya Pradesh
13	Ken	357	North-west slopes of Kaimur hills in Satna district of Madhya Pradesh
14	Kali	350	Doon Valley, Dehradun
15	Burhi Gandak	320	Someshwar hills in Champaran district
16	Sarada	308	Formed by the confluence of two streams Kuthiayankti and Kalapani near Indo-Tibet border
17	Ajay	299	near Deoghar in the Santhal Parganas District of Jharkhand
18	Sai	298	Hardoi district
19	Mahananda	268	Mahaldiran hills of Himalayas
20	Hooghly	260	Splits from Ganga at Farakka Barrage
21	Hindon	256	Southern slopes of Siwaliks in the Saharanpur district of Uttar Pradesh
22	Gandak	255	Tibet north-east of Dhaulagiri in Nepal
23	Rupnarayan	254	Tilabni hills in Bihar
24	Kali Sindh	230	Bagli (District Dewas) in Madhya Pradesh
25	Chhoti Sarju	226	Tal near south-west of Faizabad
26	Rihand	224	Surguja district of Chhattisgarh
27	Kanhar	214	Surguja district of Chhattisgarh
28	North Koel	212	Ranchi district of Bihar
29	Sahibi/Sabi Nadi	210	Aravalli Hills, near Jitgarh, Rajasthan
30	Gopat	209	Surguja district of Chhattisgarh
31	Punpun	200	Hills of the Chottanagpur Plateau of Bihar
32	Mahanadi	193	(Tributary of Sone) Mandla district of Madhya Pradesh
33	Karamnasa	192	near Sarodag on the northern face of Kaimur range
34	Tons	186	Tamaskund, in Kaimur range in Satna district of Madhya Pradesh
35	Bhagirathi	177	Gangotri glaciers in Himalayas
36	Barakar	168	Padma in Hazaribagh district of Jharkhand
37	Banas	167	(Tributary of Sone)Eastern face of Vindhya mountain
38	Kosi	163	Mahabharata Range/Lesser Himalayas north of the Indo-Nepal border
39	Alkananda	159	Garhwal Himalayas
40	Pahuj	142	Hills of Jhansi or in Tikamgarh district of Madhya Pradesh
41	Baghmari	120	Formed by the confluence of Kanloi, the Taroi and Bansloi having origin at Santhal Parganas district in Bihar
42	Chandan	118	near Deoghar in the Santhal Parganas district in Bihar
43	Shipra/Kshipra	113	Kakri bardi hills Vindhya Range
44	Kiul	111	Hills of the Chottanagpur Plateau of Bihar
45	Mayurakshi	83	Trikut hill, Deoghar in Jharkhand
46	Bagmati	41	above the southern edge of the Shivpuri Hills, Nepal
47	Mandakini	32	Garhwal Himalayas

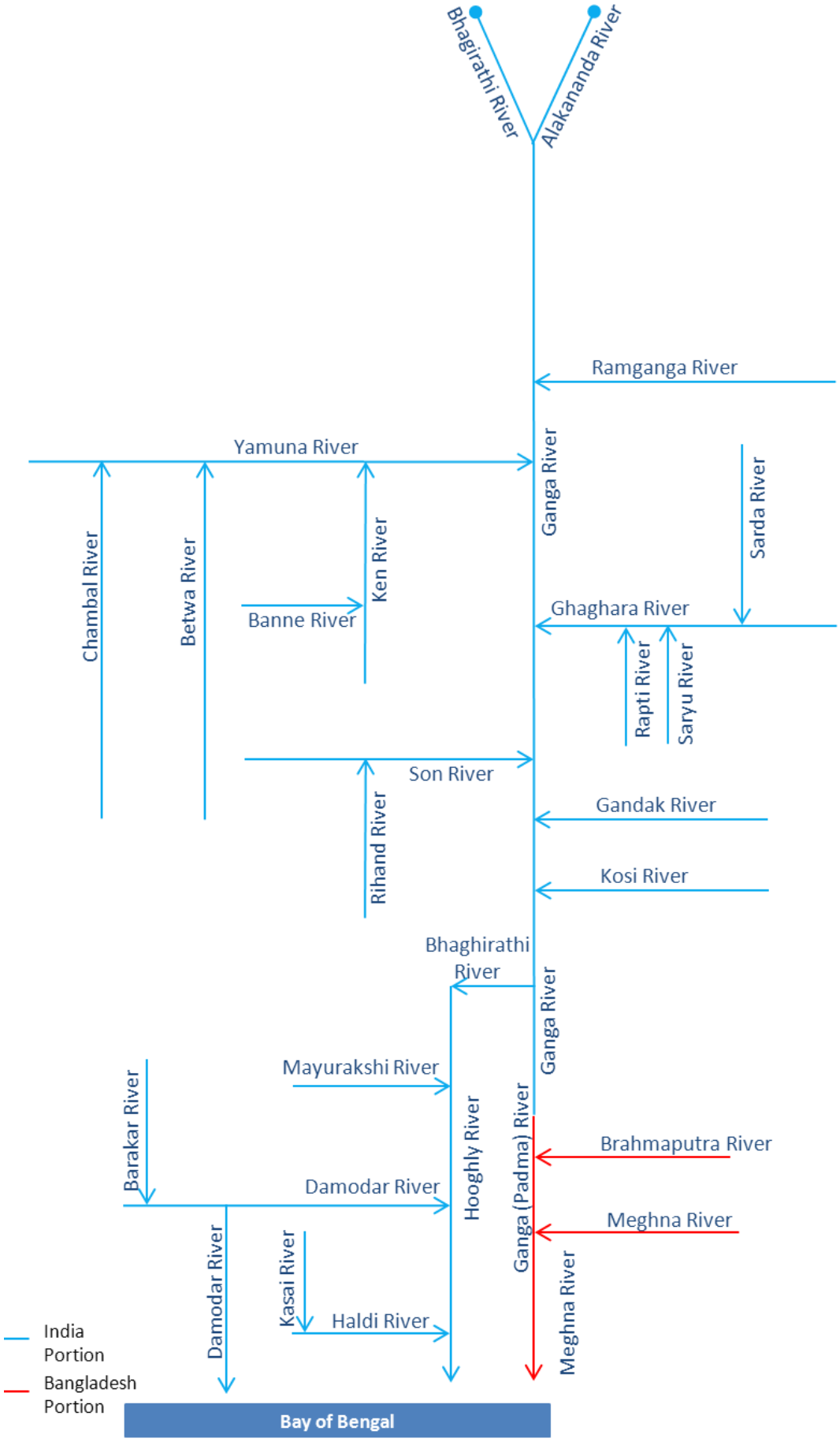


Figure 4. River line diagram of Ganga and its major tributaries and distributaries

1.5. Land Use/Land Cover

Land use is a description of how people utilize the land and socio-economic activity. At any one point or place, there may be multiple and alternate land uses, the specification of which may have a political dimension. Land cover is the physical material at the surface of the earth. Land covers include grass, asphalt, trees, bare ground, water, etc. This basin holds a variety of land cover and land use classes.

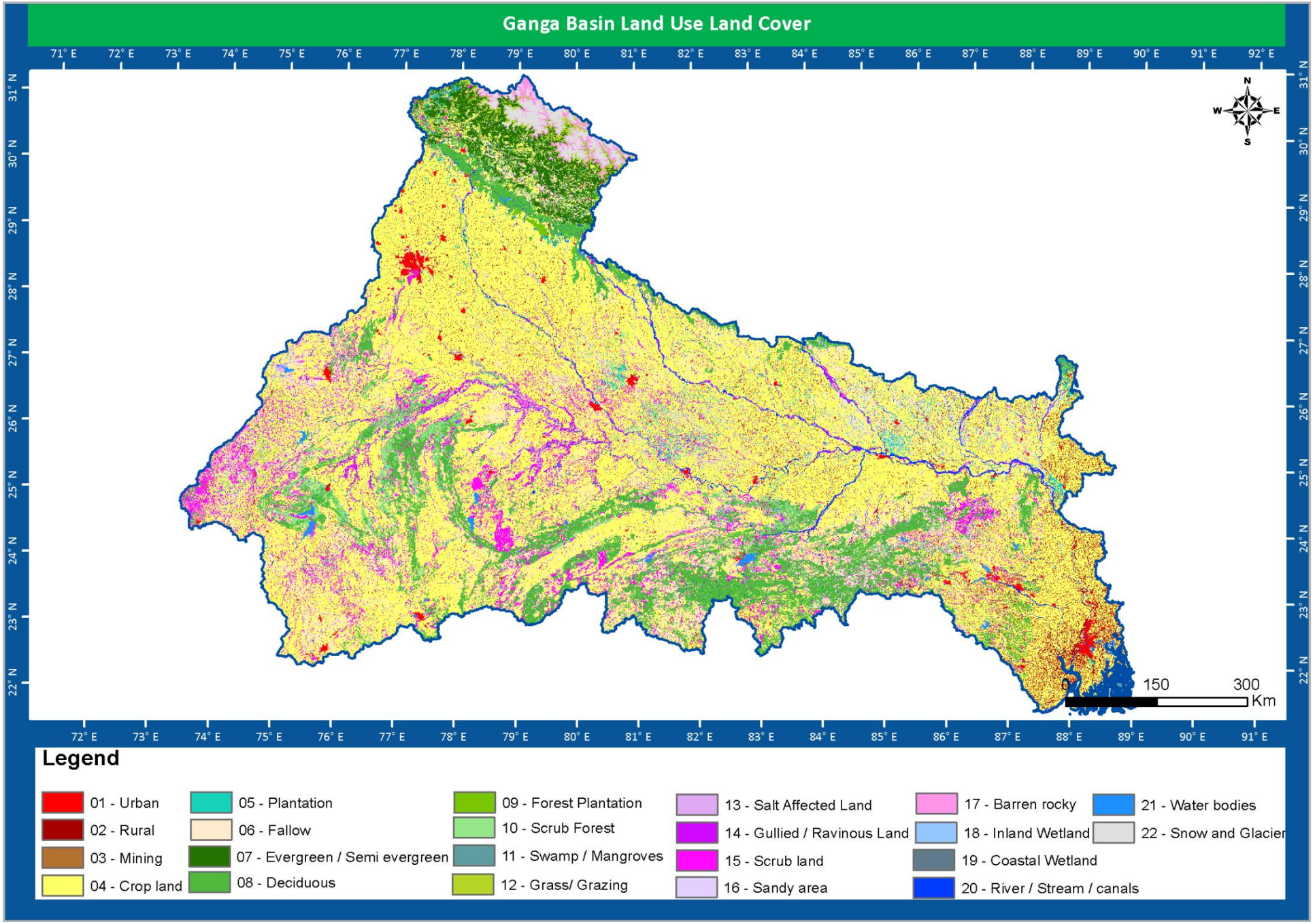
The major part of basin is covered with agriculture accounting to 65.57 percent. The states falling under Ganga basin are extensively cultivated, constituting approximately about 40 percent of the total area of the India. Other major Land cover is Deciduous Forest accounting (16 %) and statistics of level-I landuse/land cover statistics of the Ganga basin is shown below in the Table 5. The land being the chief resources has been subject to misuses which have resulted into several land and associated problems. The overgrazing and deforestation in most areas have led to soil erosion and ravine formation on the one hand and have accentuated flooding on the other. For example the Yamunanagar district in Haryana has been subjected to severe ravine-formation, particularly by the Yamuna and the Chambal. The distribution of land use/land cover in Ganga basin during 2005-06 is given in Map 6.

Also land not available for cultivation and fallow land class covers a considerable area of the basin. This category of land consists of tracts which cannot be put to agricultural or silvicultural uses at an economic level due to their unproductive nature, as well all lands put to various other economic uses, such as mineral exploitation or construction of human settlements, industrial structures, roads, railways, airports and other civil works needed for providing transport, communication and similar infrastructural facilities for human habitation. A proportion of the Ganga basin comprises of the non-arable land that is used in urbanization and in construction of homesteads in rural areas which is one of the thickly populated.

The states falling under Ganga basin have only 16.6 percent of total land areas covered by forest, as compared to India as a whole which has 21.2 percent of land under forest cover. In some states, especially Haryana, Delhi, Bihar, Uttar Pradesh, Rajasthan and West Bengal, the forest cover is as low as 0.1 to 13.2 percent of the geographical area. Most of forest tracts within the Ganga basin are severely degraded on account of over exploitation. As a result, the forest ecosystem in the Ganga basin is under severe stress. Even in the states of Uttarakhand (64.7 %), Madhya Pradesh (28.2 %) and Himachal Pradesh (19.8 %) where the forest cover is higher, the proportion of land actually under dense tree cover within the government forest tracts is very low due to extensive clear felling of trees carried out in recent decades.

Table 5. Land use/Land cover statistics (2005-06)

Category	Area (Sq.km)	% of Total Area
Agricultural	564866	65.57
Forest	137816.5	16
Wasteland	76603.61	8.89
Built Up Land	36908.24	4.28
Waterbodies	29876.51	3.47
Snow / Glaciers	8056.9	0.94
Grassland	7324.27	0.85



Map 5. Land use/Land cover (2005-06)

1.6. Soils

Soil is composed of minerals, mixed with some organic matter, which differ from its parent materials in terms of its texture, structure, consistency, color, chemical, biological and other characteristics. Information on the soil profile is also required for simulating the hydrological character of the basin. The Ganga basin consists of a wide variety of soils. While soils of the high Himalayas in the north are subject to continuous erosion, the Gangetic plain provides a huge receptacle into which thousands of meters of thick layers of sediments have been deposited to form a wide valley plain. The Deccan plateau in the south has a mantle of residual soils of varying thickness arising out of weathering of ancient rocks of the peninsular shield. In certain parts of the Ganga basin, the soils are already showing signs of salinity (as in Haryana), alkalinity (as in western U.P.), calcareousness (as in north Bihar) and acidity (as in West Bengal) due to overuse, long occupation and continued application of inputs like excessive irrigation water and toxic agro-chemicals of various types.

Among the soil types within Ganga basin, the alluvial soil covers more than 52 percent of the basin. The alluvial deposits of the basin not only cover the great Gangetic trough, but also extend over a sizable portion of the peninsular foreland in the form of a layer less than 3 meters thick. The entire alluvial formation is endowed with rich soil nutrients. The alluvial deposits of the Ganga and its tributaries, coming down the Himalaya and the peninsular foreland, have yielded annual harvests of crops for the past thousands of years with little significant deterioration. It was noted that the soil texture of most parts of the Ganga basin is fine texture but some parts of Uttarakhand and Bihar has a rocky texture and a course texture is noted in the parts of Haryana and Rajasthan and the distribution of types of soil texture and their extent in the basin is shown in the Map 7.

In the Upper Ganga plains, the soils are by and large homogeneous. The alluvial soils with the variants, the Usar and Bhur, depending on the drainage conditions, mechanical and chemical constituents and climatic characteristics observed. The two common types, the khaddar and the bhangar with different local names, with minute variations in properties, are quite widespread. The khaddar soils, relatively rich in plant nutrients, occupy the narrow frequent siltation tracts in the flood plains of the rivers. Neutral to alkaline in reactions, these are deficient in organic materials especially phosphorous, and are sandy to loamy in texture. In the proximity of the Ganga these are loamy to sandy loam in texture i.e. Fine to medium texture while near the Yamuna the silt contents decreases giving sandy to sandy loam texture possibly due to excessive drainage. Another variant, the bhur, the sandy river deposit, is highly localized in Ramganga tract and in the narrow belt along the Ganga. The soil is more sandy in texture and workable economically only with irrigation.

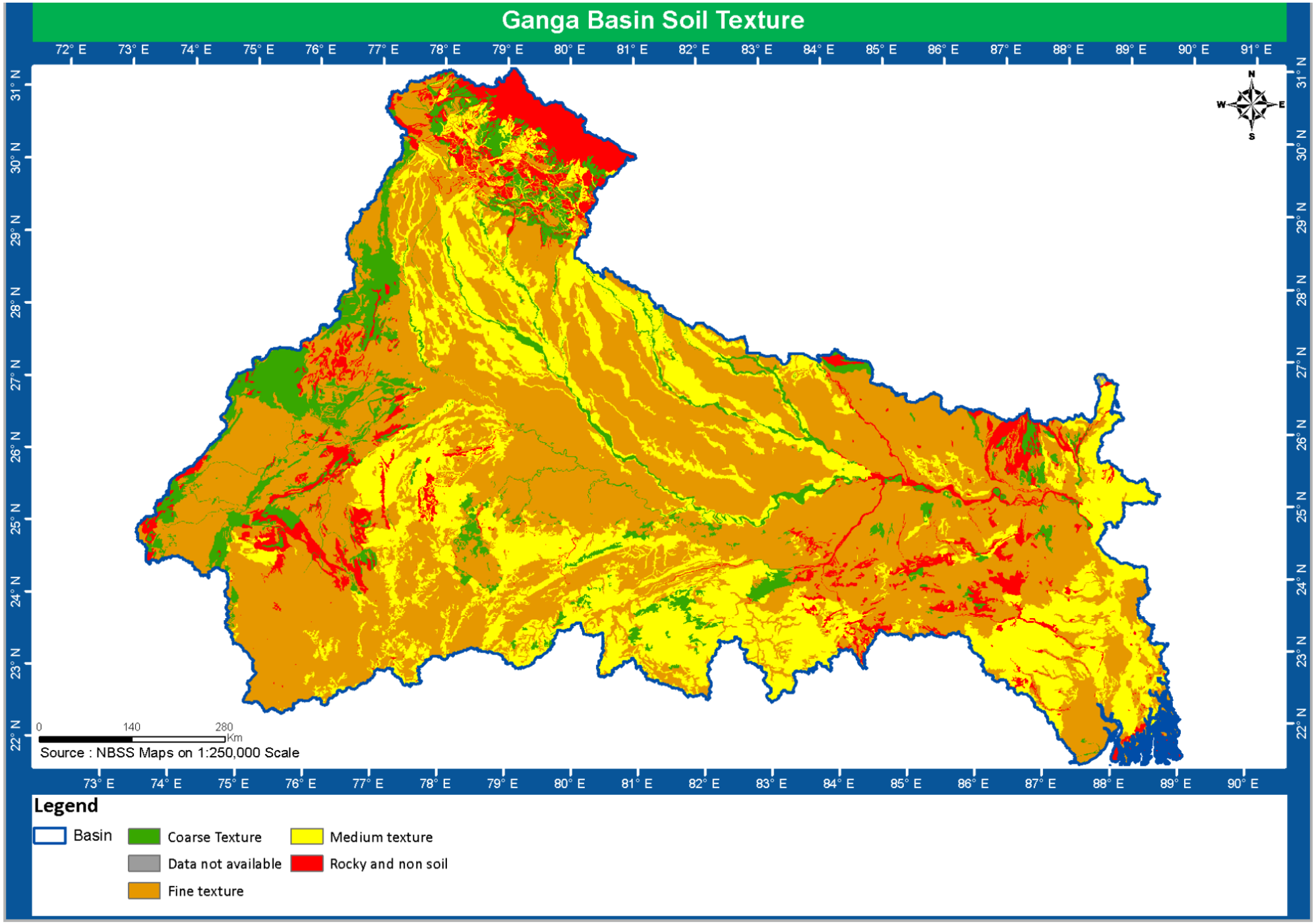
Apart from the undifferentiated soils of the Siwalik fringe zone in Champaran district of Bihar, the Middle Ganga plain has broad alluvial soil. Being a common origin and almost identical ecological environment, they show in general minor variation in color, texture and moisture content etc. Because of the better drainage, except in the river beds, newer alluvial soil contains a low percentage of humus and nitrogen and little lime and consists of fine silts but may be sandy in the places as along the Ghaghara, the Gandak, and the Sone. Being more sandy or silty, it is highly friable and is rich for the rabi, zaid crops and such as annuals as sugarcane. The Bhat or calcareous soil of the eastern Saryupar and central-western North Bihar plains in the lower Gandak valley is a chemical variant of the alluvial soil. It is white in color, riverine and low lying but well drained, good for tilth and highly fertile and having high productivity.

The soil of the Lower Ganga plain has wide variety and can be groped as Laterites, red earths soils, alluvial soils and the Coastal soils. The laterite soils re found in the undulating well-drained tract along the Chottanagpur highlands and possess low water-holding capacity and usually Sal forests thrive. The transported laterites deposited on the eastern flanks of the lateritic stretch are known as red soil or lateritic alluvium and are found in eastern margins of Maldah and Dinajpur districts of West Bengal. Mostly they have been brought under cultivation after deforestation which has accelerated the process of erosion. In the riverine tract of the Damodar and the Kasai have alternating sand beds and immature and irregular stratification and hence ill-developed profiles. The soils in these regions are neutral and relatively poor in plant nutrients and organic matter. The coastal soils are they outcomes of the interactions of rivers and tides and have developed in the districts of South and North 24 Parganas and Midnapore of West Bengal. The soil is saline and alkaline and contains deposits rich in Calcium, Magnesium, and half- decomposed organic matter.

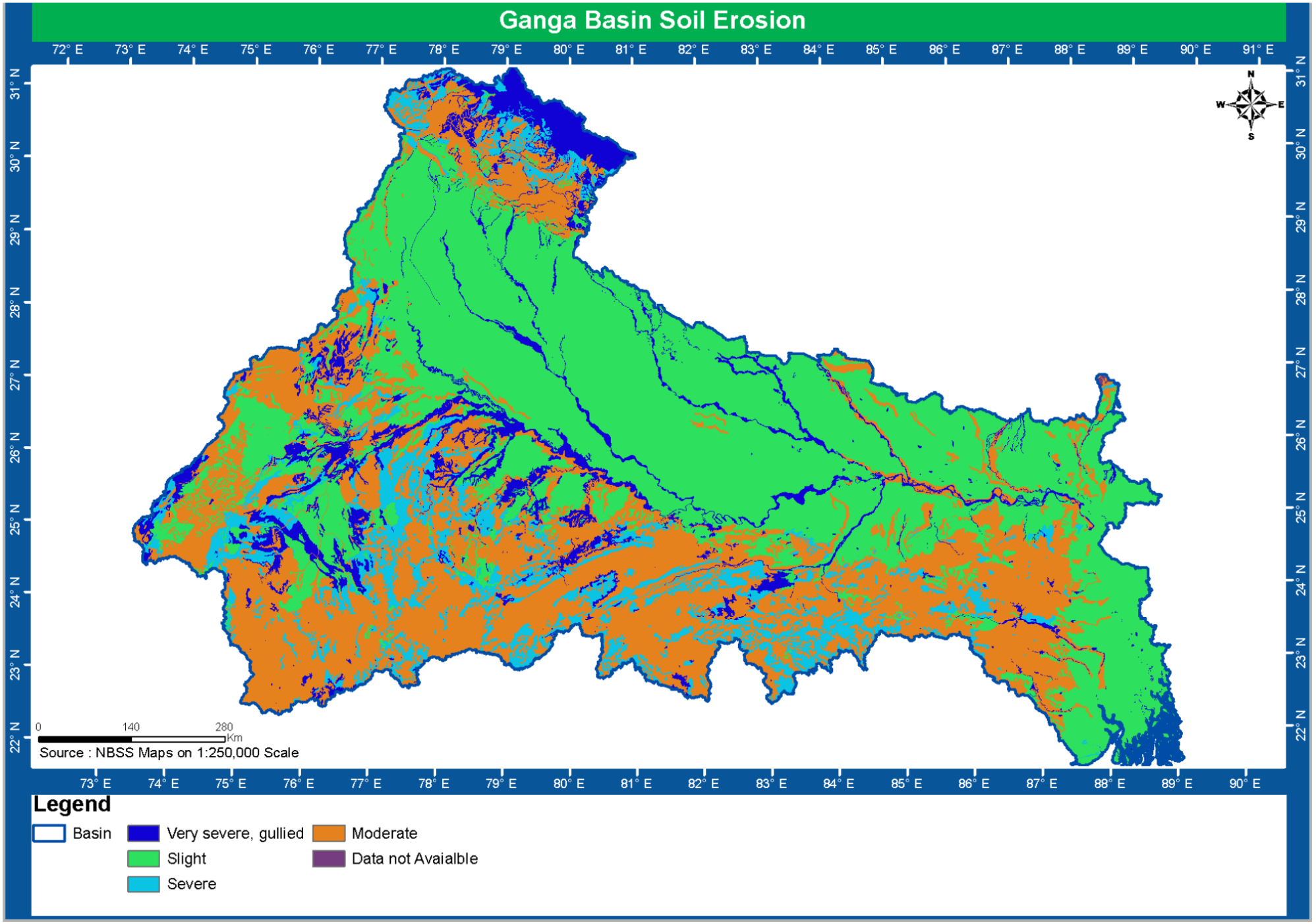
The soil erosion characteristic of Ganga basin is having a general pattern of slight erosion; however some of the soils are highly susceptible to erosion. Mountain soils, submontane soils and alluvial soils, covering 58 percent of the basin area, have very high erodibility; red soils seen in the parts of Jharkhand, Chhattisgarh, Madhya Pradesh and West Bengal covering 12 percent of the basin area have severe erodibility, red & yellow soils and mixed red and black soils of Madhya Pradesh, Bihar, Chhattisgarh and Rajasthan covering an area of 8 percent have moderate erodibility, and deep black soils and medium black soils covering an area of 14 percent have low erodibility. Shallow black soils and lateritic soils mostly seen in Chottanagpur highlands covering an area of 6 percent have very low erodibility. Broadly, it can be said that soils in Haryana, Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal, through which is the main stem of Ganga and all its tributaries flow, have very high erodibility. The severity of soil erosion and their geographical extent in the Ganga basin is shown in the Map 8.

The basin is mostly having homogeneous terrain in plains leading to a level plain or a very gentle slope in general. But some parts of Uttarakhand, Madhya Pradesh are having a steep slope because of the lesser Himalayas and Siwalik ranges. The lower parts of the basin like Jharkhand, Chhattisgarh and parts of Rajasthan and West Bengal is having a gentle slope. The soil steepness and slope of the basin is shown in the Map 9.

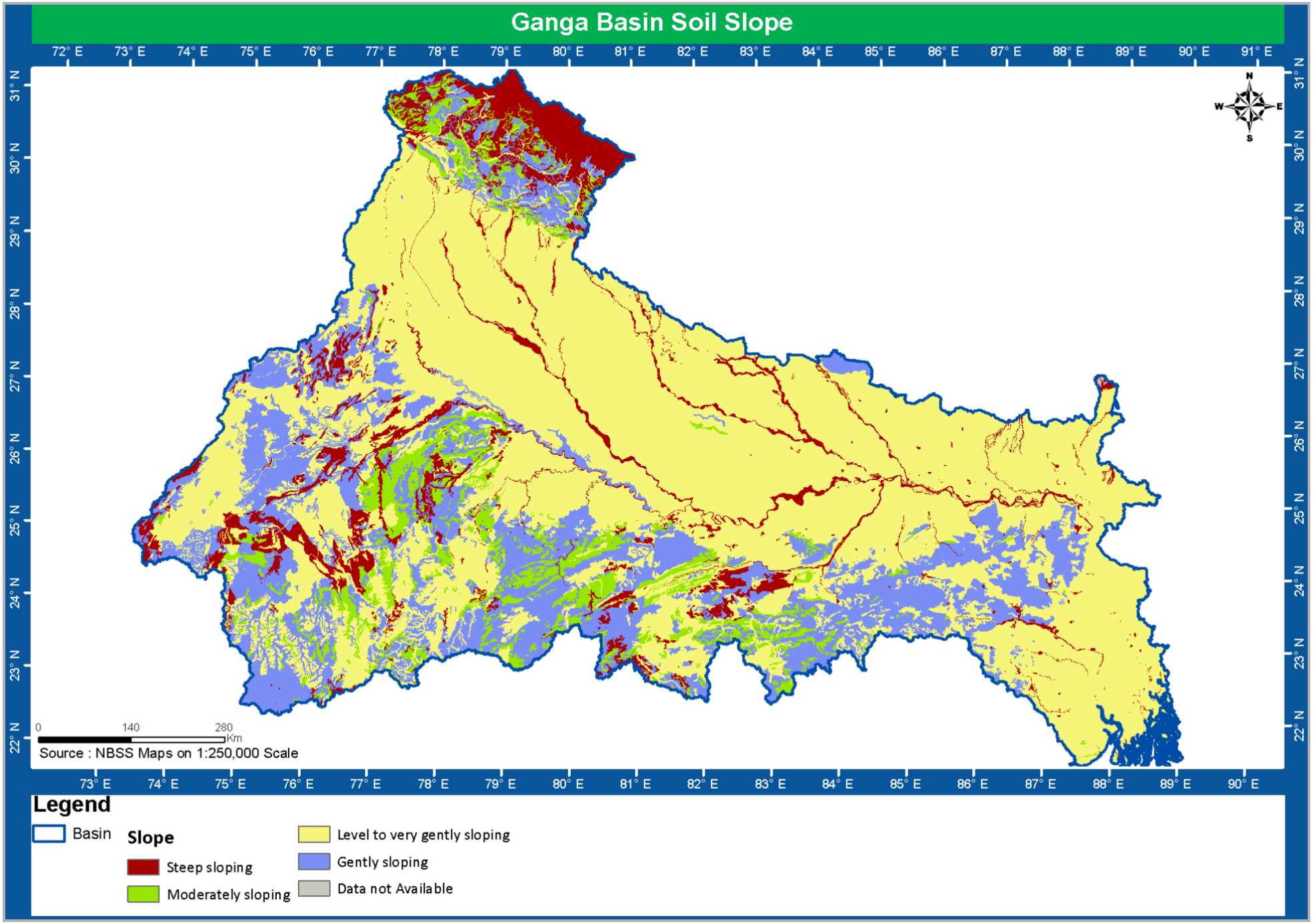
The productivity in the basin varies in a large extent. The soil productivity is very high in parts of Uttar Pradesh and the parts of Madhya Pradesh, Haryana and Rajasthan have seen less productivity compared to the others. The parts of Uttarakhand are mostly non-productive because of its hilly terrain and steep slope and gigantic drainage system. Besides paddy, this tract produces a wide variety of crops including wheat, jowar, bajra, small millets, pulses of different kinds, maize, cotton, jute and many other food and commercial crops. The pattern of soil productivity and their geographical extent in the basin is shown in the Map 10.



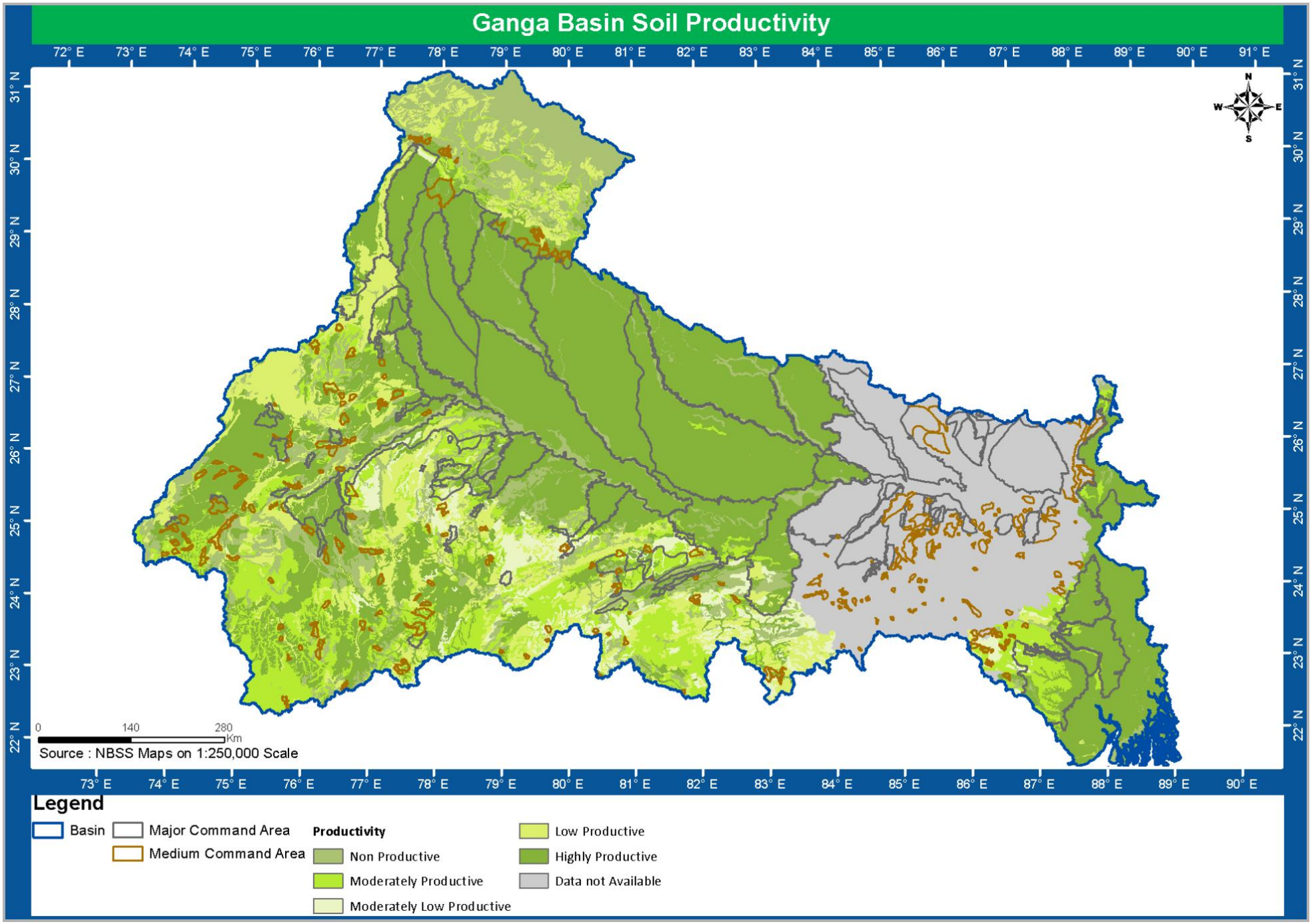
Map 6. Soil Texture



Map 7. Soil Erosion



Map 8. Soil Slope



Map 9. Soil Productivity

1.7. Agro-Climatic Zones

An agro-climatic zone is a land unit uniform in respect of climate and length of growing period (LGP) which is climatically suitable for a certain range of crops and cultivars (Source: FAO 1983). The climatic conditions like rainfall, temperature, humidity, wind velocity and duration of sunshine etc. of a region affect the agricultural cropping pattern thus, produce different crops. Annual rainfall and its distribution over the entire year, and the regimes of diurnal and annual temperatures are the prominent factors affecting agriculture and the life style of the people. Planning Commission of India (1989) made an attempt to delineate the country into different agro climatic regions based on homogeneity in rainfall, temperature, topography, cropping and farming systems and water resources. On the basis of climatic conditions and agricultural produce, Ganga basin has been divided into ten agro-climatic zones, each one having special characteristics of its own as shown in Map 11. The main characteristics of the agro-climatic zones of the Ganga basin are describes below:

1. Central Plateau and Hills region: The maximum part (31% of total basin area) of the Ganga basin is covered by this region. The part of region in Ganga basin comprises of 30 districts of Madhya Pradesh, 15 districts of Rajasthan and parts of Uttar Pradesh. The topography is highly variable nearly 1/3rd of the land is not available for cultivation and Irrigation and cropping intensity are comparatively low where 75 percent of the area is rainfed grown with low value cereal crops. A Large volume of land and water resources exists in this region with very low productivity with predominance of subsistence agriculture and excessive runoff. The potential of horticulture and livestock are under-utilized. The region mainly has coarse cereals based cropping systems with poultry farming as primary means of livelihood.

2. The Upper Gangetic Plains region: This region covers about 17 percent of total basin area comprises of 32 districts of Uttar Pradesh and parts of Uttarakhand. In this region the irrigation is mainly through canals and tube wells. The region is rich soil and water resources with medium productivity level due to salinity / alkalinity and a good potential for exploitation of ground water. The unscientific irrigation practices, poor drainage and weak input supply structure and population pressure developed land deteriorating environment with respect to land quality. The region has both rice and wheat based cropping system with Poultry farming and buffalo and cattle rearing.

3. The Middle Gangetic Plains region: This region covers about 17 percent of total basin area and comprises of 23 districts of eastern Uttar Pradesh and 37 districts of Bihar. This region has a geographical area of 16 million hectares and high rainfall. In this region about 39 percent of gross cropped area is irrigated and the cropping intensity is 142 percent. The region is rich soil and water resources but has low productivity level due to mono-cropping of rice on large area and has seen deteriorating land quality in due course of time. The region mainly has rice based cropping system with poultry, fishery and dairy as primary means of livelihood.

4. The Eastern Plateau and Hills region: This region covers about 13 percent of the total basin area and comprises of eastern part of Madhya Pradesh, southern part of West Bengal the parts of Jharkhand and Chhattisgarh falling in the basin. A large volume of land and water resources exists in this region with very low productivity and large runoff of rain water eroding soil fertility of the area. The soils are shallow and medium in depth and the topography is undulating with a slope of 1-10 percent. The region has low development of irrigation and the mode is through tanks and tube wells. The region mainly has rice & coarse cereals based cropping systems with

Poultry and Piggery farming. The Cattle, buffalo and goat are reared as primary means of livelihood in this region.

5. The Lower Gangetic Plains region: This region holds about 8 percent of the total basin area and completely contained in the 15 districts of West Bengal. The soils are mostly alluvial and are prone to floods. The region is rich in water and soil resources and has low productivity level and high population pressure beyond carrying capacity. The region mainly has rice based cropping system with Hilsa fish culture and buffalo, black Bengal goat and Garol sheep are reared.

6. The Western Plateau and Hills region: This region is about 6 percent of the total basin area and comprises the parts of Madhya Pradesh and one district of Rajasthan. The irrigation potential of the region is under developed and the irrigated area is only 12.4 percent of the zone with canals being the main source. The soil has high clay content with low drainability with large runoff and soil erosion. The region mainly has coarse cereals based cropping systems with Poultry farming and goat rearing.

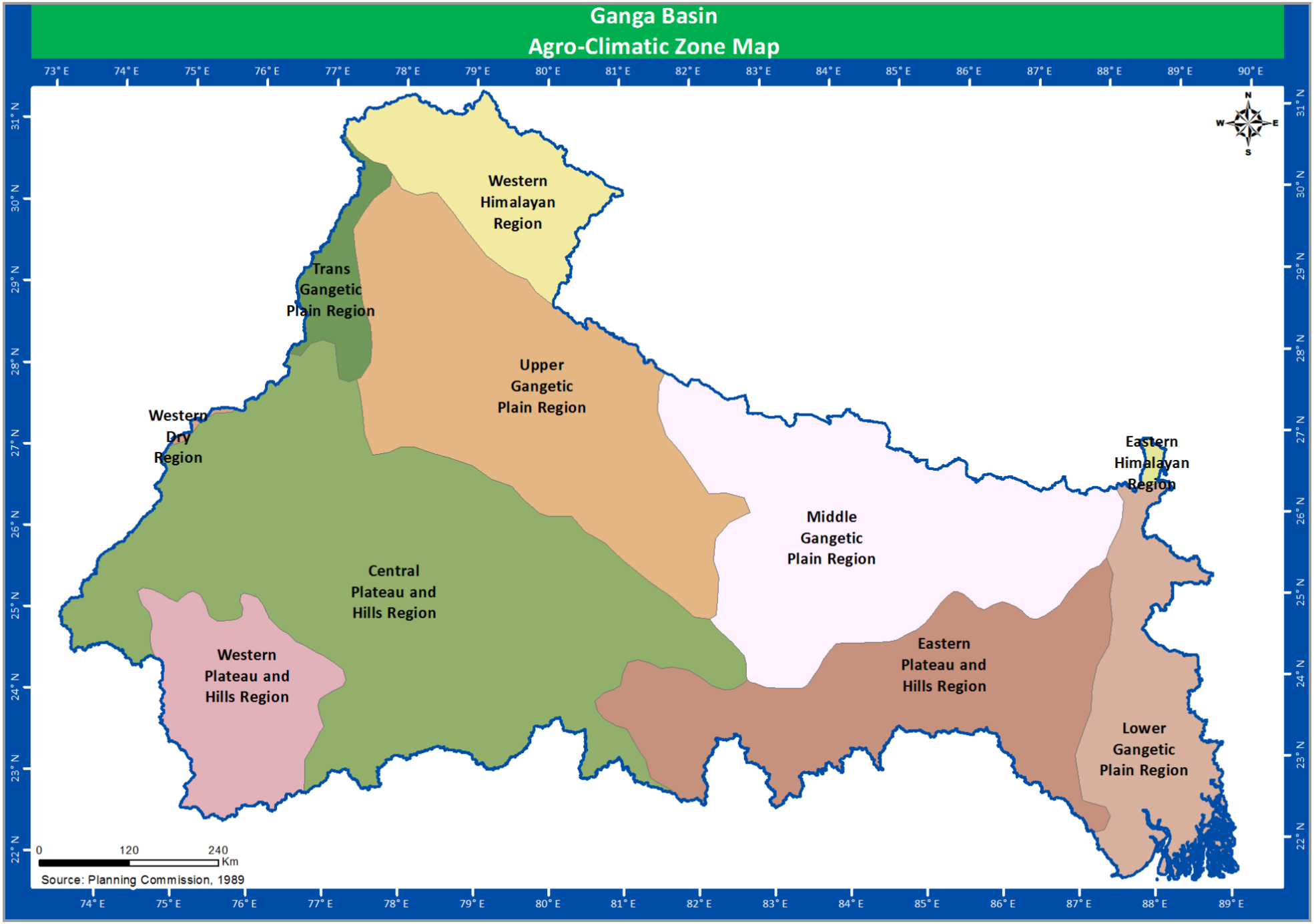
7. The Western Himalayan region: This region is about 6 percent of the total basin area and consists of two out of the three distinct sub-regions i.e. Himachal Pradesh and Uttarakhand hilly area. The region consists of skeletal soils of cold region, podsolic mountain meadow soils and hilly brown soils. Lands of the region have steep slopes in undulating terrain. Soils are generally silty loams and these are prone to erosion hazards. The region has low land productivity compared to the other parts of the basin. The region mainly has wheat based cropping system with temperate horticulture and sheep, yak, quail, turkey, horse and mules as potential livestock rearing.

8. The Trans-Gangetic Plains region: This region holds only 2 percent of the total basin area and consists of parts of Haryana and Delhi. The region is rich water & soil resources and has comparatively high land productivity level with delicate water balance in the region as exploitation of ground water has already surpassed hundred per cent of utilizable balance. The region has both rice and wheat based cropping system with Poultry farming and buffalo and cattle are reared.

9. The Eastern Himalayan region: A little part the basin fall in this basin mainly the Coochibihar districts of West Bengal. The region receives high rainfall and has high forest cover. Shifting cultivation is practiced in nearly one-third of the cultivated area and this has caused denudation and degradation of soils with the resultant heavy runoff, massive soil erosion and floods in lower reaches.

10. The Western Dry region: A very little part of the basin falls in this region mainly the parts of the Sikar and Nagaur districts of Rajasthan and is characterized by arid conditions with hot climate, erratic rainfall, high evaporation, scanty vegetation and fragile eco-system. The ground water is deep and often brackish. Famine and drought are common features of the region. The region mainly has coarse cereals based cropping systems with Poultry farming and cattle, goat, sheep, camel are reared as primary means of livelihood.

Overall the geography of the Ganga is apt for harvesting a wide variety of crops. The Ganga and its tributaries provide a constant source of irrigation to an extensive area. In general the major crops cultivated in that area include rice, lentils, sugarcane, potatoes, oil seeds and wheat. Along the banks of the river, the existence of swamps and lakes provide a rich fertile area for crops like legumes, chillies, sesame, mustard, sugarcane, and jute. There are also many fishing zones along the river, though all of them are highly polluted.



Map 10. Agro-Climatic zones

1.8. Agro-Ecological Zones

Agriculture is highly dependent on soils and climate. The ever-increasing need for food to support the growing population in the country demands a systematic appraisal of its soil and climate resources in order to prepare effective land-use plans. India has a variety of landscapes and climate conditions and this is reflected in the development of different soils and types of vegetation. Based on climate data and an up-to-date soil database, the country has been divided into 20 agro-ecological zones. Each agro-ecological zone is uniform in terms of physiography, climate, and length of growing period and soil type for macrolevel land-use planning. Out of twenty Agro-ecological zones, the Ganga basin comprises of 12 agro-ecological zones as depicted in the Map 12. The main contributing agro-ecological zones of the basin are describes below:

1. Hot semi-arid ecoregion with alluvium-derived soils zone: The maximum part (30% of total basin area) of the Ganga basin is covered by this zone. It constitutes the parts of Uttar Pradesh, Rajasthan, New Delhi, Haryana and Madhya Pradesh. The climate of the region is characterized by hot and dry summer and cool winter. The annual precipitation ranges from 500 to 1000 mm with an increasing trend from west to east and the mean annual Potential Evapotranspiration (PET) ranges from 1400-1900 mm. The length of growing period ranges between 90 and 150 days. The soil moisture regime is typic-ustic and the soil temperature regime is hyperthermic. The natural vegetation comprises tropical dry deciduous and thorn forests. The region is under irrigated agriculture as well as traditional rainfed agriculture. The area is intensively cultivated for both kharif and rabi crops, such as rice, millets, maize, pulses, berseem, wheat, mustard and sugarcane.

2. Hot subhumid ecoregion with red and black soils zone: The 14 percent of total basin area of the Ganga basin is covered by this zone. It constitutes the parts of Madhya Pradesh and Chhattisgarh. The climate of the region is characterized by hot summer and mild winter. The precipitation shows an increasing trend towards east. The mean annual rainfall ranges between 1000 and 1500 mm covering about 80 per cent of the mean annual PET (1300-1600 mm). The region remains fairly dry during the post-rainy period. The soil moisture regime is typic-ustic and the soil temperature regime is hyperthermic. The length of growing period ranges from 150-180 days. Rainfed agriculture is the common practice. Rice, sorghum, pigeon pea and soybean are common grown kharif crops. Gram, wheat and vegetables are common rabi season crops. The natural vegetation comprises tropical moist deciduous forest.

3. Hot subhumid (dry) ecoregion with alluvium-derived soils zone: The zone covers about 12 percent of total basin area of the Ganga basin. It constitutes the parts of Uttar Pradesh and Bihar. The agro-climate of the region is characterized by hot summer and cool winter. It receives an annual rainfall of 1000 to 1200 mm; 70 per cent of which is received during July to September and the annual PET of 1400 to 1800 mm. The region has length of growing period of 150 to 180 days. The soil moisture regime is ustic and the soil temperature regime is hyperthermic. Traditionally the rainfed and irrigated agriculture is common. The crops grown are rice, maize, barley, pigeon pea and jute in kharif season and wheat, mustard and lentil in rabi season. Sugarcane and cotton are grown at places under irrigated conditions. The natural vegetation comprises tropical dry deciduous forests.

4. Hot subhumid (moist) ecoregion with alluvium-derived soils zone: The agro-ecoregion covers 12 percent of total basin area of the Ganga basin, comprising eastern plains covers north-eastern

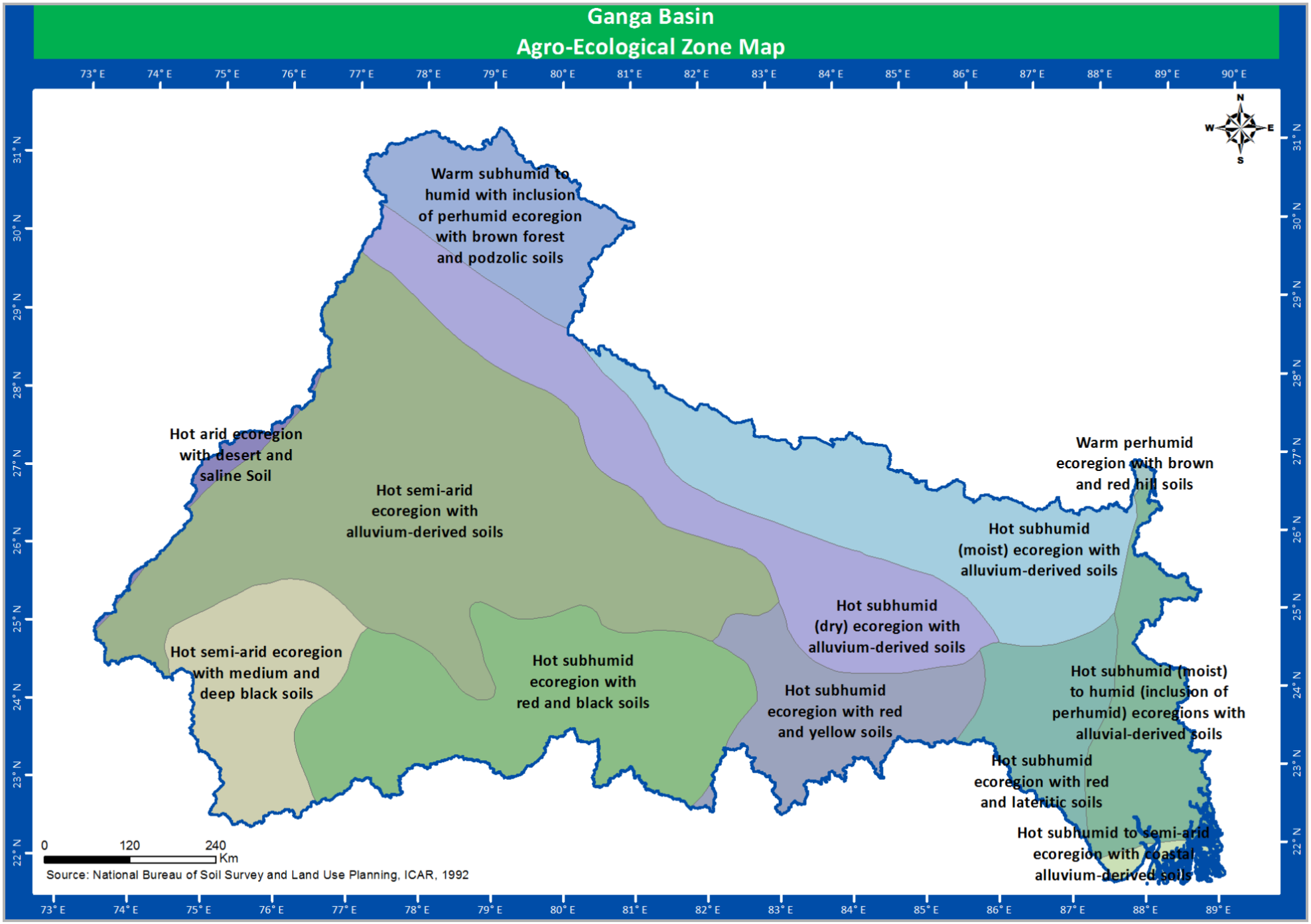
Uttar Pradesh and Northern Bihar including foothills of Central Himalayas. The climate of the region is characterized by hot, wet summer and cool, and dry winter. The area receives an annual rainfall of 1400-1800 mm which exceeds the mean annual PET demand (1300 and 1500 mm). The length of growing period ranges from 180 to 210 days in a year. The soil moisture regime is ustic and the soil temperature regime is udic. Rainfed agriculture with cultivation of rice, maize, pigeon pea, moong are common in kharif season and in post-rainy (Rabi) season, wheat, lentil, pea, sesamum, and at places, groundnut is grown on residual soil moisture with one or two protective irrigations at critical stages. The important cash crops such as sugarcane, tobacco, chilies, turmeric, coriander and potato are usually grown with supplemental irrigation. The natural vegetation comprises tropical moist deciduous and dry deciduous forests.

5. Hot semi-arid ecoregion with medium and deep black soils zone: The ecoregion covers about 7 percent of the basin area and comprises of the western parts of Madhya Pradesh and south-eastern parts of Rajasthan. The climate of the region is characterized by hot and wet summer and dry winter. The annual precipitation in the region ranges from 500 to 1000 mm and the annual PET is (1600 to 2000 mm. The length of growing period ranges from 90 to 150 days in a year. The dominant soil moisture regime in the area is typic-ustic. The soil temperature regime is hyperthermic. Dry land farming is the common practice in the region. The Kharif crops usually cultivated in the area are sorghum, pearl millet, pigeon pea, groundnut, soybean, maize and pulses and the common Rabi crops are sorghum, safflower, sunflower and gram. Wheat is grown under irrigated conditions. The natural vegetation comprises dry deciduous forest.

6. Hot subhumid (moist) to humid (inclusion of perhumid) eco-regions with alluvial-derived soils: The agro-ecoregion forms 6 percent total basin area, comprising the plains of the Ganga river, covers parts of the West Bengal. The climate of the area is characterized by hot summer and mild to moderately cool winter. The rainfall in Ganga Plain ranges between 1400 and 1600 mm. The length of growing period, in general, is more than 210 days in a year. The soil moisture and temperature regimes are **udic-ustic** and **Hyperthermic**, respectively. In view of the high rainfall, the rice based cropping system is common in Ganga Plains. The rice and jute are main crops grown in rainy season under rainfed condition and rice, wheat, and sugarcane during the rabi season under irrigation. The natural vegetation comprises tropical moist and dry deciduous forests.

7. Warm subhumid to humid with inclusion of perhumid ecoregion with brown forest and podzolic soils: The agro-ecoregion forms 6 percent of the total basin area and comprising of the hilly areas of Uttarakhand. The region is characterized by mild summer and cold winter with annual rainfall in general varies from 1000-2000 mm. Rainfed farming is the traditional practice in the valleys and on terraces. The common crops grown are wheat, millet, maize and rice. The terraced uplands are cultivated for paddy and/or horticultural plantation crops, like apples. The natural vegetation comprises Himalayan moist temperature, subtropical pine and sub-alpine forests.

The other zone are Hot subhumid ecoregion with red and yellow soils, Hot subhumid ecoregion with red and lateritic soils, Hot subhumid to semi-arid ecoregion with coastal alluvium-derived soils, Hot arid ecoregion with desert and saline Soil and Warm perhumid ecoregion with brown and red hill soils have little contribution in the agro ecological region of Ganga basin. (Source: www.fao.org)



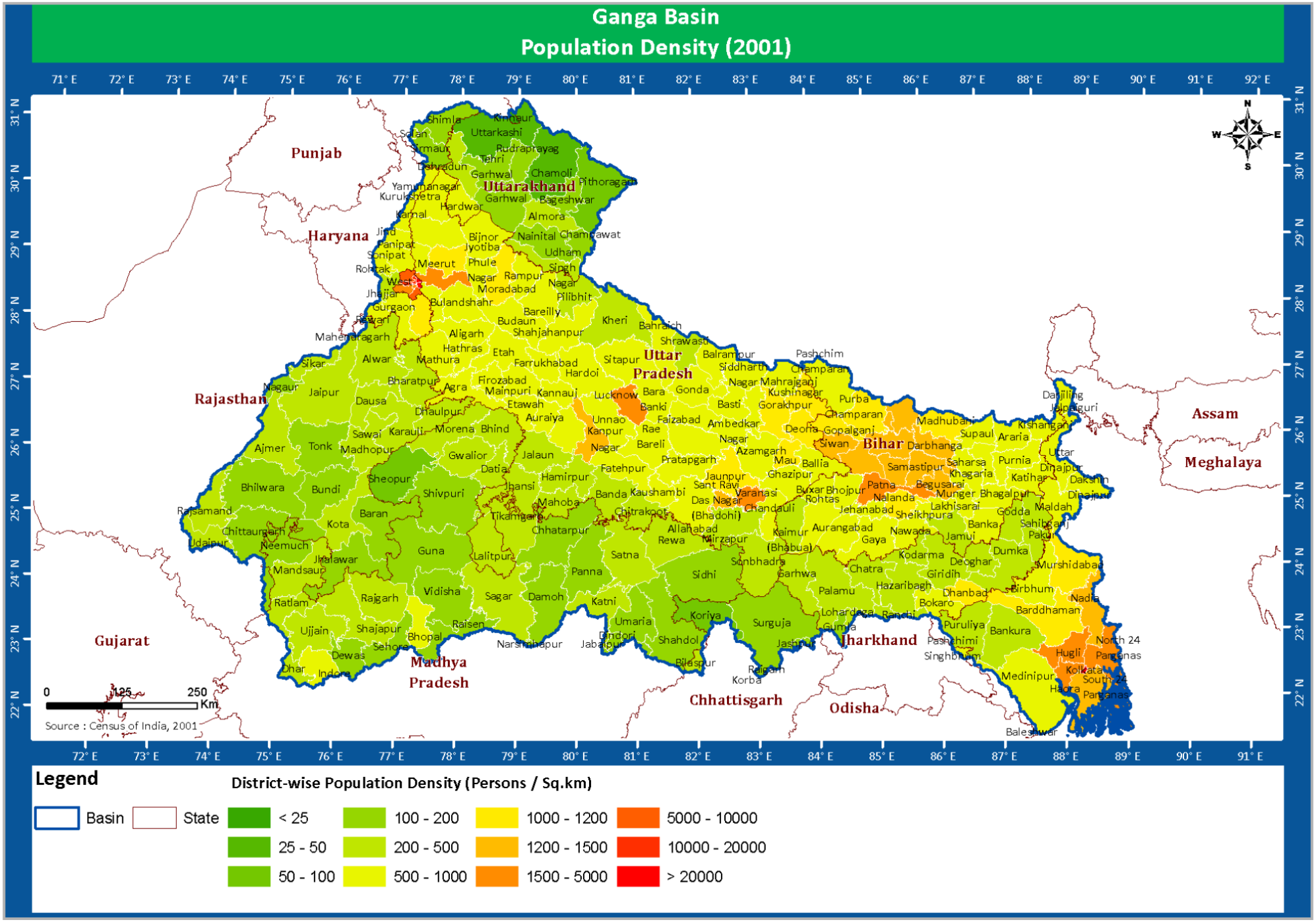
Map 11. Agro-Ecological zones

1.9. Demography

Demographics are the quantifiable statistics of a given population. Demographics are also used to identify the study of quantifiable subsets within a given population which characterize that population at a specific point in time. The Ganga basin is the largest basin in the India based on both the catchment-wise and population-wise. According to Census 2001, 242 districts fall in Ganga basin. Out of which districts of five states completely fall in Ganga basin are Uttar Pradesh (70 districts), Bihar (37 districts), Delhi (9 districts), Jharkhand (18 districts) and Uttarakhand (13 districts). Other six states have only few districts that are part of Ganga basin. They are 17 districts out of 18 districts of West Bengal, 35 districts out of 45 districts of Madhya Pradesh, 12 districts out of 19 districts of Haryana, 19 districts out of 32 districts of Rajasthan, 4 districts out of 12 districts of Himachal Pradesh and 6 districts out of 16 districts Chhattisgarh. According to Census 2011 there are 254 districts falling in the Ganga basin. The new three districts each in Jharkhand and Madhya Pradesh, two new districts in Haryana and each single district have increased West Bengal, Bihar, Rajasthan and Uttar Pradesh that falls in Ganga basin. The detailed administrative and demographical information is given in Annexure-I.

Demography has an important bearing on the state of the river as it is significantly affected by the population living within the basin. The river basin spreads over 239 parliamentary constituencies (2009) comprising 80 of Uttar Pradesh, 40 of Bihar, 40 of West Bengal, 25 of Madhya Pradesh, 16 of Rajasthan, 12 of Jharkhand, 8 of Haryana, 5 of Uttarakhand, 4 of Chhattisgarh, 2 of Himachal Pradesh and 7 of Delhi. The total no. of villages falling in the basin is 2,86,557 with 5,58,11,901 no. of households. The total population in this basin as per 2001 Census was estimated at about 32,91,55,760. Average population density in the Ganga basin is 520 persons per square km as against 312 for the entire country (2001 census). Two of the world largest industrial cities with population exceeding 10 million are Kolkata (population 13.2 million, 2001 Census) and Delhi (population 12.8 million), lie in Ganga basin. Other major cities of Delhi, Kolkata, Kanpur, Lucknow, Patna, Agra, Meerut, Varanasi and Allahabad are situated in the basin. The cities in the basin have large and growing populations and a rapidly expanding industrial base.

The Ganga plains are the most densely populated parts of India. In the Ganga basin the density of the population decreases from east to west and the overall density of districts in Upper Ganga is less than the districts in Middle Ganga and is less than the Lower Ganga plains. The population density is lowest in the parts of Utarakhand because of the hilly terrain and rushing rivers mainly in the tracts of the Ganga and the Ramganga. According to the Census Data 2001, Uttar Pradesh, Delhi, Bihar, West Bengal has more population density compared to the other states of the Ganga basin. The North Delhi, South Delhi, West Delhi and the East Delhi are the most populous districts in the basin with a population density greater than 20000. The other districts with highest density of population with about 10000 to 20000 are Lucknow and Varanasi districts of Uttar Pradesh, Patna district of Bihar and Hugli and Kolkata districts in West Bengal. The distribution of district-wise population density of Ganga Basin is shown in Map 13. Seasonal movement of population is very significant in the region.



Map 12. Population density

2. Hydrological Units

Semi-automated approach is used in India-WRIS project for delineation of hydrological units (basin, sub-basin and watershed) using SRTM DEM, topo maps on 1:50000 scale, IRS P6 LISS IV & CARTOSAT merged data, drainage network, surface water bodies, rail/road network and other ancillary data. The drainage divides from contour/ridge lines are used to demarcate the boundary of hydrological units. The divide has been marked where flow is in opposite directions. Hydrological boundary has been validated with reference to contours and drainage network. Hydrological unit boundary cuts perpendicular to the contour lines but it does not cross the drainage line at any location except its outlet. This approach is potentially more objective, repeatable, cost-effective, and consistent than previously adopted manual delineation methods.

In India-WRIS project, the country has been divided into three major Water Resource Division and the Ganga basin forms a major part of *All drainage flowing into Bay of Bengal* division. These divisions have been further subdivided into water resources regions based upon draining of rivers to outlet and Ganga forms the part of *Rivers draining into Bay of Bengal* region.

2.1. Sub Basins

The Ganga Basin contains **19 sub-basins** namely Yamuna Lower, Upstream of Gomti confluence to Muzaffarnagar, Tons, Sone, Ramganga, Kosi, Kali Sindh and others up to Confluence with Parbati, Gomti, Ghaghara Confluence to Gomti confluence, Ghaghara, Gandak and others, Damodar, Chambal Upper, Chambal Lower, Yamuna Middle, Yamuna Upper, Above Ramganga Confluence, Banas, Bhagirathi and others (Ganga Lower). The Yamuna Lower sub-basin (15.45%) has the largest percent drainage area of Ganga basin. The percentage distribution of sub-basins drainage area is represented in the Figure 5.

1. **Yamuna Lower**: The geographical extent of the Yamuna Lower sub-basin lies between 77° 6' to 81° 55' east longitudes and 22° 51' to 28° 1' north latitudes of the country. The Sind, the Betwa, the Dhasan, the Ken rivers are the major tributaries in the Yamuna lower sub-basin. The Yamuna Lower sub-basin is the largest sub-basin of the Ganga basin with a total catchment area of 1,24,867 Sq.km. The sub-basin majorly covers the states of Uttar Pradesh and Madhya Pradesh.

2. **Yamuna Middle**: The geographical extent of the Yamuna Middle sub-basin lies between 75° 51' to 79° 19' east longitudes and 26° 15' to 28° 43' north latitudes of the country.The major river flowing in this sub-basin is the Yamuna itself. The Yamuna Middle sub-basin of Ganga basin has a total catchment area of 34,586 Sq.km. The sub-basin covers the states of Delhi, Haryana, Rajasthan and Uttar Pradesh. Some other major rivers flowing in this sub-basin are Utangan or Banganga, Bangan, Gambhir, Kasaundi, Karwan Nadi and Jhirha.

3. **Yamuna Upper**: The geographical extent of the Yamuna Upper sub-basin lies between 75° 45' to 78° 37' east longitudes and 27° 18' to 31° 25' north latitudes of the country. The physiographical and geological features of the Yamuna Upper sub-basin which lies in the Himalayan range accounts for most of the runoff in the river. This region on an average receives a good rainfall of about 1500 mm. The Yamuna Upper sub-basin of Ganga basin has a total catchment area of 35,798 Sq.km. The sub-basin covers the states of Uttarakhand, Himachal Pradesh, Delhi, Haryana, Rajasthan and Uttar Pradesh.

4. **Chambal Upper**: The geographical extent of the Chambal Upper sub-basin lies between 74° 49' to 76° 12' east longitudes and 22° 25' to 25° 5' north latitudes of the country. The Chambal forms the major river draining in the Yamuna lower sub-basin. The Chambal Upper sub-basin of Ganga basin has a total catchment area of 25,546 Sq.km. The sub-basin drains mostly in Madhya Pradesh state and parts of Rajasthan. The other rivers that drain in this sub-basin are Sipra or Kshipra river, Gangi Nadi, Chamla river, Retam Nadi to name few. Some of the major dam falling in this sub-basin is Rana Pratap Sagar Dam, Yashvant Sagar (Corporation) Dam etc.

5. **Chambal Lower**: The geographical extent of the Chambal Lower sub-basin lies between 76° 38' to 79° 17' east longitudes and 24° 43' to 26° 55' north latitudes of the country. The Yamuna meets its tributary river the Chambal in Chambal Lower sub-basin. The Chambal Lower sub-basin of Ganga basin has a total catchment area of 10,941 Sq.km. The sub-basin drains mostly in Madhya Pradesh state and parts of Rajasthan and Uttar Pradesh.

6. **Tons**: The geographical extent of the Tons sub-basin lies between 80° 18' to 83° 20' east longitudes and 23° 58' to 25° 17' north latitudes of the country. The major river in this sub-basin the Tons is the longest tributary of the Yamuna river. It flows through Garhwal, the western part of the Himalayan state of Uttarakhand. The river originates at an elevation of 3,900 m and joins the Yamuna below Kalsi. With its source in the 6,315 m high Banderpoonch Mountain, it is the biggest tributary of the Yamuna. In fact, Tons carries more water than the Yamuna itself. It has a total catchment area of 16,905 Sq.km and drains mostly in the states of Madhya Pradesh and parts of Uttar Pradesh. Along with Tons the other major rivers that flow in this sub-basin are the Satna and the Belan rivers.

7. **Kosi**: The geographical extent of the Kosi sub-basin lies between 85° to 87° 21' east longitudes and 25° 25' to 26° 48' north latitudes of the country. Kosi is a major tributary of the Ganga river which originates at an altitude of 7,000 m in the Himalayas. The total drainage area of the Kosi river is 74,500 Sq.km out of which 11,000 Sq.km lie in India. Nearly 80 percent of the Kosi catchment is in Nepal and Tibet. About 77 percent of the area is under cultivation. The total catchment area of Kosi basin is 95,156 Sq.km of which 18,413 Sq.km lies in India. Other than the main river the Kosi and the Adhwara, the Bagmati, the Kareha, the Balan, the Kamla, the Lakhandal form some of the major river flowing in this sub-basin. The sub-basin completely falls in the Bihar state. The river is also known as *Sorrow of the Bihar* because of the frequent floods in the Kosi river.

8. **Sone**: The geographical extent of the Sone sub-basin lies between 80° 6' to 85° 4' east longitudes and 22° 40' to 25° 42' north latitudes of the country. The main river in this sub-basin the Sone is an important right bank tributary of the Ganga river. The river originates at an elevation of 600 m at Sonbhadra in the Maikala range of hills in Madhya Pradesh. The total catchment area of the basin is 65,110 Sq.km. The important tributaries of the Sone river are the Sone and the Mahanadi, the Kanhar, the Rihand, the Gopat, the Banas, the North Koel and the Ghaghar. The Rihand dam has been constructed on the Rihand river. The total length of the river is 784 km, out of which about 500 km lies in Madhya Pradesh, 82 km in Uttar Pradesh and the remaining 202 km in Bihar. The river meets the Ganga river about 16 km upstream of Dinapur in the Patna district of Bihar. The sub-basin comprises of the states of Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh and Uttar Pradesh.

9. **Ramganga**: The geographical extent of the Ramganga sub-basin lies between 78° 14' to 80° 8' east longitudes and 27° 7' to 30° 6' north latitudes of the country. The Ramganga is the first major tributary joining the Ganga. It rises at an altitude of about 3,110 m in the lower Himalayas near the Lohba village in the Garhwal district of Uttarakhand. The length of the Ramganga river from the source to the confluence with the Ganga is 596 km. During its course, the river flows through a mountainous terrain and has a number of falls and rapids. The river enters the plains at Kalagarh near the border of the Garhwal district, where the famous Ramganga dam has been constructed. Beyond Kalagarh, the river flows in a southeasterly direction and finally joins the Ganga on its left bank near Kanauj in the Fategarh district. The river flows entirely in the states of Uttarakhand and Uttar Pradesh. The catchment area of the sub-basin is about 30,839 Sq.km. The important tributaries that join the Ramganga river are the Ban, the Khoh, the Gangan, the Gagas, the Aril, the Kosi, the Haldgadi Rao and the Deoha.

10. **Gomti**: The geographical extent of the Gomti sub-basin lies between 79° 59' to 83° 14' east longitudes and 25° 25' to 28° 40' north latitudes of the country. The Gomti river originates near Mainkot, about 3 km east of the Pilibhit town in Uttar Pradesh, at an elevation of 200 m with a total length of about 940 km. The river drains the area between Ramganga and Ghaghara systems. The Gomti sub-basin of Ganga basin has a total catchment area of 29,865 Sq.km. The sub-basin completely falls in the Uttar Pradesh state. The river flows through Shahjehanpur, Kheri, Lucknow, Barabanki, Sultanpur, Faizabad, Jaunpur, Varanasi and Ghazipur districts before merging into the Ganga in Audihar in Jaunpur. Lucknow, the capital city of Uttar Pradesh, is situated on the banks of the Gomti river. The main tributaries of the Gomti river the Gachai, the Sai, the Jomkai, the Barna, the Chuha, the Saryu, the Giri, the Kalyani and the Kathna are some of the major river flowing in this sub-basin.

11. **Ghaghara**: The geographical extent of the Ghaghara sub-basin lies between 79° 29' to 84° 49’ east longitudes and 25° 47' to 30° 31' north latitudes of the country. The main river the Ghaghara and the Sarda, the Rapti, and the Little Gandak are some of the major tributaries flowing in this sub-basin. The Ghaghara river originates at an elevation of 4,800 m near Manasarowar Lake. The river is also known as Manchu and Karnali in Nepal. After flowing for about 72 km in a south-easterly direction, the river enters Nepal. Ghaghara enters into India at Kotia Ghat near Royal Bardia National Park, Nepal Ganj, where it is known as the river Girwa for about 25 km. The total catchment area of the Ghaghara river is 1,27,950 Sq.km, out of which 45 percent falls in India. The Ghaghara sub-basin of Ganga basin has a total catchment area of 58,634 Sq.km. The Sarda river is the important tributary of Ghaghara river, which forms the boundary between India and Nepal for some distance. The Sarju, Rapti and Little Gandak are the other important tributaries of the Ghaghara river. The total length of Ghaghara river before its confluence with Ganga river (at Doriganj downstream of Chhapra town in Bihar) is 1,080 km. It drains into the states of Uttar Pradesh, Uttarakhand and parts of Bihar.

12. **Ghaghara Confluence to Gomti confluence**: The geographical extent of the Ghaghara Confluence to Gomti confluence sub-basin lies between 81° 34' to 84° 47' east longitudes and 24° 34' to 26° 48' north latitudes of the country. In this sub-basin the Gomti and Ghaghara to its main Ganga river. The other rivers that are draining in this sub-basin are the Banas Nadi, the Chhoti Sarju, the Durgauti Nadi, the Gomati, the Kao Nadi, the Karamnasa and the Majhoi to name some. The Ghaghara sub-basin of Ganga basin has a total catchment area of 26,254 Sq.km. It drains into the states of Uttar Pradesh and Bihar.

13. **Gandak and others**: The geographical extent of the Gandak and others sub-basin lies between 83° 41' to 87° 44' east longitudes and 24° 0' to 27° 23' north latitudes of the country. The main river the Gandak and the Punpun, the Baya, the Mohana, the Dhadhar, the Sakri, the Harohar, the Kiul, the Badua, the Painiar, the Phalgu, the Dardhu, the Dardha, the Morhar form some of the major river flowing in this sub-basin. The Gandak and others sub-basin of Ganga basin has a total catchment area of 56260 Sq.km. It drains into the states of Bihar, Jharkhand and parts of Uttar Pradesh.

14. **Damodar**: The geographical extent of the Damodar sub-basin lies between 84° 35' to 88° 20' east longitudes and 21° 44' to 24° 25' north latitudes of the country. The Damodar sub-basin of Ganga basin has a total catchment area of 41965 Sq.km. The main river is the Damodar and the Usri, the Barakar and the Kasai is the other tributaries that are draining in Damodar sub-basin. It drains into the states of Jharkhand and West Bengal.

15. **Above Ramganga Confluence**: The geographical extent of the Above Ramganga Confluence sub-basin lies between 77° 47' to 80° 15' east longitudes and 27° 12' to 31° 28' north latitudes of the country. This sub-basin contains the main rivers like the Bhagirathi, the Alaknanda and other small rivers like the Nayar, the Song, and the Pinder. These all rivers meet to form the main the Ganga river in this sub-basin. The sub-basin has a total catchment area of 39104 Sq.km. It drains into the states of Uttar Pradesh, Uttarakhand and parts of Himachal Pradesh. This sub-basin contains the major dam like Tehri dam, Koteshwar dam and Maneri dam.

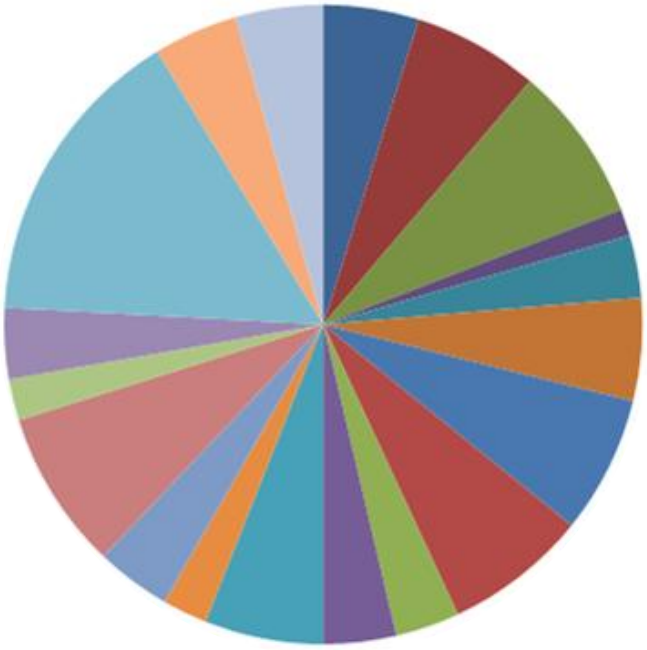
16. **Banas**: The geographical extent of the Banas sub-basin lies between 73° 24' to 76° 57' east longitudes and 24° 15' to 27° 34' north latitudes of the country. The main river is the Banas and the Morel, the Berach and the Gambhir is the other tributaries that are draining in Banas sub-basin. The Banas sub-basin of Ganga basin has a total catchment area of 51651 Sq.km. It drains into the states of Rajasthan and parts of Madhya Pradesh.

17. **Bhagirathi and others (Ganga Lower)**: The geographical extent of the Bhagirathi and others (Ganga Lower) sub-basin lies between 86° 7' to 89° 28' east longitudes and 21° 39' to 26° 56' north latitudes of the country. This sub-basin drains the main Ganga into the Bay of Bengal. The sub-basin contains many drains namely the Hoogly, the Jamuna, the Balason, the Gumani, the Mayurakshi, the Dwarka, the Bhagirathi, the Mahananda to name some. The sub-basin of Ganga basin has a total catchment area of 64038 Sq.km. It drains into the states of Bihar, Jharkhand and West Bengal

18. **Upstream of Gomti confluence to Muzaffarnagar**: The geographical extent of the Upstream of Gomti confluence to Muzaffarnagar sub-basin lies between 77° 35' to 83° 12' east longitudes and 24° 52' to 29° 37' north latitudes of the country. This forms the upstream part of Gomti river with a total catchment area of 29061 Sq.km. The sub-basin completely falls in the Uttar Pradesh state.

19. **Kali Sindh and others up to Confluence with Parbati**: The geographical extent of the Kali Sindh and others up to Confluence with Parbati sub-basin lies between 75° 15' to 77° 23' east longitudes and 22° 33' to 26° 3' north latitudes of the country. The main rivers in this sub-basin are the Kali Sindh and the Parbati and it meets with the Banas river which is tributary of the

Yamuna. The sub-basin of Ganga basin has a total catchment area of 48492 Sq.km. It drains into the states of Madhya Pradesh and Rajasthan.



- Above Ramganga Confluence Sub Basin : 4.84 %
- Banas Sub Basin : 6.39 %
- Bhagirathi and others (Ganga Lower) Sub Basin : 7.92 %
- Chambal Lower Sub Basin : 1.35 %
- Chambal Upper Sub Basin : 3.16 %
- Damodar Sub Basin : 5.19 %
- Gandak and others Sub Basin : 6.96 %
- Ghaghara Confluence to Gomti confluence Sub Basin : 3.25 %
- Ghaghara Sub Basin : 7.25 %
- Gomti Sub Basin : 3.69 %
- Kali Sindh and others up to Confluence with Parbati Sub Basin : 6.0 %
- Kosi Sub Basin : 2.28 %
- Ramganga Sub Basin : 3.82 %
- Sone Sub Basin : 8.05 %
- Tons Sub Basin : 2.09 %
- Upstream of Gomti confluence to Muzaffarnagar Sub Basin : 3.6 %
- Yamuna Lower Sub Basin : 15.45 %
- Yamuna Middle Sub Basin : 4.28 %
- Yamuna Upper Sub Basin : 4.43 %

Figure 5. Sub-basins and per cent drainage area

2.2. Watersheds

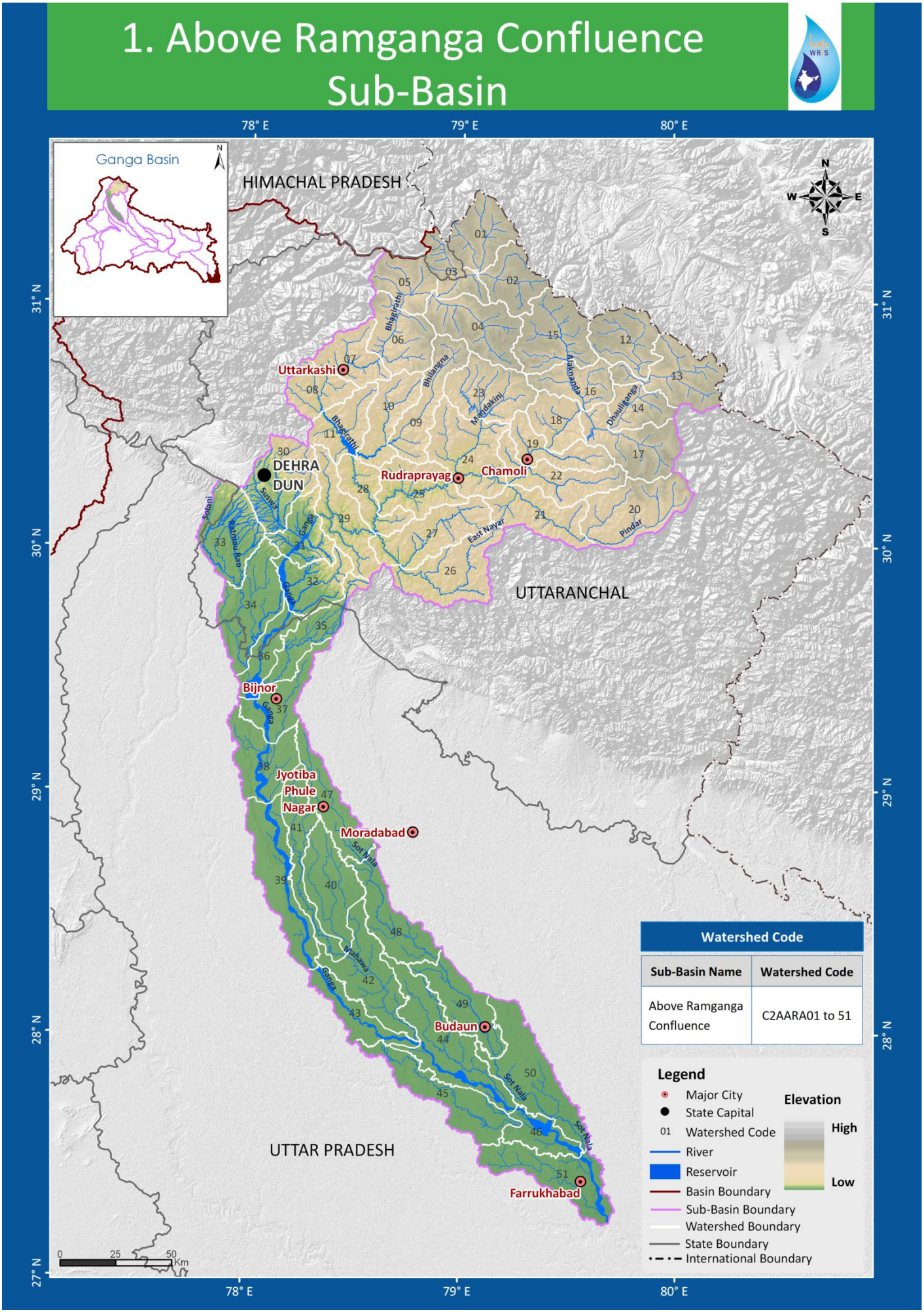
Hydrological unit wise assessment of water resources is a prerequisite for its proper management as it is fast becoming scarce in India. Sub-basins could be sub divided into smaller hydrological units namely, watershed for water resources management at larger scale (micro level). Watershed is a natural hydrological entity that covers a specific areal expanse of land surface from which rainfall flows to a defined drain, channel, stream or river at any particular point. Size of the watershed is governed by the size of stream and its boundaries.

Nineteen sub-basins of the basin have been further classified into 980 watersheds each of which represents a different tributary system for size ranging from 304 Sq.km to 1782 Sq.km with maximum number of 98 watersheds falling in Yamuna Lower sub-basin. The number of watersheds and the range of size of the watershed for the sub-basins are given in Table 6.

Table 6. Sub-basin wise watersheds

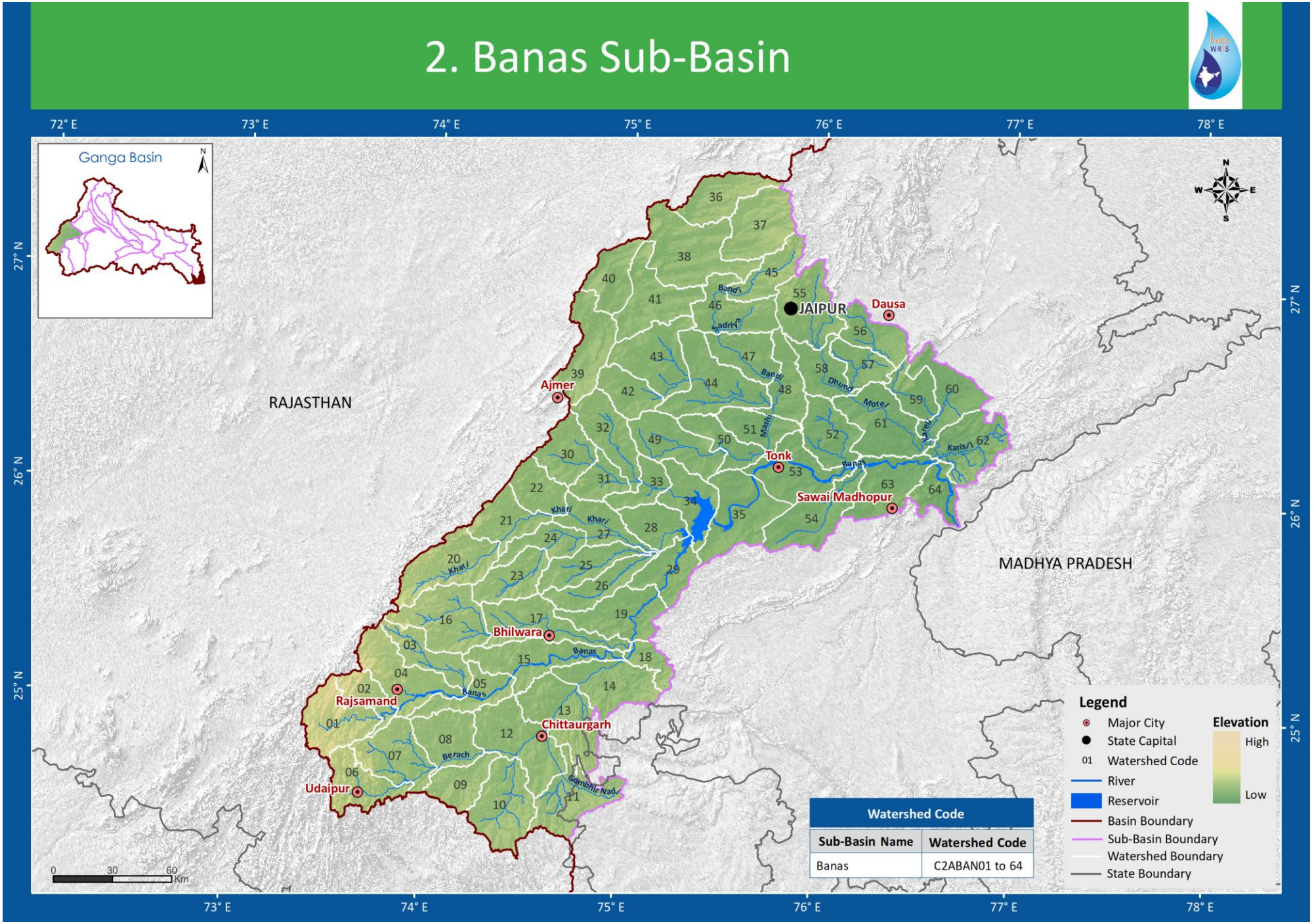
Sub Basin	Area (Sq.km.)	Size Range of Watershed	No. of Watersheds
Above Ramganga Confluence Sub Basin	39104.61	430.18 - 1301.20	51
Banas Sub Basin	51651.51	330.66 - 1432.97	64
Bhagirathi and others (Ganga Lower) Sub Basin	64038.97	308.24 - 1754.95	75
Chambal Lower Sub Basin	10941.26	405.59 - 1135.93	14
Chambal Upper Sub Basin	25546.57	405.14 - 1403.97	30
Damodar Sub Basin	41965.49	326.16 - 1301.09	60
Gandak and others Sub Basin	56260.43	334.87 - 1308.88	76
Ghaghara Confluence to Gomti confluence Sub Basin	58634.18	372.40 - 1761.77	36
Ghaghara Sub Basin	26254.06	374.93 - 1300.49	76
Gomti Sub Basin	29865.21	333.29 - 1330.50	41
Kali Sindh and others up to Confluence with Parbati Sub Basin	48492.61	429.86 - 1275.01	64
Kosi Sub Basin	18413.58	303.77 - 1694.96	19
Ramganga Sub Basin	30839.69	350.05 - 1442.76	40
Sone Sub Basin	65110.05	380.66 - 1389.01	83
Tons Sub Basin	16905.74	442.40 - 1173.36	23
Upstream of Gomti confluence to Muzaffarnagar Sub Basin	29061.37	364.16 - 1281.12	40
Yamuna Lower Sub Basin	124867.19	735.54 - 1781.43	98
Yamuna Middle Sub Basin	34586.39	410.43 - 1232.25	43
Yamuna Upper Sub Basin	35798.19	321.77 - 1241.11	47

The sub-basins wise watershed maps of Ganga basin are shown below from Map 14a to Map 14s along with their watershed code. The white boundary within the basin represents delineated watersheds. Each watershed is given an 8 digit alphanumeric code for identification. Each letter in the code has a description. For example if watershed code is C2AARA01, the first alphabet (**C**2AARA01) stands for the Water Resource Region (India-WRIS). Following 2 digits represents basin code (C**2A**ARA01) and the next three letters (C2A**ARA**01) represents sub basin name which is followed by watershed number (C2AARA**01**).

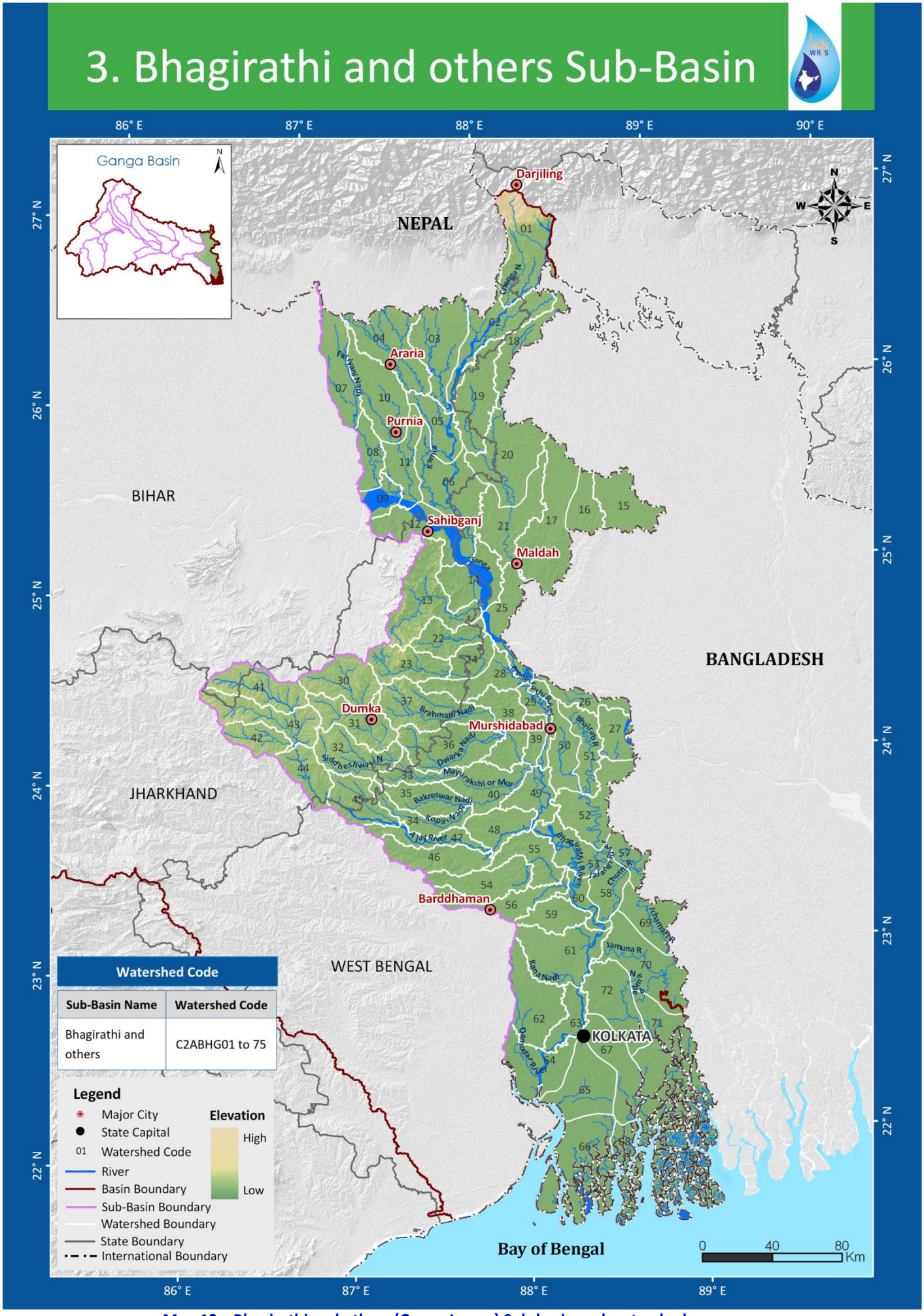


Map 13a. Above Ramganga Confluence Sub-basin and watersheds

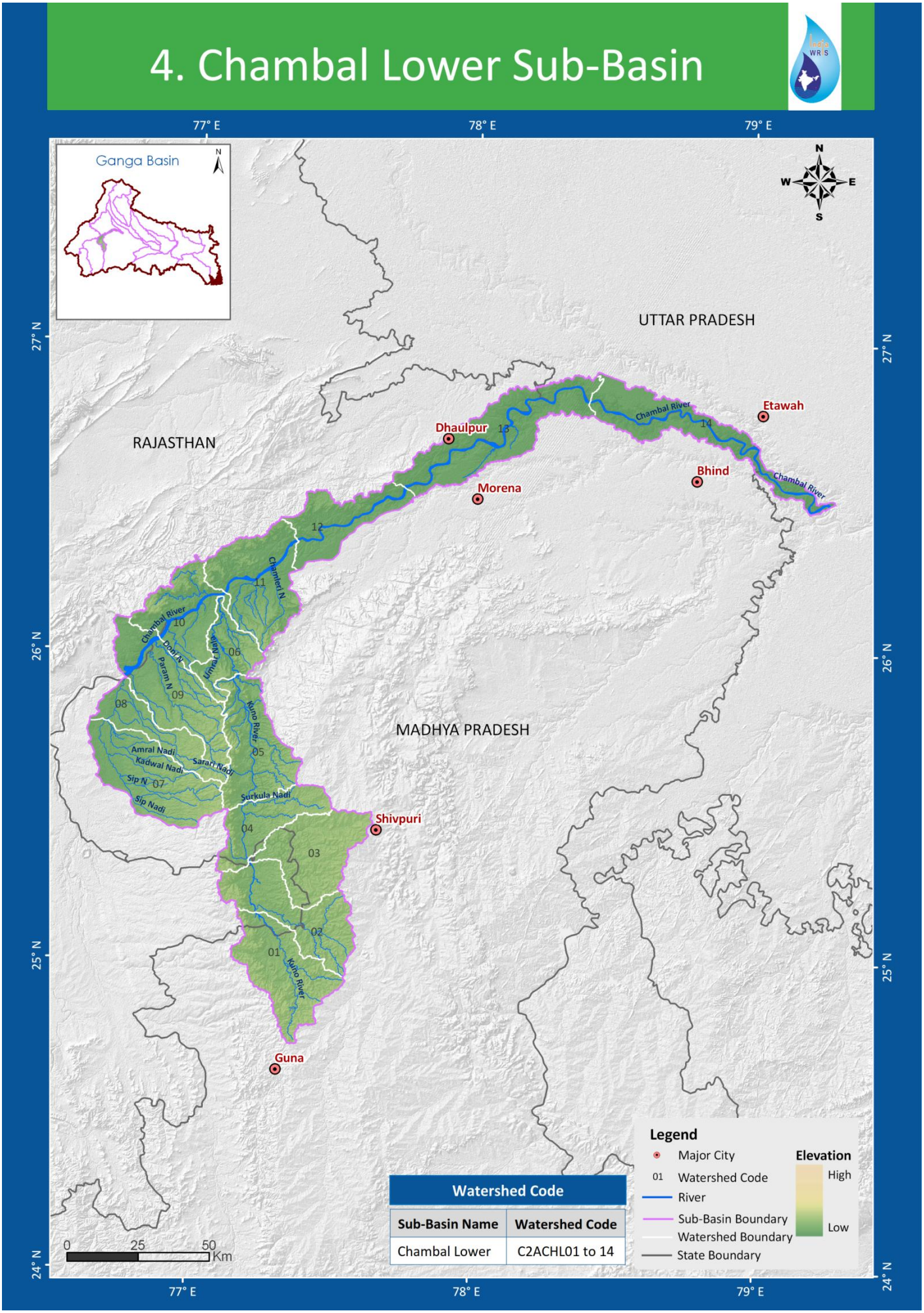
2. Banas Sub-Basin



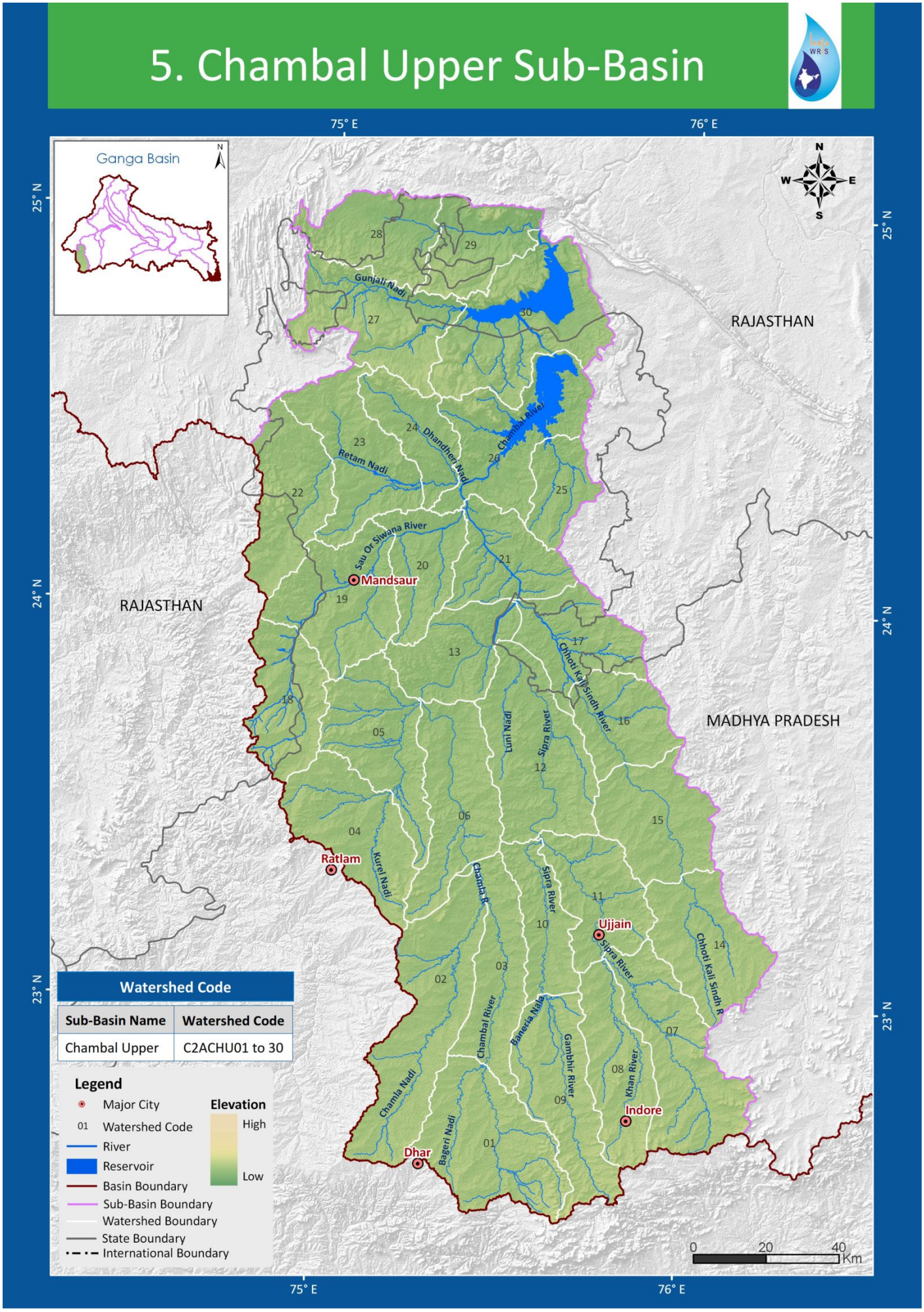
Map 13b. Banas Sub-basin Basin and watersheds



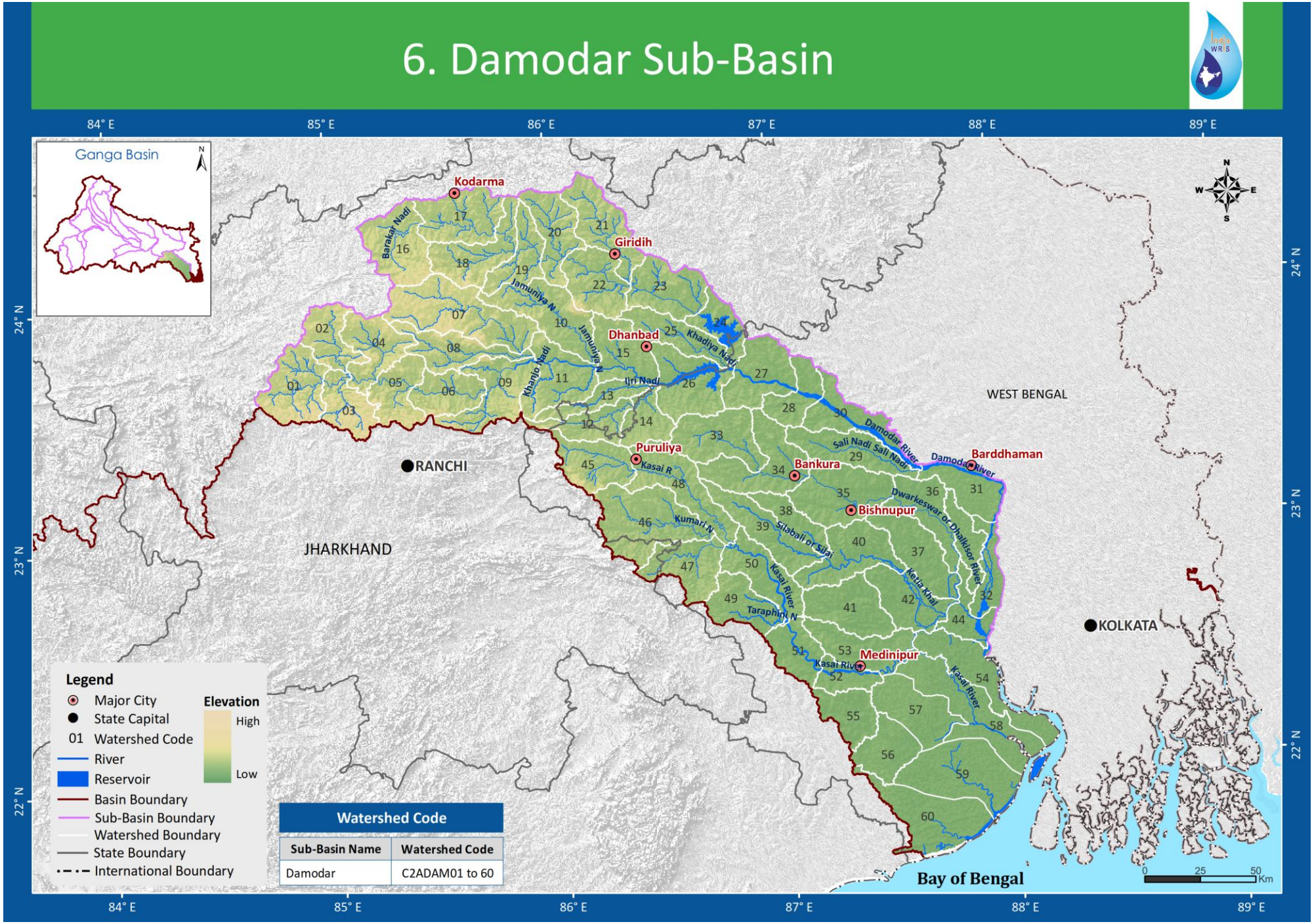
Map 13c. Bhagirathi and others (Ganga Lower) Sub-basin and watersheds



Map 13d. Chambal Lower Sub-basin and watersheds

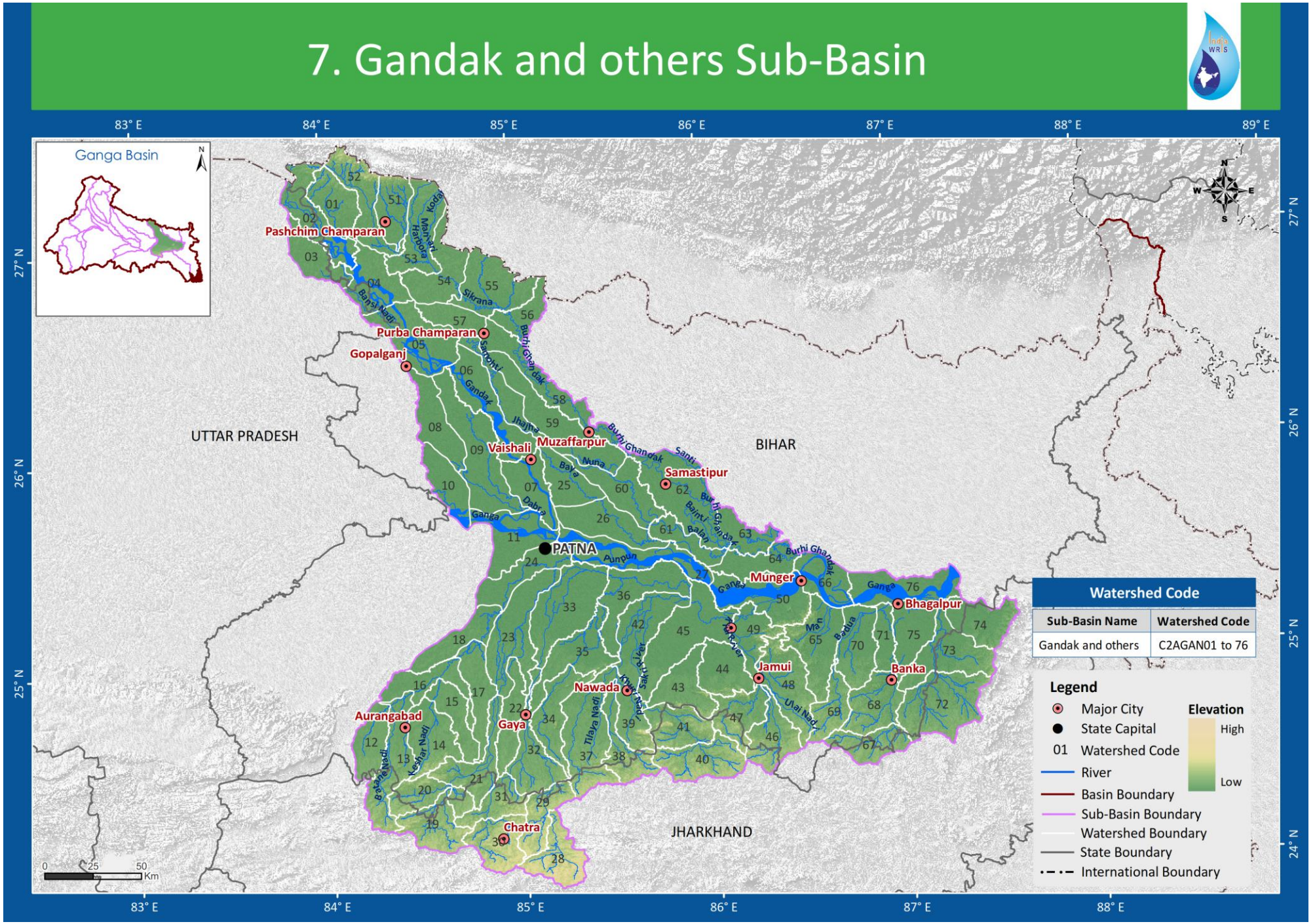


Map 13e. Chambal Upper Sub-basin and watersheds

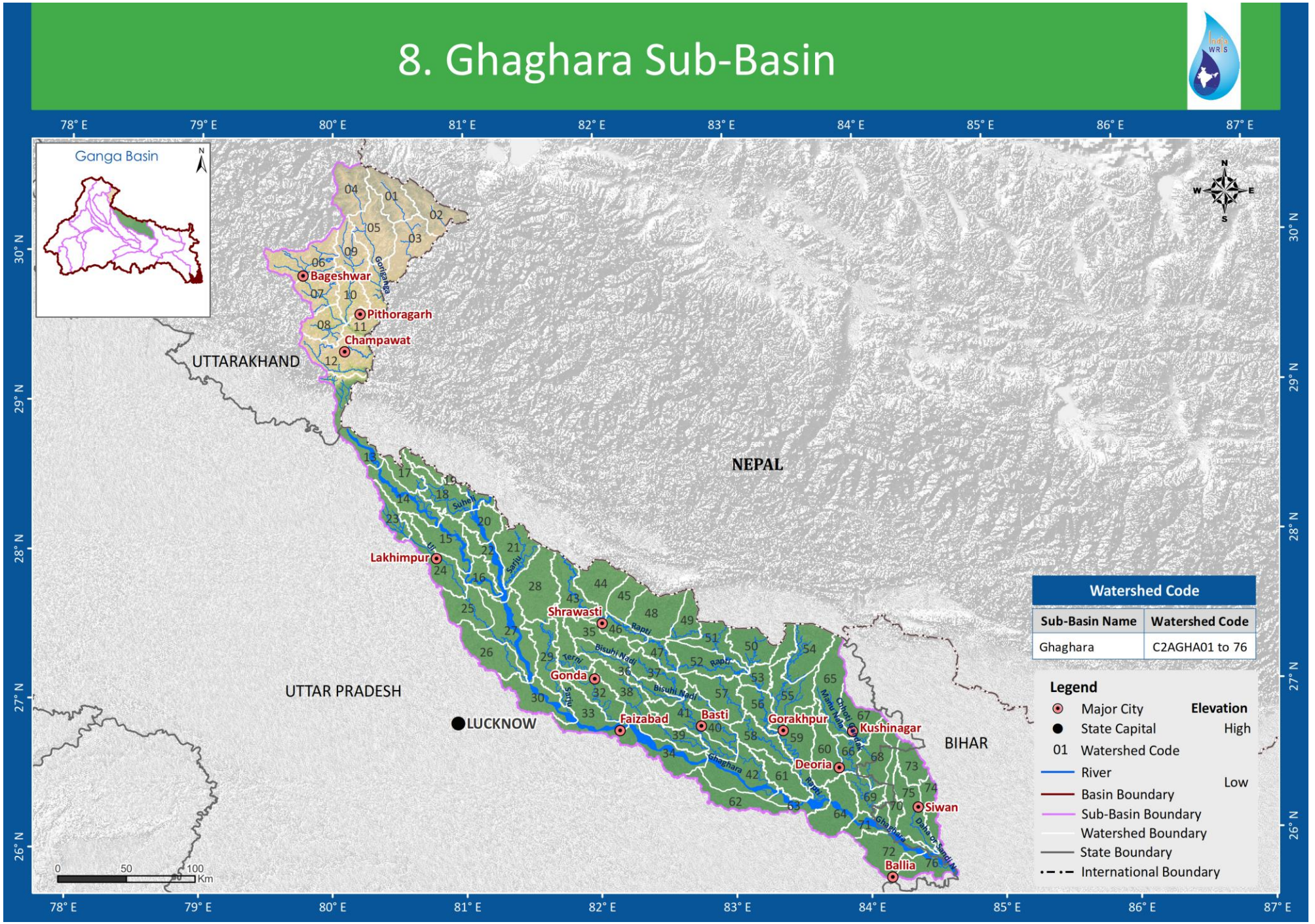


Map 13f. Damodar Sub-basin and watersheds

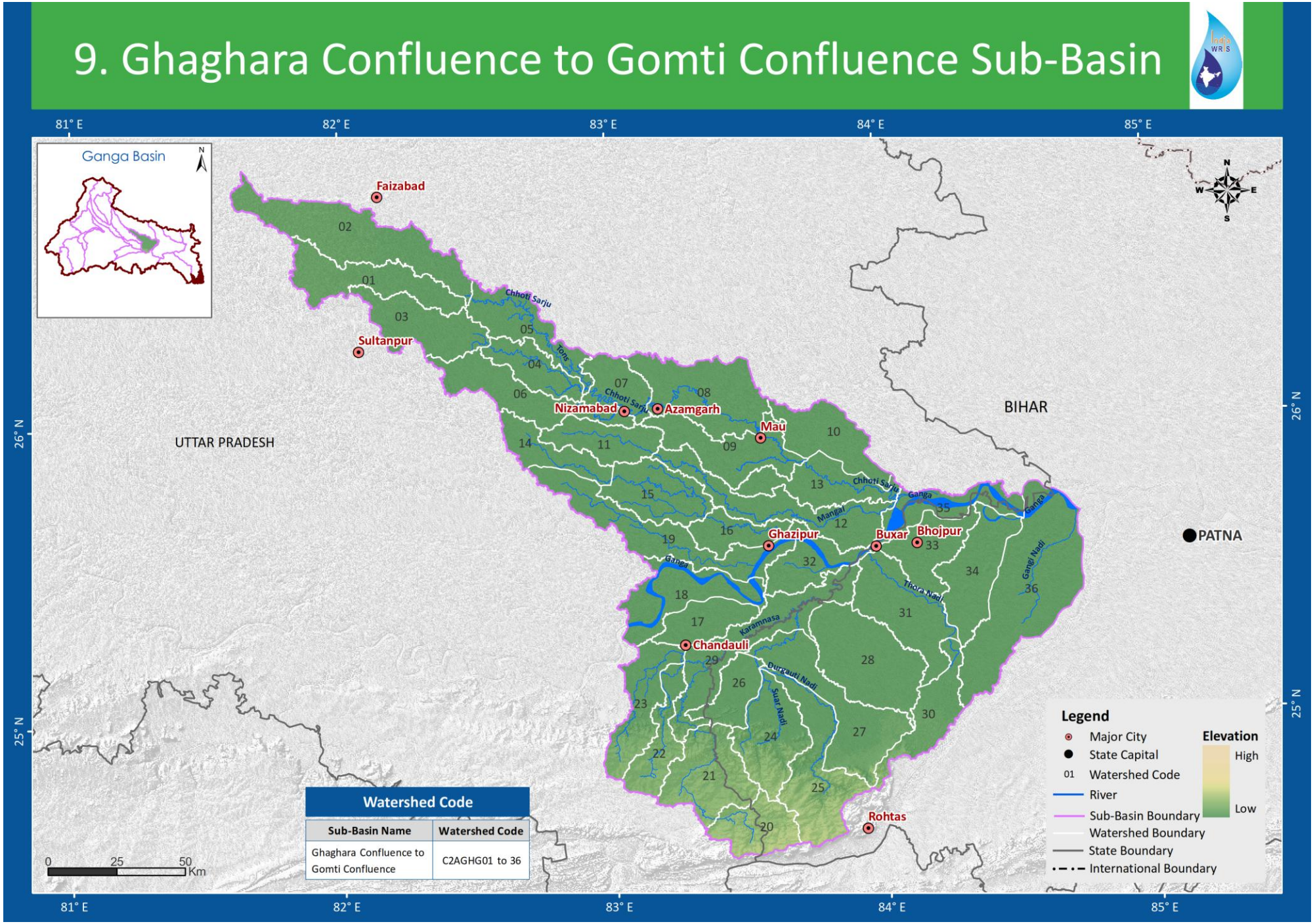
7. Gandak and others Sub-Basin



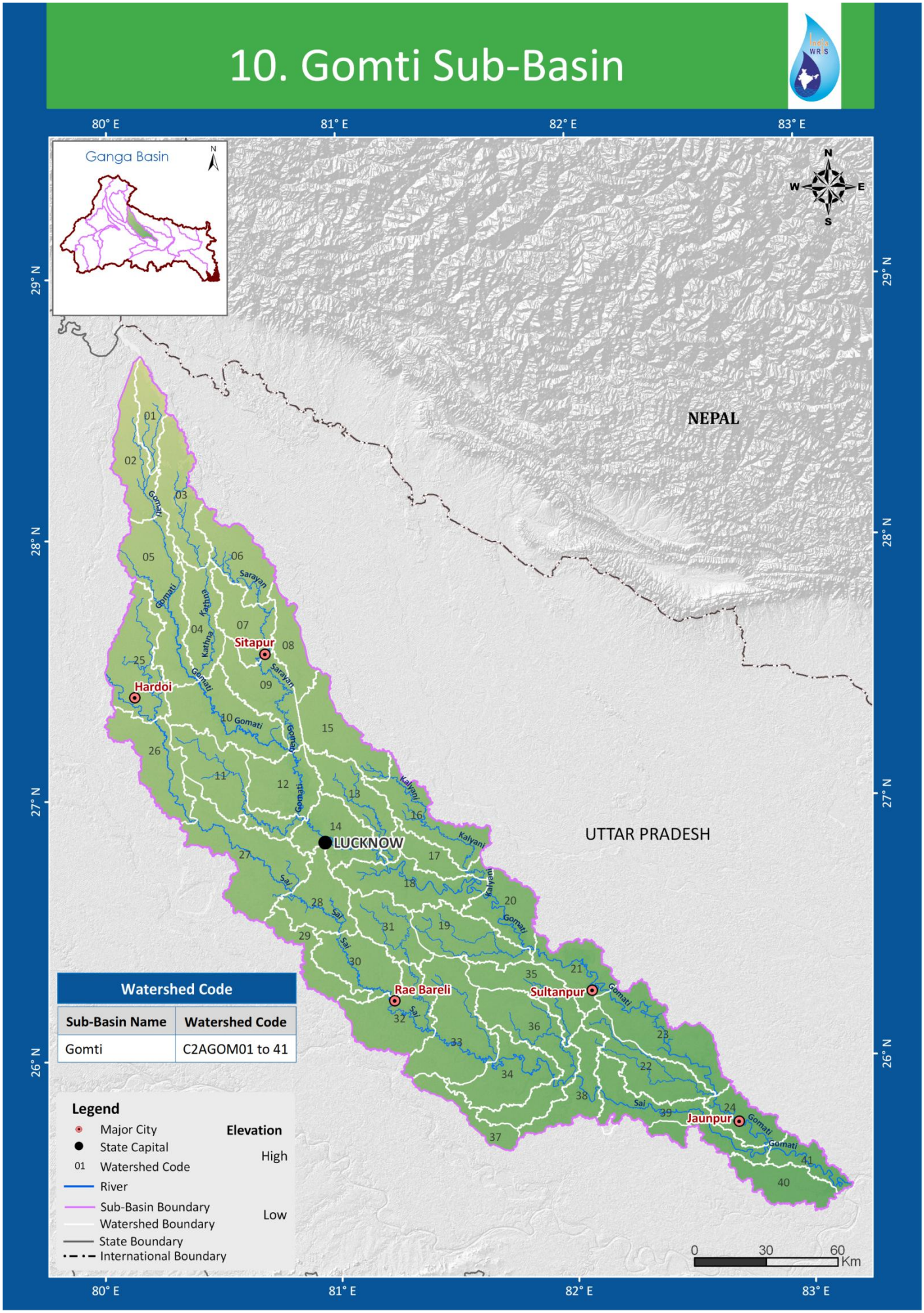
Map 13g. Gandak and others Sub-basin and watersheds



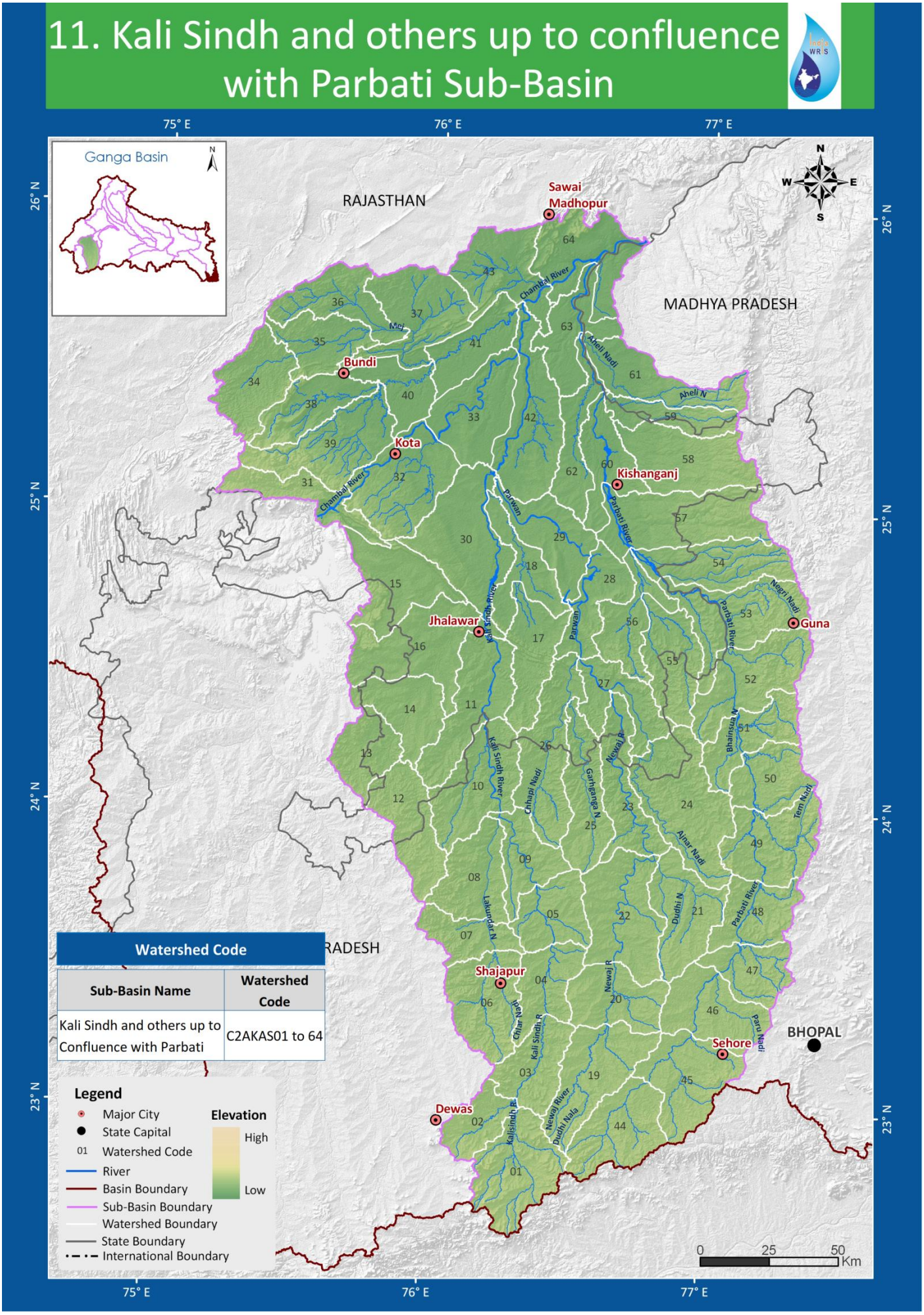
Map 13h. Ghaghara Sub-basin and watersheds



Map 13i. Ghaghara Confluence to Gomti confluence Sub-basin and watersheds



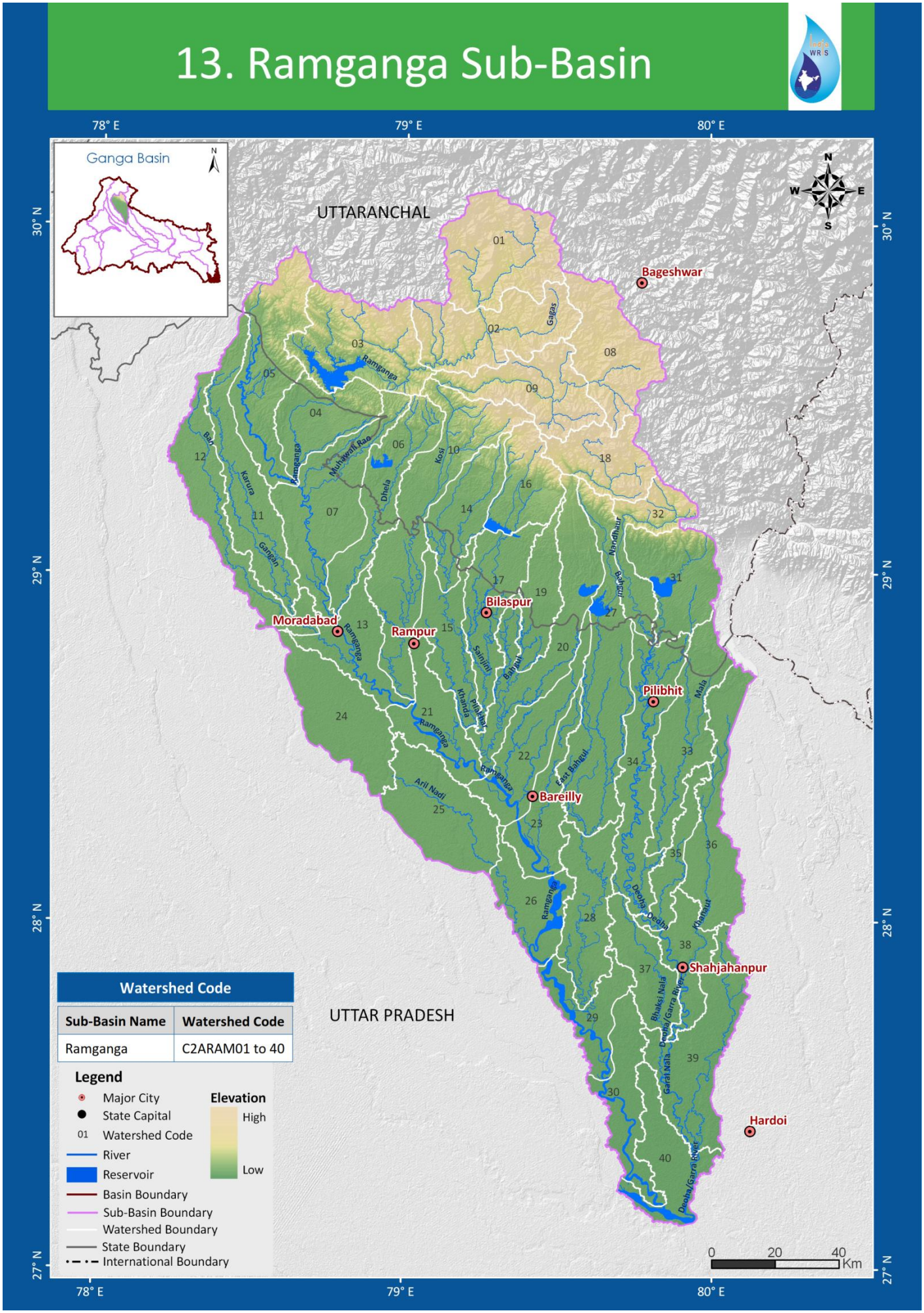
Map 13j. Gomti Sub-basin and watersheds



Map 13k. Kali Sindh and others up to Confluence with Parbati Sub-basin and watersheds

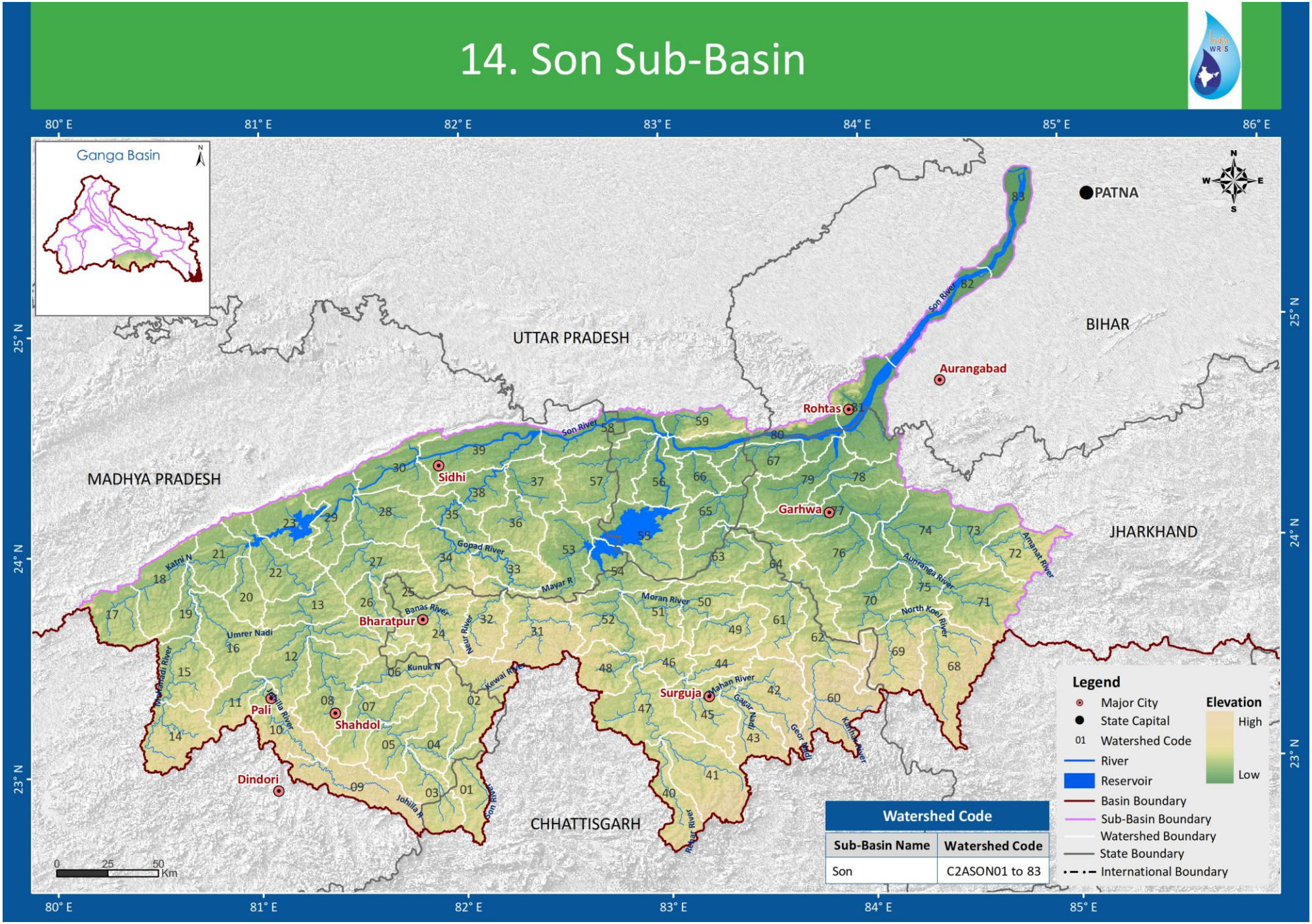
12. Kosi Sub-Basin

Map 13l. Kosi Sub-basin and watersheds



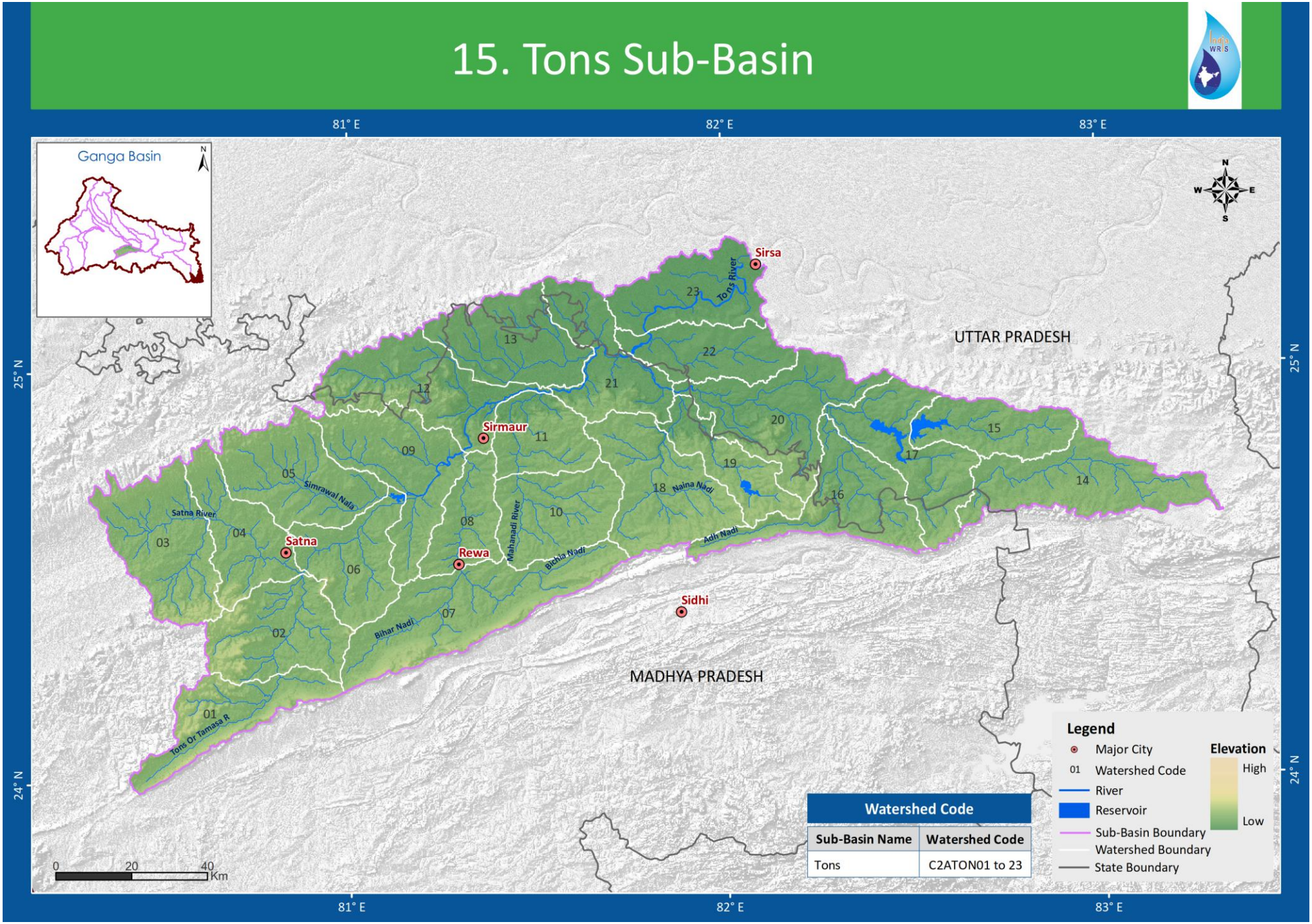
Map 13m. Ramganga Sub-basin and watersheds

14. Son Sub-Basin

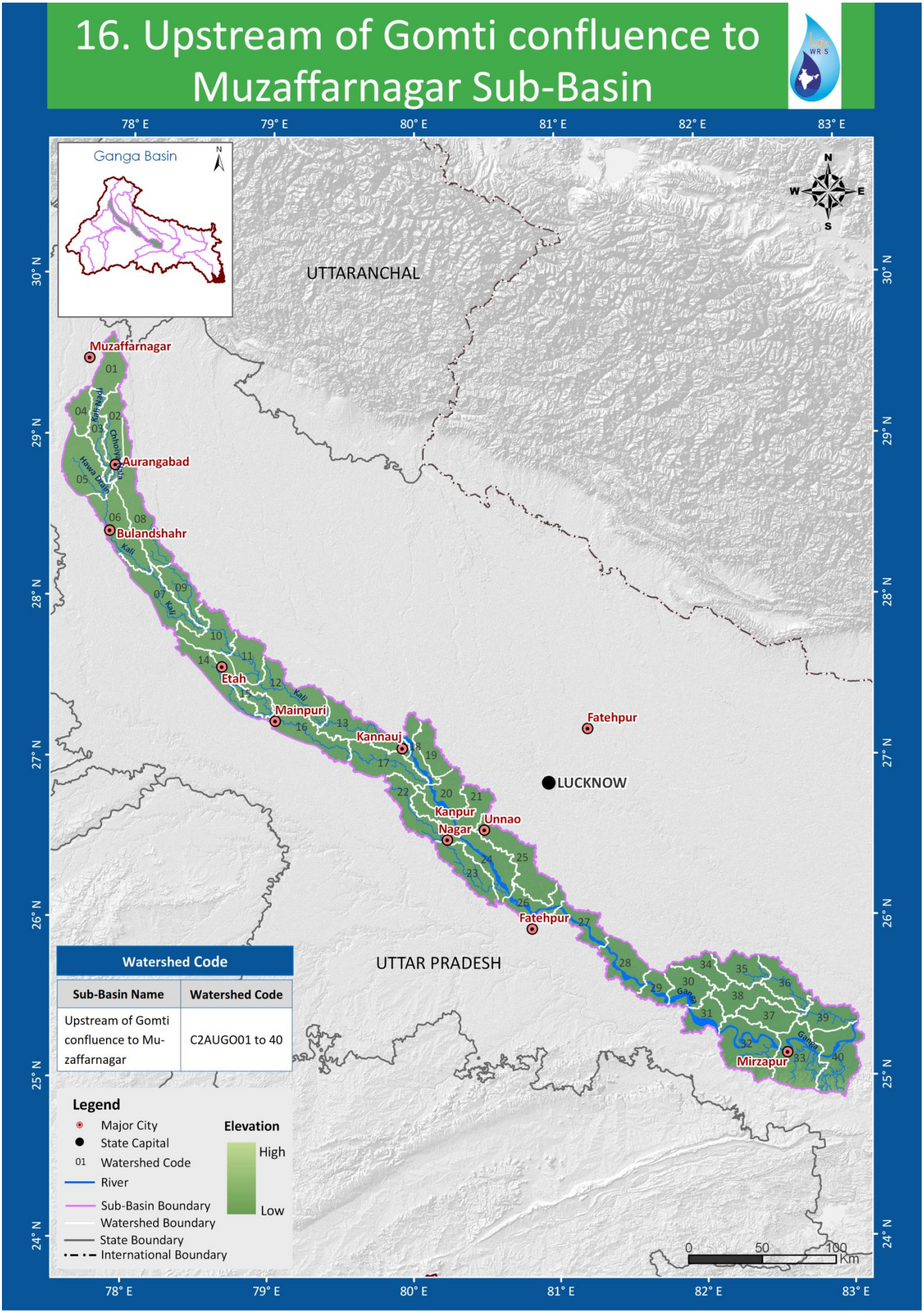


Map 13n. Sone Sub-basin and watersheds

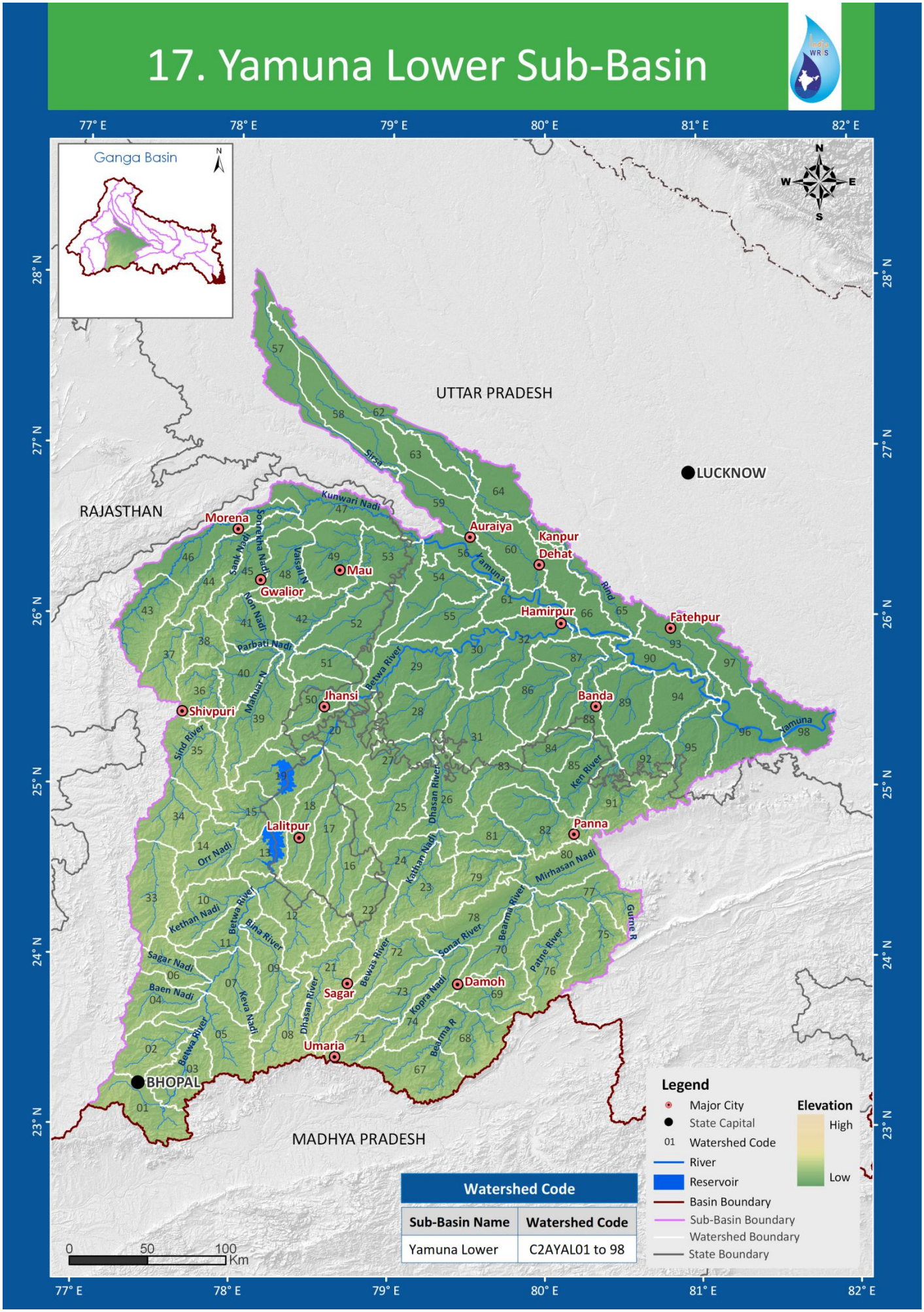
15. Tons Sub-Basin



Map 13o. Tons Sub-basin and watersheds

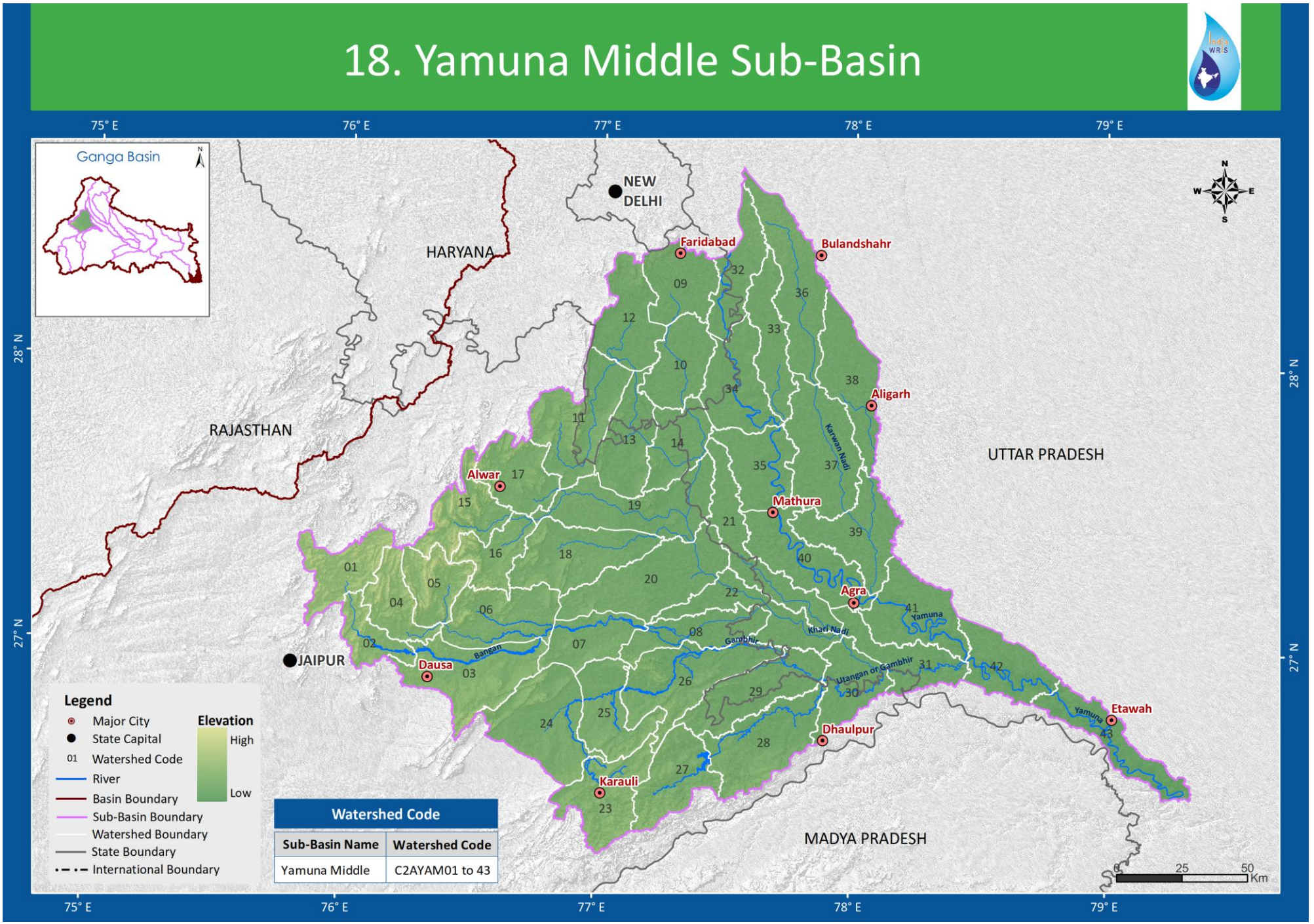


Map 13p. Upstream of Gomti confluence to Muzaffarnagar Sub-basin and watersheds

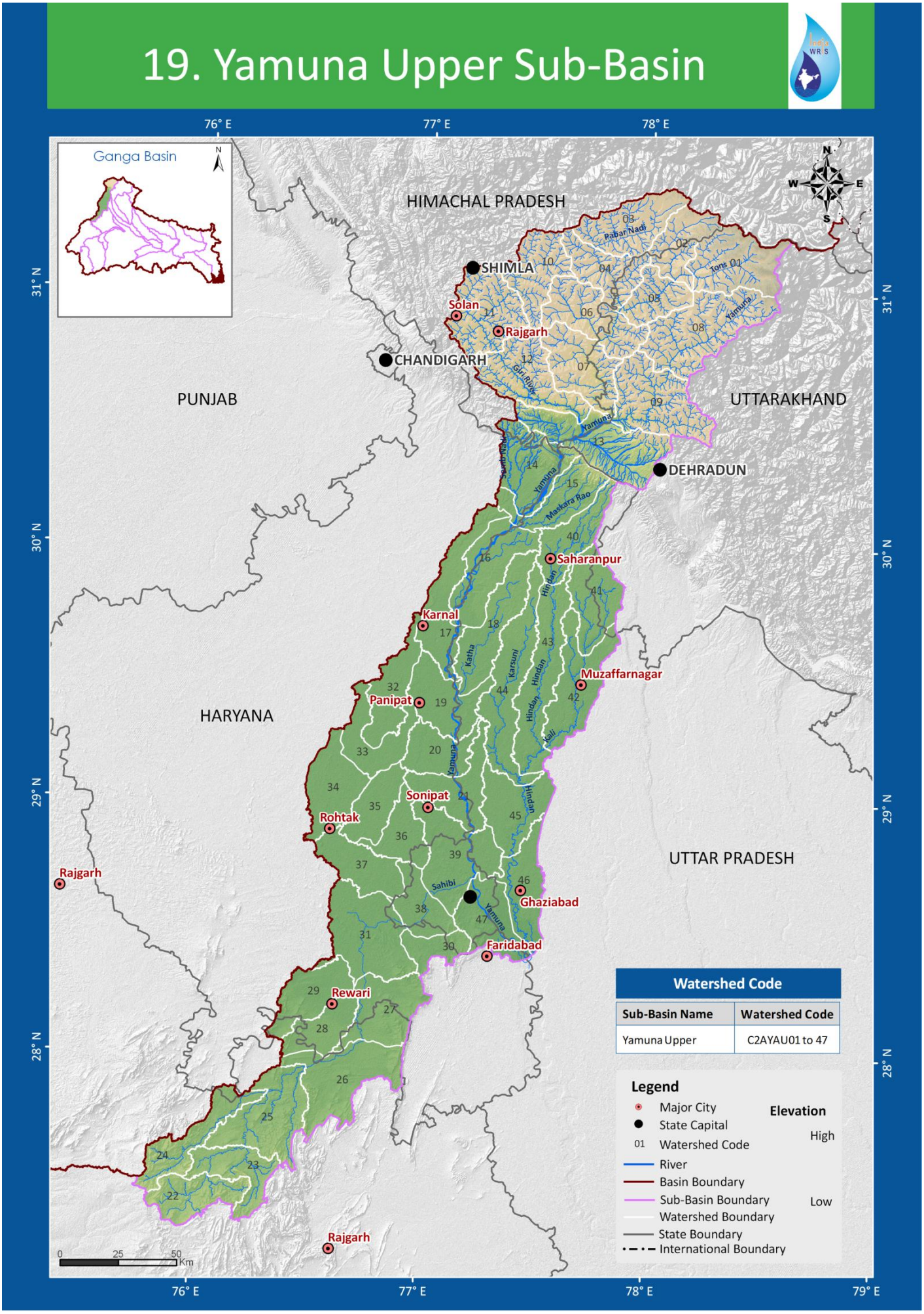


Map 13q. Yamuna Lower Sub-basin and watersheds

18. Yamuna Middle Sub-Basin



Map 13r. Yamuna Middle Sub-basin and watersheds



Map 13s. Yamuna Upper Sub-basin and watersheds

3. Surface Water Resources

Surface water is water in a river, lake or fresh water wetland. Surface water is naturally replenished by precipitation and naturally lost through discharge to the oceans, evaporation, evapotranspiration and sub-surface seepage. Although the only natural input to any surface water system is precipitation within its watershed, the total quantity of water in that system at any given time is also dependent factors like storage capacity in lakes, wetlands and artificial reservoirs, the permeability of the soil beneath these storage bodies, the runoff characteristics of the land in the watershed, the timing of the precipitation and local evaporation rates.

The rainfall, subsurface flows and snow melt from glaciers are the main sources of water in river Ganga. More than 60 percent of the water flowing into the Ganga basin comes from the Himalayan streams joining the Ganga from the north. The Peninsular streams combine to contribute only 40 percent of the water, despite the fact that the catchment area of the peninsular streams extends well over 60 percent of the entire Ganga basin. The reported average Water Resources Potential of Ganga basin is 525 BCM. According to the assessment, the total utilizable surface water resource in the Ganga is 250 BCM. The tributaries which contribute the largest amount of water per annum are, the Ghaghara including the Gomti (113.5 BCM), followed by Kosi-Mahananda (81.85 BCM), the Gandak- Burhi Gandak together (58.96 BCM), Yamuna (57.2 BCM), Sone-East of Sone (44.14 BCM), the Chambal (32.55 BCM) and Ramganga (17.79 BCM).

3.1 Surface Waterbodies

Surface water bodies have traditionally played an important role in the lives of common people in India by way of irrigation, drinking water supply, ecology, tourism and domestic uses. The Ganga basin as on today possesses some of the major water reservoirs. A reservoir is an artificial lake created by construction of a dam across the river specifically for hydro power generation, irrigation and water supply for domestic/industrial needs, flood control. There are reportedly 825 reservoirs in the Ganga basin. The Ganga basin consists of about 2,76,947 surface water bodies. The majority of water bodies that accounts 98.9 percent of total waterbodies having a size range of 0-25 ha. There are 23 major waterbodies which have size more than 2,500 ha; Bansagar reservoir located at Manakisar in Madhya Pradesh is the highest water body with an area of about 43,231 ha.

Table 7. Number and size of waterbodies

Sl. No.	Size Range (ha)	No. of Waterbodies
1	0 - 25	274072
2	25 - 50	1586
3	50 - 100	697
4	100 - 250	364
5	250 - 500	110
6	500 - 1000	61
7	1000 - 2500	34
8	More than 2500	23

The other major waterbodies with area more than 2,500 ha are Gobind Ballabh Pant Sagar/Rihand, Kali Kanch Jhil in Uttar Pradesh, Gandhi Sagar reservoir located near Kheda, Matatila reservoir located at Gareth and Samrat Ashok Sagar (Halali) located near Kabula in Madhya Pradesh, Bisalpur Dam near Tonk, Ranapratap Sagar reservoir located at Kota, Sambhar Lake in Rajasthan, Ramganga reservoir near Kalagarh (Bijnor), Tehri reservoir at Uttarkashi and Nanak Sagar reservoir at Nainital in Uttarakhand, Panchat Hill reservoir located at Dhanbad, Maithon located at Jamtara, Tilaiya located at Tenughat and Masanjor located at Sirsa in Jharkhand, Kangsabati located in West Bengal and

Kabar Tal in Bihar. The waterbodies in the basin are classified in 8 classes based on its size according to their water spread area and their frequency in each class is given in the Table 7.

The Ganga basin consists of surface water bodies in the form of Lakes/Pond, Reservoir, Tank, Cooling pond, abandoned quarry with water, Ox-bow Lake, Aquaculture pond, Salt pan, Island, Lagoon. Type wise coverage of the different waterbodies is shown in the Figure-6. Abandoned quarry with water are the most predominant with 1,38,386 in number and forms about 50.01 percent of total water bodies in the basin. They are maximally found in major parts of Bihar and West Bengal.

Other major waterbodies includes 97,383 Tanks that consitutues about 35.19 percent of total surface waterbodies in the basin. Tanks are small lakes of impounded waterways constructed on land surface for irrigation with maximum in Madhya Pradesh. Some of the major tanks in the basin are Patra Jhil in Jharkhand, Chhunchakhola Bil, Bejor Bil and Beri Bangar in West Bengal, Sarotar Chaur, Kaitya Dih, Bill Tal and Salah Chaur in Bihar, Gora Tal, Berchha Tank, Lekora Talao and Jagat Sagar in Madhya Pradesh and Munsakhand Bandh, Madan Sagar, Dah Puraina, Bijainagar Sagar and Kitham in Uttar Pradesh.

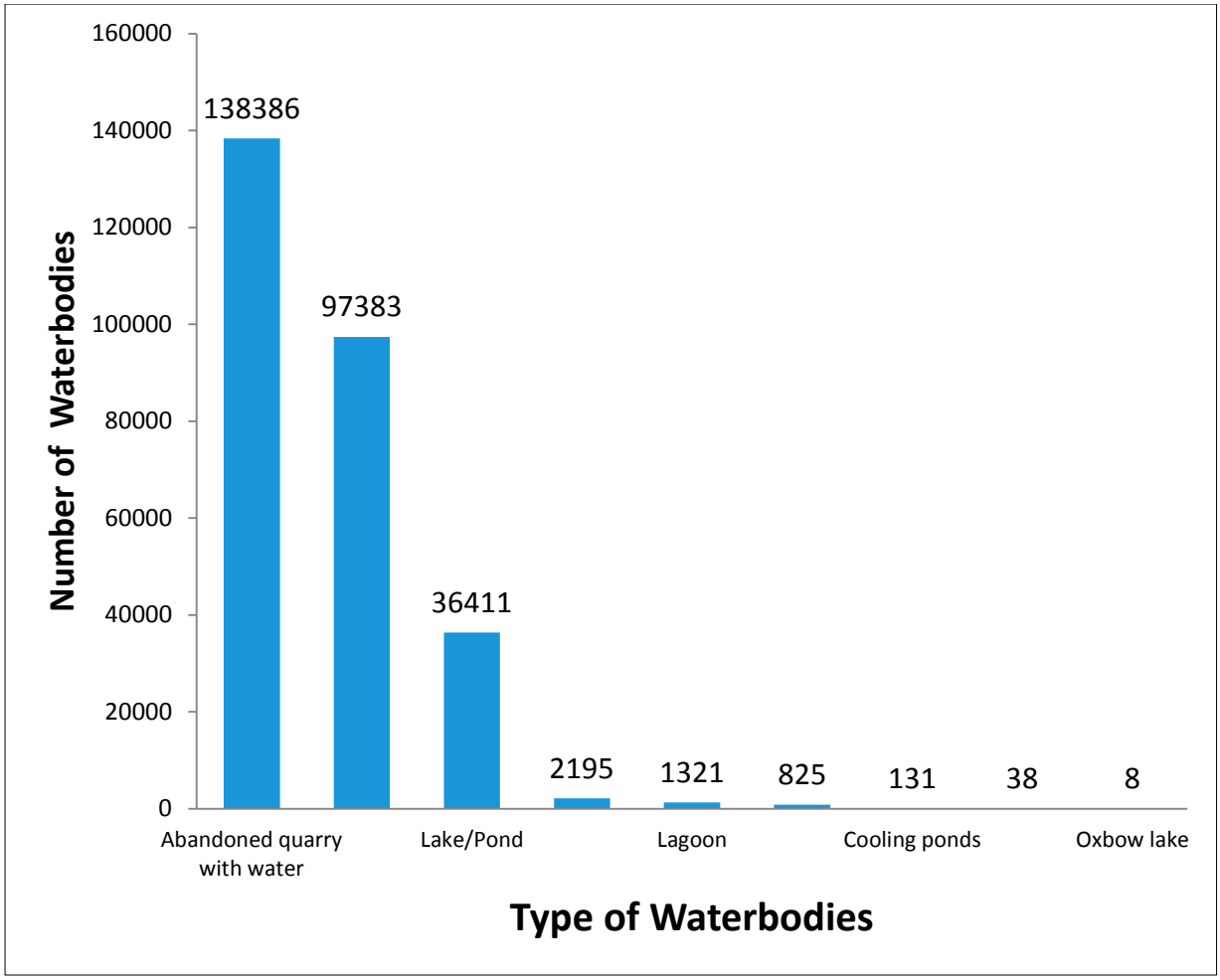


Figure 6. Type and number of waterbodies

The Lakes/ponds accounts for about 13.16 percent of total surface waterbodies with a total of 36,411 lakes in the basin. In general, it refers to accumulation of water in a depression of various sizes either natural or man-made. Ponds are regular in shape, smaller in size than a lake, natural or artificial, and generally located near settlements. The Sambhar Lake in Rajasthan is the largest lake in the basin. The Bhimsagar, Benthali, Basundni, Bilas and Chappi Lake in Rajasthan, Bela Sagar, Kaladeh and Chillua Tal in Uttar Pradesh, Kabar Tal in Bihar and Kali Kanch Jhil in Uttarakhand is some other important lakes in the basin.

The ox-bow lake is U-shaped bend in a running stream. They are mostly found in the lower Ganga plain where four are located near Jadunathbati, Bodhora, Khilgram and Poin in West Bengal; two are located at Bagru in Jharkhand and one each in Madhya Pradesh and Rajasthan. The Salt pans in the basin are mostly situated in the states of Bihar, Jharkhand, Rajasthan and West Bengal. The other category of surface water bodies, Lagoons are mostly found in West Bengal and some of the lagoons in West Bengal are Amda Bil, Beler Bil, Chakla Bil, Chapra Bil, Dhapa Bil, Galda Bil, Gargari Bil, Gazna Bangar, Ghoba Bil, Haura Bil, Jala Bil, Jamuna Dighi, Kulia Bil, Mahishmari Bil, Margangni Bil, Moalia Bil, Nigre Bil, Padina Bil, Padma Bil, Panikhali Bil, Santler Bil and Tengramara Bil.

3.2 Water Resource Projects

There are numerous Water Resources Projects in the basin which includes major and medium irrigation projects, ERM projects and hydro-electric Projects and their numbers are given in Table 8. The Ganga has total 5,25,020 MCM as average water resource potential out of which 2,50,000 MCM is utilizable surface water potential. The total live storage capacity of the Ganga basin is 60,660 MCM where live storage capacity of completed projects is 42,060 MCM and that under construction is 18,600 MCM. The water resource assets in the course of the Ganga starting from the origin are as follows: In Uttarakhand, Tehri dam has been built on Bhagirathi for hydropower generation resulting in regulated additional water during the dry months. At Haridwar, Ganga opens to the Gangetic Plains, where a Bhimogoda barrage diverts a large quantity of its waters into the Upper Ganga Canal, to provide water for irrigation. At Bijnor, Madhya Ganga barrage diverts water into the Madhya Ganga Canal but only during monsoon months. At Narora, there is further diversion of water into the Lower Ganga Canal by Narora Barrage. Further down, the Farakka barrage in West Bengal regulates the flow of the river, diverting some of the water into a feeder canal linking Hooghly to keep it relatively silt-free. It is to make the river navigable and make Diamond Harbour functional. Downstream of this barrage, the river Ganga splits, into two, Bhagirathi (Hooghly) on the right and Padma on the left. Bhagirathi (Hooghly) meets the Bay of Bengal about 150 km downstream of Kolkata. Padma enters Bangladesh and meets river Brahmaputra and Meghna before finally joining the Bay of Bengal.

Table 8. Number of water resources projects

Sl. No.	Type of Projects	Number of Projects
1	Major Irrigation Projects	144
2	Medium Irrigation Projects	334
3	ERM Projects	31
4	Hydro-Electric Projects	39

The Ganga, being a major basin in the country has various Central and interstate bodies involved in its planning, development and management of the water resources in the basin. The Damodar Valley Corporation (DVC), established for the promotion and operation of schemes in the Damodar Valley for its all-round development, is the earliest such organization with the participating states Bihar and West Bengal along with the Central Water Commission providing assistance in the reservoir regulation of the DVC system. The Ganga Flood Control Commission (GFCC) was set up in 1972 by the Ministry of Water Resources, Govt. of India, for preparing a comprehensive plan of flood control for the basin and providing technical guidance to the involved states. Another important organization, the Betwa river Board was set up in 1973 for the execution of the interstate Rajghat dam on Betwa in accordance with the interstate agreement between Uttar Pradesh and Madhya

Pradesh. Similarly the Bansagar Control Board was constituted in 1976 for the early execution of Bansagar dam on Sone sub-basin which is an interstate project of Uttar Pradesh, Madhya Pradesh and Bihar.

Some of the major water resource projects of Ganga basin are Tehri Project (UP & THDC), Yamuna Canal System in Haryana and Uttar Pradesh, Agra & Gurgaon Canal System in Haryana, Uttar Pradesh and Rajasthan, Sarda Complex project between Uttar Pradesh and Nepal, Chambal System of Madhya Pradesh and Rajasthan, Betwa Complex systems of Madhya Pradesh and Uttar Pradesh, Ken System of Madhya Pradesh and Uttar Pradesh, Bansagar Complex between Madhya Pradesh, Uttar Pradesh and Bihar, Sone Canal System in Bihar, Gandak System of Bihar, Uttar Pradesh and Nepal, Kosi System in Bihar and Nepal, Mayurakshi System of Jharkhand and West Bengal, Damodar Valley Corporation (DVC) System of Jharkhand and West Bengal. For these projects various associated dams are also being constructed and important among them are the Koteshwar dam, Rihand dam, Ban Sagar dam, Gandhi Sagar dam, Madikheda (Mohini Sagar) dam, Rana Pratap Sagar dam, Rajghat dam, Rajsamand dam, Jawahar Sagar dam, Tehri dam, Tigra dam. Among the projects under construction, the some of the important ones are the Mahanadi reservoir project, North Koel dam, Durgawati dam, Bhairwa dam, Sagad dam, Garhi dam, Sugathan dam, Kacchal dam, Newari dam. The proposed constructions are Rehti dam, Gaighat dam, Jamrani dam, Lakhwar dam etc.

3.2.1. Major and Medium Irrigation Projects

There are 478 number of medium or major irrigation projects as per India-WRIS database commanding of about 36.12 percent total geographical area of the basin. Nearly half of this command area falls in Uttar Pradesh which, at 97.13 percent coverage, is almost entirely blanketed by irrigation projects. Though Bihar has second largest command area (59,392 Sq.km.), Haryana has second highest command area (38,683 Sq.km) in terms of percentage geographical area (87.5 %). The Madhya Pradesh state, despite having the most overall projects with 364, achieves only the third highest total command area at about 48,628 Sq.km and a mere 15.78 percent coverage due to the fact that most of its projects are of a medium size. Where as, Himachal Pradesh area has the least irrigation command area that is 0.64 percent of its total geographic area.

The major and medium irrigation projects in the basin are distributed like 107 MMIR projects in Uttar Pradesh, 98 projects in Rajasthan, 82 projects in Madhya Pradesh, 77 projects in Jharkhand, 56 projects in Bihar, 31 projects in West Bengal, 12 in Uttarakhand, 6 projects in Haryana, 4 projects in Chhattisgarh, and one project in Himachal Pradesh. Some of the major irrigation projects in Ganga basin are Sutlej-Yamuna Canal Major Irrigation Project (Haryana), Sarda Canal Major Irrigation Project (Uttar Pradesh), Saryu Nahar Pariyojana Major Irrigation Project (Uttar Pradesh), Ramganga Canal Major irrigation Project (Uttar Pradesh). The more details of each Major and Medium Irrigation Projects along with their surrogate information are provided in the Annexure IV-C.

There are 45 Lift Irrigation Schemes in the Ganga basin and their geographical locations are shown sub-basin wise in the maps from Map 16.a to Map 16.s. They are spread in four states with 27 projects in Uttar Pradesh, 9 projects in Bihar, 6 projects in Haryana and 3 projects in Madhya Pradesh. Out of 19 sub-basins of Ganga, only 10 sub-basin have lift irrigation schemes. The Yamuna Lower sub-basin contains the maximum 7 lift schemes out of which six are in Uttar Pradesh and one in Madhya Pradesh. They are Augasi, Kishanpur, Yamuna, Chillimal, Umarahat and Jarauli Lift Irrigation Schemes are in Uttar Pradesh and Renhat Lift Irrigation Scheme in Madhya Pradesh. The Yamuna Upper sub-basin contains only one lift irrigation scheme i.e. Jawahar Lal Nehru Lift Irrigation Scheme Stage III, IV, V, VI, VII and VIII. The Ghaghara confluence to Gomti confluence also has 7 different Lift Irrigation Scheme namely Zamania, Narainpur, Deokali, Larma, Chausa, Karamnasa and Gyanpur Lift Irrigation Scheme. The next maximum lifts schemes are in Ghaghara sub-basin with 6

lift schemes and they are Sarju Lift Irrigation Scheme Stage- I & II, Kwano, Tanda, Gola and Dohrighat Lift Irrigation Scheme.

The Chambal Lift Irrigation Scheme with Stage I and Stage - II are the only major irrigation scheme in the Chambal lower sub-basin and Parwan Lift Irrigation Scheme is the only major irrigation scheme in the Chambal upper sub-basin. Three irrigation schemes come under Gandak and other sub-basin are Surajgarh Lift Irrigation Scheme, Bateshwarasthan Lift Irrigation Scheme Phase- I Stage- I & II and Dhakranalla Lift Irrigation Scheme Phase-I Stage- I & II and Phase II Stage-I. The Sone sub-basin has majorly two irrigation schemes specifically Gopad and Sone Lift Irrigation Scheme Stage- I, II, III and IV. In Tons and Upstream of Gomti confluence to Muzaffarnagar two each irrigation schemes exist and they are Tons, Dhoba Lift Irrigation Scheme and Bhupali Lift Irrigation Scheme, Dalmau Lift Irrigation Scheme Stage- I, II respectively. The further details of each lift irrigation schemes are provided in the Annexure IV-D.

According to India WRIS database there are about 31 Extension, Renovation and Modernization (ERM) projects in the Ganga basin. Out of which 22 projects are completed and 9 projects are still ongoing. Some of the major ERM projects in Ganga basin are Remodeling of Agra Canal, Remodeling of Bhimogoda head works, Remodeling of Eastern Yamuna Canal, Sone Barrage Remodeling and Link Canal and Extension of Kosi Canal System including the Raipur canal etc. The further details of each ERM projects are provided in the Annexure IV-F.

3.2.2. Hydroelectric projects

With extensive monotonous regions and a multitude of tributaries, the Ganga basin is rich in various projects. According to India-WRIS, basin consists of 39 hydro-electric projects and 56 powerhouses are a testament to the regions importance to India‘s overall hydroelectricity portfolio. The sub-basin wise powerhouse numbers are given in Table 9. There are 27 Major and 12 small hydro-electric projects in the basin. Out of the total 39 hydro-electric projects 29 projects are maintained by State Government, 6 are maintained by Central Government and 4 are maintained by private organization. The hydroelectric projects are owned by many large organizations. The Uttarakhand Jal Vidyut Nigam Ltd. (UJVNL) owns around 9 hydroelectric projects and Uttar Pradesh Jal Vidyut Nigam Ltd. (UPJVNL) owns 5 projects and 4 projects are owned by Madhya Pradesh State Electricity Department/MPPGCL to name some. The maximum installed capacity of the basin is 2000 MW that is installed in Tehri dam by THDC India Ltd.

The Hydro-electric projects are distributed in 9 states in the Ganga basin. There are 14 projects in Uttarakhand, 4 projects in West Bengal, 3 projects in Bihar, 3 projects in Jharkhand, 3 projects in Madhya Pradesh, 3 projects in Uttar Pradesh, 2 projects in Haryana. There are 5 interstate hydro-electric projects are there in Ganga basin, Yamuna Hydroelectric Project with Himachal Pradesh and Uttarakhand, Chambal Hydroelectric Project with Madhya Pradesh and Rajasthan, Rajghat Hydroelectric Project , Matatila Hydroelectric Project and Rihand Hydroelectric Project between Madhya Pradesh and Uttar Pradesh.

The Ganga basin has 56 power houses and their geographical locations are shown sub-basin wise in the maps from Map 16.a to Map 16.s. The Yamuna upper sub-basin contains the maximum number of power houses of about 14 power houses where five in Uttarakhand, four are in Himachal Pradesh, four in Haryana and one in Uttar Pradesh. The Yamuna Lower sub-basin has three power houses where two are in Madhya Pradesh namely Matatila (UPJVNL) and Madikheda Power House (MPPGCL) and Rajghat Power House in Uttar Pradesh maintained by MPSEB/MPPGCL. The above Ramganga confluence sub-basin has 11 power houses all falling in Uttarakhand state with the largest Tehri Power House maintained by THDC India Ltd. The Sone sub-basin has 7 power houses, three in Madhya Pradesh; two in Uttar Pradesh and one each in Jharkhand and Bihar. The Bhagirathi and

other sub-basin have four power houses, with three located in West Bengal and Massanjore Power house located at Jharkhand. The Chambal upper basin has only two power houses, i.e. Gandhi Sagar Power house in Madhya Pradesh and Rana Pratap Sagar Power house in Rajasthan. The Damodar sub-basin has four power houses out of which three are in Jharkhand and Panchet Hill Power house is located in West Bengal. The Ghaghara sub-basin has three power houses all located in Uttarakhand out of which two are maintained by NHPC and one is maintained by UJVNL. There are two power houses in the Ghaghara confluence to Gomti confluence sub-basin both maintained by Bihar State Hydro-electric Power Cooperation Ltd. The Tons sub-basin also has two powers Stage- I & II Bansagar in Madhya Pradesh. The Kali Sindh and others up to Confluence with Parbati sub-basin, Kosi sub-basin and Ramganga sub-basin has each power house namely Jawahar Sagar Power House in Rajasthan, Kosi (East Canal) Power House maintained by Bihar State Electricity Board and Ramganga Power House maintained by UJVNL respectively. The details of each power houses and their surrogate informations are provided in the Annexure IV-E.

3.2.3 Dams, Barrages/Weirs/Anicuts

Water resources structures are manmade structures to store the water for hydro-electric, irrigation, drinking water supply etc. The water resources structures map of Ganga basin that includes Dams, Barrages/Weirs/Anicuts and Lifts are shown in Map 14. There are 784 dams situated in the Ganga basin, out of which maximum number of dams are in Madhya Pradesh with 364 dams. The number of dams located in other states falling in the basin is 145 dams in Rajasthan, 98 dams in Uttar Pradesh, 64 dams in Chhattisgarh, 49 dams in Jharkhand, 24 dams in West Bengal, 24 dams in Bihar, 15 dams in Uttarakhand and one dam in Himachal Pradesh. Some of the important dams in the basin include Tehri dam, Ramganga dam, Kangsbatti dam, Sarda Sagar dam, Mataila dam, Bansagar dam, Barwa Sagar Dam etc.

Table 9. Sub-basin wise number and type of water resources structures

Sl. No.	Name of Sub-basin	Dam	Barrage	Weir	Anicut	Lift	Power house
1	Above Ramganga Confluence	3	9	0	0	0	11
2	Banas	76	0	0	0	0	0
3	Bhagirathi and others (Ganga Lower)	12	10	3	0	0	4
4	Chambal Lower	3	0	0	0	2	0
5	Chambal Upper	31	1	0	0	1	2
6	Damodar	39	3	6	0	0	4
7	Gandak and others	30	5	36	0	6	0
8	Ghaghara	11	7	0	0	7	3
9	Ghaghara confluence to Gomti confluence	12	0	7	0	7	2
10	Gomti	0	1	0	0	0	0
11	Kali Sindh and others up to confluence with Parbati	125	1	2	0	0	1
12	Kosi	0	0	2	0	0	1
13	Ramganga	11	9	1	0	0	1
14	Sone	159	2	19	0	5	7
15	Tons	32	3	1	0	2	2
16	Upstream of Gomti confluence to Muzaffarnagar	14	0	1	0	2	1
17	Yamuna Lower	201	5	11	1	7	3
18	Yamuna Middle	19	1	0	0	0	0
19	Yamuna Upper	6	9	3	0	6	14

Other than dams there are 66 barrages, 92 weir and 45 lift schemes are constructed in the Ganga basin. A major barrage at Farakka is located close to the point where the main flow of the river enters Bangladesh, and the tributary Hooghly (also known as Bhagirathi) continues in West Bengal past Kolkata. This barrage, feeds the Hooghly branch of the river by a 42 km long feeder canal, and its water flow to Bangladesh. The other major barrages include Hathnikund Barrage, Kota Barrage, New Okhla Barrage, Tons Barrage, Gandak Barrage, Durgapur Barrage and Madhya Ganga Barrage etc. are to name some.

The maximum number of dams in the Ganga basin exists in Yamuna Lower sub-basin with 201 dams and their geographical location along with their associated structures are shown in the Map 15.q. In Yamuna Lower sub-basin, 163 dams are in Madhya Pradesh and 38 dams are in Uttar Pradesh. And about 186 dams are completed, five dams are under-construction, one dam is proposed. The Rajghat Dam with 11.2 km length on the Betwa river in the Lalitpur district of Uttar Pradesh is the longest dam in this sub-basin that is used for irrigation and hydro-electric purposes. The Madikheda (Mohini Sagar) Dam is the highest dam in the sub-basin with a height of 61.9 m on the river Sindh at Shivpuri district of Madhya Pradesh. Other major projects in this sub-basin are Matatila Dam Project on Betwa river 56 km south-west of Jhansi in Madhya Pradesh that is also benifitted to Uttar Pradesh state, Barwa Sagar dam on Barwa Nala near Jhansi city of Uttar Pradesh.

The Yamuna Upper sub-basin has two major water resource projects, the Yamuna Canal System and Agra and Gurgaon Canal System. The Yamuna canal system has two main projects Western Yamuna Canal which make use of the additional water available from the storages on the Sutlej and the Beas (Indus Basin) to irrigate the areas in Haryana State and Eastern Yamuna Canal to irrigate the areas of Saharanpur, Muzaffarnagar and Meerut districts of Uttar Pradesh. The major structure associated with Yamuna canal system is Hathnikund Barrage with a length of 360 m located at Yamunanagar district in Haryana and the geographical location of water resource structures in Yamuna Upper sub-basin is shown in the Map 15.s. The Agra and Gurgaon Canal System contains New Okhla barrage as associated structure with a length of 743.11 m located at Gautam Buddha Nagar district of Uttar Pradesh which irrigates the areas of Haryana and Rajasthan. The geographical location of water resource structures in Yamuna Middle sub-basin is shown in the Map 15.r.

The Sone sub basin has 69 dams located in Madhya Pradesh, 64 dams in Chhattisgarh, 14 dams in Jharkhand and 12 dams are located in the Uttar Pradesh and the geographical location along with their associated structures is shown in the Map 15.n. About 140 dams are completed and the major water resource project in this sub-basin is Sone Canal System in Bihar with Inderpuri barrage/Sone Barrage as an important associated structure. The project has culturable command area of 560 Th ha and a hydro-electric potential of 9.9 MW. The Dhandhraul dam on the Ghaghara river is the longest dam in the sub-basin with 7.3 km length. The Rihand dam having a height of 91.46 m is the highest dam situated on the Rihand tributary of the Sone.

One of the major water resource projects of Ganga basin, Chambal System encompasses in three sub-basins: Kali Sindh and others up to Confluence with Parbati, Chambal Upper and Chambal lower sub-basin. The system consists of Chambal Irrigation project with culturable command area of 230 Th ha in Rajasthan and 328 Th ha in Madhya Pradesh. In Kali Sindh and others up to Confluence with Parbati sub-basin there are 124 dams out of which 85 dams are in Madhya Pradesh and 40 dams are in Rajasthan and the geographical location along with their associated structures is shown in the Map 15.k. The Ruthai (Gopi Krishna Sagar) dam is the highest dam in Kali Sindh and others up to confluence with Parbati sub-basin with 40.15 m height and situated at Guna district in Madhya Pradesh. The Chambal power complex with Jawahar Sagar Dam and Kota barrage (Rajasthan) in Kali Sindh and others up to Confluence with Parbati sub-basin and Ranapratap Sagar dam (Rajasthan)

and Gandhi Sagar Dam (Madhya Pradesh) in Chambal Upper sub-basin are important associated structures with a hydro-electric potential of 386 MW. The geographical location of water resource assets along with their associated structures in Chambal Upper and Chambal Lower sub-basin are shown in Map 15.d and Map 15.e.

In Banas sub-basin other than Morwan dam in Madhya Pradesh all other dams are located in Rajasthan and its geographical location along with their associated structures is shown in the Map 15.b.

The Damodar sub-basin of Ganga basin has 20 dams located in West Bengal and 19 dams in Jharkhand and their geographical location along with their associated structures is shown in the Map 15.f. The major water resource project in this sub-basin is Barrage and Irrigation System of DVC using Durgapur barrage in West Bengal with a culturable command area of 426 Th ha and Kangsbatti Irrigation Project with Kangsbatti dam as associate structure having a culturable command area of 396 Th ha.

The major water resource project in Tons sub-basin is Bansagar Complex which is used for both Irrigation and hydro-electric purposes with Bansagar dam and Tons barrage as associated structures. The sub-basin has 20 dams in the Madhya Pradesh and 12 dams in Uttar Pradesh and the geographical location along with their associated structures is shown in the Map 15.o.

The Gandak and others sub-basin has largest number of barrages/weirs/anicuts in the Ganga basin. The Gandak system is one of the major water resource project of the basin with an agreement between the Government of Nepal and Government of India lies in this sub-basin. The Gandak system comprises of three major projects namely Western Gandak Canal Project in Uttar Pradesh (India & Nepal), Eastern Gandak Canal Project in Bihar and Tribeni & Dhaka Canal project in Bihar. The main associated structure with this project is Gandak barrage across the Gandak river at Valmiki Nagar about 760 m below the Tribeni head regulator. The barrage is situated on the border of India and Nepal and is about 739 m long and 9.81 m above the bed level of the river. The geographical location of water resource assets in the Gandak sub-basin is shown in the Map 15.g

The Kosi sub-basin has one of the major irrigation-cum-flood control project in the Ganga basin under Kosi System. It comprises of Kosi Eastern Canal Project including Raipur canal system in Bihar and Western Kosi Canal Irrigation Project in Bihar (India & Nepal). The project consists of Kosi barrage across the Kosi about 5 km. upstream of Hanumannagar in Nepal. The Eastern Irrigation Canal provides irrigation to Saharsa and Purnia districts of Bihar with a total culturable command area from the project to be 612 Th ha. About 20 MW of power is generated in the Eastern Kosi Canal Project of which 10MW is provided to the Nepal. The geographical location of water resource assets in the Kosi sub-basin is shown in the Map 15.l. Another important structure is the Farakka Barrage with a length of 2240 m in the Murshidabad district of West Bengal. The barrage is the last control point of Ganga in India and situated in the Bhagirathi and others (Ganga Lower) sub-basin and their geographical location along with their associated structures is shown in the Map 15.c.

The Above Ramganga Confluence sub-basin contains major 3 dams of the Ganga basin; Tehri dam, Koteshwar dam and Maneri dam located in Uttarakhand state. The sub-basin has many major water resource projects and Tehri Project being the largest hydro-electric project in the basin with a capacity of 1000 MW power generation. The other major water resource projects are Eastern Ganga Canal System and Upper Ganga Canal System with Bhimgoda barrage as associated structure, Madhya Ganga Canal Stage-I & Stage-II with Madhya Ganga barrage as associate structure and Lower Ganga Canal Project with Narora barrage as associated structure in the projects. The geographical location of water resource assets in the sub-basin is shown in the Map 15.a.

The major water resource project in Ramganga sub-basin is Ramganga Project in Uttar Pradesh with Ramganga dam as associated structure. The sub-basin has 9 dams in Uttarakhand and 2 dams in Uttar Pradesh and the geographical location of their associated structures is shown in the Map 15.m. The Nanak Sagar Dam (19.2 km), the longest dam in the Ganga basin also located in this sub-basin.

The Ghaghara sub-basin has many major irrigation projects mainly the Sarda Complex, Sharda Sahayak Irrigation Project with Lower Sarda Barrage having a length 408 m at Kheri district of Uttar Pradesh and Girija Barrage having a length 716 m at Bahraich district of Uttar Pradesh as associated structures and Sarju Nahar Irrigation Project with Girija barrage, Saryu barrage at Bahraich district of Uttar Pradesh and Rapti Barrage at Shrawasti district in Uttar Pradesh as major associated structures. The Sarda Complex system comprises of Sarda Canal Project (UP & Nepal), Sarda Sagar Irrigation Project Stage-I & Stage-II has Banbassa barrage and Sarda Sagar Dam as major associated structures. The project has a total culturable area of about 1612.6 Th ha and a hydro-electric potential of 41.4 MW. The geographical location of water resource assets in the Ghaghara and Ghaghara confluence to Gomti confluence sub-basin is shown in the Map 15.h. & Map 15.i. respectively. The Gomti sub-basin has only one barrage Gomti barrage with a length of 202.5 m located at the Lucknow district of Uttar Pradesh and its geographical location is shown in the Map 15.j. The Upstream of Gomti confluence to Muzaffarnagar sub-basin contains 14 dams and one barrage all contained in the Uttar Pradesh state and their spatial locations are shown in Map 15.p. The detailed inventory table of dams and barrages/weirs/annicuts information is given in Annexure-IV A and B respectively.

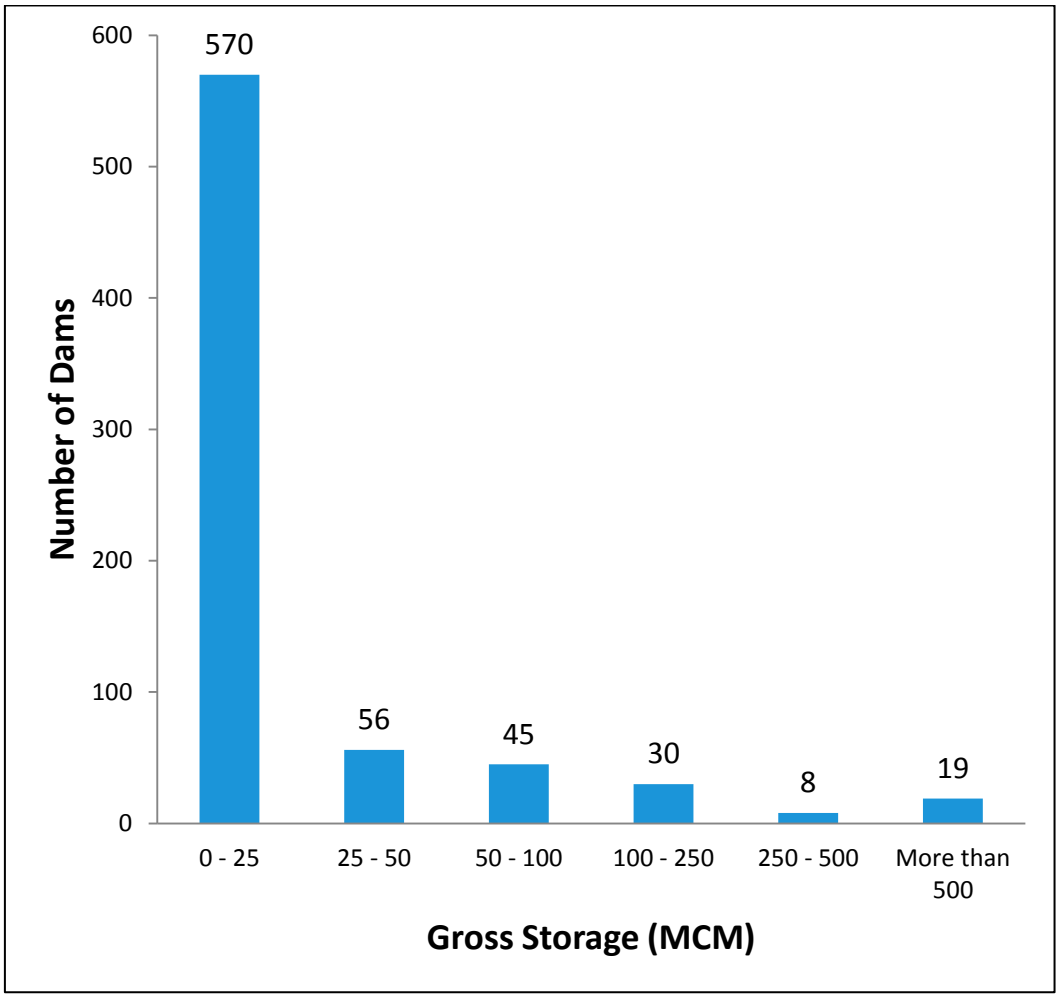


Figure 7. Dam classification based on storage

The majority of dams that accounts 75.9 percent of total structures have a storage capacity of 0-25 MCM. There are 19 dams which have storage capacity more than 500 MCM. The Rihand dam in Sonbhadra district of Uttar Pradesh has a largest gross storage capacity of 10,600 MCM in the Ganga basin and the Champat dam located at Surguja district of Chhattisgarh has the least gross storage capacity of about 0.028 MCM. The dams in the basin are classified in 6 classes based on its storage and the frequency of dam based on their storage is given in the Figure 7.

The water resource assets especially dams in Ganga basin are used for varied purpose like Irrigation, Water Supply, Hydro-Electric, Pisiculture and Drinking Water. Around 712 dams which account 92.83 percent of total water resource assets of the basin are used for irrigation purposes. About 5 dams are used for Drinking water supply only and 28 dams are used for Water Supply along with other purposes. About 5 dams are used for hydro-electric purpose only and 20 dams are used for hydro-electric power generation along with other purposes. Also two dams are used for Pisiculture along with irrigation. The classification of dams based on its purpose is given in the Figure 8.

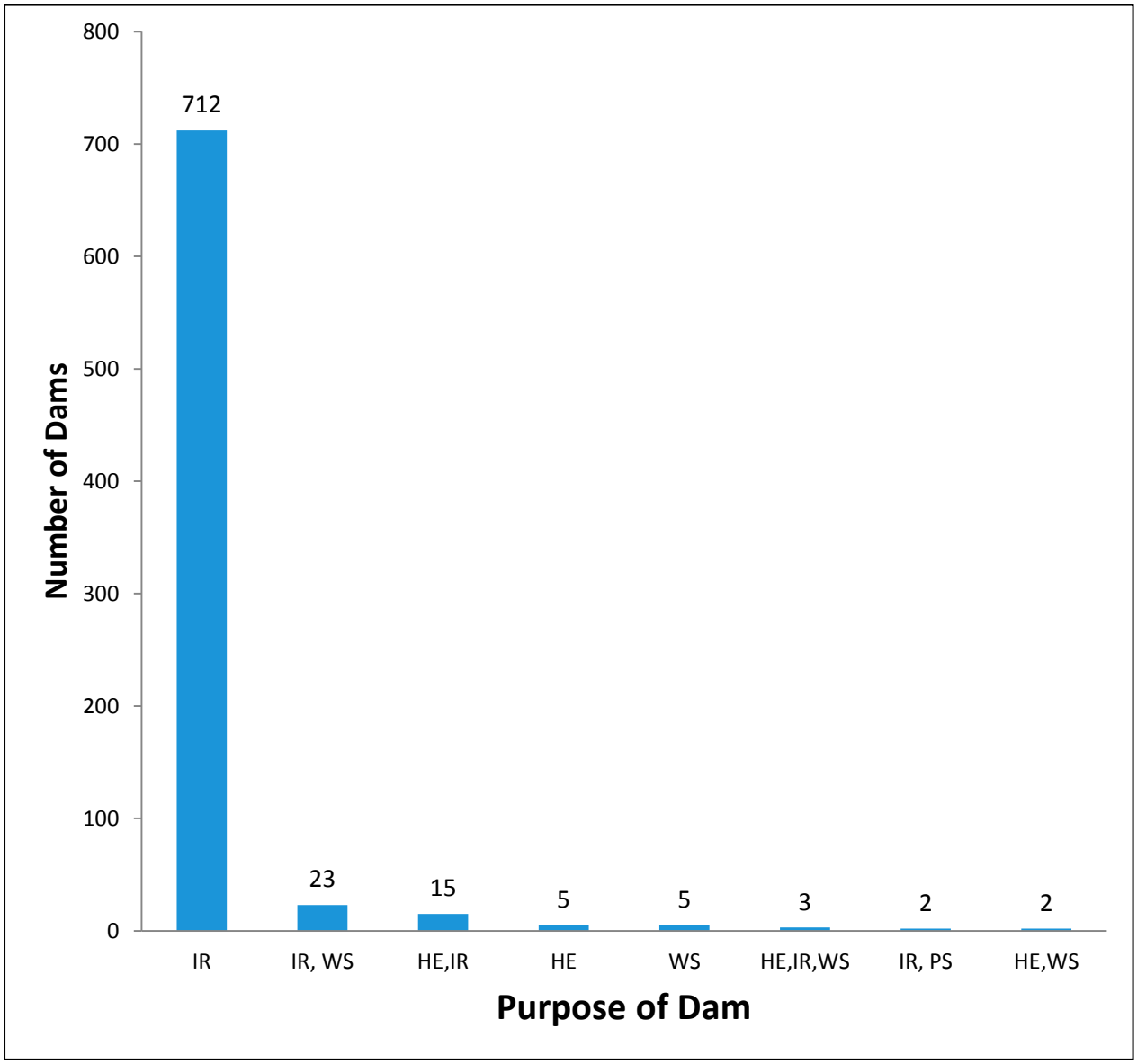
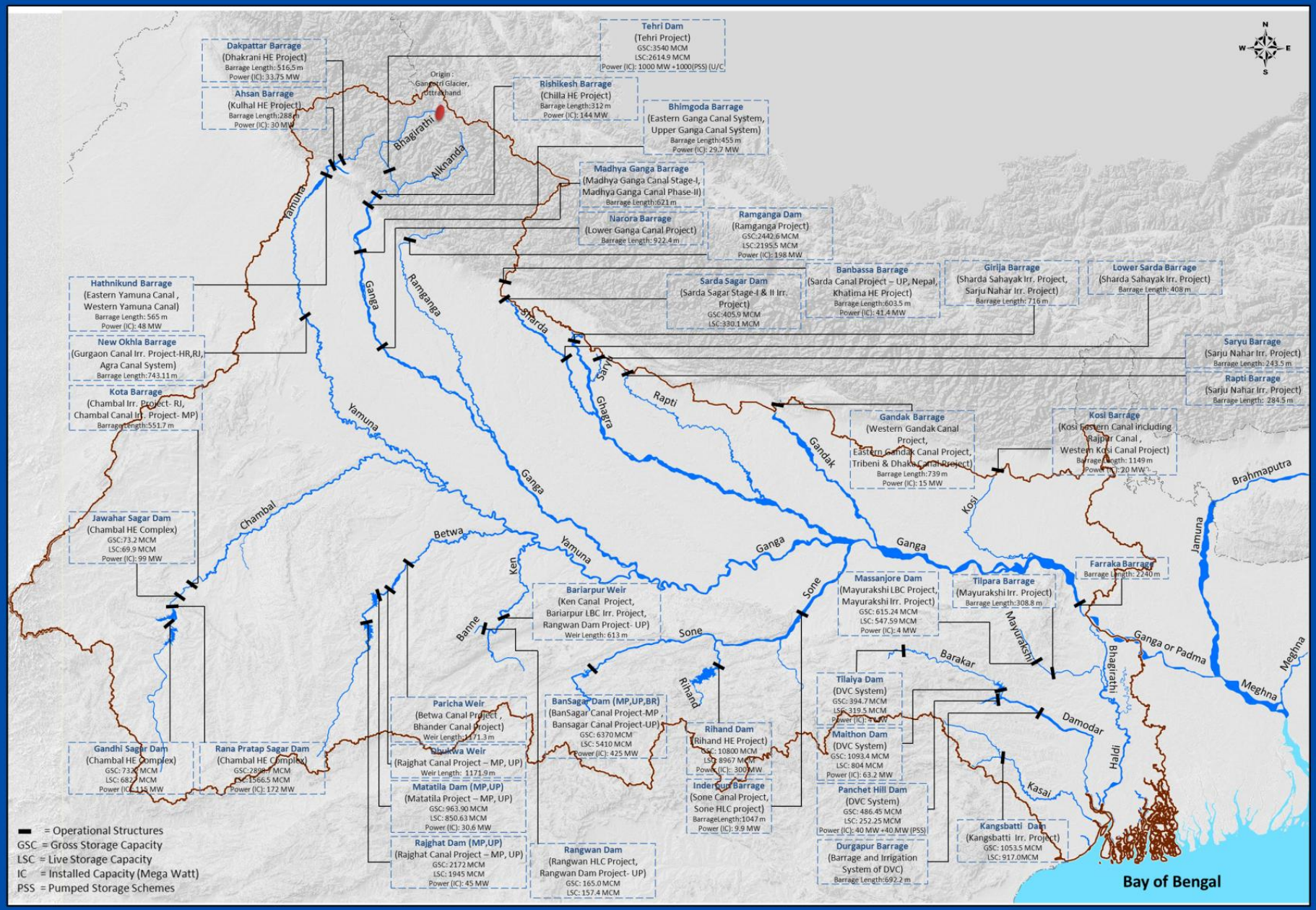
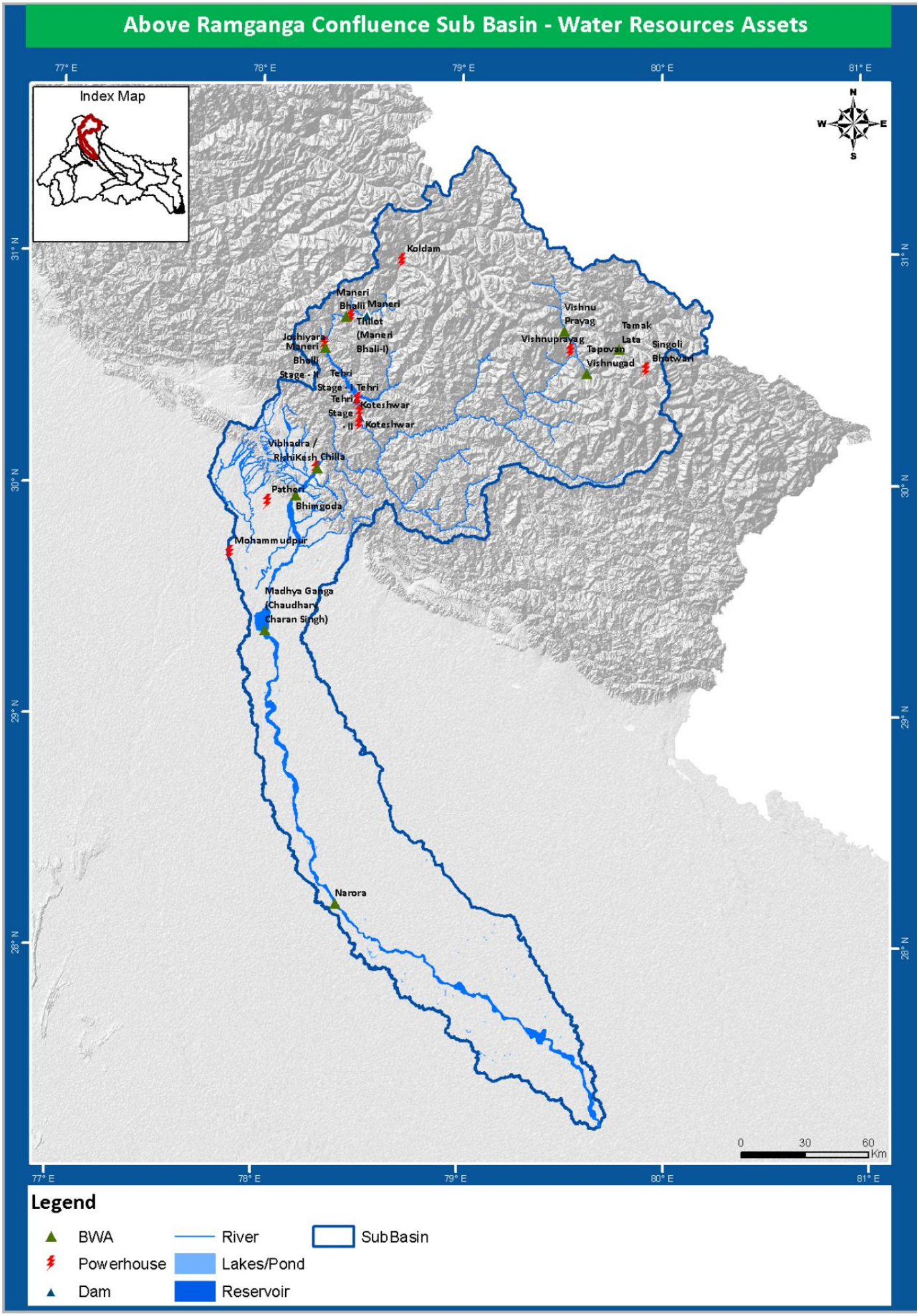


Figure 8. Dam classification based on purpose

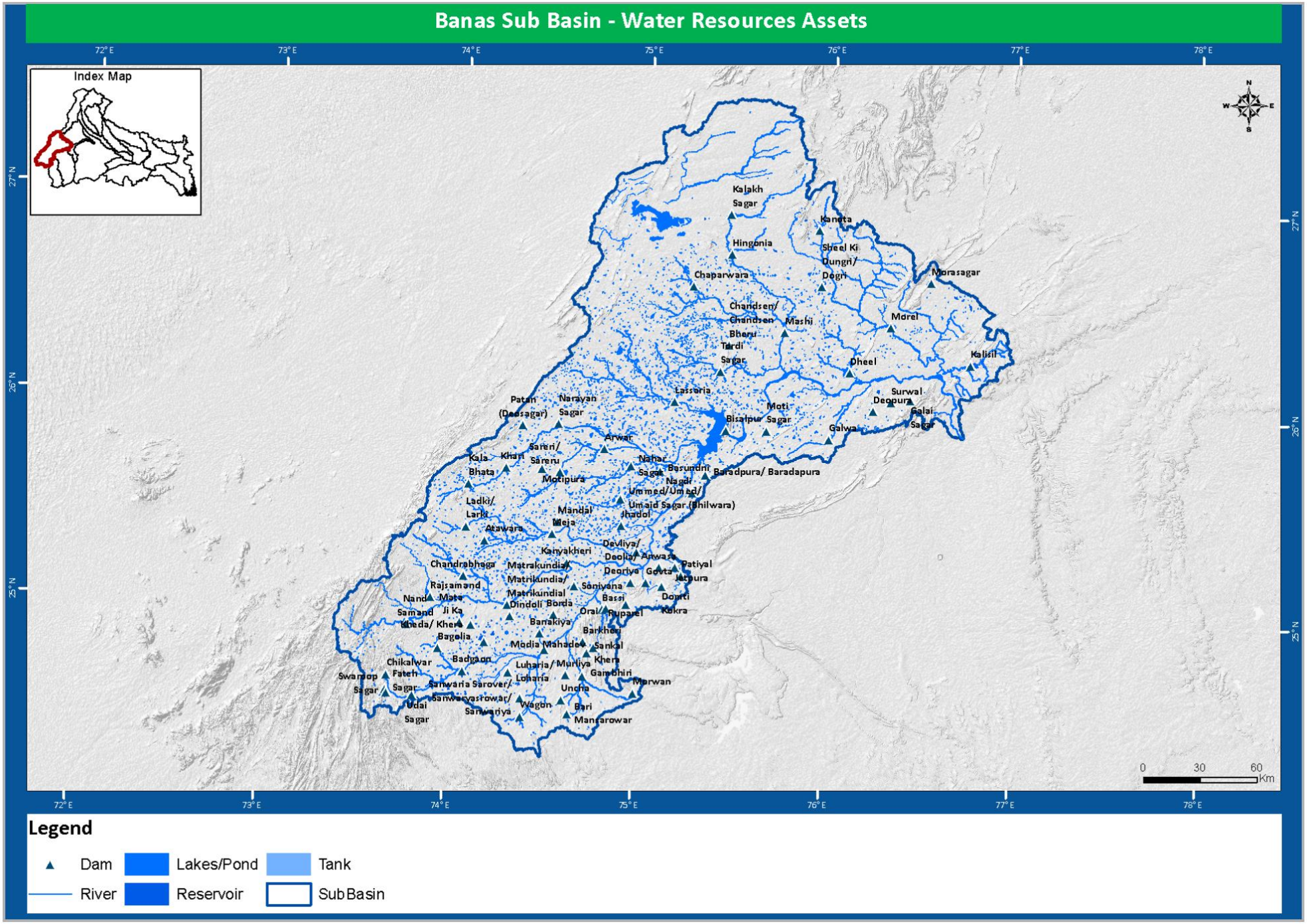
Major water resources structures and projects



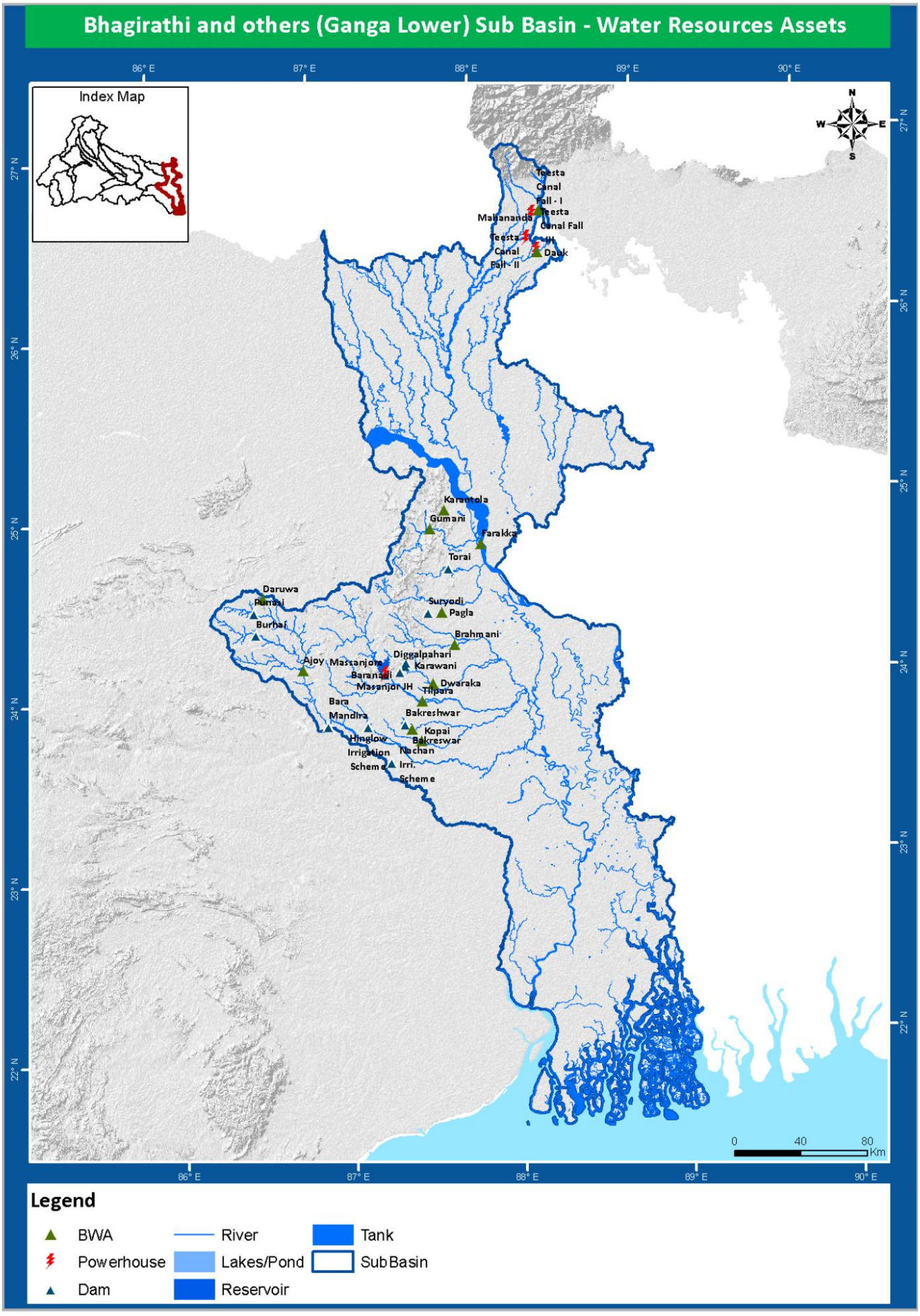
Map 14. Major water resources structures and projects



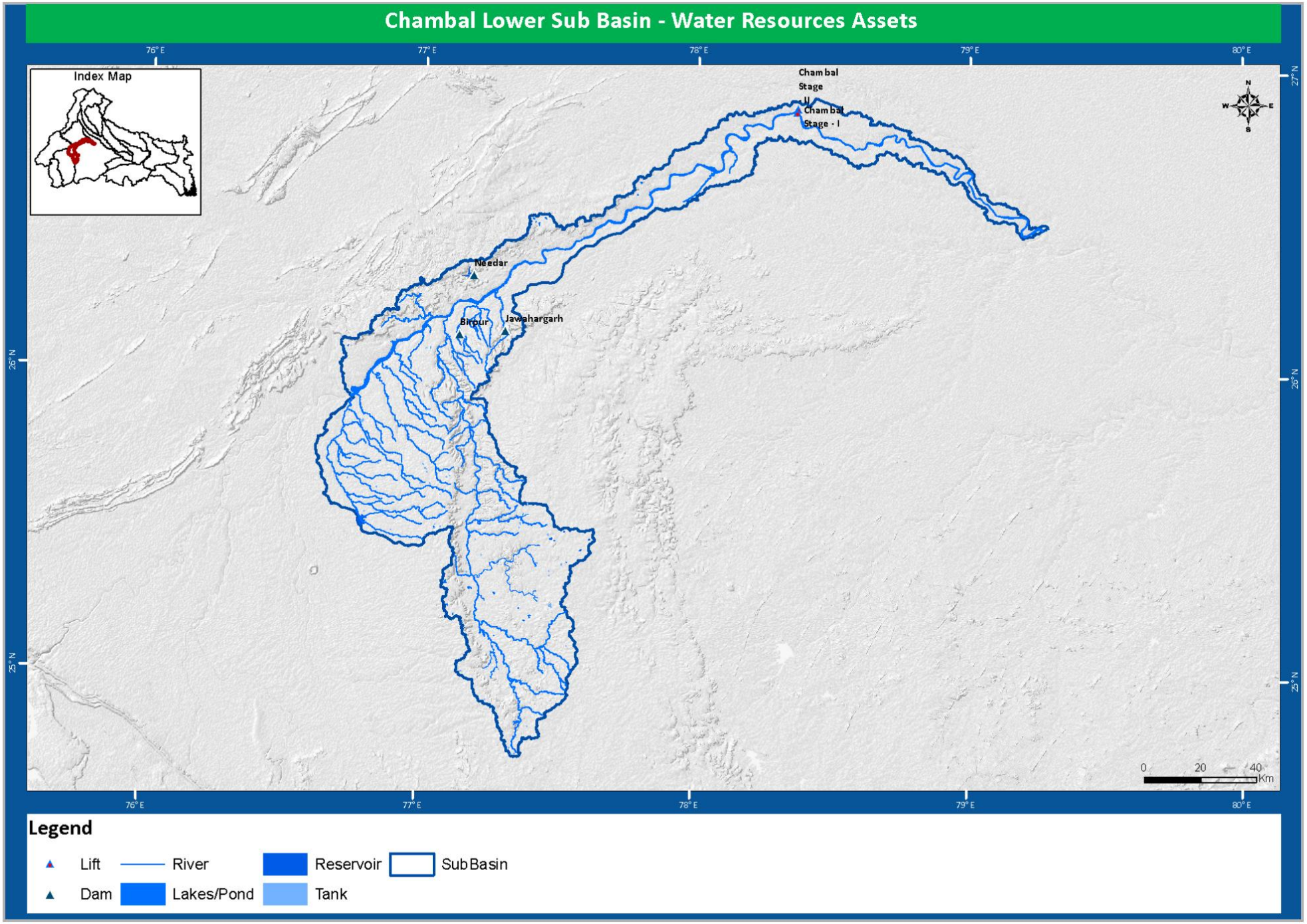
Map 15.a. Above Ramganga Confluence Sub-basin - Water Resources Assets



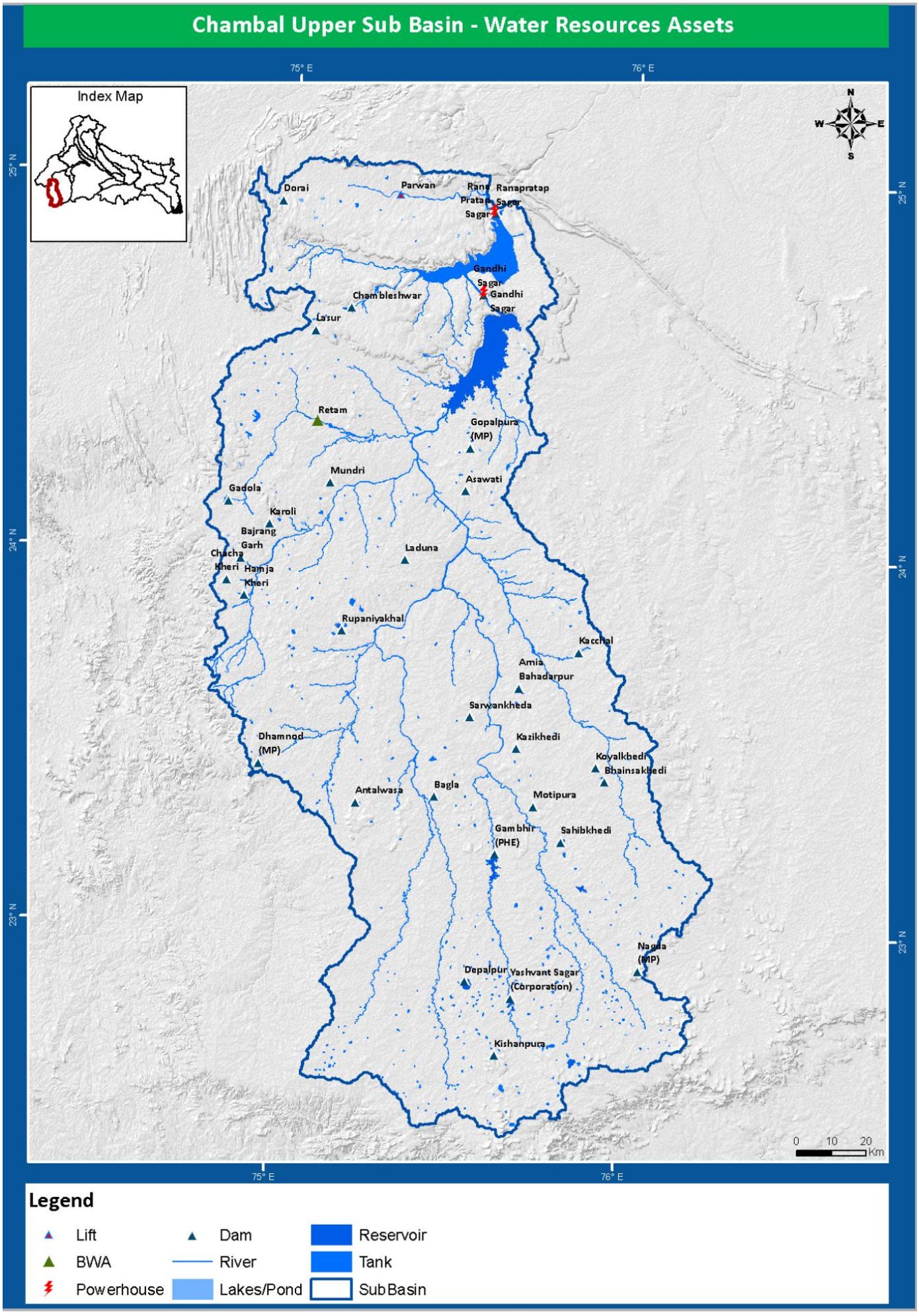
Map 16b. Banas Sub-basin - Water Resources Assets



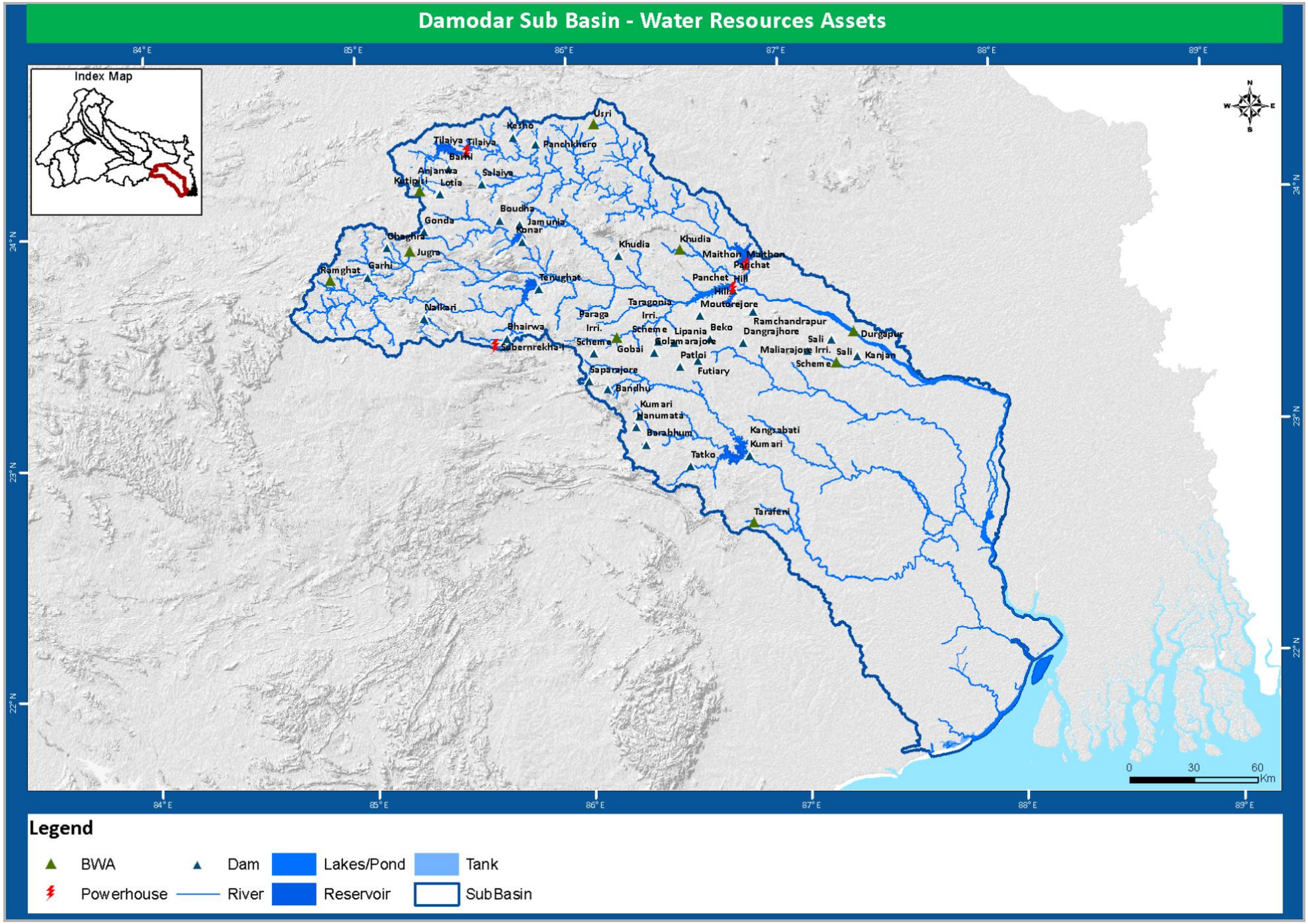
Map 15.c. Bhagirathi and others (Ganga Lower) Sub-basin - Water Resources Assets



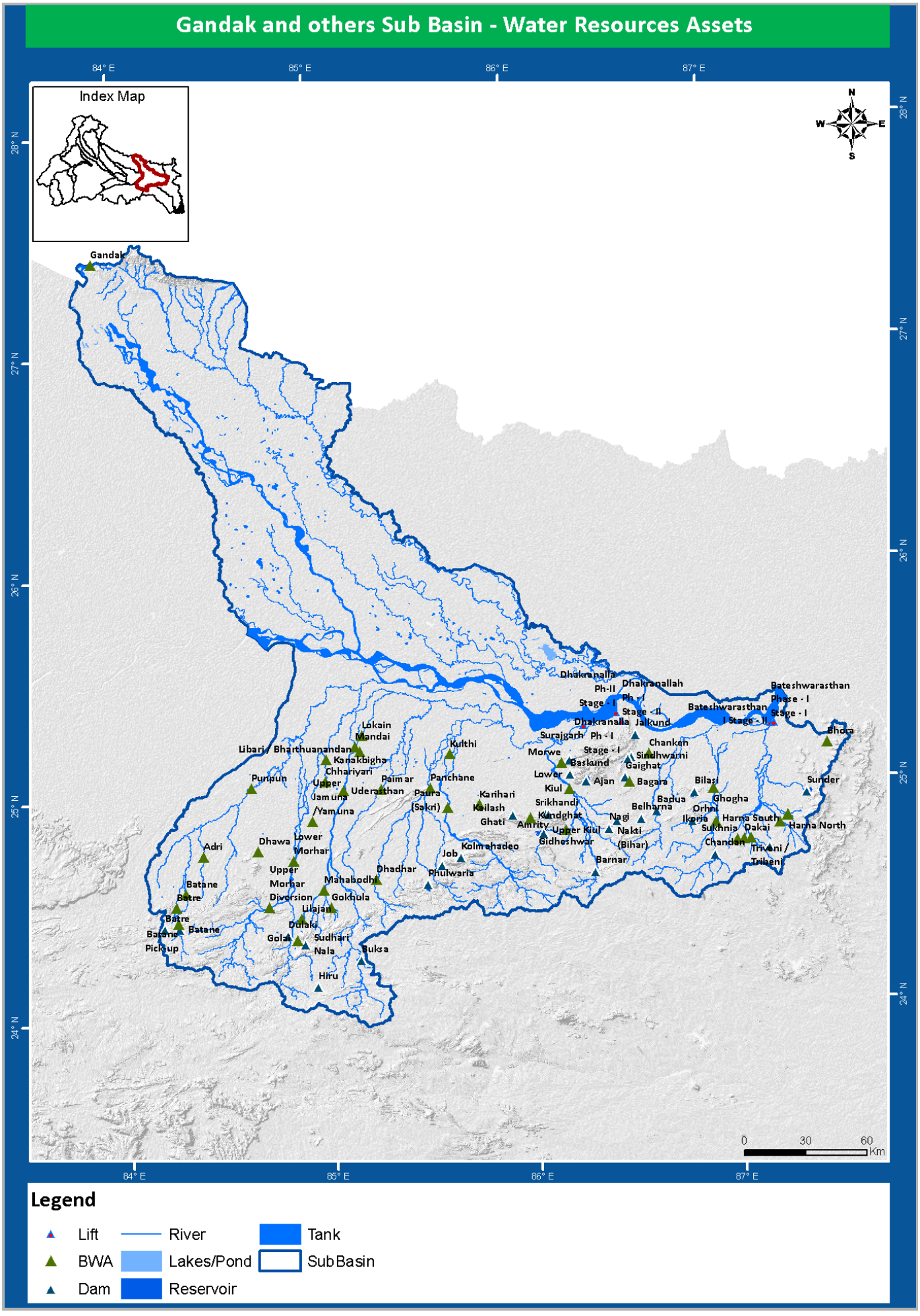
Map 16d. Chambal Lower Sub-basin - Water Resources Assets



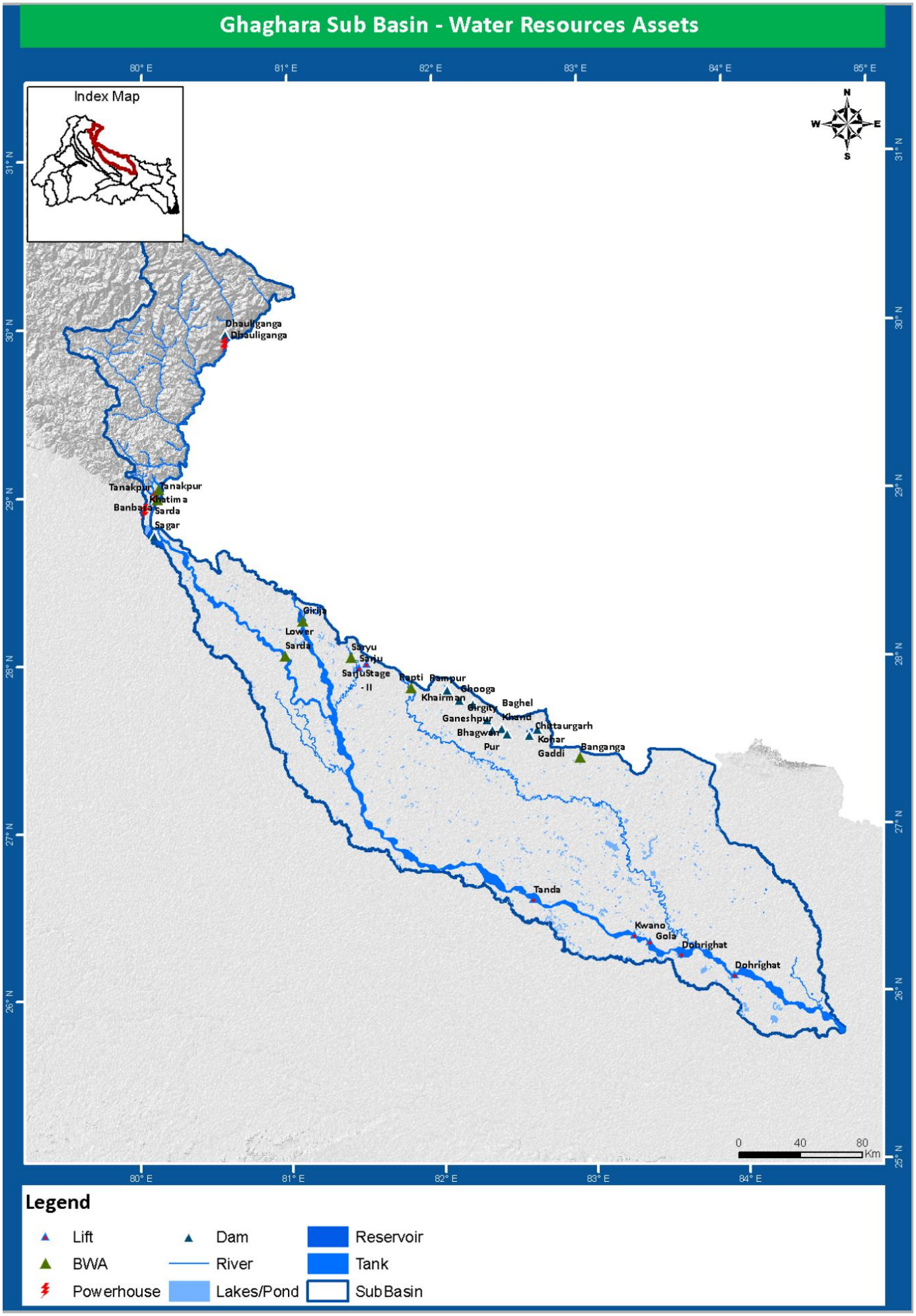
Map 15.e. Chambal Upper Sub-basin - Water Resources Assets



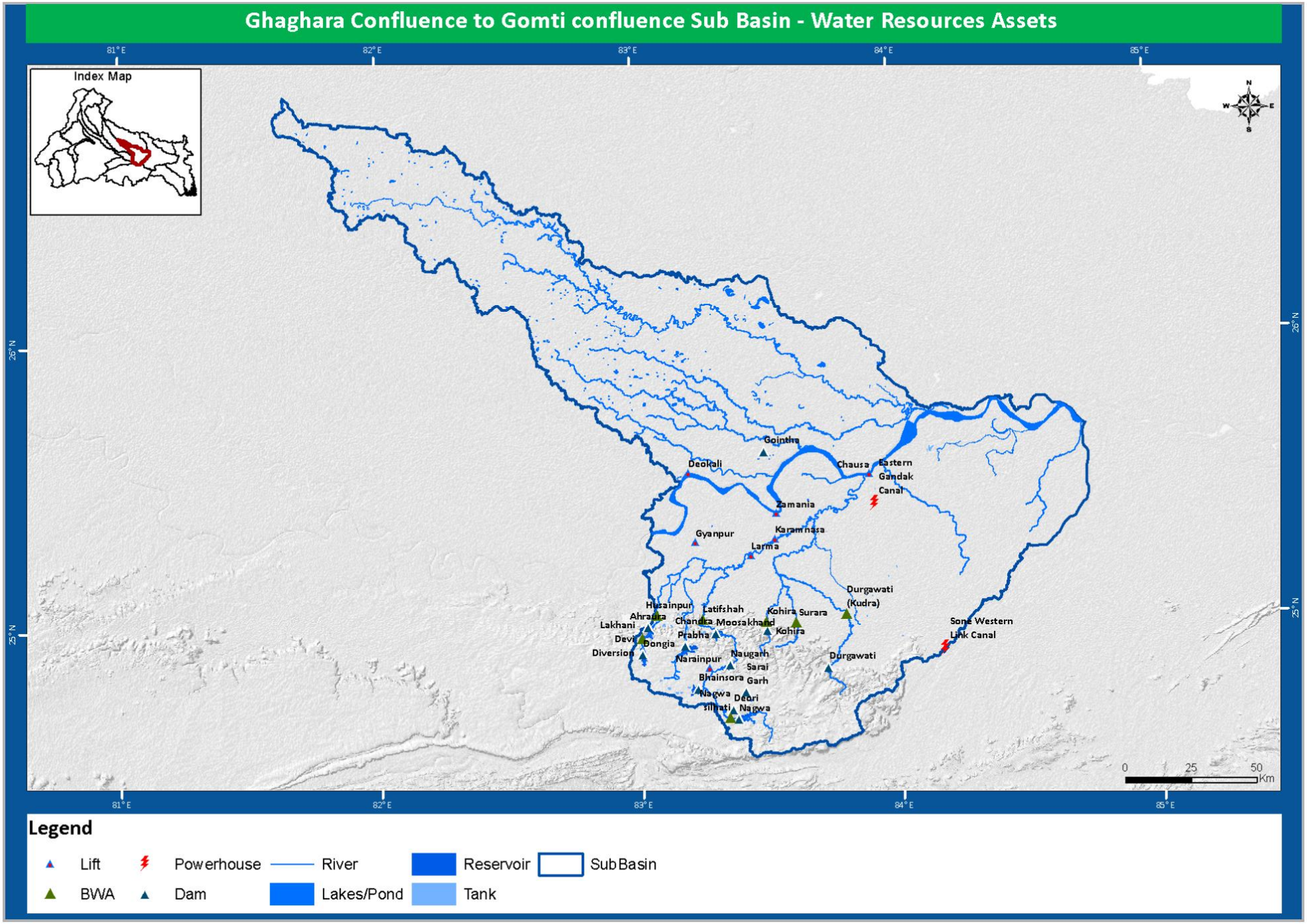
Map 15.f. Damodar Sub-basin - Water Resources Assets



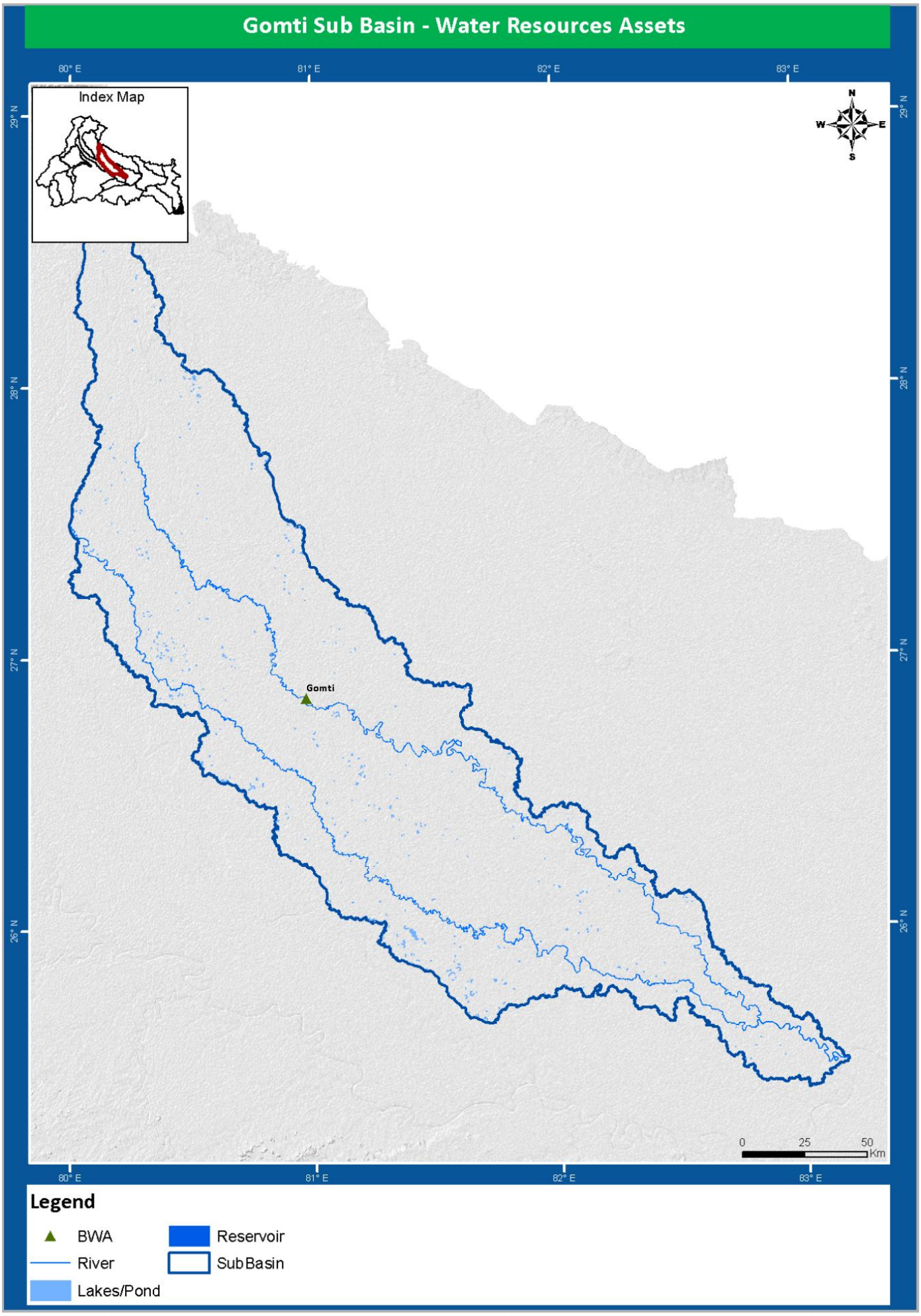
Map 15.g. Gandak and others Sub-basin - Water Resources Assets



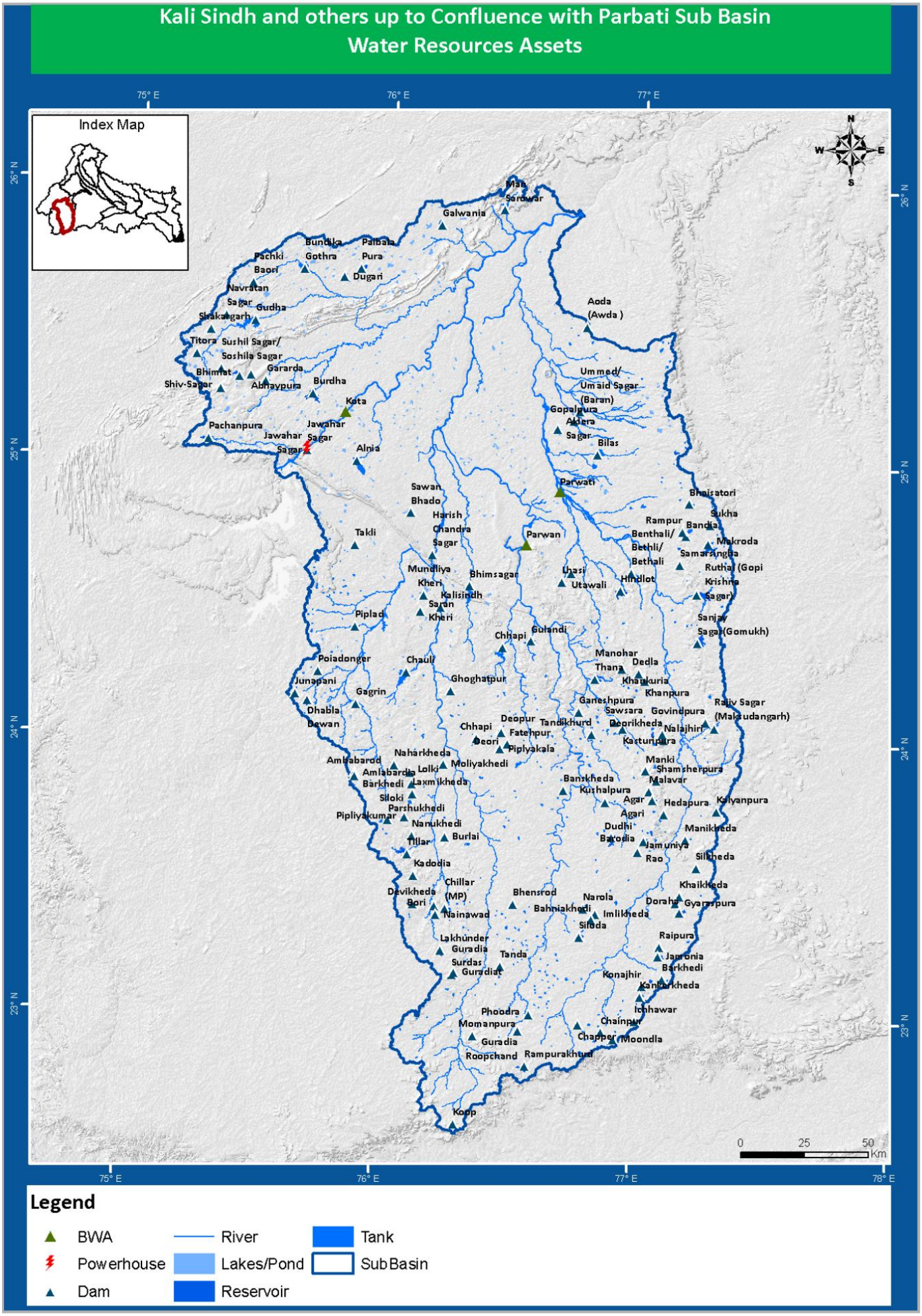
Map 15.h. Ghaghara Sub-basin - Water Resources Assets



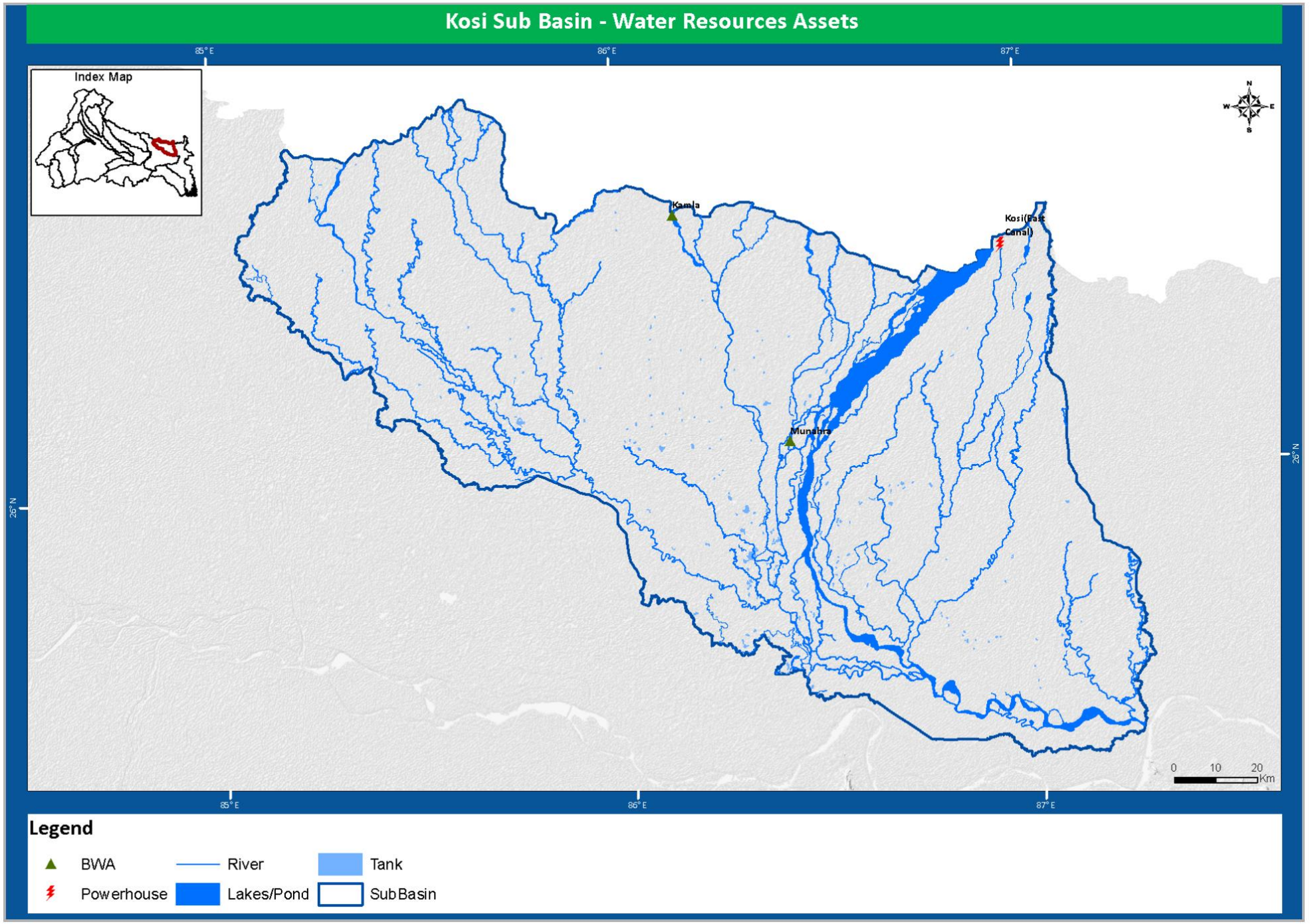
Map 15.i. Ghaghara Confluence to Gomti confluence Sub-basin - Water Resources Assets



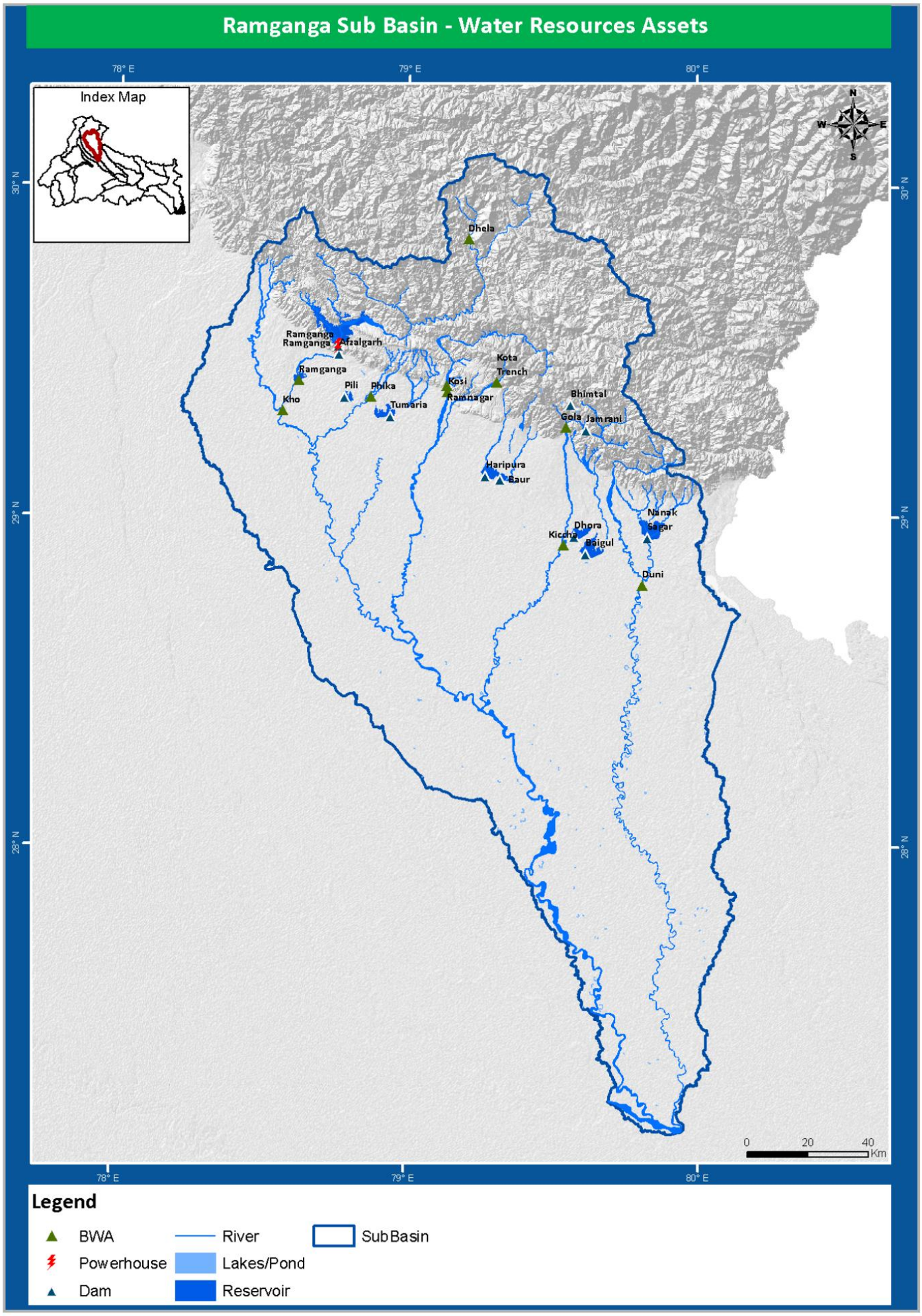
Map 15.j. Gomti Sub-basin - Water Resources Assets



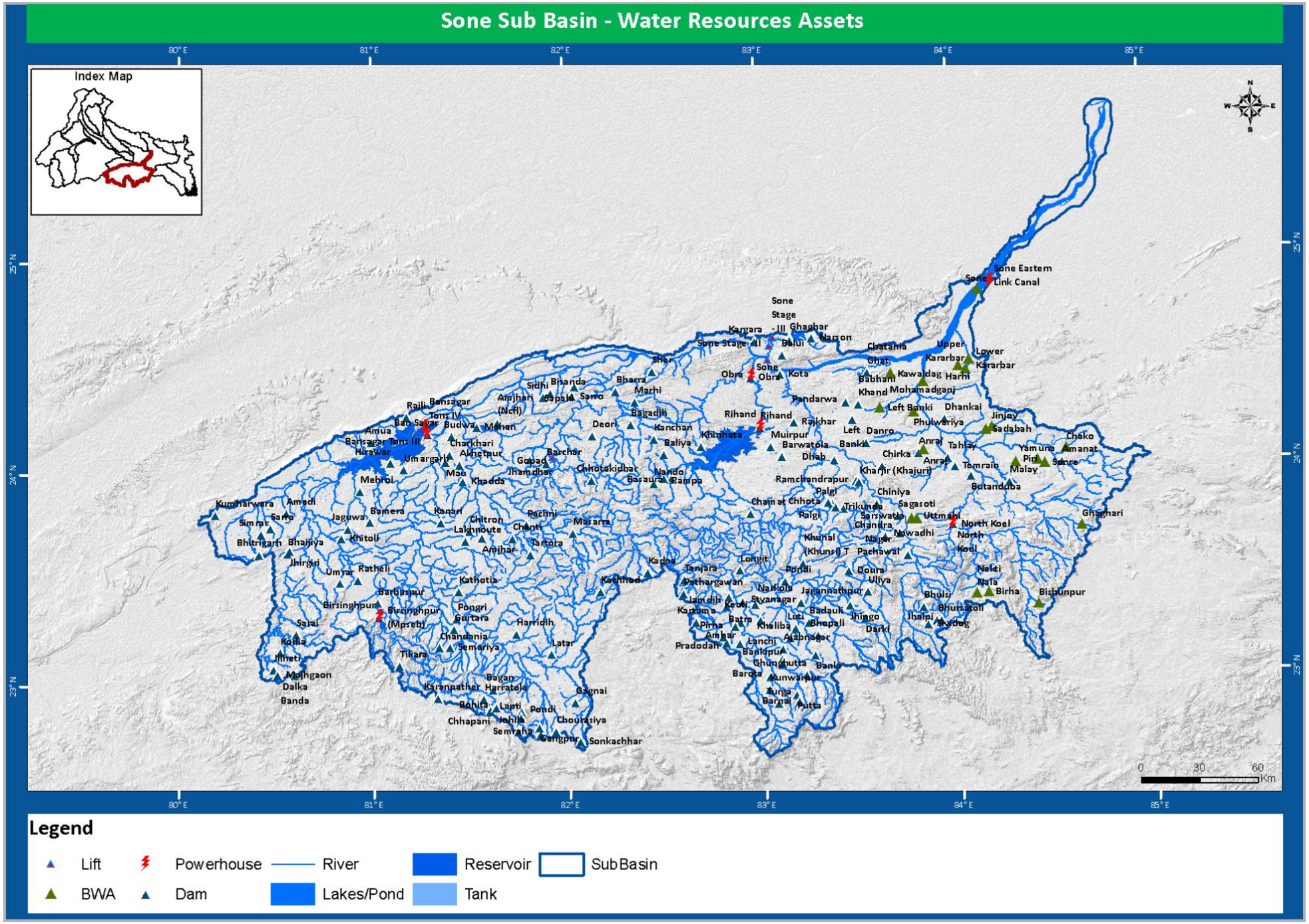
Map 15.k. Kali Sindh and others up to Confluence with Parbati Sub-basin - Water Resources Assets



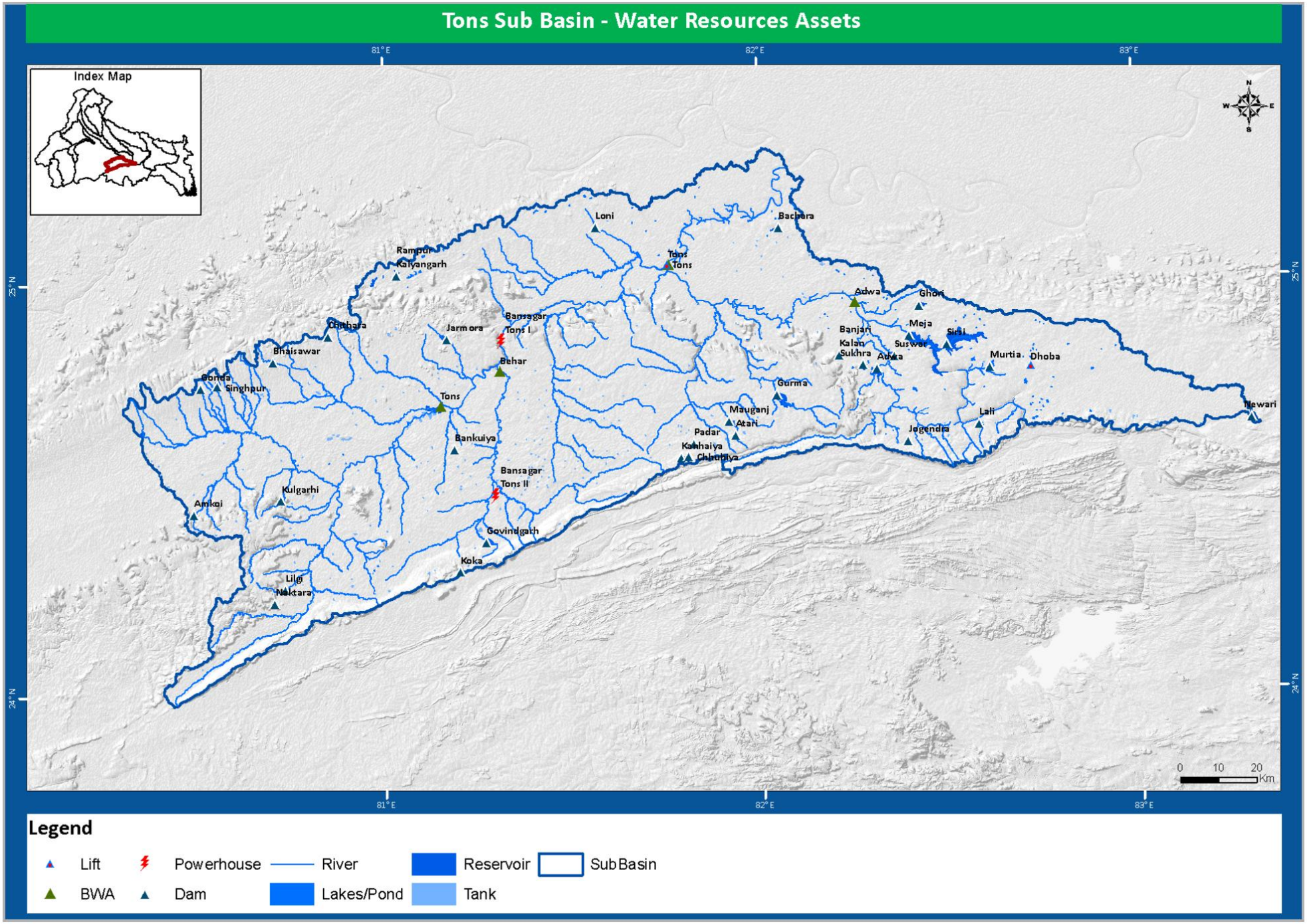
Map 15.I. Kosi Sub-basin - Water Resources Assets



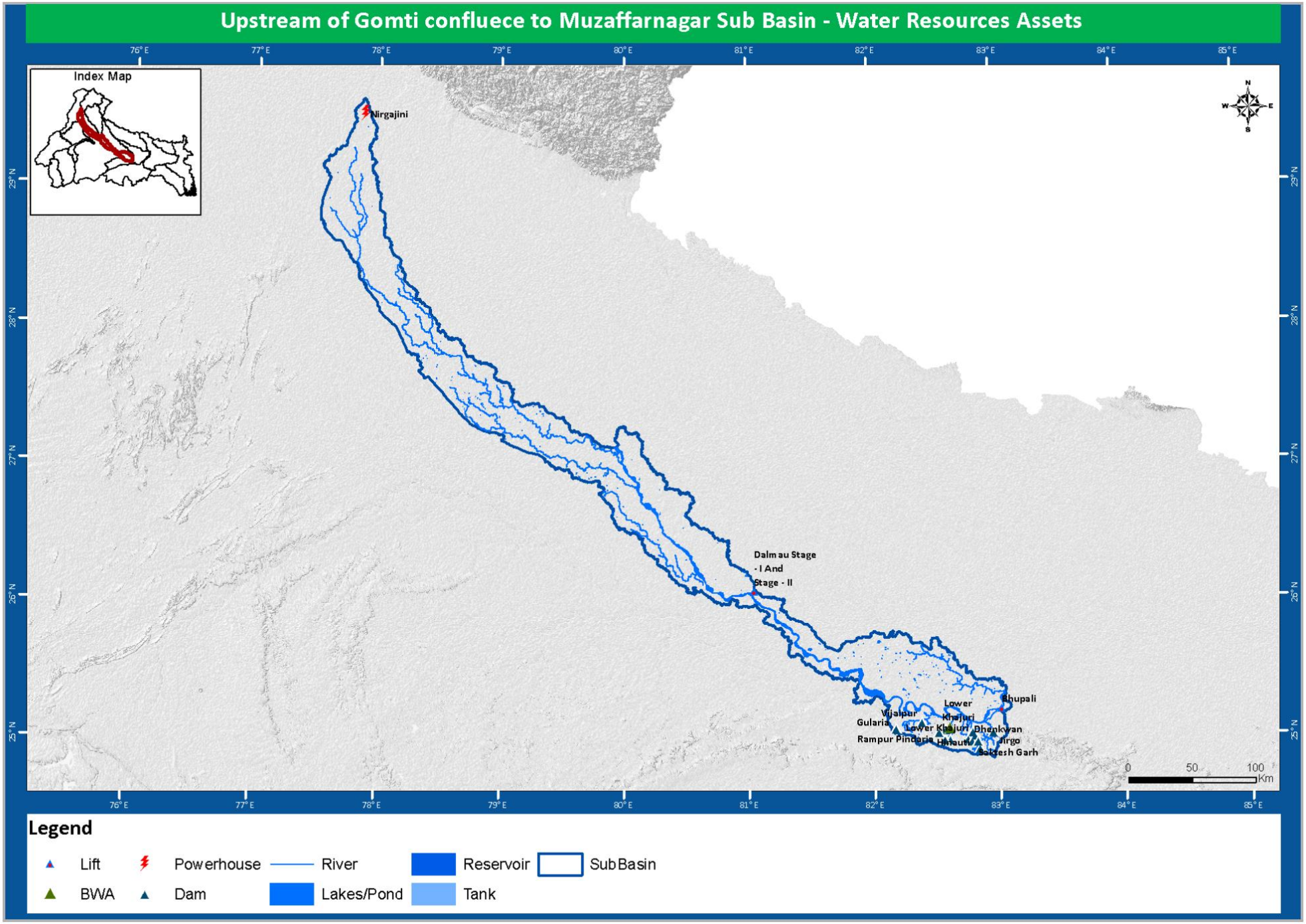
Map 15.m. Ramganga Sub-basin - Water Resources Assets



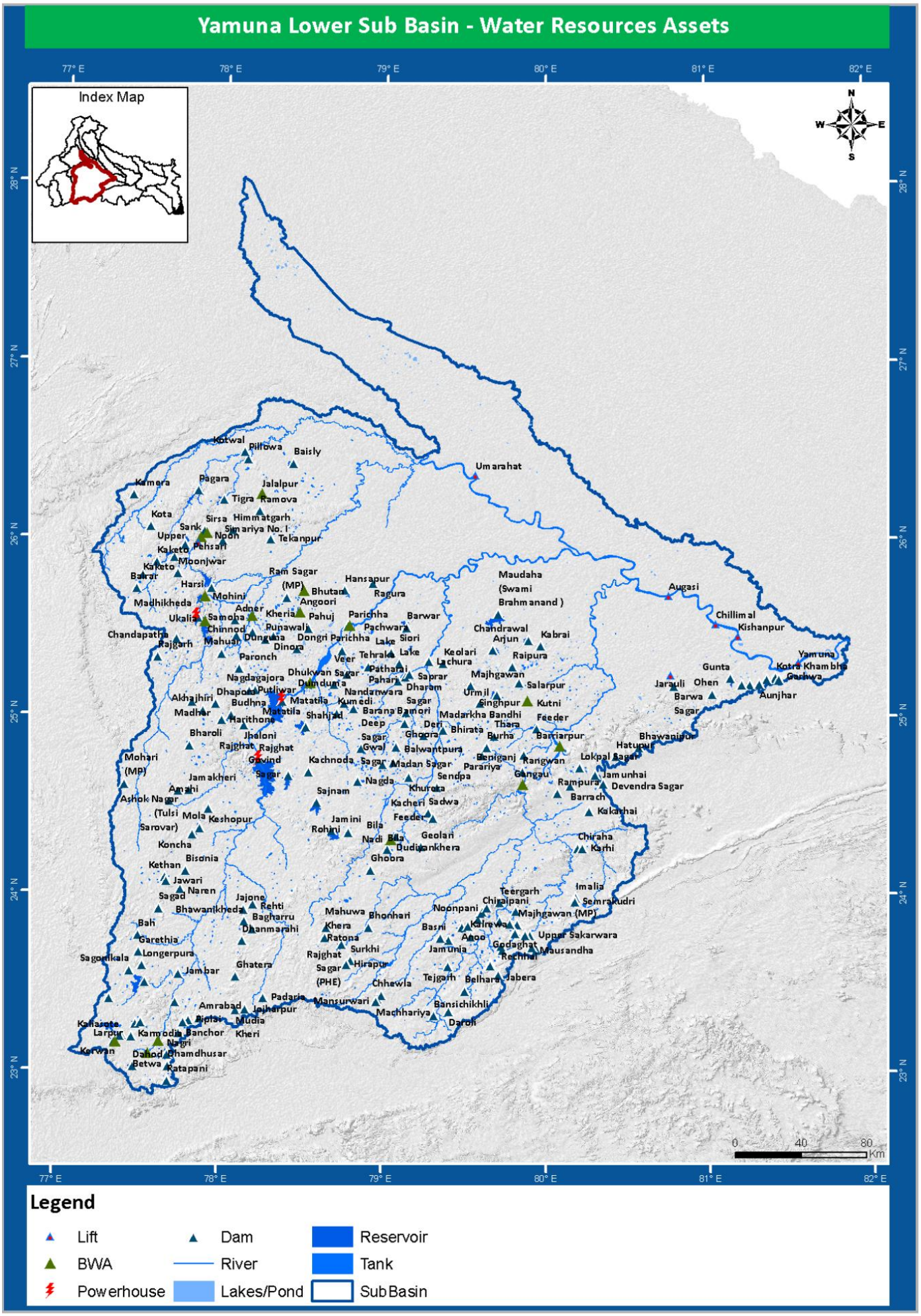
Map 15.n. Sone Sub-basin - Water Resources Assets



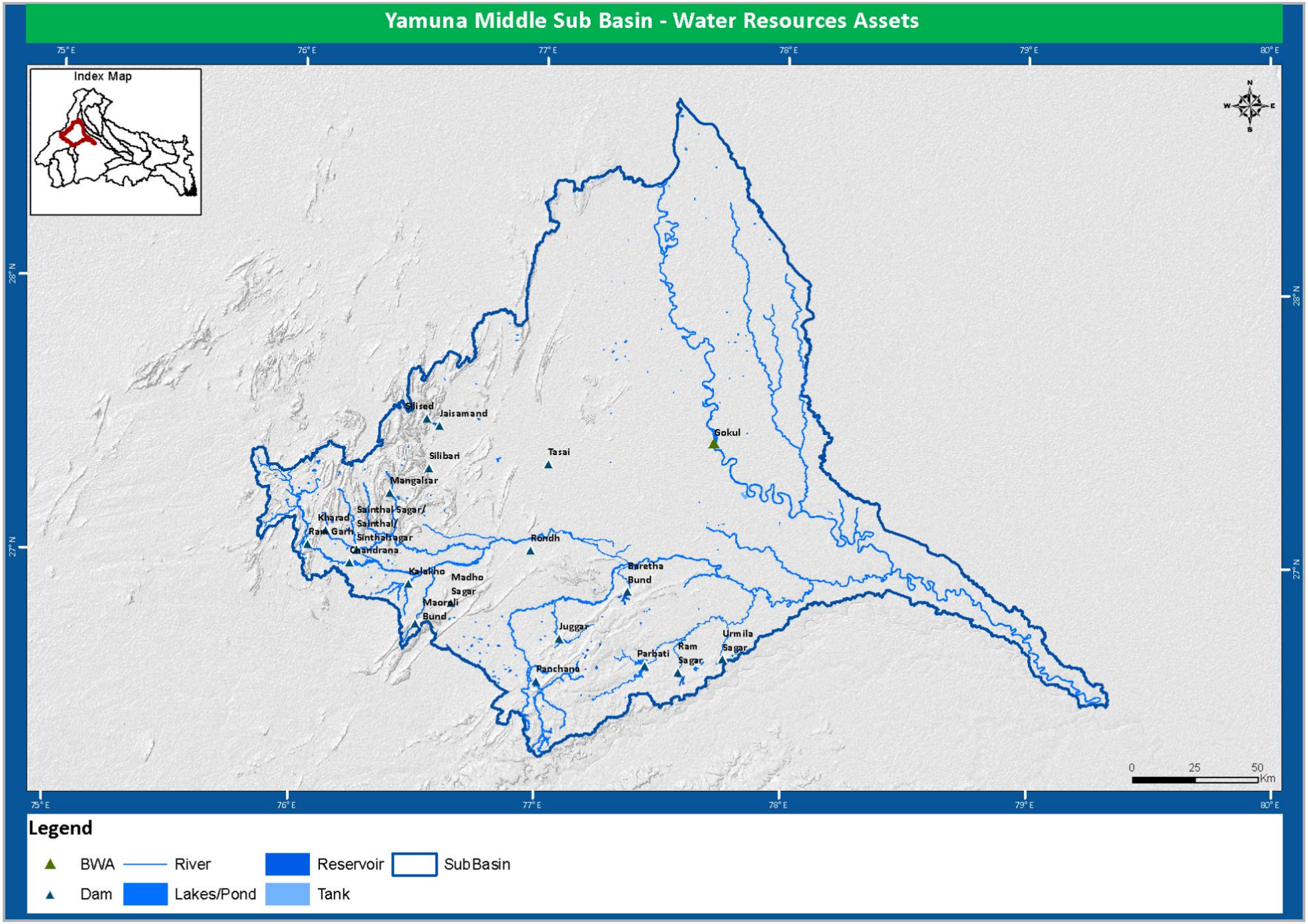
Map 15.o. Tons Sub-basin - Water Resources Assets



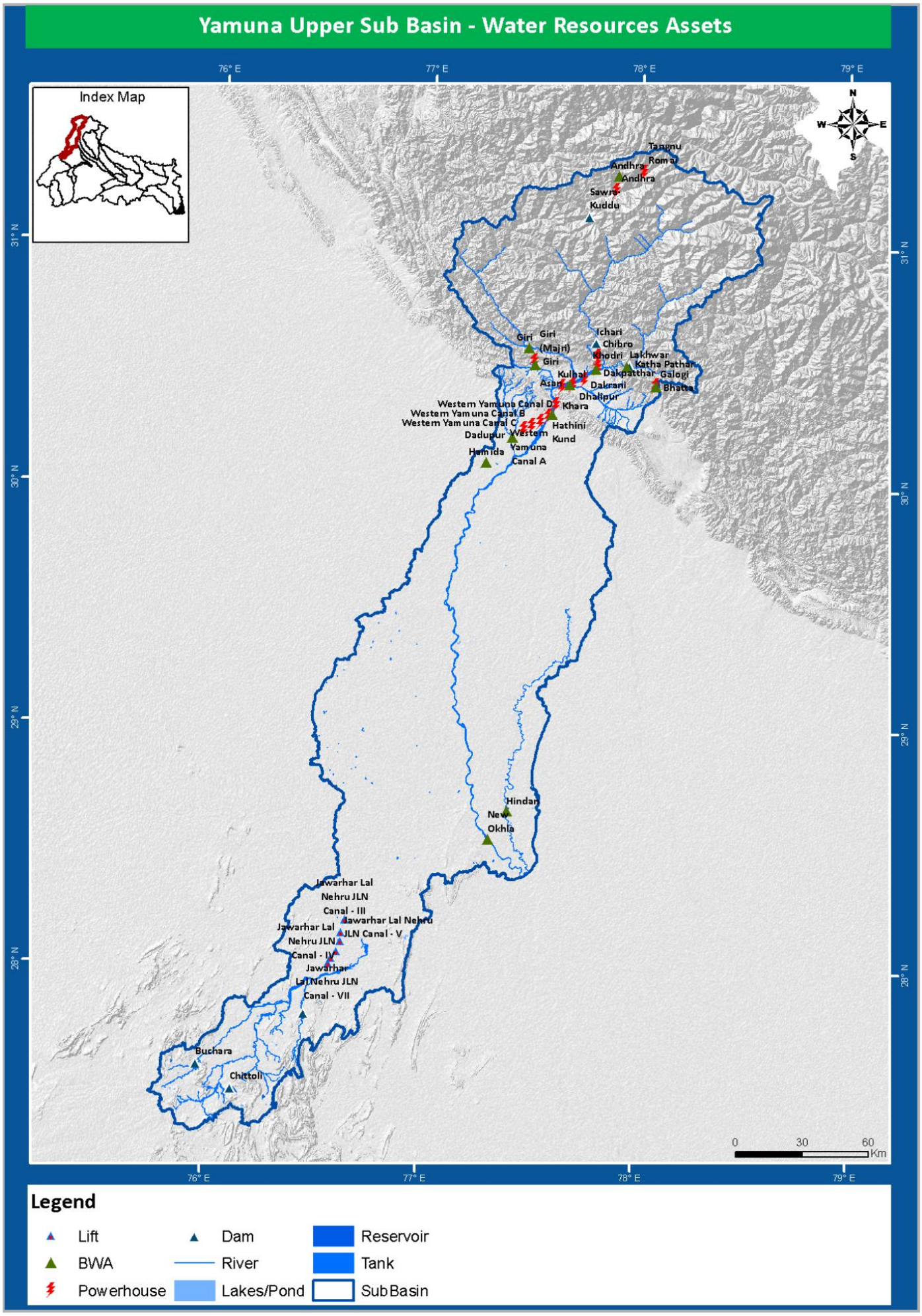
Map 15.p. Upstream of Gomti confluence to Muzaffarnagar Sub-basin - Water Resources Assets



Map 15.q. Yamuna Lower Sub-basin - Water Resources Assets



Map 15.r. Yamuna Middle Sub-basin - Water Resources Assets



Map 15.s. Yamuna Upper Sub-basin - Water Resources Assets

3.2.4. Command Area and Canal Network

Canals are man-made channels for conveyance of water. When the water is to be transported across landscape to deliver the water to the respective command areas by canal network, construction of various irrigation structures are necessary to negotiate terrain including drains, road, rail lines. Important Irrigation structures are regulators, bridge, aqueduct / syphon aqueduct, super passage / syphon, level crossing / inlets and outlets, and other cross drainage structures. Distributary head regulator controls the supply to an off taking channel from the parent channel. The total irrigation command area of major and medium projects in the Ganga basin comes to about 4,72,226 Sq.km or 36 percent of the Ganga basin. Of that irrigated area, 1.75 percent, or 8,268.6 Sq.km is waterlogged. In Bihar about 10.5 percent of its irrigated area is waterlogged being the highest and Jharkhand seems to have avoided any waterlogging issues despite its proximity to Bihar, although the extent of irrigation in this region is relatively low. In the basin, seasonal waterlogging far outweighs perennial waterlogging except for Madhya Pradesh which receives no additional waterlogging as a result of the monsoon. The Bihar leads the way in seasonal waterlogging, accounting for more seasonal waterlogging than all the other states combined. A study was carried out jointly by CWC & ISRO to assess the existing status of the irrigation commands. IRS P4 LISS III data of two different seasons namely, pre monsoon (2006) and post monsoon (2005) were used for delineation of waterlogged and salt affected areas of major and medium irrigation commands. The total waterlogged area within the Ganga basin 806,853 ha whereas salt affected area has been extended to 458,823 ha.

According to India-WRIS database, Ganga basin has about 68 major command areas and about 250 medium command areas as shown in the Map 16. Some of the Major Commands covering the basin are Agra Canal System (Uttar Pradesh, Haryana), Lower Ganga Canal System (Uttar Pradesh), Western Yamuna Canal System (Haryana), Eastern Yamuna Canal System (Uttar Pradesh), Eastern Ganga Canal System (Uttar Pradesh), Eastern Kosi Irrigation Scheme (Bihar), Madhya Ganga Canal System (Uttar Pradesh), DVC System (Jharkhand, West Bengal), Gurgaon Canal System (Haryana, Rajasthan), Ken Canal (Uttar Pradesh) and Bandar Canal (Madhya Pradesh). There are major three international canal systems mainly Western Gandak Canal (Uttar Pradesh, Nepal), Sarda Canal (Uttar Pradesh, Nepal) and Western Kosi Canal (Bihar, Nepal).

In the Ganga basin, there are several major systems of canals. Canals cater to some 28 percent of the net irrigated area. There are more than 100 major canals that are used for various purposes in the Ganga basin. One of the major canals, the upper Gangetic main canal, taking off from Haridwar, is 230 km long and carries a discharge of about 300 cubic meters per second. Further down, the lower Gangetic canal has a discharge of more than 150 cubic meters per second. Some of the other main canals of the basin are Adri Canal, Agra Canal Major Irrigation Project, Ara Canal, Badua Canal, Bakreswar Canal, Baksa Canal, Bansagar Canal, Barhi Canal, Betwa Canal, Barabanki Canal, Bhakra Canal, Birai Canal, Chandan Canal, Damodar Canal, Eastern Ganga Canal, Eastern Kosi Canal, Eastern Yamuna Canal, Eden Canal, Ganga Canal, Gumani Canal, Gurgaon Canal, J L N Irrigation Canal, Kamala Western Canal, Kangsabati Canal, Kanthi Canal, Ken Canal, Lower Kiul Canal, Madhuban Canal, Madhya Ganga Canal, Mayurakshi Bakreswar Canal, Mayurakshi Dwarkeswar Main Canal, Midnapore Canal, Parallel Lower Ganga Canal, Ramganga Canal, Rewari Irrigation Scheme, Sakri Canal, Saran Canal, Sarda Canal, Sarda Sahayak Canal, Supur Canal, Taraphini Canal, Western Yamuna Canal.

Canal created under *Assessment of Irrigation Infrastructure and Irrigation Potential for Accelerated Irrigation Benefit Programme (AIBP)* project (executed by National Remote Sensing Centre, NRSC, Hyderabad in collaboration with Central Water Commission, CWC) is also available in India-WRIS database. Canal network has been delineated under AIBP (Phase-I) using high resolution Cartosat-1 data on 1:5000 scale. Attribute information regarding canal type, canal status, percentage progress, types of hydraulic structures and construction gaps are available. Information regarding length of canal and irrigation potential has been assessed both field and remote sensing observation. Some of the major AIBP Canal in Ganga Basin are Ara Main Canal, Barabanki Branch Canal, Betwa Main Canal, Bihia Branch Canal, Bithri Main Canal, Buxar Branch Canal, C.Tanda Parallel Canal, Chausa Branch Canal, Dariyabad Branch, Dauk Nagar Main Canal, Dumraon Branch Canal, Eastern Sone High Level Canal, Faizabad Branch, Gara Choubey Branch Canal, Gonda Sakha Pranali, Hidargarh Branch, Kaitha Branch Canal, Kakarghati Br. Canal, Keoti Main Canal, King's Canal, Kubri Branch Canal, Mahananda Main Canal, Mankapur Shakha Pranali, Patna Main Canal, Poshak Canal, Purwa Canal, Sihawal Main canal, Tarabganj branch Canal, Ukalia Canal, Western Kosi Main Canal, Western Sona High Level Canal.

The details of some of the key canals systems in the Ganga basin are described below:

Ganga Canal Systems: The five major key canals in the Ganga Canal Systems are Upper Ganga Canal, Madhya Ganga Canal, Lower Ganga Canal, Agra Canal and East Ganga Canal.

i. **Upper Ganga Canal:** The Upper Ganga Canal system is a leading irrigation system in India. It extends over an area of 24,000 Sq.km and is one of the oldest irrigation systems of Uttar Pradesh. In Western Uttar Pradesh besides augmenting irrigation water to Agra canal and Lower Ganga canal system is bounded by natural or man-made water courses. The Canal is bounded by the Ganga river is on the eastern side, the Hindon river and the Yamuna river on the western side, and the lower Ganga canal on the southern side. The canal provides irrigation to about ten districts. The length of main canal is 290 km and head discharge capacity is 311 cumec and has distribution system of 6537 km. The command area of the system is located between 27°N and 30°N latitudes and 77°15'E and 78°40'E longitudes covering the districts of Saharanpur, Muzaffarnagar, Meerut, Ghaziabad, Bulandshahar, Aligarh, Mathura, Agra, Etah, and Mainpuri.

   The Upper Ganga Canal system is fed through a headwork complex with a regulation at Mayapur near Haridwar and a diversion weir at Bhimogoda across the Ganga river. The important branches of the system are the Deoband branch (taking off on the left bank at 35 km), the Anupshahr branch (taking off on the left bank at 80 km), the Mat branch (taking off on the right bank at 177 km), and the Hathras branch (taking off from the Mat branch on the left bank at 80 km). The system is unlined and has a network of 115 distributaries. The canal system is connected with natural drains/rivers to discharge the surplus water of the canal.

ii. **Madhya Ganga Canal:** The Madhya Ganga Canal takes off from the Ganga at the Raoli Barrage, about 11 km east of Bijnor in Uttar Pradesh. Raoli Barrage is 583 m long; the normal water level of the pond is 221.5 m. The capacity at the head of this 115 km long canal is 234 cumec and its distributaries are 1466 km long. The usage of water is: Anupshahr branch 25.5 cumec, Lakhaoti Branch 63 cumec, Upper Ganga Canal 58 cumec, Parallel Mat Feeder 74 cumec, and losses 13.5 cumec. Madhya Ganga Canal provides irrigation to paddy crop in 1,14,000 ha as well as augments supply to the Upper Ganga Canal system. The Lakhaoti branch canal takes off at chainage 82 km from the Madhya Ganga Canal. Its discharge at the head is 63 cumec and it is 74 km long. Minors

from this canal provide irrigation over about 1,92,000 ha land in Neem-Kali Doab in Aligarh and Bulandshahar Districts.

iii. **Lower Ganga Canal:** The Lower Ganga Canal system comprises a weir across Ganga at Narora (near Aligarh), about 6 km below Rajghat, and the canal takes off from the right bank of the river. The weir, which is 1,158 m long, is fitted with falling shutters and enables the level of the normal cold weather supply of the Ganga to be raised by 3.05 m to feed the canal. Under sluices, consisting of 42 vents each of 2.14 m span are provided on the right flank of the weir. The canal head which is set at right angle to the sluices has 30 bays of equal width. The main canal is 100 km long and irrigates 0.5 million ha. The Lower Ganga Canal has a discharge capacity of 156 cumec. It serves the districts of Mainpuri, Etah, Farrukhabad, Etawah, Kanpur, Fatehpur and Allahabad in central Uttar Pradesh. These canal systems are irrigating a large area of the Ganga-Yamuna Doab. The Lower Ganga Canal system has 1,060 km of main canal and branches and 5,015 km of distributaries.

iv. **Agra Canal:** The canal was constructed for a cold weather supply discharge of 30.8 cumec with a depth of 2.13 m and for a discharge of 56.0 cumec during the rainy season with a depth of 3.05 m, the width at the head being 21.4 m. It terminates after 116 km from its initial discharge at which point the Agra Navigation channel, 25 km long, connected it with the Yamuna at Agra. The distribution system comprises of 1,440 km of distributaries. In the first 13 km of its course, the canal crosses three important torrents, which bring down to the Yamuna the drainage of the rocky hills on the right bank of the canal. To make the water of the Hindon available for the canal, a regulating weir, consisting of 39 vents each of 3.2 m span, was constructed across that river, by means of which its discharge can be diverted through an artificial channel, known as Hinan cut into the Yamuna immediately above the Okhla weir.

v. **East Ganga Canal Project:** The East Ganga Canal Project envisages the utilization of surplus water of the Ganga river during the monsoon season from the existing Barrage at Bhimogoda Haridwar for providing irrigation to 1,05,000 ha of paddy crop, mainly in the Bijnor district (99.64 thousand ha), the Haridwar district (360 ha), and the Moradabad district (5,000 ha). The gross command area of the project is 3.01 lakh ha, out of which 2.33 lakh ha is cultivated.

Yamuna Canal Systems: The five major key canals in the Yamuna Canal Systems are Western Yamuna Canal, Eastern Yamuna Canal, Betwa Canal, Dhasan Canal and Ken Canal.

i. **Western Yamuna Canal:** The Western Yamuna Canal mainly irrigates the areas of Upper Yamuna sub-basin. The total length of the Western Yamuna Canal with all its branches is 325 km. In addition, there are about 32 distributaries and 95 minors, the combined length of which is 1,220 km. To augment canal supplies and prevent water logging in adjacent tract, a large number of augmentation wells were constructed along the canal.

ii. **Eastern Yamuna Canal:** The earliest canals in Northern India of which any record exists are the old canals that take off from both banks of the Yamuna. The canal has its head on the Yamuna on its eastern bank, a point not far from the head of the Western Yamuna canal. The Eastern Yamuna Canal system has 1, 207 km of main canal and branches and 1,287 km of distributaries. The canal capacity is 84.95 cumec with a total command area of 1,618.8 Million Sq.km.

iii. **Betwa Canal:** The canal is constructed for irrigation of the triangular area in the Jalaun district formed by three rivers: Yamuna, Pahuj and Betwa. The head works of the canal are situated on the Betwa river near Parichcha, 27 km from Jhansi. The river at this point has a discharge of 23,000 cumec. Canal regulator has five bays. This weir forms a reservoir in the river channel and impounds

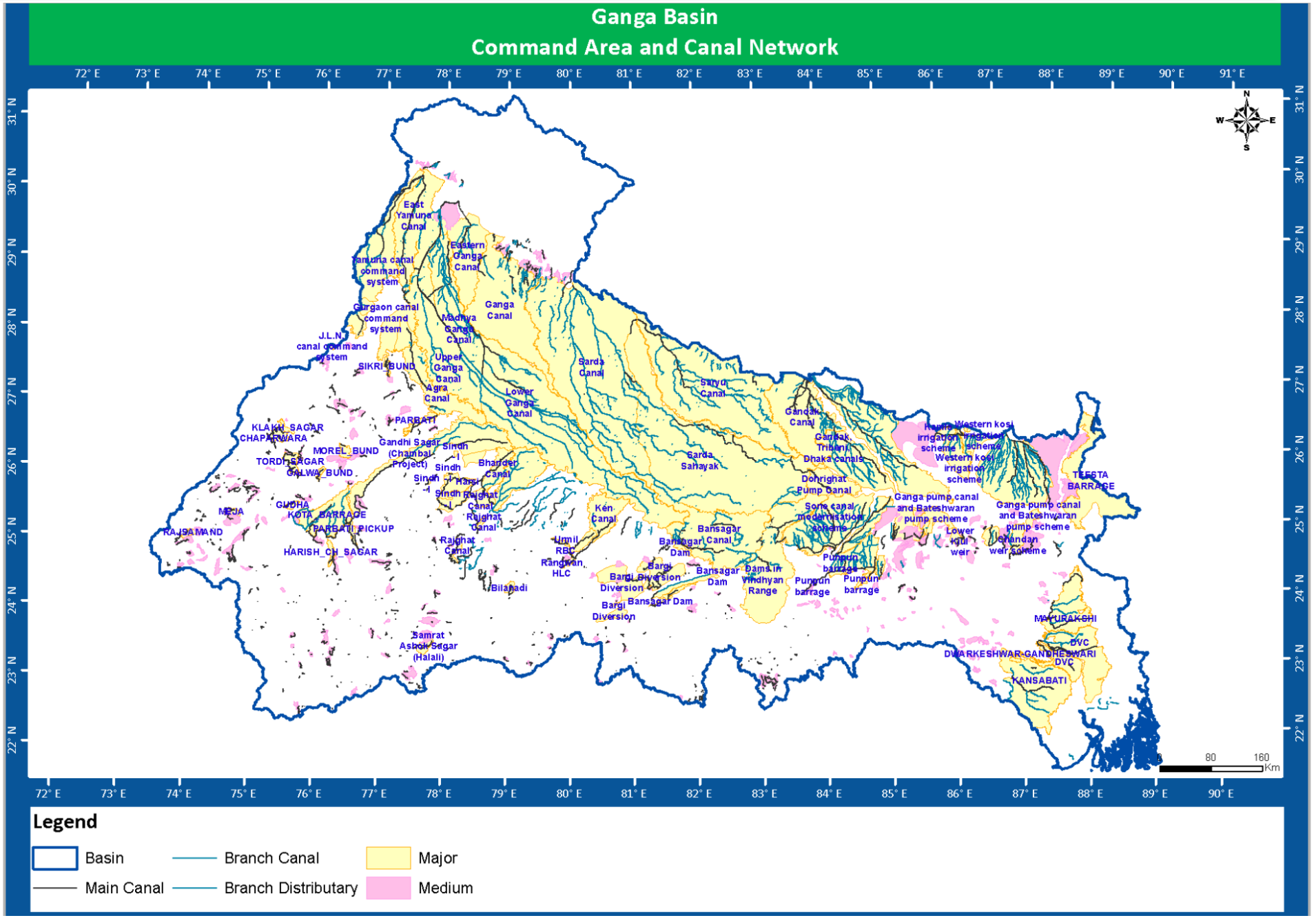
48 MCM of water at crest level. The main canal is 30 km long. At its termination it bifurcates into Hamirpur and Kathound Branches.

iv. **Dhasan Canal:** The Dhasan and Bearma are tributaries of Betwa, flowing from the east. The canal lies in Hamirpur district between triangular areas made by above rivers. Two dams have been constructed upon Dhasan river, the upper one at Pahari, the lower at Lachaura some 11 km further down. Both dams have same maximum height of 16 m and Pahari dam is 580 m, Lachaura dam 542 m long. The Dhasan canal has a head discharge of 20 cumec and a bed width of 13.7 m. With its 3 branches, it has a total length of 170 km and feeds 300 km of distributaries. There is only one masonry work of importance on the main line the Kohina Nala aqueduct.

v. **Ken Canal:** To irrigate the watershed between the Ken and the Bhagin, the Ken canal has been constructed. It consists primarily of a weir across the Ken at Bariarpur, some 100 km south of Banda, a main canal 59 km long, and two branches with a connected distributary system. The Bariarpur weir has a crest length of 512 m and a maximum height of 8.0 m above the solid rock on which it is founded. The weir is capable of impounding 14 MCM of water. The canal takes off direct from this reservoir and is designed to carry a normal supply 22.5 cumec, which can be increased to 28 cumec at time of intense demand. There are a large number of masonry falls about 22 such falls in the first 13 km of the main canal. Two principal works for cross drainage are Majhgawan and Mawapura aqueduct. The canal system has 138 km of main canal and branches and 413 km of distributaries. In addition to large works smaller storage schemes were also provided in the Bundelkhand area.

Ghaghar Canal: The canal system consisting of 100 km of main canals and branches and 120 km of distributaries is fed. The canal is crossed by 48 drainages. The steep slope of the country necessitated the provision of numerous masonry falls in the beds of various channels. The main feature of the scheme is the masonry dam at Dhandhraul, which has been constructed across a gorge where Ghaghar river pierces a low line of hills on its way to join the Sone.

Sarda Canal: The Sarda Canal scheme consists of two parts: the Sarda canal proper and the Sarda Kichcha Feeder which leaves it at about 11 km. The former comprises a comprehensive project for irrigation of the north western district of Oudh, while the latter assures a supply to the extension of the existing Rohilkhand canals. The head works and the first 11 km of the canal are common to both. Thereafter, the Sarda canals runs in a southerly direction, while the feeder flows through the Tarai, the low-lying land at the foot of Himalayas. The head works of the combined project are situated on the Sarda river a few km below the point where it debauches from the hills. The Sarda canal proper, below bifurcation consists of main canal with a length of 28.15 km, after which it bifurcates into three branches. The project comprises 769.10 km of main canal and branches, 5,422.33 km of distributaries and 160.90 km of escapes or 6,352.33 km of channel in all. The Upper Sarda Barrage is located in Banbassa of Nainital district for purpose of directing water in Sarda main canal for irrigation and power generation. Design flood discharge was 16,900 cumec. The length of barrage is 598 m and it has 4 under sluice bays.



Map 16. Command areas and canal network

3.2.5. Multipurpose projects

The Ganga basin has 18 multipurpose water resource projects serving for the Irrigation and Hydro-electric purpose. The list of multipurpose projects in the basin with their associated individual projects is listed in the Table 10.

Table 10. List of Multipurpose Water Resource Projects

Sl. No.	Name	Associated Projects
1.	Bansagar Multipurpose Project	i. Bansagar Hydroelectric Project ii. Bansagar Dam Major Irrigation
2.	Chambal Multipurpose Project	i. Chambal Major Irrigation Project ii. Chambal Hydroelectric Project
3.	Damodar Valley Corporation Multipurpose Project	i. Barrage And Irrigation System Of DVC ii. Modernization of DVC iii. Damodar Valley Corporation Hydroelectric Project iv. Tilaiya - Dhadhar Major Irrigation Project
4.	Gandak Multipurpose Project	i. Eastern Gandak Hydroelectric Project ii. Gandak Canal Major Irrigation Project iii. Restoration of Eastern Gandak Canal System iv. Restoration of Western Gandak Canal System
5.	Ganga Multipurpose Project	i. Upper Ganga Irrigation Modernization Project ii. Increasing Capacity of Upper Ganga Canal iii. Nirgajini Hydroelectric Project iv. Mohammudpur Hydroelectric Project Eastern Ganga Canal Major Irrigation Project v. Upper Ganga Canal Major Irrigation Project
6.	Giri Multipurpose Project	i. Giri Medium Irrigation Project ii. Giri Hydroelectric Project
7.	Kosi Multipurpose Project	i. Restoration and Extension of Kosi Canal System including Raipur canal ii. Kosi Hydroelectric Project iii. Kosi Barrage and Eastern Canal Major Irrigation Project iv. Western Kosi Canal Major Irrigation Project
8.	Matatila Multipurpose Project	i. Matatila Hydroelectric Project ii. Bhander Canal Major Irrigation Project
9.	Mayurakshi Multipurpose Project	i. Mayurakshi Major Irrigation Project ii. Massanjore Hydroelectric Project iii. Mayurakshi LBC

10.	North Koel Multipurpose Project	i. North Koel Hydroelectric Project ii. North Koel Major Irrigation Project
11.	Rajghat Multipurpose Project	i. Rajghat Hydroelectric Project ii. Rajghat Canal Major Irrigation Project iii. Rajghat Dam Irrigation Project iv. Rajghat Unit - I Major Irrigation Project v. Rajghat Unit - II Major Irrigation Project
12.	Ramganga Multipurpose Project	i. Ramganga Hydroelectric Project ii. Ramganga Major Irrigation Project
13.	Sarda Multipurpose Project	i. Aliganj Major Irrigation Project ii. Khatima Medium Irrigation Project iii. Khatima Hydroelectric Project iv. Madho Tanda Major Irrigation Project v. Sarda Sagar Stage I Major Irrigation Project vi. Sarda Sagar Stage II Major Irrigation Project vii. Sarda Canal Major Irrigation Project viii. Rohilkhand Canal Major Irrigation Project ix. Nanak Sagar Major Irrigation Project
14.	Sindh Phase - II Multipurpose Project	i. Madhikhera Hydroelectric Project ii. Sindh Phase - II Major Irrigation Project
15.	Sone Multipurpose Project	i. Sone Canal Modernization Scheme ii. Sone Barrage Remodeling And Link Canal iii. Sone Hydroelectric Project iv. Sone Canals Major Irrigation Project v. Sone High Level Canal Major Irrigation Project
16.	Teesta Multipurpose Project	i. Teesta Barrage, Phase -I, Stage-I Irrigation Project ii. Teesta Canal Falls Hydroelectric
17.	Tehri Multipurpose Project	i. Tehri Hydroelectric Project ii. Tehri Dam (Irrigation Share) Irrigation Project
18.	Yamuna Canal Multipurpose Project	i. Western Yamuna Canal Remodeling ii. Remodeling Eastern Yamuna Canal iii. Khara Canal Medium Irrigation Project iv. Western Yamuna Canal Stage - I Hydroelectric Project v. Western Yamuna Canal Stage - II Hydroelectric Project vi. Eastern Yamuna Canal Major Irrigation Project vii. Western Yamuna Canal Major Irrigation Project viii. Providing Kharif Channel in Hindon Krishi Doab ix. Augmentation Canals (Carrier Channels) Major Irrigation Project

3.2.6. Interstate projects

The Ganga basin has 29 interstate water resource projects and they are listed in the Table 11. Out of which 22 are irrigation projects, five are hydroelectric projects (Chambal HE Project, Matatila HE Project, Rajghat HE Project, Rihand HE Project and Yamuna HE Project) and two are multipurpose projects (Jamrani Multipurpose Project and Lakhwar Multipurpose Project).

Table 11. List of Interstate Water Resource Projects

Sl. No.	Name	States	Sharing Type
1.	Agra Canal Irrigation Project	Haryana, Rajasthan and Uttar Pradesh	Benefits
2.	Banjar Irrigation Project	Madhya Pradesh and Chhattisgarh	Cost,Benefits
3.	Bansagar Dam Irrigation Project	Bihar, Madhya Pradesh and Uttar Pradesh	Cost
4.	Bateshwar Pump Canal Project	Bihar and Jharkhand	Cost,Benefits
5.	Baur Irrigation Project	Uttar Pradesh and Uttarakhand	Cost
6.	Chambal Hydroelectric Project	Madhya Pradesh and Rajasthan	Power
7.	Chambal Irrigation Project	Madhya Pradesh and Rajasthan	Cost,Benefits
8.	Chandan Irrigation Project	Bihar and Jharkhand	Cost,Benefits
9.	East Baigul Irrigation Project	Uttar Pradesh and Uttarakhand	Cost,Benefits
10.	Gandak Irrigation Project	Bihar and Uttar Pradesh	Cost,Benefits
11.	Gurgaon Canal Irrigation Project	Haryana and Rajasthan	Cost,Benefits
12.	Jamni Irrigation Project	Madhya Pradesh and Uttar Pradesh	Cost,Benefits
13.	Jamrani Multipurpose Project	Uttar Pradesh and Uttarakhand	Cost,Benefits
14.	Kosi Irrigation Project	Uttar Pradesh and Uttarakhand	Cost,Benefits
15.	Lakhwar Multipurpose Project	Uttar Pradesh and Uttarakhand	Cost,Benefits
16.	Lalitpur Irrigation Project	Madhya Pradesh and Uttar Pradesh	Cost,Benefits
17.	Matatila Hydroelectric Project	Madhya Pradesh and Uttar Pradesh	Power
18.	Matatila Irrigation Project	Madhya Pradesh and Uttar Pradesh	Cost,Benefits
19.	Mayurakshi Irrigation Project	Jharkhand and West Bengal	Cost,Benefits
20.	Moosakhand Irrigation Project	Bihar and Uttar Pradesh	Cost,Benefits
21.	North Koel Irrigation Project	Bihar and Jharkhand	Cost,Benefits
22.	Pili Dam Irrigation Project	Uttar Pradesh and Uttarakhand	Cost,Benefits
23.	Rajghat Dam Irrigation Project	Madhya Pradesh and Uttar Pradesh	Cost
24.	Rajghat Hydroelectric Project	Madhya Pradesh and Uttar Pradesh	Power
25.	Rangwan Dam Irrigation Project	Madhya Pradesh and Uttar Pradesh	Cost,Benefits
26.	Rihand Hydroelectric Project	Madhya Pradesh and Uttar Pradesh	Power
27.	Sarda Canal Project	Uttar Pradesh and Uttarakhand	Cost,Benefits
28.	Urmil Irrigation Project	Madhya Pradesh and Uttar Pradesh	Cost,Benefits
29.	Yamuna Hydroelectric Project	Himachal Pradesh and Uttarakhand	Power

4. Ground Water Resources

Ground water is an essential and vital component of our life support system. Sub-surface water, or groundwater, is fresh water located in the pore space of soil and rocks. It is also water that is flowing within aquifers below the water table. Behavior of ground water in the Indian sub-continent is highly complicated due to the occurrence of diversified geological formations with considerable lithological and chronological variations, complex tectonic framework, climatological dissimilarities and various hydro-chemical conditions. The ground water resources are being utilized for drinking, irrigation and industrial purposes. The important attributes of ground water regime monitoring are ground water level and its fluctuation due to draft and recharge and wells lithology. The ground water monitoring network stations records the response of ground water regime to the natural and anthropogenic stresses of recharge and discharge parameters with reference to geology, climate, physiography, land use pattern and hydrologic characteristics. The natural conditions affecting the regime involve climatic parameters like rainfall, evapo-transpiration etc., whereas anthropogenic influences include pumpage from the aquifer, recharge due to irrigation systems and other practices like waste disposal etc.

4.1. Ground Water Observation Wells

The Ganga basin has a vast reservoir of groundwater, replenished every year at a very high rate. The mean annual replenishable groundwater in India as a whole has been assessed at 433 BCM per annum, of which about 202.5 billion cumec per annum (46.8%) lies in the states of the Ganga basin. The conjunctive use of groundwater for irrigation within the canal command areas not only ensures steady supply to the cultivated fields on time but also helps reduce water logging and salinization due to consequent downward movement of subsurface moisture. The most extensively used water sources for irrigation in the basin are the groundwater wells.

On an average, each square kilometer of the Ganga Basin receives a million cubic meters of water as rainfall. Thirty percent of this is lost as evaporation, while the remainder eventually exits the land surface as run off and/or seeps down into the subsoil as groundwater recharge, a portion of which often oozes out at lower levels into streams. In the course of the water‘s movement either overland or below the surface, various chemical compounds become dissolved in it. Some of these extraneous chemical constituents are derived from the residues of pesticides and chemical fertilizers, which are added to the soil every year for better yield of crops. The sub-basin wise distribution of number of ground water observation wells are given in Table 12.

The groundwater usage for irrigation in the states falling under Ganga basin exceeded 104.7 billion cum per annum as of 2008 and accounted for nearly 50 percent of the groundwater irrigated area of the entire country. The net annual groundwater availability for irrigation, domestic and industrial usage in the states of the Ganga basin has been assessed at 187.4 BCM per annum. Some 60 percent of this potential has already been utilized. The extent of groundwater utilization for irrigation is highest in Uttar Pradesh (45.36 BCM per annum), followed by Madhya Pradesh (16.08 BCM per annum), West Bengal (10.84 BCM per annum) and Rajasthan (11.6 BCM per annum). The net irrigated area percentage in the basin by ground water wells are Uttar Pradesh and Uttarakhand (73%), West Bengal (59%), Madhya Pradesh (64%), Delhi (88%) Rajasthan (71%). Apart from irrigation, groundwater resources are also being heavily tapped for industrial and domestic uses majoring both urban and rural areas. Throughout the alluvial area of the Ganga basin, the major urban water supply schemes are dependent upon groundwater resources. Similarly, a large number of industries also withdraw significant amounts of groundwater, especially from the easily accessible

aquifers in the alluvial zone. As per India-WRIS there are 5745 Ground Water Observation sites out of which 303 sites are Monitoring sites of National Hydrograph Network Stations, 4005 sites are CGWB Ground Water Monitoring sites. The spatial distribution of ground water observation wells in the Basin is shown in the Map 17.

Table 12. Sub-basin wise number of ground water observation wells

Sl. No.	Sub Basin	No. of Observation Wells
1	Above Ramganga Confluence Sub Basin	102
2	Banas Sub Basin	321
3	Bhagirathi and others (Ganga Lower) Sub Basin	940
4	Chambal Lower Sub Basin	37
5	Chambal Upper Sub Basin	142
6	Damodar Sub Basin	472
7	Gandak and others Sub Basin	349
8	Ghaghara Confluence to Gomti confluence Sub Basin	183
9	Ghaghara Sub Basin	273
10	Gomti Sub Basin	351
11	Kali Sindh and others up to Confluence with Parbati Sub Basin	208
12	Ramganga Sub Basin	151
13	Sone Sub Basin	278
14	Tons Sub Basin	82
15	Upstream of Gomti confluence to Muzaffarnagar Sub Basin	229
16	Yamuna Lower Sub Basin	623
17	Yamuna Middle Sub Basin	311
18	Yamuna Upper Sub Basin	561
19	Kosi Sub Basin	132

4.2. Ground Water Level Fluctuation

The occurrence of ground water generally depends upon the rainfall, drainage, topography and the geological conditions of the area. In Ganga basin according to India-WRIS database there are 2186 CGWB observation sites that has pre and post monsoon data. The pre monsoon data indicates that in north of river Ganga, Sub-Himalayan area of the basin, and in the north eastern part of the country generally the depth to water level varies from 2-5 meter below ground level. In major parts of Rajasthan depth to water level generally ranges from 10-40 m below ground level. Based on pre and post monsoon data two interpolated maps, the ground water level fluctuation maps (recharge)-2011 and ground water level fluctuation maps (draft)-2011 are generated using inverse distance weighted interpolation technique.

Ground water fluctuation observed in the Ganga basin is assessed for recharge and draft conditions based on the available groundwater level in four different seasons. Groundwater recharge is estimated by the difference between the pre and post monsoon seasons. The ground water level fluctuation maps due to recharge-2011 shown in Map 18, in general there is a rise of ground water level due to recharge in the basin. The map shows in 2011, in Bihar Water level fluctuation data of recharge analysis shows that there is rise in water level between 2-4 m in entire state. Some of the districts of Bihar like Kaimur, Bhojpur, Patna, Nawada and Jamuai have shown rise in more than 4 m range. Only few wells analyzed are showing falls less than 2 meter in the water level in the districts

of Madhubani, Supaul and Kishanganj of Bihar. The Chhattisgarh districts in the basin have shown a rise greater than 4m and in Surguja district a fall of water level less than 2m is seen in patches.

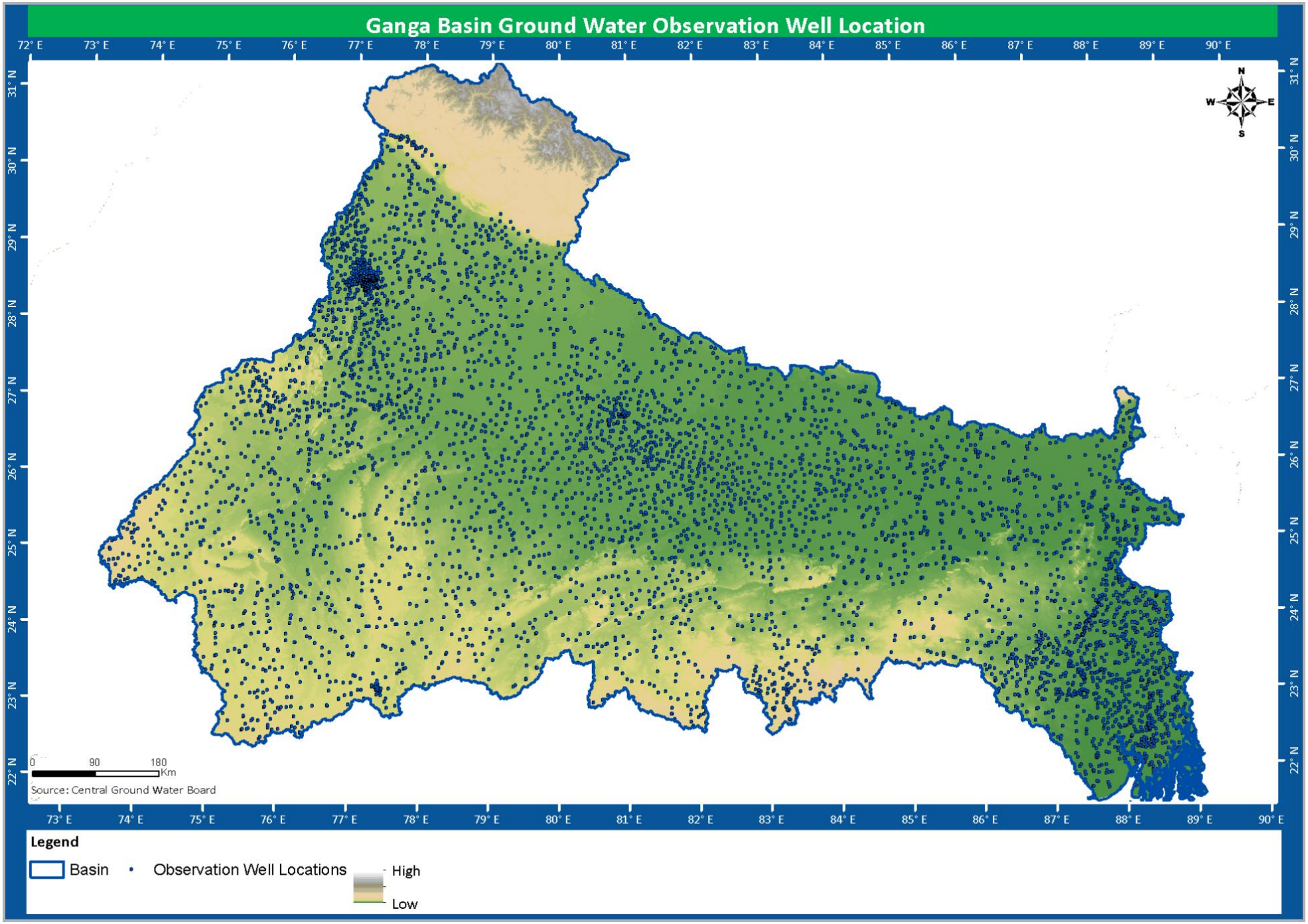
The Delhi has shown a varied pattern in the recharge of water level. Most of the areas have a fall of 2m in water level recharge with few locations having a fall in range of 2-4m and other parts have registered a rise of water level less than 2m. The fluctuation of water level in Haryana indicates that in general there is a rise and fall in water level with some districts like Sonepat and Gurgaon showing a decline of greater than 4m in water level. In the districts of Jharkhand within the basin, there is an overall rise in water level in greater than 4m other than the district Hazaribagh there a small pocket of fall less than 2m in the water level recharge. In the districts of Madhya Pradesh comprising in the basin, there is an overall rise in water level in greater than 4m other than the district Sheopur and Morena there a small pocket of fall greater than 2m in the water level recharge.

The fluctuation of water level in Rajasthan indicated that there is both general decline and rise in water level. The Alwar, Bharatpur, Dausa, Dhaulpur, Karauli and Kota districts has shown a decline of water level recharge greater than 4m. The fluctuations of water level recharge in Uttar Pradesh indicate that there is in general rise in water level by a range of 2-4m other the Lalitpur district having a fall greater than 4m. Uttarakhand state is mainly covered by hilly/ mountainous areas and has no appreciable ground water potential other than the district Hardwar were water level less than 2m is observed. West Bengal observation wells are showing a rise in water level recharge greater than 4m other than Murshidabad district where the water level is noted with a fall greater than 4m.

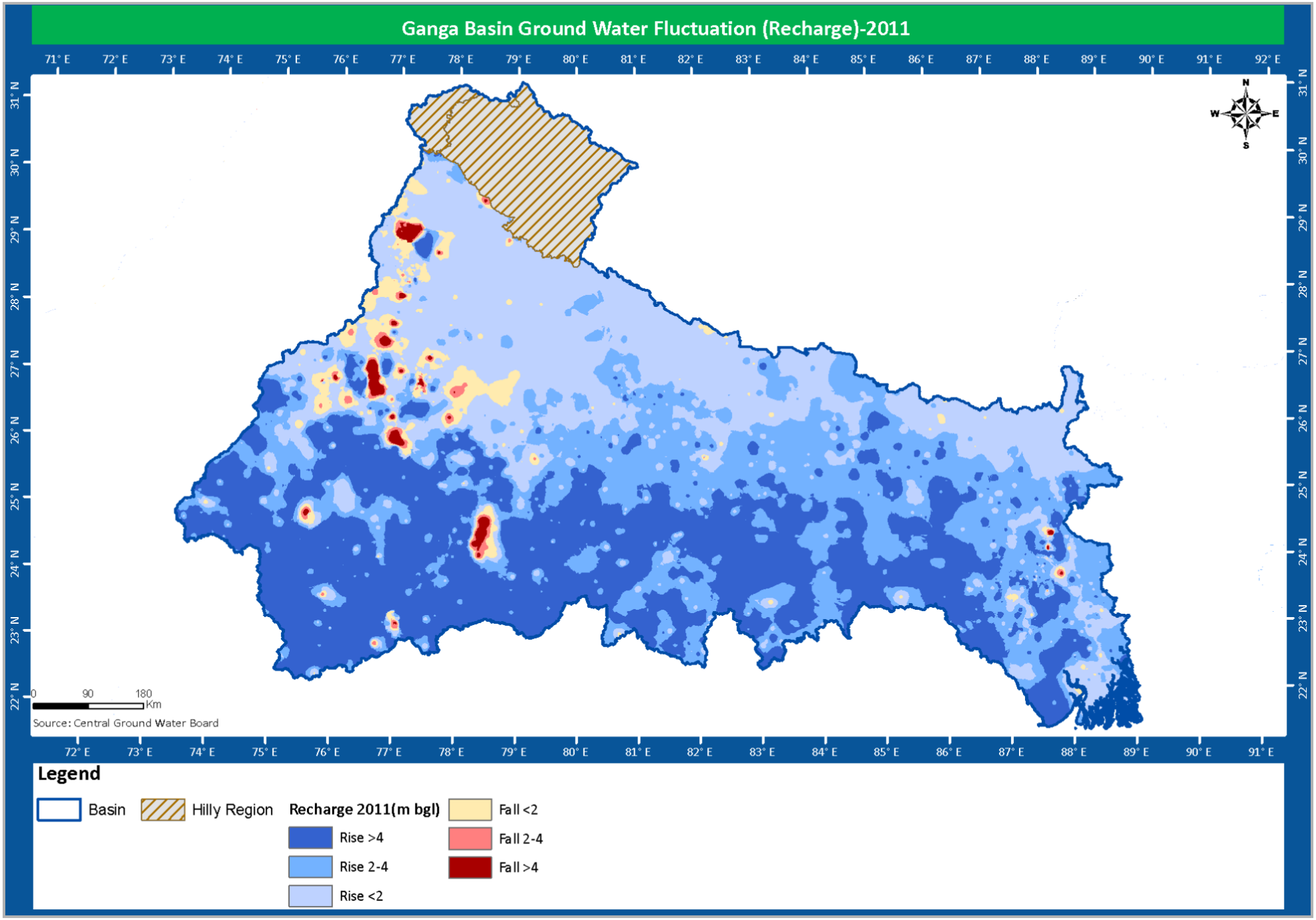
Similarly, groundwater draft is estimated by the difference between successive post-monsoon (Rabi) seasons data. The ground water level fluctuation maps (draft)-2011 shown in Map 19, in general there is a fall of ground water in the basin. The map shows in 2011, in the districts of Chhattisgarh, Haryana, Himachal Pradesh and Jharkhand comprising in the basin, there is fall of water level by 2m in the water level draft. In Bihar Water level fluctuation data of draft analysis shows that in general there is fall and rise in water level in entire state. Only few wells analyzed are showing fall less than 2 meter in the water level in the Jamuai and Lakhisarai districts of Bihar.

The Delhi has shown a varied pattern in the draft of water level by both rise and fall in the level. Most of the areas have a fall of 2m in water level (recharge) with few locations having a fall less than 2m and other parts have registered a rise of water level in the range of 2-4m. The districts of Madhya Pradesh within the basin, there is an overall fall in water level in less than 2m other than the districts Bhopal, Guna, Indore, Sheopur and Ujjain there are pocket of fall greater than 4m in the water level draft. The fluctuation of water level in Rajasthan indicated that there is both general decline and rise in water level due to draft. The Bharatpur, Dausa, Dhaulpur, Karauli and Sawai Madhopur districts has shown a decline of water level (recharge) greater than 4m.

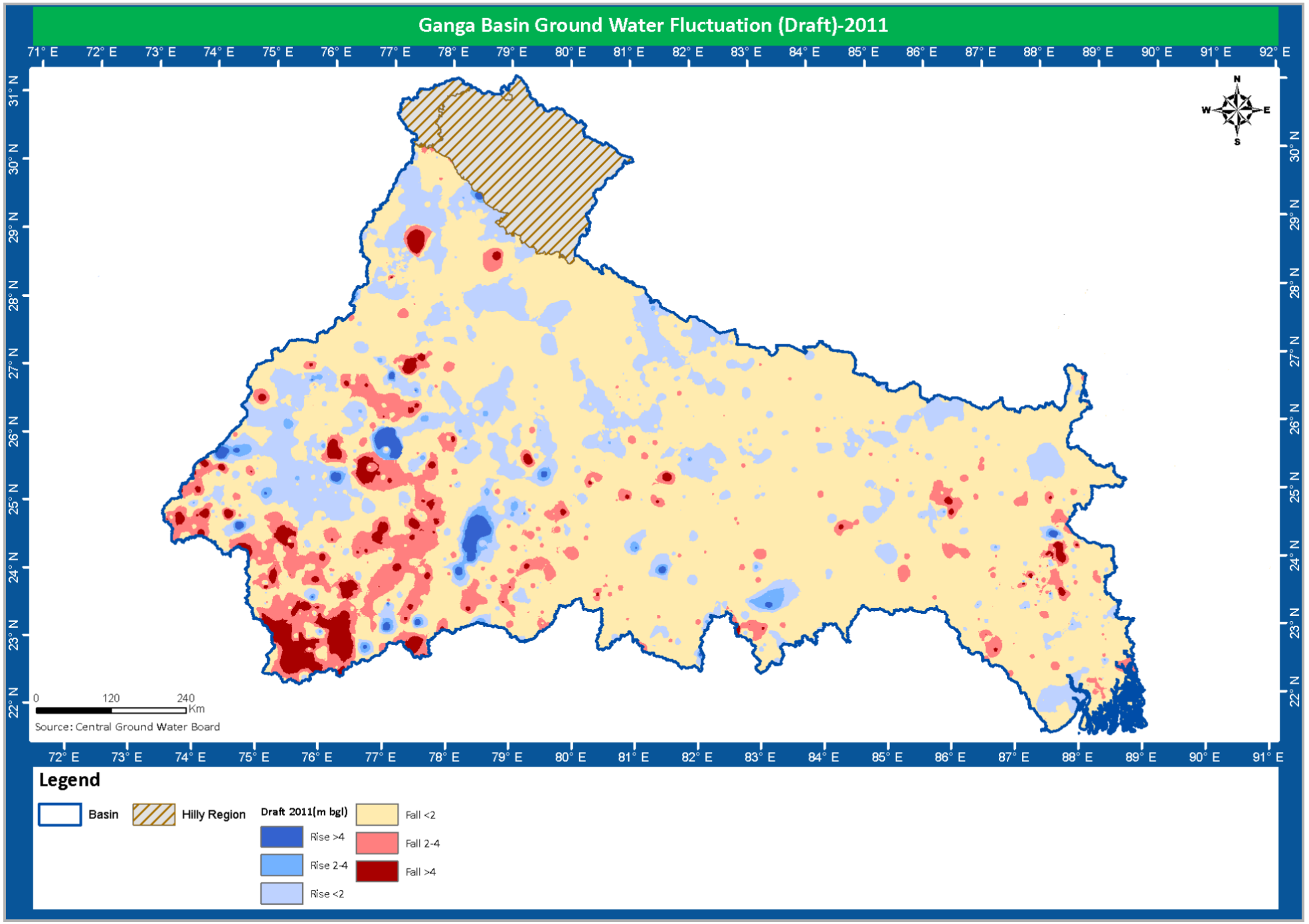
The fluctuations of water level (draft) in Uttar Pradesh indicate that there is in general fall in water level by a range of 2-4m. Also it is noted in some part of the state the water level due to draft has a rise in the range of 2-4m and the Lalitpur district having a rise greater than 4m. Uttarakhand state is mainly covered by hilly/ mountainous areas and has no appreciable ground water potential other than the district Hardwar where fluctuation in water level (draft) has shown a decline of less than 2m. West Bengal observation wells are matching with the general pattern of the basin with a decline of water level draft by less than 2m, except for Murshidabad, Birbhum district where the water level observed with a fall greater than 4m.



Map 17. Location of ground water observation wells



Map 18. Ground water level fluctuation (Recharge)



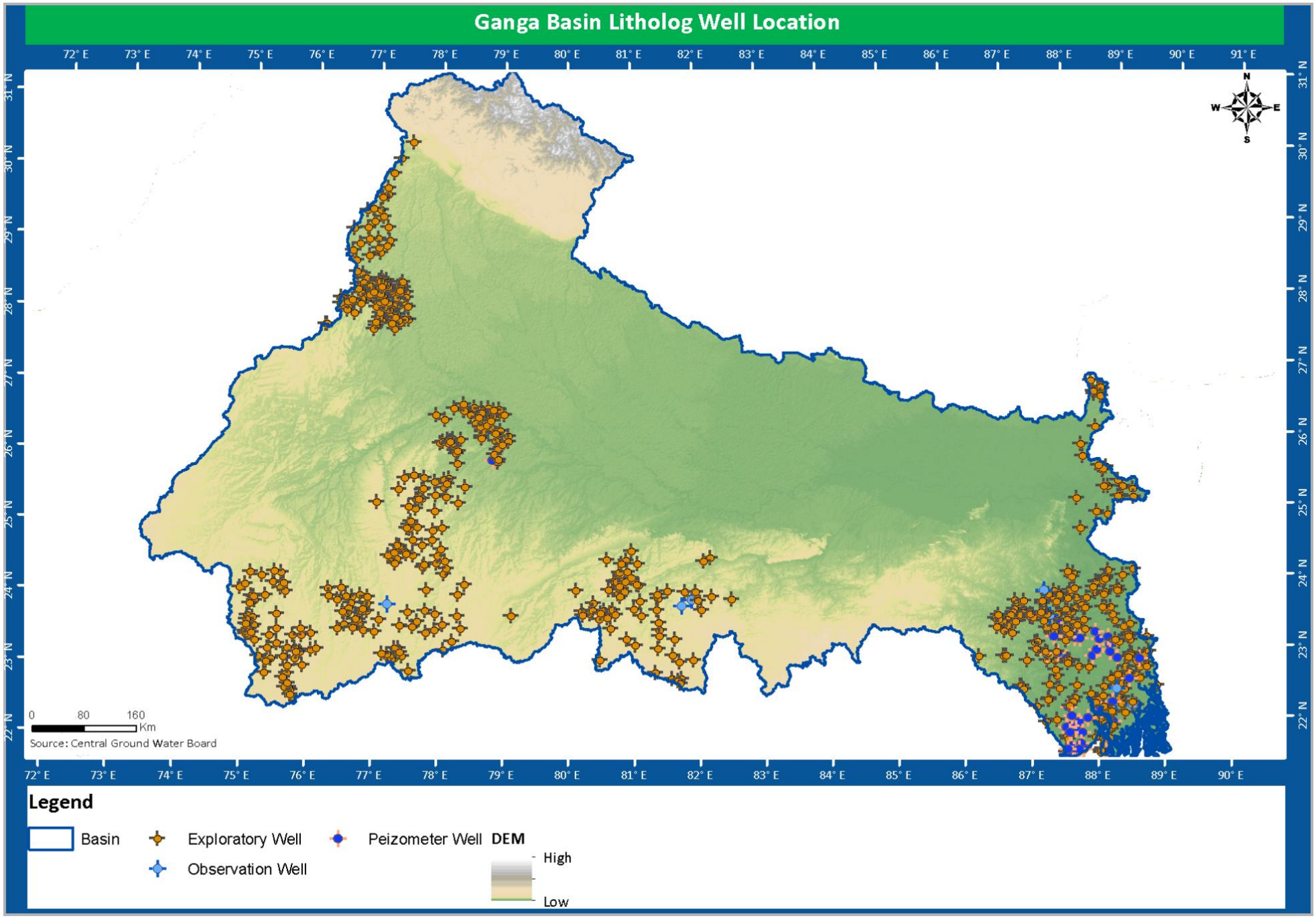
Map 19. Ground water level fluctuation (Draft)

4.3. Litholog Well Locations

An aquifer is an underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, or silt) from which groundwater can be extracted using water well. Related terms include aquitard, which is a bed of low permeability along an aquifer and aquiclude (or aquifuge), which is a solid, impermeable area underlying or overlying an aquifer. If the impermeable area overlies the aquifer pressure could cause it to become a confined aquifer. Aquifers may occur at various depths. Those closer to the surface are not only more likely to be used for water supply and irrigation, but are also more likely to be topped up by the local rainfall. Many desert areas have limestone hills or mountains within them or close to them that can be exploited as groundwater resources.

As per India-WRIS database, Ganga basin contains 690 aquifer/lithology observation locations which are further classified as 46-Exploratory well, 635-Observation well, 9 Peizometer well and other wells as shown in Map 20. The aquifer/lithology information of only 3 states of the basin is available in the database which is distributed in 282 wells in West Bengal, 286 wells in Madhya Pradesh and 121 wells of Haryana. Variety of rock types are found in the Ganga basin aquifer. The major 7 types of rock groups are found in the Ganga basin are Crystalline Rocks (Archaean-Pre-Cambrian), Semi-Consolidated Sediments (Carboniferous-Pliocene and other ages), Consolidated Sediments (Pre-Cambrian-Devonian and other ages, Intrusive Rocks (Archaean-Pre-Cambrian), Volcanic Flows & Inter-trapeans (Cretaceous-Eocene-Recent), Residual Cappings (Cretaceous-Recent), Un-consolidated Sediments (Quaternary-Recent).

The Alluvium, Sandstone, Schist, Quartzite, Banded Gneissic Complex are major types of Aquifer-lithology seen in the Ganga basin. The other lithology formation are Alluvium, Achaeans, Anchorage camp, Haldia (EW)/ Sutahata, Barakar Sandstone, Basalt Jointed/ Fractured / vesicular, Lameta, Bhander limestone & Ganurgarh Shale, Bijawar Sandstone, Bouldary Formation, Clay Sand mix with Kankar & weathered Quartzite, Deccan Trap Basalt, Dolomite & Limestone, Garnetiferous schist, Gondwana (Barakar, Barren Measures, Panchet, Raniganj), Cartoceams Shale, Granite/Granite Gneiss, Hornblende gneiss, Laterites & Rajmahal Trap, Meta- sediments, Morar Shale, Par Quarzite, Porcellanite stage & Shale, Porphyritic granite, Quaternary Alluvium/ Tertiary sediments, Rajmahal Trap, Rohtas limestone & Shale, Sand Silt Clay & weathered Quartzite, Sirbu ShaleSlate, Talchir Sandstone, Tertiary sediments, Trap Vesicular, Vesicular Basalt, Vindhyan Sandstone, weathered Quartzite. The detailed lithology of each observation wells are given in Annexure-V.



Map 20. Litholog well locations

5. Hydro-met Observations

This section describes the Hydrological and meteorological characteristics of the Ganga basin. The hydrological and meteorological parameters of three main organizations, Central Water Commission (CWC), India Meteorological Department (IMD) and ISRO (Automatic Weather Stations) are incorporated in India-WRIS database. CWC has contributed substantially in the collection of hydrological data all over the country. India Meteorological Department (IMD) divides the country into various meteorological sub divisions and has 1025 stations all over India having data of monthly average precipitation and potential evapotranspiration, average annual rainfall and potential evapotranspiration for last 10 years. In India-WRIS distribution of Automatic Weather Stations (AWS) maintained by ISRO are also included. The details of these data in the Ganga basin is described in the below sub sections.

5.1. Hydrological Observation Sites

Central Water Commission provides about various hydrological parameters as gauge (river water level), discharge (amount of water released from a cross section in the river in a given time period), sediment (concentration of solid particles in water) and river water quality pertaining to different quality parameters. They also measure rainfall in the plains of Ganga and snow in the higher heights like areas of Uttarakhand and Himachal Pradesh. The location map of Hydro Observation Sites and Flood Forecasting Sites of CWC in Ganga basin are shown in the Map 21.

There are 318 Hydro-observation stations of CWC (Central Water Commission) are located in the Ganga basin. These stations are categorized as 'GDSQ', where the abbreviation stands as: G-Gauge, D-Discharge, S-Sediment and Q-Water Quality and the concise categorization of Ganga basin sites are shown in the Table 13. RF stands for rainfall measuring station. Hydrological observations are carried out by the Central as well as State Governments. The Central Water Commission maintains 111 gauge measuring stations and around 75 stations also measure discharge along with gauge in these sites in the Ganga basin. Sediment, Water quality parameters are also measure with gauge and discharge at 8 and 27 CWC Stations respectively. CWC has 7 stations where Rainfall is measured in the basin. Also there are 6 Snow Stations of CWC in the Ganga basin where 3 stations are located in Uttarakhand and 3 snow stations in Himachal Pradesh. The snow stations are Harsil, Auli, and Hanuman Chetty of Uttarakhand and Kufri, Jubbal-I, and Jubbal-II of Himachal Pradesh.

Table 13. Hydrological observation sites of CWC

Sl. No.	Station Type	Number of Stations
1	G	113
2	GQ	2
3	GD	75
4	GDQ	27
5	GDS	8
6	GDSQ	80
7	Rainfall	7
8	Snow	6

Out of the 318 Hydro-observation stations of CWC, 112 stations are maintained by Lower Ganga Basin CE Office at Patna, 105 stations under Upper Ganga Basin regional office at Lucknow, 88 stations are maintained by Yamuna Basin regional office at New Delhi with 7 rainfall monitoring stations, 6 snow monitoring stations of Indus Basin Organization at Chandigarh and 4 stations of Brahmaputra and Barak Basin regional office at Shillong and 2 stations of North Eastern Investigation Circle at Shillong and one station of HOC at Varanasi CE offices of CWC.

5.2. Flood Forecasting Sites

In the Ganga basin, the flood problem is mostly in the areas on the northern bank of the Ganga river caused by the northern tributaries of Ganga. Uttar Pradesh, Bihar, and West Bengal are the worst affected states in the basin. The large scale devastation took places in Uttar Pradesh and Bihar due to high floods in the Ghaghara, the Rapti, the Gandak, the Kosi, the Mahananda, and the Bagmati & Adhwara Group leading to loss of lives, dwellings, properties, installations, communication, and infrastructure facilities.In Haryana, flooding takes place along the river Yamuna and the problem of poor drainage exists in some of the southwestern districts. In Delhi, the area along the banks of the Yamuna is flood prone. North Bihar suffers from floods almost every year due to spillage of river Kosi in the lower reaches, and the Mahananda, spill over their banks causing considerable damage to crops and dislocation of life. In south and central West Bengal, the Mahananda, the Bhagirathi, the Ajay, the Damodar rivers etc., cause flooding due to the inadequate capacity of river channels and tidal effect. In Rajasthan and Madhya Pradesh, the problem is not serious but these states have also experienced some isolated incidents of heavy floods in recent years.

When the river comes out from the hilly region into the plains, there is a certain amount of spilling over of its banks and the flooding of the adjoining territories. Almost all the rivers of Ganga rise in the Himalayan ranges and during the monsoon bring enormous quantities of water and silt. As they enter the plains their sloped get reduced, the slit load carried by them is dropped and as a consequence, the rivers have a tendency to spill their banks and to shift their courses. The Gandak and Burhi Gandak river also has serious flood problem which affects the parts of Uttar Pradesh has been more or less controlled. The eastern districts of Uttar Pradesh which lie in Gomti and Ghaghara sub-basin are perhaps the worst flood affected districts in the State. The Ghaghara, the Rapti and the Sarada are the big rivers with considerable portions of their catchment areas in the Himalayan regions and have very high discharges. Even the smaller rivers like the Gomti, the Sai and the Tons which rise in the plain cause considerable inundation in the areas through which they flow. The Ramganga has a shifting and an uncertain course during its course in the plains. In the districts of Hardoi, Farrukhabad, Shahjehanpur, Budaun, Bareilly, Rampur, Moradabad and Bijnor of Uttar Pradesh, floods cause serious damage. However the extent of the area flooded is not large except near its confluence with the Ganga.

The Kosi river which is known as ‘Sorrow of Bihar’ is the most treacherous of the north Bihar rivers so far as flood is concerned. The river has marked tendency to change its course and during last 200 years it has shifted in a westward direction. The river deposits coarse slit brought down from Himalayas on the vast stretches of cultivated areas and renders them unfit for cultivation. Unlike the rivers of North Bihar, those in South Bihar have not serious floods other than some flooding that takes place at their confluence points with the main Ganga. Of the rivers flowing from the Chottanagpur plateau into West Bengal the Damodar, the Ajay, the Rupnarayan and the Kangsabati used to be the worst affected due to flood. Flood is also observed in the low lying plains of the Sone between Arrah and Maner districts of Bihar. The main characteristics of the flood that occur in these areas are of short duration hardly lasting for few days. They also recede very rapidly. Flood of 2004 demonstrates the severity of flood problem when a vast area of 23490 Sq.km was badly affected by the floods of Bagmati, Kamla & Adhwara. The flood problems in the Yamuna basin are not as severe as those on some of the other tributaries of the Ganga. When the Yamuna is in flood it spills its banks and submerges the low lying areas in the Haryana and Delhi.

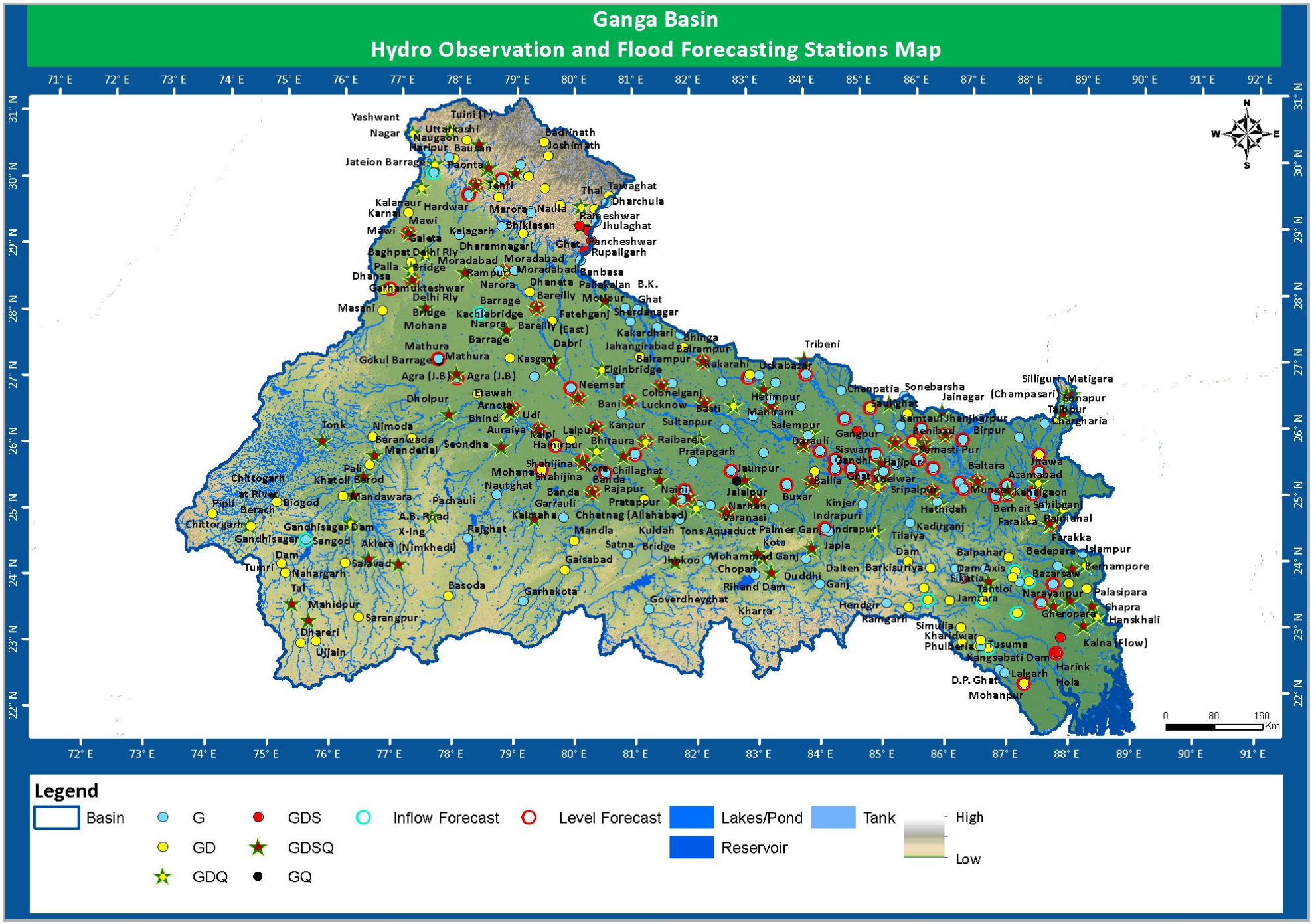
In 2008 based on the analysis of Radarsat-2 Satellite data flood Inundated areas in Araria, Madhepura, Saharsa and Supaul districts of Bihar and Barabanki district of Uttar Pradesh. In 2009 based on the analysis of Radarsat-2 data by ISRO it is noted that three states in Ganga basin, Bihar, Uttar Pradesh and West Bengal has a large flood inundation area. About 10 districts of Bihar namely Darbhanga, East Champaran, Katihar , Khagaria, Madhepura ,Madhubani , Muzaffarpur, Saharsa, Samastipur , Sitamarhi, 2 districts of West Bengal Bardhaman and Hoogly District and 5 districts of Uttar Pradesh that is Murshidabad , Bahraich, Balrampur, Siddharth Nagar, Barabanki, Sitapur. In 2010 four districts of Uttar Pradesh are also inundated by flood are Bahraich, Barabanki, Mahrajganj and Shrawasti.

In June 2013, the nature faced another devasting flood that is country's worst natural disaster since 2004 Tsunami. Uttarakhand received heavy rainfall which was about 375 percent more than benchmark rainfall during a normal monsoon. This caused the melting of Chorabari Glacier at height of 3800m and eruption of the Mandakini which led to heavy flood near Gobindgat, Kedarnath and Rudraprayag in Uttarakhand.

Central Water Commission, Ministry of Water Resources has set up a network of flood forecasting stations covering all important flood prone rivers. Flood forecasting indicates the forecast or inflow level with its time of occurrence. Two kinds of forecasts are issued based on the utility of the forecast. Inflow forecasts assist in reservoir regulation (full reservoir level & maximum water level) and the level forecast is used for predicting water level (warning level & danger level) well ahead of its occurrence. The CWC operates 87 flood forecasting stations in the Ganga basin which is located on major flood prone rivers where 81 are located on main Ganga river, 4 stations on Bhagirathi, and 2 stations on Hooghly river. Out of total stations, 10 stations are flood inflow stations (Reservoirs) and 77 are flood level stations (river forecast stations) as mentioned in Table 14. They are distributed in the 8 states where maximum flood forecasting stations in Uttar Pradesh, Bihar with 35 and 32 stations respectively. There are 9 flood forecasting sites in West Bengal, 4 stations at Jharkhand, 3 stations at Uttarakhand, 2 stations at Delhi and one station each at Madhya Pradesh and Haryana. Out of 87 stations 47 stations are under Lower Ganga Basin, Patna, 24 stations are maintained by Upper Ganga Basin, Lucknow and 16 stations are maintained by Yamuna Basin, New Delhi. Out of 87 Flood Forecasting stations, the modes of collection of 52 stations are Wireless/ Telemetry, 34 stations are Wireless and one station is by Telemetry mode.

Table 14. Types of flood forecasting stations of CWC

Sl. No.	Station Type	Number of Stations
1	Level Forecast	77
2	Inflow Forecast	10



Map 21. Hydro observation and flood forecasting stations

5.3. Meteorological Stations

CWC has established 291 Hydro-Meteorology stations in the basin. These stations are established to understand the relationship between meteorological parameter and river dynamics. These CWC stations monitor parameters like rainfall, temperature, pan evaporation, relative humidity, absolute pressure, wind speed, wind direction and sunshine.

The Ganga basin has 265 Indian Meteorological stations (IMD) which contains the records of monthly average meteorological parameters like precipitation, average annual rainfall and potential evapotranspiration of last 10 years. Out of which 178 stations are in Uttar Pradesh, 44 stations are in Madhya Pradesh, 14 stations each in Haryana and Rajasthan, 6 stations in Bihar, 4 stations in Uttarakhand, 3 stations in Jharkhand and 2 stations in Chhattisgarh. The Ganga basin also has 32 weekly average monitoring stations that monitors weekly data of rainfall, maximum and minimum temperature, wind speed, evaporation and sunshine hours. Out of which 8 stations each are there in Uttar Pradesh and Madhya Pradesh, 4 stations each in Bihar and West Bengal, two stations each in Uttarakhand and Rajasthan and a single station each in Jharkhand, Himachal Pradesh, Chhattisgarh and Delhi.

There are 703 District-wise Rainfall Monitoring Stations in Ganga basin which is monitored by IMD. Out of which 209 stations are in Uttar Pradesh, 121 stations in Bihar, 94 stations in Madhya Pradesh, 86 stations in Rajasthan, 75 stations in West Bengal, 38 stations in Jharkhand, 33 stations in Uttarakhand, 22 stations in Haryana, 12 stations in Himachal Pradesh and 6 stations each in Chhattisgarh and Delhi. World Meteorological Organization (WMO) has recognized 148 IMD sites in Ganga basin. Out of which 41 stations are in Uttar Pradesh, 25 stations each in Madhya Pradesh and West Bengal, 16 stations are in Bihar, 15 stations are in Rajasthan, 14 stations are in Uttarakhand, 4 stations are in Jharkhand, 3 stations are in Haryana, 2 stations each in Chhattisgarh and Delhi and a single station in Himachal Pradesh.

The integrated approach of measuring meteorological parameter using Automated Weather Stations (AWS) is helpful in the remote region which requires minimum maintenance and the data is generated on the temporal basis. Under the supervision of ISRO there are 133 AWS stations, out of which 49 sites are in Rajasthan, 37 sites are in Jharkhand, 18 sites are in Madhya Pradesh, 17 sites are in Uttarakhand, 7 sites are in Uttar Pradesh, 3 sites are in West Bengal and 2 sites are in Delhi. The number of meteorological stations in Ganga basin is given below in Table 15.

Table 15. Meteorological stations

Sl. No.	Organization	Number of Stations
1	CWC Observation Stations	291
2	IMD Stations	703
3	ISRO AWS Stations	133

The detailed Hydro-Observation and Flood forecasting station information is given in Annexure-VI.

6. Water Quality

The water quality monitoring of the River Ganga and its several tributaries are being done in the basin by the State Pollution Control Boards of Uttarakhand, Uttar Pradesh, Bihar, West Bengal, Haryana, Himachal Pradesh, Rajasthan, Madhya Pradesh, Jharkhand, Central Water Commission, Central Ground Water Board and Central Pollution Control Board. The observation of water quality is categorized in two sections, the surface water quality and ground water quality. Surface water quality is measure by Central Water Commission and Central Pollution Control Board whereas the ground water quality is measured by Central Ground Water Board, Central Pollution Control Board and other state departments. The details of water quality of Ganga basin in each section is given below.

6.1. Surface Water Quality Observations

The vast Gangetic alluvial trough is characterized by not only one of the most prolific aquifers in quantitative terms, but also by the relatively high quality of the available water, though the quality deteriorates as one proceeds down the river to the outfall. Along the Himalayan foothills the water is of high quality, as these belts are under continuous recharge from the Himalayan streams. There are a total of 110 water quality monitoring stations in the basin, of which 39 are along main stream of Ganga and 71 are along the tributaries and sub-tributaries.

CWC stations carry out observations for testing the surface water quality pertaining to sixty eight water quality parameters which are considered to be the 'Standard Hydrology Project Water Quality Parameters'. All physical, chemical and biological water quality parameters are categorized further under sub categories like field determinations, nutrients, organic matter, alkalinity, hardness, other inorganics, major ions, coliforms and others. The frequency of monitoring at the stations on surface water bodies such as rivers, lakes, ponds, canals and creeks is either monthly or quarterly, whereas samples at the groundwater monitoring stations are taken on a half yearly basis. As per India-WRIS database there are 110 Surface Water Quality stations of CWC which monitors the major quality parameters of river and surface water bodies. Some major locations of monitoring stations are Devprayag, Rishikesh, Rudraprayag, Uttarkashi, Farakka, Gaya, Kota, Tehri, Ayodhya, Lucknow, Varanasi, Silliguri (Champasari).

The Central Pollution Control Board observes quality parameters at 233 locations and the water quality parameters observed in rivers in Ganga Basin are pH, Conductivity, DO, BOD, Total Coliform and Faecal Coliform. The monitoring results obtained during 2009 indicate that organic pollution continues to be the predominant pollution of aquatic resources. The organic pollution measured in terms of bio-chemical oxygen demand (BOD) & Coliform bacterial count gives the indication of extent of water quality degradation in different parts of our country. The river water quality in the Himalayan Segment and the Diluted Segment is comparatively good. However, due to heavy abstraction from and discharge of pollutants into the river system, the lower segments are very highly polluted. The pH value is an important criterion for drinking purposes with the desired range of 6.5-8.5 and the value of pH in the Ganga basin is observed in the range of 6.5-8.9. The pH is not meeting the desired criteria at some major locations like Varanasi, Chapra, Rishikesh, Haridwar, Kannauj, Indrapuri, Bithoor, Trighat and Kanpur.

The desired criterion of Conductivity for irrigation is 2250 µmhos/cm. and the value for the basin range between 68-4460 µmhos/cm and thus not meeting its required criteria. The Dissolved Oxygen (DO) and Bio chemical Oxygen Demand (BOD) is an important parameter for aquatic life of flora and

fauna. The desired value for DO should be more than 4 mg/l and for BOD should be less than 3 mg/l. The observed value for DO and BOD in the basin lies in the range of 4.3-9.2 mg/l and 0.2-16.0 mg/l. respectively and doesn't meet the criteria at places like Kanpur, Varanasi, Dakshineshwar, Haridwar, Bithoor, Kannauj etc. Though there are number of bathing Ghats along the river stretch, the quality of water is far below the bathing standards and are measured by parameters like the Faecal Coliform and total Coliform. The Faecal Coliform should be less than 2500 MPN/100ml whereas the value for the basin ranges from 0-400000 MPN/100ml. The Faecal Coliform is not complying with the permissible limit of water quality criteria for bathing at Dakshineshwar, Howrah-Shivpur and Garden Reach, Palta, Serampore, Uluberia and Diamond Harbour, Varanasi, Bhagirathi with Alaknanda at Devprayag, Mandakini Alaknanda at Rudraprayag.

In the river Yamuna, a major tributary of Ganga, is observed that about 500 km long stretch of the river is in bad shape, having water quality, most of the time, below desired level for "designated best use". The water quality of the Yamuna for year 2009 is pH is observed in the range of 7.0-9.4. The Conductivity of Yamuna river lies in the range of 80-3040 µmhos/cm. The DO value of the Yamuna lies in the range of 0.0-17.9 mg/l and is meeting the criteria. The BOD of the Yamuna was observed in the range of 0.2-103 mg/l, the Faecal Coliform ranges from 9- 21, 00,00,00,00 MPN/100ml and the total Coliform is in the range of 4- 23,00,00,00,000 MPN/100ml and not meeting the required water quality desired value.

The pH value of the other tributaries like Ramganga, Gomti, Saryu, Ghaghara, Rihand, Burhi Gandak and Gandak is ranges from 7.1 to 8.7. The pH value of tributaries like Kali Nadi, Hindon, Chambal, Khan, Kshipra, Parvati, Betwa, Tons, Sind, Sone, Sankh, Sikrana, Dhous, Kaliasot and Churni ranges from 6.8 to 9.2 and do not meet the desired criteria. The value of the tributaries like Damodar, Barakar, Mahananda, Jumar, Bokaro, Konar, Rupnarayan, Dwarakeshwar, Dwarka, Vindyadhari, Silabati, Ram Rekha, Mayurakshi, Matha Bhanga, Manusmar, Koshi, Kansi, Kamala, Jalangi and Harbora ranges from 6.0 to 8.4 and meets the desired criteria.

The Conductivity of Ramganga, Gomti, Saryu, Ghaghara, Rihand, Burhi Gandak and Gandak ranges from 67-967µmhos/cm, tributaries like Kali Nadi, Hindon, Chambal, Khan, Kshipra, Parvati, Betwa, Tons, Sind, Sone, Sankh, Sikrana, Dhous, Kaliasot and Churni ranges from 72-9720 µmhos/cm and meets the desired criteria. And the value for the other tributaries like Damodar, Barakar, Mahananda, Jumar, Bokaro, Konar, Rupnarayan, Dwarakeshwar, Dwarka, Vindyadhari, Silabati, Ram Rekha, Mayurakshi, Matha Bhanga, Manusmar, Koshi, Kansi, Kamala, Jalangi and Harbora ranges from 105 – 55800 µmhos/cm and doesn't meet the desired criteria.

The other parameters for Ramganga, Gomti, Saryu, Ghaghara, Rihand, Burhi Gandak and Gandak like the value of DO and BOD ranges from 0.7 to 10.7 mg/l and 1.4 to 13.0 mg/l respectively and is not meeting the desired criteria in these rivers. The Faecal Coliform and Total Coliform in the range of 60-130,000MPN/100ml and 400-850,000 MPN/100ml and is also not meeting the desired criteria. The value of DO and BOD for the tributaries like Kali Nadi, Hindon, Chambal, Khan, Kshipra, Parvati, Betwa, Tons, Sind, Sone, Sankh, Sikrana, Dhous, Kaliasot and Churni ranges from 0.0 to 10.7 mg/l and 0.1 to 353.0 mg/l respectively and is not meeting the desired criteria in these rivers. The Faecal Coliform and Total Coliform in the range of 0-40,000,000MPN/100ml and 4-550,000,000 MPN/100ml and is also not meeting the desired criteria.

The Water Quality Status of canal in Ganga basin is also affected to a large extent. The Western Yamuna Canal downstream of Yamuna Nagar and at Damla is grossly polluted due to municipal and industrial waste water disposal. Some of the lakes and Tanks in the Ganga basin also are having high

concentration of organic matter and not complying to the standard limits for BOD are Tighi Talab, Surajkund & Kawar Lake in Bihar; Rabindrasarobar, Mainh Ghat, Hanuman Ghat, Mirikh Lake, Hathishala Ghat, Kochbihar Lake, Delo Reservoir & Sahebbandh in West Bengal; Maahil Pond, Ramgarh Lake, Samarpur Jheel & Laxmi Pond in Uttar Pradesh; Naini Lake in Uttarakhand, Udaisagar lake, Pushkar Lake & Pichola lake in Rajasthan; Lower lake, Upper Lake, Kewra Dam, Govingarh tank & Janunia Talab in Madhya Pradesh.

6.2. Ground Water Quality Observations

Ground water quality is influenced by contribution from the atmosphere and surface water bodies. The natural chemical composition of ground water is influenced predominantly by type & depth of soils and subsurface geological formations through which ground water passes. Due to rapid growth of population, urbanization, industrialization and agriculture activities, ground water resources are under stress. There is growing concern on the deterioration of ground water quality due to geogenic and anthropogenic activities. Overexploitation of ground water in coastal regions may result in sea water ingress and consequent increase in salinity of ground water and excessive use of fertilizers and pesticides in agriculture and improper disposal of urban/industrial waste can cause contamination of ground water resources.

The groundwater quality is monitored by the Central Ground Water Board once a year (April/May) through a network of observation wells located all over the country. The hot spots for groundwater in districts coming under basin states are identified on the basis of six main parameters: salinity (EC>3000 micro simen/cm), chloride, fluoride (>1.5 mg/l), iron (>1.0 mg/l), arsenic (>0.05 mg/l) and nitrate (>45 mg/l). The states of Bihar, Uttar Pradesh and West Bengal is affected by arsenic (where the concentration is greater than the permissible limit of 0.05 mg/l as per IS: 10500), fluoride, iron & nitrate. More than permissible level of salinity and chloride has been identified in Haryana, Delhi, Himachal Pradesh, West Bengal, Uttar Pradesh, Rajasthan and Madhya Pradesh.

In the central alluvial trough, the groundwater has low mineral contents. The mineral content increases near the southern fringe of the alluvial formation, especially in certain parts of Agra, Aligarh, Mathura, Mainpuri and Ballia districts of Uttar Pradesh, near the delta area in West Bengal, the water in certain aquifers turns saline due to incursion of sea water. According to India-WRIS database there are 571 Ground Quality Observation sites in 124 districts of 10 states which fall in Ganga Basin. There are 181 sites of Rajasthan, 169 of Madhya Pradesh, 62 of Uttar Pradesh, 50 of West Bengal, 47 of Haryana, 27 sites in Bihar, 21 sites in Delhi, 10 in Jharkhand, 3 sites in Uttarakhand and 1 site in Chhattisgarh.

According to the CGWB, the Ganga basin is severely affected by arsenic, fluoride, nitrate, chloride and salinity. The problem of arsenic contamination in ground water from the vast tract of alluvial aquifers in West Bengal, Bihar and Uttar Pradesh has affected a large population in different districts of Ganga basin. A large population of West Bengal live in the arsenic belt and few places are also affected by fluoride. Arsenic in ground water have been reported in a range 0.05-3.2 mg/l in shallow aquifers in 8 districts of West Bengal namely Malda, Mushirbad, Nadia, North and South 24 Pargana, Bardhaman, Howrah, and Hugli. The incidence of arsenic problem is due to excessive use of ground water irrigation. For e.g. up to 80 percent of the annual replenishable recharge in North 24 Parganas district of West Bengal for multiple cropping which causes dropping of water levels resulting exposure of the arsenic rich beds to air. In Ganga basin there are 152 arsenic affected ground water

observation sites in 31 districts of 3 states that are contained in Ganga basin. There are 74 sites of West Bengal, 42 sites of Bihar and 36 sites of Uttar Pradesh.

Salinity/Electrical Conductance (EC) is the saltiness or dissolved salt contents of a water body and is an important factor in water use. Salinity always exists in ground water but in variable amounts. It is mostly influenced by aquifer material, solubility of minerals, duration of contact and factors such as the permeability of soil, drainage facilities, quantity of rainfall and above all, the climate of the area. In the Ganga basin relatively high values of EC exceeding the permissible limit of 3000 µS/cm are observed in many parts. Some of the hot spots from salinity point of view are Faridabad, Gurgaon, Jhajjar, Panipat, Rewari, Rohtak, Sonepat districts of Haryana, Bhind, Indore, Ujjain and Neemuch districts of Madhya Pradesh, Ajmer, Alwar, Bhilwara, Bundi, Chittaurgarh, Dausa, Jaipur, Sikar, Sawai Madhopur, Tonk, Udaipur, Nagaur and Rajsamand districts of Rajasthan, Agra, Allahabad, Aligarh, and Mathura districts of Uttar Pradesh, Haora, Medinipur, North 24 Parganas, South 24 Parganas of West Bengal and all districts of Delhi.

Chloride is present in all natural waters, mostly at low concentrations. It is highly soluble in water and moves freely with water through soil and rock. The recommended desirable limit of chloride concentration in drinking water ranges from 250 -1000 mg /l. However few districts in the basin are observed relatively high values of Chloride are Gurgaon, Jhajjar, Rohtak and Sonepat districts of Haryana, Bhind and Ujjain districts of Madhya Pradesh, Bundi, Chittaurgarh, Dausa, Jaipur, Karauli, Nagaur, Sawai Madhopur, Nagaur, Sikar, Tonk and Udaipur districts of Rajasthan, Aligarh, Agra and Mathura districts of Uttar Pradesh, North 24 Parganas, South 24 Parganas of West Bengal and all districts of Delhi.

Fluorine is the most electronegative and reactive of all elements that occur naturally within many type of rock. The desirable limit of fluoride concentration in drinking water ranges from 1.0 - 1.5 mg/l and more than 1.5 mg/l are not suitable for drinking purposes. Almost all parts of the basin are affected by fluoride and the severities are seen in the parts of Bihar, Chhattisgarh, Delhi, Haryana Jharkhand Madhya Pradesh, Rajasthan, Uttar Pradesh and West Bengal. Nitrate is a naturally occurring compound that is formed in the soil when nitrogen and oxygen combine. The dissolved nitrogen in the form of Nitrate is the most common contaminant of ground water. The maximum desirable limit of Nitrate concentration in ground water is 45 mg/l with no relaxation. The parts of all 11 states that are falling in the basin, Bihar, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jharkhand Madhya Pradesh, Rajasthan, Uttar Pradesh, Uttarakhand and West Bengal has observed nitrate greater than 45 mg/l.

7. Inter Basin Transfer Links

One of the most effective ways to increase the irrigation potential for increasing the food grain production, mitigate floods and droughts and reduce regional imbalance in the availability of water is the Inter Basin Water Transfer (Inter Basin Water Transfer) from the surplus rivers to deficit areas. There are 12 inter-basin transfer links made /proposed in the basin, out of which 10 links falls under Himalayan component and most of its data is classified and two Peninsular Components as shown in Map 22. The Himalayan component envisages construction of storage reservoirs on the main river Ganga and its principal tributaries in India to conserve monsoon flows for irrigation and hydro-power generation, besides flood control. Links will transfer surplus flows of the Kosi, Gandak and Ghagra to the west. In addition, the links will augment dry-weather flow of the river Ganga. Surplus flows that will become available on account of inter-linking of the Ganga and the Yamuna are proposed to be transferred to the drought prone areas of Haryana, Rajasthan and Gujarat. The ten Himalayan Components of Ganga basin is given below:

1. **Kosi-Ghaghara Link**: The 428.76 km long link, which will start from the right side of the Chatra barrage, will fall in the Gaura river, a tributary of the Chaghara river, in Uttar Pradesh after crossing over the Tiljuga, the Khanro, the Bagmati and the Lalbakkeya rivers in Nepal and the river Gandak in Bihar. The receiving capacity will be 1021 cumecs while it will discharge 67 cumecs in Gaura river. The total benefited area through this link canal is 10.58 lakh hectares. Out of this 8.17 lakh hectare and 0.67 lakh hectare area of North Bihar and Uttar Pradesh, respectively.

2. **Gandak-Ganga Link**: The 639 km long link canal, which would start from the right side of the proposed dam across Gandak river in Nepal, will fall in Ganga river near Mustafabad in Rai Bareli district of Uttar Pradesh. It will run through Nepal and various districts of Uttar Pradesh.

3. **Ghaghara-Yamuna Link**: The Ghagra-Yamuna link project is an inter-dependent link under the Himalayan Component of NPP. A study reveals that the Ghagra river (known as Karnali in Nepal) at the proposed the Chisapani dam site has surplus water. It is proposed that the existing requirement of water for the Sarda Sahayak Pariyojna, Saryu Nahar Pariyojna and various pump canals would be met from the proposed Gandak - Ganga link project and the water saved thereby could be diverted from the proposed Chisapani reservoir through the Ghagra - Yamuna link canal. The height of proposed dam is 175 m. A regulating dam downstream of the Chisapani dam is proposed with a full reservoir level of 200 m and a minimum drawdown level 193 m. The link canal shall join Yamuna river in Etawah district of Uttar Pradesh. The total length of the link canal would be about 417 km with its depth varying from 8 m in the head reach to 5 m in the tail reach and the width varying from 85.5 m in the head reach to 18 m towards the tail end.

4. **Sarda-Yamuna Link**: This link canal is planned to divert 17,906 MCM water of Himalayan rivers. Its length will be 1,835 km out of which 75 km will be in Gujarat State. A total of 4 states, Uttar Pradesh, Haryana, Rajasthan and Gujarat, are to be benefited by this link. About 1,627 MCM water has been allocated to North Gujarat which is only 9 percent of the total divertible water at the canal head.

5. **Yamuna-Rajasthan Link**: The Yamuna-Rajasthan link proposal is an extension of the proposed Sarda–Yamuna Link beyond the Yamuna to provide irrigation to the drought prone areas of Haryana and Rajasthan. It envisages diversion of 8,657 MCM of water from the Sarda basin at Purnagiri. The Yamuna - Rajasthan link is to take off from the right bank of proposed Yamuna barrage and passes through the Karnal, Sonipat, Jind, Hisar and Bhiwani districts of Haryana and Churu, Hanumangarh, Ganganagar, Bikaner, Jodhpur and Jaisalmer districts of Rajasthan and

ends on the Jaisalmer-Hamira-Shri Mohangarh Road at a distance of 4.5 km from village Kanod towards Jaisalmer. The length of the link canal is 786 km, out of which 196 km lies in Haryana and the rest 590 km in Rajasthan. The Yamuna - Rajasthan link will provide an annual irrigation of 244,200 ha in the districts of Ganganagar, Bikaner, Jodhpur and Jaisalmer of Rajasthan.

6. **Chunar-Sone Barrage Link**: The 149.10 km long canal will start from the right side of Ganga river near Chunar Tehsil of Mirzapur district in Uttar Pradesh. It will fall into the Sone river near Indrapuri barrage in Rohtas district. There would be a lift of 38.8 meters, 16.10 meters and 4.4 meters at three different places on route. In addition to stabilizing substantial command areas of Western Sone high level and low level canals, this link canal will provide irrigation in 66,793 hectares of new area in Mirzapur, Varanasi and Gazipur districts of Uttar Pradesh and Bhabhua, Rohtas, Buxar and Bhojpur districts of Bihar.

7. **Sone Dam-Southern tributaries of Ganga Link**: The 339 km long canal will begin from the right side of the proposed dam across the Sone river near Kadwan in Jharkhand. The canal would fall into the Badua river after crossing over the Morhar, the Lilajan, the Dharmajayi, the Sakri and the Kiul rivers. Two hydal projects of 3.5 MW and 1.5 MW capacities would be finalised near the junction of the Sakri river. The total benefited area through this link canal will be 3.07 lakh hectares in the districts of Patna, Nalanda, Gaya, Jehanabad, Munger, Bhagalpur, Nawada, Jamui and Aurangabad of Bihar and Palamu district of Jharkhand.

8. **Manas-Sankosh-Tista-Ganga Link**: Interlinking of the Brahmaputra with the Ganga, the Subernarekha and the Mahanadi is proposed to transfer waters of the Brahmaputra to benefit areas in Assam, West Bengal, Bihar and Jharkhand. This link envisages diversion of surplus water from Manas and Sankosh rivers in the Brahmaputra basin to augment flows of the Ganga upstream of Farakka. For this link high dams are proposed at Manas and Sankosh with storage capacities of 8.75 BCM and 4.93 BCM, respectively. The 114 km long link canal between Manas and Sankosh will have a discharge capacity of 3,725 cubic meters per second. Beyond Sankosh and up to the Teesta barrage, the link canal is 137 km long with a capacity of 1,092 cubic meters per second.

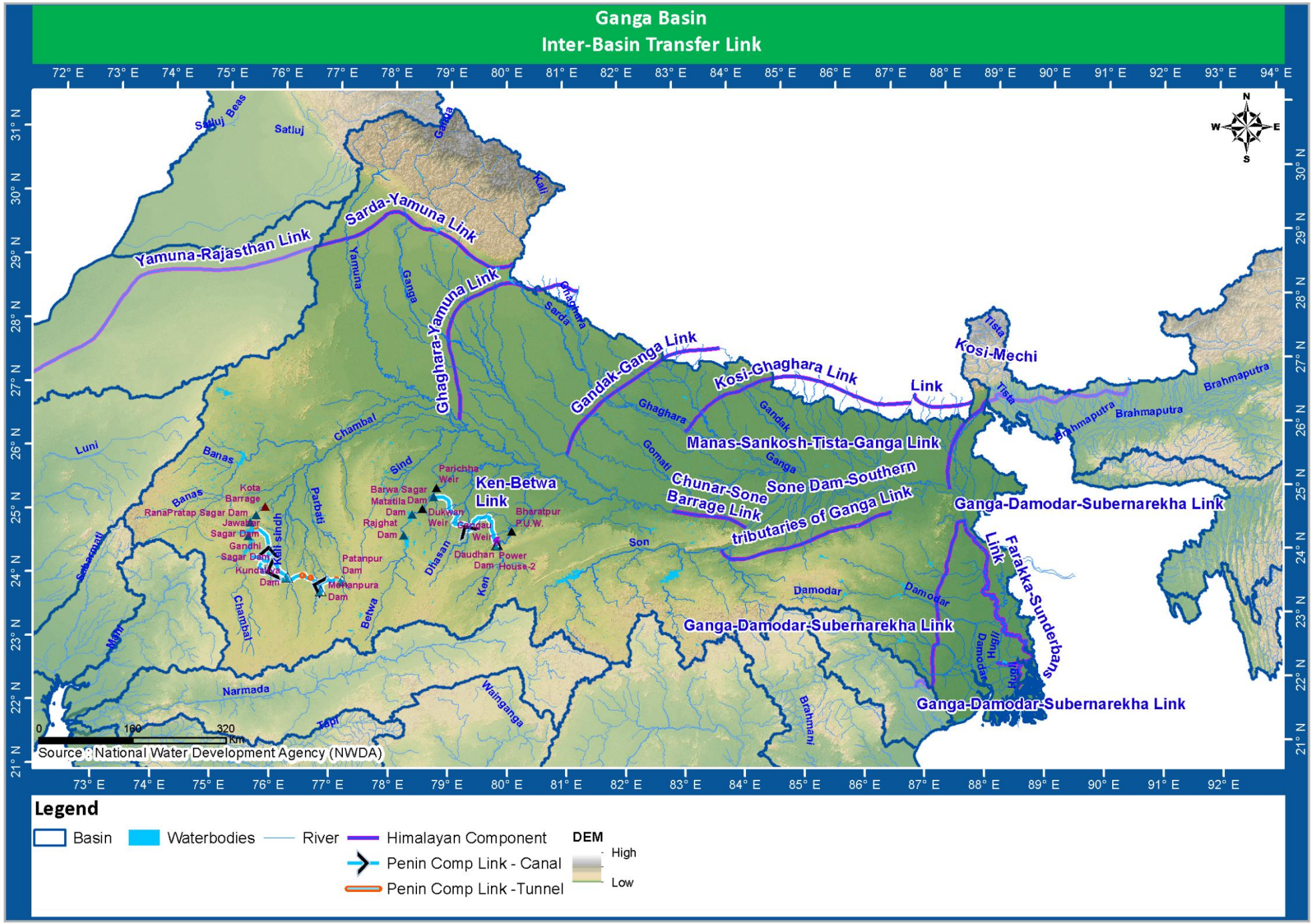
9. **Farakka-Sunderbans Link**: The Farakka-Sunderbans Link will join Ganga river (Farakka Barrage) to Sunderban Delta in West Bengal.

10. **Ganga-Damodar-Subernarekha Link**: The Ganga-Damodar-Subernarekha Link will join the Ganga to Subernarekha river.

The Ken-Betwa Link and Parbati-Kalisindh-Chambal Link are two peninsular inter-basin transfer links that falls in Ganga basin.

1. **Ken-Betwa Link**: This link will cover a length of about 231 km. and provide irrigation in the downstream of proposed Daudhan dam, water short areas of Upper Betwa basin by way of substitution and also irrigate areas of Uttar Pradesh and Madhya Pradesh. It will also provide domestic and industrial water needs of 12 MCM, besides an installed capacity of 72 MW of power. About 37 MCM will be used for meeting the transmission losses of the canal. NWDA has already completed the feasibility study of this link. About 8,550 people shall be affected in ten villages by implementation of this link.

2. **Parbati-Kalisindh-Chambal Link**: Parbati-Kalisindh-Chambal link project envisages the diversion of surplus waters of Parbati and Kalisindh sub-basins to Gandhisagar dam /Rana Pratap Sagar dam across Chambal river. The water will be utilized for irrigation in the new command areas enroute the link canal & the existing command of Chambal system at Kota barrage. A population of 27,055 people in 65 villages is likely to be affected by implementation of this link.



Map 22. Inter basin transfer links

8. Inland Navigation Waterways

The Ganga-Bhagirathi-Hooghly river system from Allahabad to Haldia was declared as **National Waterway No.1** as per National Waterway (Allahabad-Haldia stretch of the Ganga Bhagirathi-Hooghly river) Act 1982 (49 of 1982). It became operative from 27th Oct 1986 after the formation of the Inland Waterway Authority of India (IWAI). The waterway extends from Haldia to Allahabad for a distance of 1620 kms. NW-1 passes through Uttar Pradesh, Bihar, Jharkhand and West Bengal. The National Waterway No.1, Inland Navigation Waterway of Ganga basin is shown in Map 23.

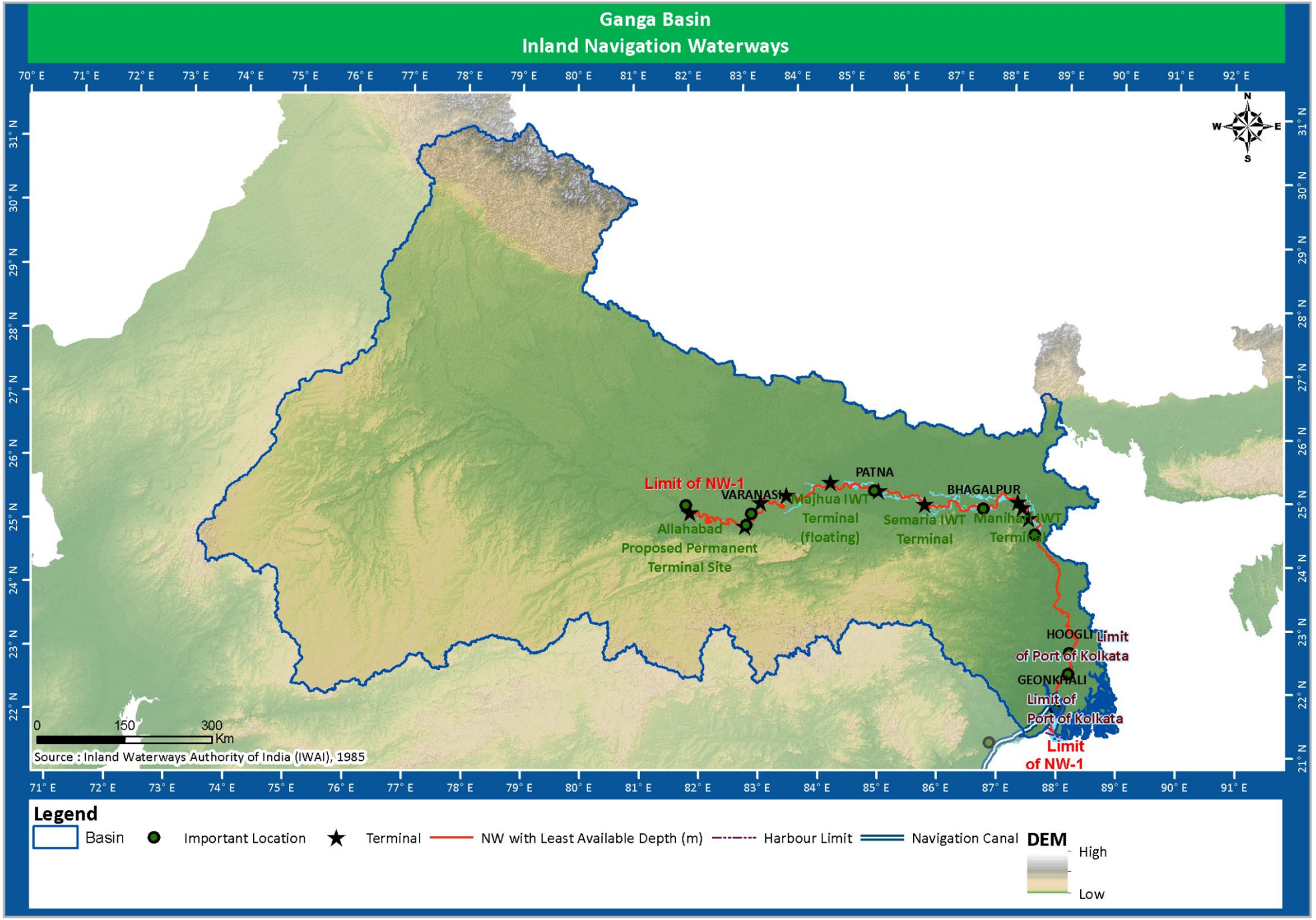
This stretch covered by following sections-

- Haldia(Sagar)-Farakka-560 km
- Farakka-Patna-460 km
- Patna-Allahabad-600 km.

The Hooghly river portion of the waterway from Haldia to Nabadwip is tidal. Sea going vessels navigate up to Calcutta (140 kms) and the fairway up to Calcutta is maintained by the Calcutta Port Trust. From Calcutta up to Tribeni there are no restrictions for navigation by inland vessels of a loaded draft up to 4m. From Nabadwip to Jangipur the waterway is formed by Bhagirathi river. Bhagirathi river is a regulated river because of the Barrages at Farakka and Jangipur. With the controlled discharge from the Farakka Barrage and limited river conservancy work a navigable depth of 2m is maintained in this route throughout the year.

From Farakka upstream the navigable route is through the main Ganga river. The Feeder Canal and the navigation lock at Farakka become the link between the Bhagirathi and main Ganga up-stream Farakka Barrage. The large variation in discharge along with unstable morphological condition of bank and bed, heavy sediment load, continuous braiding and meandering make development of navigational channel a complex task.

The floating terminals at 18 locations and one fixed/permanent terminal RCC Jetty at Patna named as G.R.Jetty-2 with a chainage length of 134.5 km are being maintained on NW-1 for handling cargo vessels and passenger ferries. There are 7 floating terminals on Haldia (Sagar) - Farakka stretch and they are Haldia with a chainage length of 35.0 km, Botanical Garden Jetty (Chainage length - 134.5 km), BISN Jetty (Chainage length - 135.0 km), Shantipur (Chainage length - 241.0 km), Katwa (Chainage length - 334.50 km), Hazardwari (Chainage length - 439 km), and Farakka (Chainage length - 542.0 km). The left 11 floating terminals are on Farakka-Patna-Allahabad stretch and they are Rajmahal in Manglahat (Chainage length - 588 km), Sahebganj in Samdaghat (Chainage length - 617 km), Bateshwarsthan (Chainage length - 683 km), Bhagalpur (Chainage length - 715 km), Munger (Chainage length - 793 km), Semaria(Chainage length - 850 km), Barh (Chainage length - 880 km), Buxar (Chainage length – 1,124 km), Ghazipur (Chainage length – 1,177 km), Rajghat in Varanasi (Chainage length – 1,308 km) and Allahabad (Chainage length – 1,535 km). In order to provide the safe navigation for various cargo vessels, tourist vessels with foreign tourists, local regular service by private operators and mechanized country boats day navigation marks with bamboos and navigational lights fixed on country boats have been also provided from Tribeni to Varanasi.



Map 23. Inland navigation waterways

9. Water Tourism Sites

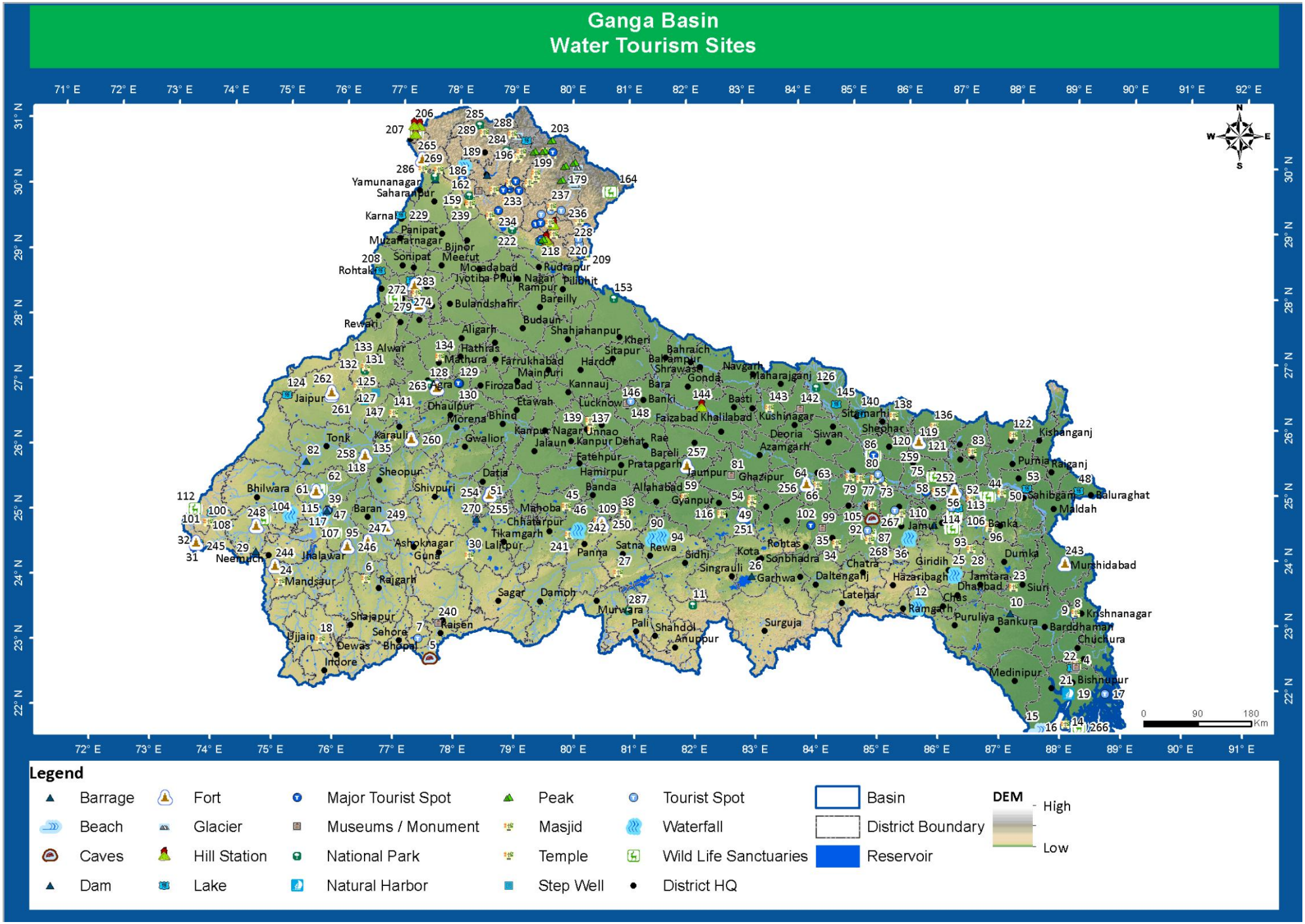
Ganga basin has diverse variety of tourist stations like the glaciers, hill stations, mountains/peaks, caves, national parks, forts and other major tourist locations as given in Table 16. The Ganga valley in the Uttarakhand is a place of breath taking natural beauty. It is the home of the work renowned Valley of flowers, a protected area. The famous high altitude Nanda Devi Biosphere also falls in the basin which is a part of UNESCO Global World Heritage site. According to India-WRIS database Ganga basin has about 290 Water tourism sites that are shown spatially in Map 24. Taj Mahal in Agra, one of world's seven wonders, is located on the banks of Yamuna, a tributary of Ganga.

The major glaciers in the basin include Gangotri, Yamunotri, Kafni situated in Uttarakhand state. A list of major hill stations and mountains/peak falls in this region are Almora, Shimla Dehradun, Mussoorie (Uttarakhand), and Nanga Parwat, Nanda Devi, Chukhamba (Badrinath Shikhar) are some key peaks in the basin. Badhkhal Lake (Haryana), Sambhar Lake (Rajasthan), Pichhola Lake (Rajasthan) are few important lakes in the basin. Some other important water tourist locations in the basin includes India Gate (New Delhi), Gaya (Bihar), Sanchi Stupa (Madhya Pradesh), Howrah Bridge (West Bengal), Fatehpur sikri (Uttar Pradesh), Jal Mahal (Rajasthan), Amber Fort (Rajasthan), Sunderbans (West Bengal). The basin also contains countries significant national parks like Sariska Tiger Reserve (Rajasthan), Ranthambore National Park (Rajasthan), Jim Corbett National Park (Uttarakhand), Dudhwa National Park (Uttar Pradesh), Kalesar National Park (Haryana), Rajaji National Park (Uttarakhand). The further details of each tourist locations, wild life sanctuary and national parks are provided in the Annexure VII.

Tourism is also related with economic activity. Kumbh Mela is a mass Hindu pilgrimage in which Hindus gather at the Ganga river celebrated every 3 years, the Ardh (half) Kumbh is celebrated every six years at Haridwar and Prayag, the Purna Kumbh takes place every twelve years at four places (Prayag (Allahabad), Haridwar, Ujjain, and Nasik). Three towns holy to Hinduism – Haridwar, Allahabad, and Varanasi – attract thousands of pilgrims. The rapids of the Ganges in Rishikesh also are popular for river rafting, attracting hundreds of adventure seekers in the summer months. During festival of Chatth, Ganga ghats at Bihar attract thousands of devotes and tourists. The Ganga basin is a source of economy to the states and country through tourism related activities.

Table 16. Water tourism sites

Sl. No.	Tourist Site Category	No. of Places
1	Beach	1
2	Lake	29
3	Step Well	2
4	Peak	8
5	Dam	6
6	Fort	24
7	Tourist Spot	24
8	Museums / Monument	14
9	Pilgrimage (Masjid)	5
10	Caves	2
11	Barrage	4
12	Major Tourist Spot	30
13	Natural Harbor	1
14	Glacier	4
15	Pilgrimage (Temple)	90
16	Waterfall	9
17	Hill Station	8
18	National Park	19
19	Wildlife Sanctuary	56



Map 24. Water tourism sites

Table 17. Ganga basin Major Water Tourism Sites

Sl. No.	Water Tourism Site	Sl. No.	Water Tourism Site	Sl. No.	Water Tourism Site
1	Belur Math Temple	31	Pichhola Lake	61	Jaitsagar
2	Nivedita Setu	32	Fatehsagar Lake	62	Ramgarh Vishdhari Sanctuary
3	Vivekananda Setu	33	Bari Ka Talav	63	Bihariji Temple
4	Dakshineshwar Temple	34	Deo Kund (Suryakund Talab)	64	Sri Ram Rekha Ghat
5	Bhimbetka	35	Sun Temple	65	Gurudwara Shri Guru Baag Sahib
6	Bhojeshwar Temple	36	Kakolat Waterfall	66	Ahirouli Mata Ahilya Mandir
7	Bhopal	37	Vishnupad Temple	67	Mangal Talab
8	Nabadwip	38	Chitrakoot	68	Takht Sri Patna Sahib
9	Mayapur	39	Jagmandir	69	Sanjay Gandhi Jaivik Udyan
10	Durgapur Barrage	40	Daragaah Hazrat Bibi Kamaal	70	Kumhrar Excavation Park
11	Guru Ghasidas National Park	41	Shiva Temple Ajgaivinath	71	Mahavir Mandir
12	Rajrappa Waterfall	42	Murali Pahad Mosque	72	Patliputra Karuna Stupa & Buddha Memorial Park
13	Bakkhali	43	Maharshi Mehi Ashram, Kuppaghat	73	Chitrgupta Temple At Naujarghat
14	Frazerganj	44	Vikramshila Gangetic Dolphin Sanctuary	74	Patna
15	Mandarmani	45	Manaiyadevi Temple	75	Kanwar Lake Bird Sanctuary
16	Gangasagar	46	Suntemple and Rahilasagar	76	Mahatma Gandhi Setu
17	Sunderbans	47	Keshoraipatan Temple	77	Sadaquat Ashram
18	Mahakaleshwar	48	Tapan Dighi Lake	78	Maner Dargah
19	Diamond Harbour	49	Kashi Vishwanath Temple	79	Goddess Kali Temple
20	Vidhyasagar Setu	50	Lord Shiva Temple, Bateshwar Sthan	80	Sonepur
21	Santragachi Jheel	51	Orchha	81	Shahi Bridge
22	Howrah Bridge	52	Sita Kund	82	Bisalpur
23	Bakreshwar	53	Gogabil Lake / Gogabil Pakshi Vihar	83	Singheshwar Asthan
24	Pashupatinath Temple	54	Dhamekstupa	84	Vaishali Garh
25	Usri Waterfall	55	Sri Krishna Vatika	85	Barela Salim Ali Zubba Sahni Wildlife Sanctuary
26	Rihand Dam	56	Chandika Astahan	86	World Peace Pagoda/vishwa Shanti Stup
27	Maihar	57	Simaria Ghat	87	Surya Kund
28	Baidyanathdham Temple	58	Naulakha Mandir And Pond	88	Gautam Buddha Wildlife Sanctuary
29	Bari Dam	59	Triveni Sangam	89	Gaya
30	Deogarh	60	Nawal Sagar	90	Chachai Waterfall

Sl. No.	Water Tourism Site	Sl. No.	Water Tourism Site	Sl. No.	Water Tourism Site
91	Jain Mandir	121	Harahi Pokhar (Harahi Lake)	151	Sultanpur Bird Sanctuary
92	Ramshila Pahaad And Temple	122	Mata Kali Temple	152	Surajkund
93	Nagi Dam Bird Sanctuary	123	Galtaji	153	Dudhwa National Park
94	Keoti Waterfall	124	Sambhar Lake	154	Old Fort (purana Qila) Lake
95	Dara Wildlife Sanctuary	125	Chand Baori Step Well	155	India Gate
96	Mandar Parbat	126	Valmiki National Park	156	Naini Lake
97	Pretshila Hill	127	Bhangarh	157	Bhalswa Lake
98	Amriti Dam	128	Keoladeo Ghana National Park	158	Maya Devi Temple
99	Nehru Setu	129	Taj Mahal	159	Haridwar
100	Eklingji Temple	130	Red Fort (Agra)	160	Har Ki Pauri
101	Nathdwara	131	Sariska Tiger Reserve	161	Jwalpa Devi Temple
102	Sher Shah Suri ' Tomb	132	Bhartari Temple	162	Rajaji National Park
103	Rajgir Sanctuary	133	Siliserh Lake	163	Triveni Ghat
104	Bassi Wildlife Sanctuary	134	Bankey Bihari Temple	164	Askot Musk Deer Sanctuary
105	Barabar Hill And Caves	135	Keladevi	165	Ram Jhula
106	Bhimbandh Wildlife Sanctuary	136	Girija Mandir Of Rajnagar	166	Laxman Jhula
107	Gaipernath Waterfall	137	J.k.temple Kanpur	167	Tarakund
108	Rajasamand Lake	138	Janki Temple	168	Kandoliya
109	Vankhandeshwar Mahadev Temple	139	Valmiki Ashram	169	Devprayag
110	Jal Mandir	140	Moti Jheel	170	Kyunkaleshwar Mahadev
111	Menal Waterfall	141	Shri Mahavirji	171	Khirsu
112	Kumbhalgarh Wildlife Sanctuary	142	Nirvana Stupa	172	Kafni Glacier
113	Kharagpur Lake	143	Gorakhnaththtemple	173	Devalgarh
114	Hirannya Mountain	144	Hanuman Garhi Ayodhya	174	Dhari Devi
115	Chambal Garden	145	Sagar Pokhara	175	Pindari
116	Vindhyavasini Temple	146	Rumi Darwaza	176	Karnaprayag
117	Kota Barrage	147	Bhandarej Step Well	177	Rudraprayag
118	Ranthambore National Park	148	Kukrail Picnic Spot	178	Tajewala Barrage
119	Ganga Sagar Lake	149	Damdama Lake	179	Trisul
120	Digghi Pokhar(lake)	150	Badhkhal Lake	180	Dehradun

Sl. No.	Water Tourism Site	Sl. No.	Water Tourism Site	Sl. No.	Water Tourism Site	Sl. No.	Water Tourism Site
181	Nandprayag	211	Sattal	241	Khajurao	271	National Zoological Park
182	Kalesar National Park	212	Nakuchia Tal	242	Raneh Waterfall	272	Jama Masjid
183	Nanda Devi	213	Champawat	243	Hazarduari Palace	273	Raj Ghat
184	Tehri Dam	214	Bhimtal Hill Station	244	Malhargarh	274	Safdarjang Tomb
185	Chamoli	215	Khurpa Taal	245	Sajjangarh	275	Jantar Mantar
186	Asan Barrage	216	Naini Lake	246	Gagron Fort	276	Gandhi Smriti
187	Mussoorie	217	Bhowali	247	Shergarh Fort	277	Akshardham Temple, Delhi
188	Milam	218	Kilbury	248	Chittaurgarh Fort	278	Birla Mandir
189	Kempty Waterfall	219	Naina	249	Nahargarh	279	The Garden of Five Senses
190	Dunagiri	220	Lohaghat	250	Kalinjar Fort	280	Humayun's Tomb
191	Trishul (west)	221	Mukteshwar	251	Chunar Fort	281	Red Fort
192	Renuka Lake	222	Jim Corbett National Park	252	Munger Fort	282	Qutab Minar
193	Son Prayag	223	Pithoragarh	253	Bundi Fort	283	Lotus Temple
194	Gauri Kund	224	Almora	254	Jhansi Fort	284	Gangotri National Park
195	Hemkund Sahib	225	Binsar	255	Ranimahal	285	Govind Pashu National Park
196	Kedarnath	226	Ranikhet	256	Buxar Ka Qila	286	Adibadri (SarswatiUdagam Sthal)
197	Badrinath	227	Jageshwar	257	Pratapgarh Fort	287	Bandhavgarh National Park
198	Valley Of Flowers	228	Patal Bhuvaneshwar	258	Ranthambhore Fort	288	Gangotri
199	Chukhamba (Badrinath Shikhar)	229	Karan Lake	259	Aanand Bag Palace	289	Yamunotri
200	Nanga Parvat	230	Kotdwar	260	Mandrayal Fort		
201	Gangotri	231	Sidhbali Temple	261	Jal Mahal		
202	Vasuki Taal	232	Dwarahat	262	Amber Fort		
203	Kamet	233	Pauri Garhwal	263	Fatehpur sikri		
204	Chail Wildlife Sanctuary	234	Lansdowne	264	Raja Nahar Singh Palace		
205	Chail	235	Kausani	265	Jaitak Fort		
206	Kufri	236	Bageshwar	266	Lothian Island Wildlife Sanctuary		
207	Shimla	237	Baijnath	267	Nalanda		
208	Tilyar Lake	238	Piran Kaliyar	268	Bodh Gaya		
209	Purnagiri Temple	239	Chandi Devi Temple	269	Paonta Sahib		
210	Shyamlatal	240	Sanchi Stupa	270	Matatila Dam		

10. Conclusions

This report provides valuable information related to the topographic, demographic, climatic, surface and ground water resources, hydro-meteorological and water quality scenario of Ganga basin. The Ganga and its tributaries, an interstate river system flows through 11 states of our country. Gauge and Discharge observations of the various sites in the basin should be continued on a permanent basis to obtain the data essential not only for the preparation of individual projects but also for the regulation, to the best advantage, of the available river water in any year. Systematic and scientific exploratory work is needed for quantitative and qualitative assessment of the ground water resources in the basin, so that these resources can be exploited in a rational way either independently or in conjunction with surface water.

Rapidly increasing population, rising standards of living and exponential growth of industrialization and urbanization have exposed water resources, in general, and rivers, in particular, to various forms of degradation. The mighty Ganga is no exception. The deterioration in the water quality impacts the people immediately. Ganga, in some stretches, particularly during lean seasons has become unfit even for bathing. The threat of global climate change and the effect of glacial melt on Ganga flow, taking into account also the impacts of infrastructural projects in the upper reaches of the river, raise issues that need a comprehensive response.

In the Ganga basin approximately 12,000 million litres per day (MLD) sewage is generated, for which presently there is a treatment capacity of only around 4,000 MLD. Approximately 3000 MLD of sewage is discharged into the main stem of the river Ganga from the major cities and towns located along the banks, against which treatment capacity of about 1000 MLD has been created till date. The contribution of industrial pollution, volume-wise, is about 20 percent but due to its toxic and non-biodegradable nature, this has much greater significance. The industrial pockets in the catchments of Ramganga and Kali rivers and in Kanpur city are significant sources of industrial pollution. The major contributors are tanneries in Kanpur, distilleries, paper mills and sugar mills in the Kosi, Ramganga and Kali river catchments.

There is a need for inter-state co-operation and agreement in respect of soil conservation measures and the storage capacities of existing and proposed reservoirs in the basin. It is necessary for systematic data to be collected of the sediment carried by the rivers which would be of considerable use in working out the dead storages and the lives of reservoir. It will also reflect the effect of the soil conservation work carried out in the basin. For effective utilization and management of water resources this report has been generated for Ganga basin to provide an overview on the water statistics and its critical parameters. The outcome of the report can be used to increase awareness of the need to protect our water resource assets of Ganga basin.

Annexure I: State, district and parliamentary constituency in the basin

A. District Details						
Sl. No.	State Name	District (2011)	Population (2011)	Total Area (Sq.km)	District Area in Basin (Sq.km)	% of District Area in the Basin
1	Bihar	Buxar	1,706,352	1642.98	1642.98	100
2	Bihar	Vaishali	3,495,021	1928.65	1928.65	100
3	Bihar	Gaya	4,391,418	4773.72	4773.72	100
4	Bihar	Gopalganj	2,562,012	1963.69	1963.69	100
5	Bihar	Jamui	1,760,405	2930.37	2930.37	100
6	Bihar	Jehanabad	1,125,313	894.73	894.73	100
7	Bihar	Kaimur (bhabua)	1,626,384	3218.32	3218.32	100
8	Bihar	Katihar	3,071,029	2917.21	2917.21	100
9	Bihar	Khagaria	1,666,886	1432.65	1432.65	100
10	Bihar	Kishanganj	1,690,400	1861.48	1861.48	100
11	Bihar	Lakhisarai	1,000,912	1217.38	1217.38	100
12	Bihar	Madhepura	2,001,762	1766.55	1766.55	100
13	Bihar	Madhubani	4,487,379	3311.67	3311.67	100
14	Bihar	Munger	1,367,765	1376.03	1376.03	100
15	Bihar	Muzaffarpur	4,801,062	3063.92	3063.92	100
16	Bihar	Nalanda	2,877,653	2244.43	2244.43	100
17	Bihar	Nawada	2,219,146	2386.27	2386.27	100
18	Bihar	Pashchim Champaran	3,935,042	5060.43	5060.43	100
19	Bihar	Patna	5,838,465	3081.79	3081.79	100
20	Bihar	Purba Champaran	5,099,371	3833.66	3833.66	100
21	Bihar	Purnia	3,264,619	3119.23	3119.23	100
22	Bihar	Araria	2,811,569	2701.89	2701.89	100
23	Bihar	Arwal	700,843	639.76	639.76	100
24	Bihar	Aurangabad	2,540,073	3151.17	3151.17	100
25	Bihar	Banka	2,034,763	2980.79	2980.79	100
26	Bihar	Begusarai	2,970,541	1862.87	1862.87	100
27	Bihar	Bhagalpur	3,037,766	2445.40	2445.40	100
28	Bihar	Bhojpur	2,728,407	2280.65	2280.65	100
29	Bihar	Rohtas	2,959,918	3714.92	3714.92	100
30	Bihar	Saharsa	1,900,661	1623.07	1623.07	100

31	Bihar	Samastipur	4,261,566	2567.43	2567.43	100
32	Bihar	Saran (Chhapra)	3,951,862	2542.70	2542.70	100
33	Bihar	Sheikhpura	636,342	614.24	614.24	100
34	Bihar	Sheohar	656,246	374.84	374.84	100
35	Bihar	Sitamarhi	3,423,574	2148.15	2148.15	100
36	Bihar	Siwan	3,330,464	2140.21	2140.21	100
37	Bihar	Supaul	2,229,076	2308.97	2308.77	99.99
38	Bihar	Darbhanga	3,937,385	2426.07	2426.07	100
39	Chhattisgarh	Jashpur	851,669	5583.19	459.74	8.23
40	Chhattisgarh	Korba	1,206,640	6333.50	0.33	0.01
41	Chhattisgarh	Surguja	2,359,886	15125.37	12489.17	82.57
42	Chhattisgarh	Bilaspur	2,663,629	8022.86	832.15	10.37
43	Chhattisgarh	Raigarh	1,493,984	6819.11	0.58	0.01
44	Chhattisgarh	Koriya	658,917	6383.21	3905.20	61.18
45	Delhi	Central	582,320	14.62	14.62	100
46	Delhi	East	1,709,346	63.17	63.17	100
47	Delhi	New Delhi	142,004	37.26	37.26	100
48	Delhi	North	887,978	66.87	66.87	100
49	Delhi	West	2,543,243	118.20	118.20	100
50	Delhi	North West	3,656,539	429	429	100
51	Delhi	South	2,731,929	245.51	245.51	100
52	Delhi	South West	2,292,958	420.46	420.46	100
53	Delhi	North East	2,241,624	60.53	60.53	100
54	Himachal Pradesh	Kinnaur	84,121	6328.35	254.78	4.03
55	Himachal Pradesh	Solan	580,320	1912.81	220.31	11.52
56	Himachal Pradesh	Sirmaur	529,855	2741.72	2326.13	84.84
57	Himachal Pradesh	Shimla	814,010	5014.90	3221.90	64.25
58	Haryana	Karnal	1,505,324	2474.19	1081.65	43.72
59	Haryana	Kurukshetra	964,655	1639.64	20.98	1.28
60	Haryana	Mahendragarh	922,088	1865.28	44.47	2.38
61	Haryana	Mewat	1,089,263	1471.17	1471.17	100
62	Haryana	Palwal	1,042,708	1225.05	1225.05	100
63	Haryana	Panipat	1,205,437	1189.68	1166	98.01
64	Haryana	Rewari	900,332	1442.66	1076.73	74.64
65	Haryana	Rohtak	1,061,204	1655.74	891.97	53.87
66	Haryana	Sonipat	1,450,001	2091.23	2050.01	98.03

67	Haryana	Jind	1,334,152	2628.12	50.88	1.94
68	Haryana	Jhajjar	958,405	1882.99	1124.88	59.74
69	Haryana	Yamunanagar	1,214,205	1691.15	1010.78	59.77
70	Haryana	Faridabad	1,809,733	813.23	813.23	100
71	Haryana	Gurgaon	1,514,432	1196.55	1196.55	100
72	Jharkhand	Chatra	1,042,886	3606.10	3606.10	100
73	Jharkhand	Saraikela-kharsawan	1,065,056	2546.17	10.07	0.40
74	Jharkhand	Dhanbad	2,684,487	2047.31	2047.31	100
75	Jharkhand	Dumka	1,321,442	3621.64	3621.64	100
76	Jharkhand	Garhwa	1,322,784	3944.25	3944.25	100
77	Jharkhand	Giridih	2,445,474	4812.28	4812.28	100
78	Jharkhand	Godda	1,313,551	2152.10	2152.10	100
79	Jharkhand	Gumla	1,025,213	5149.51	836.78	16.25
80	Jharkhand	Hazaribagh	1,734,495	4474.09	4474.09	100
81	Jharkhand	Jamtara	791,042	1731.56	1731.56	100
82	Jharkhand	Kodarma	716,259	1447.99	1447.99	100
83	Jharkhand	Latehar	726,978	4092.97	4081.12	99.71
84	Jharkhand	Lohardaga	461,790	1439.38	527.53	36.65
85	Jharkhand	Pakur	900,422	1744.11	1744.11	100
86	Jharkhand	Palamu	1,939,869	4247.14	4247.14	100
87	Jharkhand	Purbi Singhbhum	2,293,919	3433.65	314.37	9.16
88	Jharkhand	Bokaro	2,062,330	2688.22	2671.21	99.37
89	Jharkhand	Ramgarh	949,443	1259.52	1122.88	89.15
90	Jharkhand	Ranchi	2,914,253	4743.84	791.18	16.68
91	Jharkhand	Sahibganj	1,150,567	2108.84	2108.84	100
92	Jharkhand	Deoghar	1,492,073	2342.33	2342.33	100
93	Madhya Pradesh	Chhatarpur	1,762,375	8342.32	8342.32	100
94	Madhya Pradesh	Vidisha	1,458,875	7025.11	7025.11	100
95	Madhya Pradesh	Datia	786,754	2587.42	2587.42	100
96	Madhya Pradesh	Dewas	1,563,715	6700.19	2959.31	44.17
97	Madhya Pradesh	Dhar	2,185,793	7842.30	1580.78	20.16
98	Madhya Pradesh	Dindori	704,524	5543.20	917.87	16.56
99	Madhya Pradesh	Guna	1,241,519	6060.03	6060.03	100
100	Madhya Pradesh	Gwalior	2,032,036	4412.02	4412.02	100
101	Madhya Pradesh	Indore	3,276,697	3765.95	2752.27	73.08
102	Madhya Pradesh	Jabalpur	2,463,289	4911.29	291.97	5.94

103	Madhya Pradesh	Katni	1,292,042	4867.17	3773.24	77.52
104	Madhya Pradesh	Mandla	1,054,905	7201.48	118.12	1.64
105	Madhya Pradesh	Mandsaur	1,340,411	5423.63	5423.63	100
106	Madhya Pradesh	Morena	1,965,970	4801.55	4801.55	100
107	Madhya Pradesh	Narsimhapur	1,091,854	4947.28	129.08	2.61
108	Madhya Pradesh	Neemuch	826,067	4001.43	3972.25	99.27
109	Madhya Pradesh	Panna	1,016,520	6825.17	6825.17	100
110	Madhya Pradesh	Anuppur	749,237	3637.40	2998.25	82.43
111	Madhya Pradesh	Ashoknagar	845,071	4544.76	4544.76	100
112	Madhya Pradesh	Bhind	1,703,005	4303.13	4303.13	100
113	Madhya Pradesh	Bhopal	2,371,061	2618.98	2615.65	99.87
114	Madhya Pradesh	Raisen	1,331,597	8172.10	3678.06	45.01
115	Madhya Pradesh	Rajgarh	1,545,814	5890.53	5890.53	100
116	Madhya Pradesh	Ratlam	1,455,069	4639.98	2819.12	60.76
117	Madhya Pradesh	Rewa	2,365,106	6066.63	6066.63	100
118	Madhya Pradesh	Sagar	2,378,458	9858.18	9486.40	96.23
119	Madhya Pradesh	Satna	2,228,935	7209.39	7209.39	100
120	Madhya Pradesh	Sehore	1,311,332	6317.41	3173.75	50.24
121	Madhya Pradesh	Shahdol	1,066,063	5466.49	5466.49	100
122	Madhya Pradesh	Shajapur	1,512,681	6057.30	6057.30	100
123	Madhya Pradesh	Sheopur	687,861	6287.97	6287.97	100
124	Madhya Pradesh	Shivpuri	1,726,050	9914.77	9914.77	100
125	Madhya Pradesh	Sidhi	1,127,033	4591.09	4591.09	100
126	Madhya Pradesh	Singrauli	1,178,273	5556.78	5556.78	100
127	Madhya Pradesh	Tikamgarh	1,445,166	4873.10	4873.10	100
128	Madhya Pradesh	Ujjain	1,986,864	5858.11	5858.11	100
129	Madhya Pradesh	Umaria	644,758	4411.61	4411.14	99.99
130	Madhya Pradesh	Damoh	1,264,219	7068.37	6650.59	94.09
131	Rajasthan	Bundi	1,110,906	5588.77	5588.77	100
132	Rajasthan	Udaipur	3,068,420	11459.12	2468.91	21.55
133	Rajasthan	Dausa	1,634,409	3346.82	3346.82	100
134	Rajasthan	Dhaulpur	1,206,516	2917.31	2917.31	100
135	Rajasthan	Jaipur	6,626,178	10860.83	10830.40	99.72
136	Rajasthan	Jhalawar	1,411,129	6015.32	6015.32	100
137	Rajasthan	Karauli	1,458,248	4758.42	4758.42	100
138	Rajasthan	Kota	1,951,014	5081.79	5081.79	100

139	Rajasthan	Nagaur	3,307,743	17026.59	1433.32	8.42
140	Rajasthan	Pratapgarh	867,848	4141.45	1147.93	27.72
141	Rajasthan	Ajmer	2,583,052	8206.23	6335.47	77.20
142	Rajasthan	Alwar	3,674,179	8018.80	7651.83	95.42
143	Rajasthan	Baran	1,222,755	6559.53	6559.53	100
144	Rajasthan	Bharatpur	2,548,462	4876.59	4876.59	100
145	Rajasthan	Bhilwara	2,408,523	10052.59	10050.36	99.98
146	Rajasthan	Rajsamand	1,156,597	4485.42	4120.53	91.87
147	Rajasthan	Sawai Madhopur	1,335,551	4850.38	4850.38	100
148	Rajasthan	Sikar	2,677,333	7428.38	1872.20	25.20
149	Rajasthan	Tonk	1,421,326	6980.76	6980.76	100
150	Rajasthan	Chittaurgarh	1,544,338	7500.49	7331.04	97.74
151	Uttarakhand	Chamoli	391,605	7634.39	7633.46	99.99
152	Uttarakhand	Champawat	259,648	1709.81	1709.81	100
153	Uttarakhand	Dehradun	1,696,694	3037.93	3037.93	100
154	Uttarakhand	Garhwal	687,271	5164.98	5164.98	100
155	Uttarakhand	Hardwar	1,890,422	2320.94	2320.94	100
156	Uttarakhand	Nainital	954,605	4015.68	4015.68	100
157	Uttarakhand	Uttarkashi	330,086	7814.34	7799.68	99.81
158	Uttarakhand	Almora	622,506	3014.52	3014.52	100
159	Uttarakhand	Bageshwar	259,898	2219.31	2219.31	100
160	Uttarakhand	Rudraprayag	242,285	1932.03	1932.03	100
161	Uttarakhand	Tehri Garhwal	618,931	3768.93	3768.93	100
162	Uttarakhand	Udham Singh Nagar	1,648,902	2558.02	2558.02	100
163	Uttarakhand	Pithoragarh	483,439	7045.65	7045.65	100
164	Uttar Pradesh	Bulandshahr	3,499,171	3391.08	3391.08	100
165	Uttar Pradesh	Chandauli	1,952,756	2435.72	2435.72	100
166	Uttar Pradesh	Chitrakoot	991,730	2964.50	2964.50	100
167	Uttar Pradesh	Deoria	3,100,946	2460.09	2460.09	100
168	Uttar Pradesh	Etah	1,774,480	2425.23	2425.23	100
169	Uttar Pradesh	Etawah	1,581,810	2240.89	2240.89	100
170	Uttar Pradesh	Faizabad	2,470,996	2636.17	2636.17	100
171	Uttar Pradesh	Farrukhabad	1,885,204	2108.36	2108.36	100
172	Uttar Pradesh	Fatehpur	2,632,733	4018.45	4018.45	100
173	Uttar Pradesh	Firozabad	2,498,156	2317.45	2317.45	100
174	Uttar Pradesh	Gautam Buddha Nagar	1,648,115	1414.90	1414.90	100

175	Uttar Pradesh	Ghaziabad	4,681,645	1914.50	1914.50	100
176	Uttar Pradesh	Ghazipur	3,620,268	3254.22	3254.22	100
177	Uttar Pradesh	Gonda	3,433,919	3891.82	3891.82	100
178	Uttar Pradesh	Gorakhpur	4,440,895	3239.44	3239.44	100
179	Uttar Pradesh	Hamirpur	1,104,285	4101.03	4101.03	100
180	Uttar Pradesh	Hardoi	4,092,845	5798.38	5798.38	100
181	Uttar Pradesh	Jalaun	1,689,974	4401.29	4401.29	100
182	Uttar Pradesh	Jaunpur	4,494,204	3880.28	3880.28	100
183	Uttar Pradesh	Jhansi	1,998,603	4874.66	4874.66	100
184	Uttar Pradesh	Jyotiba Phule Nagar	1,840,221	2200.69	2200.69	100
185	Uttar Pradesh	Kannauj	1,656,616	2000.33	2000.33	100
186	Uttar Pradesh	Ramabai Nagar (Kanpur Dehat)	1,795,092	3037.07	3037.07	100
187	Uttar Pradesh	Kanpur Nagar	4,581,268	2829.92	2829.92	100
188	Uttar Pradesh	Kanshiram Nagar	1,436,719	1898.61	1898.61	100
189	Uttar Pradesh	Kaushambi	1,599,596	1733.47	1733.47	100
190	Uttar Pradesh	Kheri	4,021,243	7451.20	7451.20	100
191	Uttar Pradesh	Kushinagar	3,564,544	2781.20	2781.20	100
192	Uttar Pradesh	Lalitpur	1,221,592	4854.02	4854.02	100
193	Uttar Pradesh	Lucknow	4,589,838	2447.26	2447.26	100
194	Uttar Pradesh	Mahamaya Nagar	1,564,708	1707.10	1707.10	100
195	Uttar Pradesh	Maharajganj	2,684,703	2795.66	2795.66	100
196	Uttar Pradesh	Mahoba	875,958	2762.60	2762.60	100
197	Uttar Pradesh	Mainpuri	1,868,529	2603.74	2603.74	100
198	Uttar Pradesh	Mathura	2,547,184	3237.68	3237.68	100
199	Uttar Pradesh	Mau	2,205,968	1630.87	1630.87	100
200	Uttar Pradesh	Meerut	3,443,689	2531.96	2531.96	100
201	Uttar Pradesh	Mirzapur	2,496,970	4339.75	4339.75	100
202	Uttar Pradesh	Moradabad	4,772,006	3510.20	3510.20	100
203	Uttar Pradesh	Muzaffarnagar	4,143,512	3933.07	3933.07	100
204	Uttar Pradesh	Pilibhit	2,031,007	3476.17	3476.17	100
205	Uttar Pradesh	Pratapgarh	3,209,141	3573.68	3573.68	100
206	Uttar Pradesh	Rae Bareli	3,405,559	4446.98	4446.98	100
207	Uttar Pradesh	Budaun	3,681,896	4907.53	4907.53	100
208	Uttar Pradesh	Agra	4,418,797	3881.78	3881.78	100
209	Uttar Pradesh	Aligarh	3,673,889	3616.50	3616.50	100
210	Uttar Pradesh	Allahabad	5,954,391	5236.76	5236.76	100

211	Uttar Pradesh	Ambedkar Nagar	2,397,888	2230.08	2230.08	100
212	Uttar Pradesh	Auraiya	1,379,545	1933.60	1933.60	100
213	Uttar Pradesh	Azamgarh	4,613,913	4111.29	4111.29	100
214	Uttar Pradesh	Baghpat	1,303,048	1287.67	1287.67	100
215	Uttar Pradesh	Bahraich	3,487,731	4177.07	4177.07	100
216	Uttar Pradesh	Ballia	3,239,774	2891.62	2891.62	100
217	Uttar Pradesh	Balrampur	2,148,665	3207.65	3207.65	100
218	Uttar Pradesh	Banda	1,799,410	4359.05	4359.05	100
219	Uttar Pradesh	Bara Banki	3,260,699	3656.31	3656.31	100
220	Uttar Pradesh	Bareilly	4,448,359	3661.37	3661.37	100
221	Uttar Pradesh	Basti	2,464,464	2640.01	2640.01	100
222	Uttar Pradesh	Bijnor	3,682,713	4189.19	4189.19	100
223	Uttar Pradesh	Rampur	2,335,819	2490.83	2490.83	100
224	Uttar Pradesh	Saharanpur	3,466,382	3620.75	3620.75	100
225	Uttar Pradesh	Sant Kabir Nagar	1,715,183	1679.61	1679.61	100
226	Uttar Pradesh	Sant Ravi Das Nagar (Bhadohi)	1,578,213	969.83	969.83	100
227	Uttar Pradesh	Shahjahanpur	3,006,538	4495.51	4495.51	100
228	Uttar Pradesh	Shrawasti	1,117,361	2418.09	2418.09	100
229	Uttar Pradesh	Siddharth Nagar	2,559,297	2731.74	2731.74	100
230	Uttar Pradesh	Sitapur	4,483,992	5578.10	5578.10	100
231	Uttar Pradesh	Sonbhadra	1,862,559	6520.20	6520.20	100
232	Uttar Pradesh	Sultanpur	3,797,117	4252.77	4252.77	100
233	Uttar Pradesh	Unnao	3,108,367	4429.61	4429.61	100
234	Uttar Pradesh	Varanasi	3,676,841	1490.60	1490.60	100
235	West Bengal	Dakshin Dinajpur	1,676,276	2086	2085.99	100
236	West Bengal	Uttar Dinajpur	3,007,134	3105.26	3105.25	100
237	West Bengal	Haora	4,850,029	1392.19	1392.19	100
238	West Bengal	Hugli	5,519,145	3024.34	3024.34	100
239	West Bengal	Jalpaiguri	3,872,846	5995.18	42.47	0.71
240	West Bengal	Kolkata	4,496,694	87.92	87.92	100
241	West Bengal	Maldah	3,988,845	3460.80	3460.80	100
242	West Bengal	Murshidabad	7,103,807	5131.45	5131.45	100
243	West Bengal	Nadia	5,167,600	3768.09	3768.08	100
244	West Bengal	North 24 Parganas	10,009,781	5582.36	5571.07	99.80
245	West Bengal	Pashchim Medinipur	5,913,457	9021.98	6634.30	73.53
246	West Bengal	Purba Medinipur	5,095,875	3893.57	3803.61	97.69

247	West Bengal	Puruliya	2,930,115	6003.10	5071.18	84.48
248	West Bengal	Birbhum	3,502,404	4370.85	4370.85	100
249	West Bengal	Bankura	3,596,674	6682.18	6682.18	100
250	West Bengal	Barddhaman	7,717,563	6755.32	6755.32	100
251	West Bengal	South 24 Parganas	8,161,961	5365.72	5363.54	99.96
252	West Bengal	Darjiling	1,846,823	3076.97	1281.25	41.64

Source : Survey of India and Census Data 2011 Note: Population is mentioned for complete district

B. Parliamentary Constituency Details

Sl. No.	State Name	Parliamentary Constituencies (2009)	Total Area (Sq.km)	Area Falling in Basin (Sq.km)	% Area in the Basin
1.	Bihar	Purba Champaran	2015.17	2015.17	100
2.	Bihar	Sheohar	1692.27	1692.27	100
3.	Bihar	Gaya	2489.78	2489.78	100
4.	Bihar	Aurangabad	3293.53	3293.53	100
5.	Bihar	Jamui	3892.41	3892.41	100
6.	Bihar	Saran (Chhapra)	1431.44	1431.44	100
7.	Bihar	Karakat	2618.15	2618.15	100
8.	Bihar	Ujiapur	1474.61	1474.61	100
9.	Bihar	Valmiki Nagar	4063.94	4063.94	100
10.	Bihar	Pashchim Champaran	1952.41	1952.41	100
11.	Bihar	Madhubani	1583.62	1583.62	100
12.	Bihar	Kishanganj	2699.42	2699.42	100
13.	Bihar	Jhanjharpur	2209.21	2209.21	100
14.	Bihar	Araria	2701.86	2701.86	100
15.	Bihar	Supaul	2742.33	2742.33	100
16.	Bihar	Gopalganj	1963.69	1963.69	100
17.	Bihar	Muzaffarpur	1430.05	1430.05	100
18.	Bihar	Siwan	1601.28	1601.28	100
19.	Bihar	Vaishali	1915.24	1915.24	100
20.	Bihar	Darbhanga	1422.50	1422.50	100
21.	Bihar	Purnia	2732.25	2732.25	100
22.	Bihar	Maharajganj	1650.19	1650.19	100
23.	Bihar	Madhepura	2466.84	2466.84	100
24.	Bihar	Katihar	2490.68	2490.68	100

25.	Bihar	Samastipur	1576.23	1576.23	100
26.	Bihar	Begusarai	1862.87	1862.87	100
27.	Bihar	Khagaria	2218.39	2218.39	100
28.	Bihar	Pataliputra	1762.44	1762.44	100
29.	Bihar	Buxar	2578.57	2578.57	100
30.	Bihar	Arrah	2280.67	2280.67	100
31.	Bihar	Patna Sahib	598.27	598.27	100
32.	Bihar	Bhagalpur	2077.63	2077.63	100
33.	Bihar	Munger	2760.20	2760.20	100
34.	Bihar	Nalanda	2244.43	2244.43	100
35.	Bihar	Sasaram	4967.82	4967.82	100
36.	Bihar	Nawada	2620.74	2620.74	100
37.	Bihar	Banka	3348.56	3348.56	100
38.	Bihar	Jahanabad	2087.92	2087.92	100
39.	Bihar	Sitamarhi	1693.29	1693.29	100
40.	Bihar	Hajipur	1362.22	1362.22	100
41.	Chhattisgarh	Korba	14210.21	4700.14	33.08
42.	Chhattisgarh	Bilaspur	6519.67	23.51	0.36
43.	Chhattisgarh	Raigarh	12402.30	460.31	3.71
44.	Chhattisgarh	Surguja	15136.19	12504.40	82.61
45.	Delhi	West Delhi	367.32	367.32	100
46.	Delhi	New Delhi	169.80	169.80	100
47.	Delhi	East Delhi	99.55	99.55	100
48.	Delhi	South Delhi	210.06	210.06	100
49.	Delhi	North East Delhi	128.72	128.72	100
50.	Delhi	Chandni Chowk	76.33	76.33	100
51.	Delhi	North West Delhi	403.83	403.83	100
52.	Haryana	Karnal	3614.03	2247.64	62.19
53.	Haryana	Krukshetra	4331.65	317.27	7.32
54.	Haryana	Ambala	3521.91	714.49	20.29
55.	Haryana	Sonipat	3439.22	2157.40	62.73
56.	Haryana	Gurgaon	3418.27	3377.87	98.82
57.	Haryana	Faridabad	2088.05	2088.05	100
58.	Haryana	Rohtak	4142.45	2277.15	54.97
59.	Haryana	Bhiwani - Mahendragarh	5536.13	44.47	0.80
60.	Himachal Pradesh	Shimla	8720.45	5771.79	66.19

61.	Himachal Pradesh	Mandi	31949.23	259.23	0.81
62.	Jharkhand	Rajmahal	4866.89	4866.89	100
63.	Jharkhand	Dumka	5090.18	5090.18	100
64.	Jharkhand	Godda	3743.52	3743.52	100
65.	Jharkhand	Palamu	7190.25	7190.25	100
66.	Jharkhand	Hazaribagh	5041.25	4904.61	97.29
67.	Jharkhand	Dhanbad	1985.45	1985.45	100
68.	Jharkhand	Kodarma	5930.79	5930.79	100
69.	Jharkhand	Lohardaga	7228.69	1545.98	21.39
70.	Jharkhand	Jamshedpur	3433.56	314.37	9.16
71.	Jharkhand	Chatra	8700.02	8688.17	99.86
72.	Jharkhand	Ranchi	3823.03	619.58	16.21
73.	Jharkhand	Giridih	3771.89	3754.88	99.55
74.	Madhya Pradesh	Bhind	6730.59	6730.59	100
75.	Madhya Pradesh	Rewa	6146.45	6146.45	100
76.	Madhya Pradesh	Satna	7129.57	7129.57	100
77.	Madhya Pradesh	Mandsaur	10338.44	10271.68	99.35
78.	Madhya Pradesh	Guna	13165.10	13165.10	100
79.	Madhya Pradesh	Sidhi	12499.40	12499.40	100
80.	Madhya Pradesh	Rajgarh	10237.78	10237.78	100
81.	Madhya Pradesh	Sagar	9711.45	9711.45	100
82.	Madhya Pradesh	Damoh	13976.51	13186.94	94.35
83.	Madhya Pradesh	Shahdol	12869.04	11562.35	89.85
84.	Madhya Pradesh	Dewas	8586.17	8538.52	99.45
85.	Madhya Pradesh	Ujjain	7159.54	7159.53	100
86.	Madhya Pradesh	Bhopal	3580.19	3570.85	99.74
87.	Madhya Pradesh	Vidisha	14364.18	6705.78	46.68
88.	Madhya Pradesh	Ratlam	8945.73	642.48	7.18
89.	Madhya Pradesh	Jabalpur	3855.87	288.72	7.49
90.	Madhya Pradesh	Mandla	19060.61	1035.99	5.44
91.	Madhya Pradesh	Hoshangabad	11427.68	129.08	1.13
92.	Madhya Pradesh	Dhar	8901.06	1892.18	21.26
93.	Madhya Pradesh	Indore	2707.19	2440.88	90.16
94.	Madhya Pradesh	Morena	11099.32	11099.32	100
95.	Madhya Pradesh	Tikamgarh	8378.19	8378.19	100
96.	Madhya Pradesh	Khajuraho	13995.81	12516.78	89.43

97.	Madhya Pradesh	Khandwa	12833.27	332.90	2.59
98.	Madhya Pradesh	Gwalior	9063.42	9063.42	100
99.	Rajasthan	Alwar	2651.88	2284.91	86.16
100.	Rajasthan	Nagaur	13330.88	1433.32	10.75
101.	Rajasthan	Bharatpur	8092.61	8092.61	100
102.	Rajasthan	Ajmer	9489.83	8245.33	86.89
103.	Rajasthan	Karauli - Dhaulpur	7587.16	7587.16	100
104.	Rajasthan	Tonk - Sawai Madhopur	11810.70	11810.70	100
105.	Rajasthan	Bhilwara	11896.84	11894.62	99.98
106.	Rajasthan	Kota	8841.45	8841.45	100
107.	Rajasthan	Jhalawar - Baran	12574.89	12574.89	100
108.	Rajasthan	Rajsamand	11057.91	4241.78	38.36
109.	Rajasthan	Dausa	6676.24	6676.24	100
110.	Rajasthan	Chittaurgarh	12452.35	9767.42	78.44
111.	Rajasthan	Jaipur	886.70	886.70	100
112.	Rajasthan	Udaipur	11034.48	1087.93	9.86
113.	Rajasthan	Jaipur Rural	6470.58	6440.15	99.53
114.	Rajasthan	Sikar	6801.56	2351.88	34.58
115.	Uttar Pradesh	Chandauli	1686.29	1686.29	100
116.	Uttar Pradesh	Allahabad	2890.56	2890.56	100
117.	Uttar Pradesh	Mirzapur	4339.75	4339.75	100
118.	Uttar Pradesh	Robertsganj	7819.84	7819.84	100
119.	Uttar Pradesh	Ambedkar Nagar	2448.92	2448.92	100
120.	Uttar Pradesh	Banda	5871.63	5871.63	100
121.	Uttar Pradesh	Kanpur	107.74	107.74	100
122.	Uttar Pradesh	Unnao	4357.02	4357.02	100
123.	Uttar Pradesh	Kannauj	3637.58	3637.58	100
124.	Uttar Pradesh	Lucknow	219.90	219.90	100
125.	Uttar Pradesh	Varanasi	577.83	577.83	100
126.	Uttar Pradesh	Gorakhpur	1611.11	1611.11	100
127.	Uttar Pradesh	Basti	2663.74	2663.74	100
128.	Uttar Pradesh	Shrawasti	4536.18	4536.18	100
129.	Uttar Pradesh	Agra	1252.94	1252.94	100
130.	Uttar Pradesh	Gautam Buddha Nagar	2367.29	2367.29	100
131.	Uttar Pradesh	Bijnor	3045.50	3045.50	100
132.	Uttar Pradesh	Moradabad	2575.50	2575.50	100

133.	Uttar Pradesh	Saharanpur	2348.07	2348.07	100
134.	Uttar Pradesh	Kairana	2581.95	2581.95	100
135.	Uttar Pradesh	Nagina	1722.58	1722.58	100
136.	Uttar Pradesh	Muzaffarnagar	1982.99	1982.99	100
137.	Uttar Pradesh	Baghpat	2159.35	2159.35	100
138.	Uttar Pradesh	Amroha	2717.13	2717.13	100
139.	Uttar Pradesh	Rampur	2490.83	2490.83	100
140.	Uttar Pradesh	Sambhal	2218.74	2218.74	100
141.	Uttar Pradesh	Meerut	1060.80	1060.80	100
142.	Uttar Pradesh	Ghaziabad	775.37	775.37	100
143.	Uttar Pradesh	Pilibhit	3847.82	3847.82	100
144.	Uttar Pradesh	Bulandshahr	2438.75	2438.75	100
145.	Uttar Pradesh	Kheri	5057.51	5057.51	100
146.	Uttar Pradesh	Bareilly	1667.83	1667.83	100
147.	Uttar Pradesh	Aonla	3134.49	3134.49	100
148.	Uttar Pradesh	Budaun	3394.93	3394.93	100
149.	Uttar Pradesh	Shahjahanpur	4495.51	4495.51	100
150.	Uttar Pradesh	Bahraich	3516.93	3516.93	100
151.	Uttar Pradesh	Aligarh	2227.83	2227.83	100
152.	Uttar Pradesh	Dhaurahra	3872.77	3872.77	100
153.	Uttar Pradesh	Etah	3034.54	3034.54	100
154.	Uttar Pradesh	Mathura	3245.27	3245.27	100
155.	Uttar Pradesh	Farrukhabad	2744.13	2744.13	100
156.	Uttar Pradesh	Hardoi	3657.43	3657.43	100
157.	Uttar Pradesh	Hathras	3077.63	3077.63	100
158.	Uttar Pradesh	Domriaganj	2714.50	2714.50	100
159.	Uttar Pradesh	Sitapur	2666.35	2666.35	100
160.	Uttar Pradesh	Firozabad	2282.20	2282.20	100
161.	Uttar Pradesh	Maharajganj	2794.71	2794.71	100
162.	Uttar Pradesh	Mainpuri	3387.72	3387.72	100
163.	Uttar Pradesh	Kaisarganj	3068	3068	100
164.	Uttar Pradesh	Gonda	2616.24	2616.24	100
165.	Uttar Pradesh	Misrikh	3669.78	3669.78	100
166.	Uttar Pradesh	Barabanki	2944.37	2944.37	100
167.	Uttar Pradesh	Kushi Nagar	1967.43	1967.43	100
168.	Uttar Pradesh	Fatehpur Sikri	3278.36	3278.36	100

169.	Uttar Pradesh	Mohanlalganj	2888.07	2888.07	100
170.	Uttar Pradesh	Deoria	1811.03	1811.03	100
171.	Uttar Pradesh	Sant Kabir Nagar	2413.48	2413.48	100
172.	Uttar Pradesh	Faizabad	2842.14	2842.14	100
173.	Uttar Pradesh	Etawah	3453.83	3453.83	100
174.	Uttar Pradesh	Bansgaon	1953.66	1953.66	100
175.	Uttar Pradesh	Amethi	3028.49	3028.49	100
176.	Uttar Pradesh	Akbarpur	2608.12	2608.12	100
177.	Uttar Pradesh	Rae Bareli	3186.05	3186.05	100
178.	Uttar Pradesh	Sultanpur	2485.21	2485.21	100
179.	Uttar Pradesh	Salempur	1933.17	1933.17	100
180.	Uttar Pradesh	Lalganj	2144.48	2144.48	100
181.	Uttar Pradesh	Jalaun	6937.30	6937.30	100
182.	Uttar Pradesh	Azamgarh	2012.52	2012.52	100
183.	Uttar Pradesh	Ghosi	2025.80	2025.80	100
184.	Uttar Pradesh	Fatehpur	4018.45	4018.45	100
185.	Uttar Pradesh	Jaunpur	2206.21	2206.21	100
186.	Uttar Pradesh	Pratapgarh	2434.85	2434.85	100
187.	Uttar Pradesh	Hamirpur	8315.14	8315.14	100
188.	Uttar Pradesh	Kaushambi	3093.12	3093.12	100
189.	Uttar Pradesh	Ballia	2097.32	2097.32	100
190.	Uttar Pradesh	Jhansi	7966.01	7966.01	100
191.	Uttar Pradesh	Ghazipur	2359.90	2359.90	100
192.	Uttar Pradesh	Machhlishahr	2035.43	2035.43	100
193.	Uttar Pradesh	Phulpur	1333.22	1333.22	100
194.	Uttar Pradesh	Sant Ravi Das Nagar (Bhadohi)	1762	1762	100
195.	Uttaranchal	Tehri Garhwal	12699.14	12684.48	99.88
196.	Uttaranchal	Garhwal	16643	16643	100
197.	Uttaranchal	Nainital - Udhamsingh Nagar	5740.48	5740.48	100
198.	Uttaranchal	Hardwar	3142.61	3142.61	100
199.	Uttaranchal	Almora	14011.17	14011.17	100
200.	West Bengal	Darjiling	3475.94	1680.21	48.34
201.	West Bengal	Basirhat	1511.31	1500.79	99.30
202.	West Bengal	Maldah Uttar	2540.08	2540.08	100
203.	West Bengal	Jangipur	1703.43	1703.43	100
204.	West Bengal	Murshidabad	1957.89	1957.89	100

205.	West Bengal	Krishnanagar	1736.70	1736.70	100
206.	West Bengal	Birbhum	2738.48	2738.48	100
207.	West Bengal	Bolpur	3040.20	3040.20	100
208.	West Bengal	Asansol	1129.81	1129.81	100
209.	West Bengal	Barddhaman - Durgapur	1927.12	1927.12	100
210.	West Bengal	Puruliya	4444.18	3651.18	82.16
211.	West Bengal	Barddhaman Purba	1868.78	1868.78	100
212.	West Bengal	Bankura	4184.97	4184.97	100
213.	West Bengal	Ranaghat	1384.58	1384.58	100
214.	West Bengal	Bishnupur	3472.47	3472.47	100
215.	West Bengal	Bangaon	1423.92	1423.92	100
216.	West Bengal	Arambag	1817.29	1817.29	100
217.	West Bengal	Barasat	622.59	622.59	100
218.	West Bengal	Medinipur	2667.39	2185.73	81.94
219.	West Bengal	Tamluk	1287.50	1287.11	99.97
220.	West Bengal	Jhargram	5271.39	3197.59	60.66
221.	West Bengal	Kolkata Dakshin	130.26	130.26	100
222.	West Bengal	Uluberiya	1034.90	950.79	91.87
223.	West Bengal	Mathurapur	2023.74	2023.73	100
224.	West Bengal	Jalpaiguri	3054.27	42.47	1.39
225.	West Bengal	Baharampur	1578.54	1578.54	100
226.	West Bengal	Maldah Dakshin	1134.42	1134.42	100
227.	West Bengal	Raiganj	2319.72	2319.72	100
228.	West Bengal	Ghatal	2311.48	2311.48	100
229.	West Bengal	Dum Dum	143.09	143.09	100
230.	West Bengal	Barakpur	362.37	362.37	100
231.	West Bengal	Haora	193.26	193.26	100
232.	West Bengal	Jadavpur	677.47	677.47	100
233.	West Bengal	Hugli	1261.15	1261.15	100
234.	West Bengal	Shrirampur	621.53	621.53	100
235.	West Bengal	Kolkata Uttar	45	45	100
236.	West Bengal	Jaynagar	3666.52	3666.50	100
237.	West Bengal	Diamond Harbour	738.49	738.49	100
238.	West Bengal	Kanthi	1964.40	1908	97.13
239.	West Bengal	Balurghat	2472.57	2472.57	100

Source : Election Commission of India

Annexure II: Climate – Rainfall (1971-2004) and Temperature (1969-2004) profile in the basin

A. Sub-Basin Wise Annual Rainfall (mm) (1971-2004)																			
Sl. No.	Year	Annual Rainfall (mm)																	
		Above Ramganga Confluence Sub Basin	Banas Sub Basin	Bhagirathi and others (Ganga Lower) Sub Basin	Chambal Lower Sub Basin	Chambal Upper Sub Basin	Damodar Sub Basin	Gandak and others Sub Basin	Ghaghara Confluence to Gomti confluence Sub	Ghaghara Sub Basin	Gomti Sub Basin	Kali Sindh and others up to Confluence with Parbati	Ramganga Sub Basin	Sone Sub Basin	Tons Sub Basin	Upstream of Gomti confluece to	Yamuna Lower Sub Basin	Yamuna Middle Sub Basin	Yamuna Upper Sub Basin	Kosi Sub Basin
1	1971	1451	761	2220	1135	967	2013	1686	1580	1687	1500	1209	1494	1609	1435	1231	1240	755	1194	1820
2	1972	915	441	1252	654	605	1206	884	788	861	674	697	877	1116	953	720	801	600	742	762
3	1973	1121	945	1856	792	1493	1561	1401	1017	1171	1020	1293	1241	1166	1058	919	983	636	896	1483
4	1974	793	627	1845	753	777	1340	1281	789	953	774	887	784	878	743	685	820	590	727	1575
5	1975	1209	918	1625	1032	905	1343	1158	1057	1293	1194	1083	1210	1225	1241	1013	1110	826	1055	1234
6	1976	951	774	1474	851	1133	1183	1094	993	1011	893	985	1016	1128	996	824	885	746	885	1348
7	1977	1068	726	1879	872	906	1649	1232	1040	961	838	959	1057	1338	1213	1003	1063	925	931	1242
8	1978	1442	737	1682	746	969	1691	1174	1218	1121	1229	936	1323	1465	1449	1196	1107	707	1218	1176
9	1979	809	556	1384	538	768	992	957	750	842	807	681	748	774	719	664	608	389	671	1128
10	1980	1163	541	1873	857	738	1356	1468	1336	1530	1415	821	1239	1336	1408	1156	1233	679	760	1449
11	1981	949	599	1705	725	848	1345	1267	1019	1205	1024	823	959	1054	962	856	805	635	728	1409
12	1982	1191	630	1314	950	794	1115	1010	947	1229	1157	963	1128	1091	1062	934	1150	680	943	793
13	1983	1316	824	1618	950	891	1311	1219	921	1338	1125	971	1440	1128	1057	982	1177	913	1011	1243
14	1984	906	518	2107	535	898	1604	1487	1133	1170	1052	814	975	1260	1120	872	825	529	711	1667
15	1985	1084	506	1655	889	707	1288	1400	1074	1378	1124	951	1234	1167	1028	909	1096	685	825	1598
16	1986	992	521	1731	680	943	1518	1447	1053	1138	905	1027	994	1171	1040	831	889	487	752	1491
17	1987	618	376	1974	594	635	1449	1576	1135	949	750	802	592	1284	1035	624	817	323	545	1990
18	1988	1203	543	1805	725	837	1398	1337	971	1118	866	832	1098	997	961	887	908	751	1054	1414
19	1989	946	492	1814	483	641	1351	1342	1039	1102	781	621	906	978	843	623	670	424	763	1594
20	1990	1282	729	1892	835	1061	1627	1235	1233	1287	1026	1103	1345	1307	1251	922	1155	694	1020	1228
21	1991	767	561	1915	680	754	1490	1112	962	916	882	779	781	1018	980	753	812	512	642	1193

22	1992	884	653	1471	813	689	1254	913	792	840	834	765	872	907	952	773	927	705	753	956
23	1993	1142	537	1895	750	859	1460	1189	891	1175	793	979	1248	1045	898	717	936	644	800	1450
24	1994	974	732	1427	805	1120	1496	1182	1088	935	770	1104	855	1462	1228	819	1032	631	919	931
25	1995	1073	702	2252	877	753	1713	1187	951	994	835	905	1092	1036	954	802	865	817	966	1250
26	1996	1080	774	1705	845	1051	1435	1285	1024	1076	971	1039	1019	1091	949	904	994	812	1047	1261
27	1997	1130	821	1875	853	973	1686	1353	1145	1121	988	1008	1081	1353	1187	925	1015	736	1008	1401
28	1998	1354	627	2276	751	830	1514	1421	1077	1308	1030	831	1362	1187	1011	985	939	800	1052	1570
29	1999	914	556	2404	866	801	1924	1500	1184	1001	968	1008	950	1238	1318	961	1138	654	686	1723
30	2000	1267	415	1924	635	496	1406	1251	965	1276	962	632	1339	971	1033	839	811	516	839	1380
31	2001	906	507	1842	753	664	1538	1303	1101	1022	877	796	853	1312	1123	774	925	513	761	1296
32	2002	918	300	1768	415	528	1437	1122	842	901	736	578	1009	986	869	701	749	430	574	1092
33	2003	1196	580	1814	725	829	1461	1255	1103	1166	1089	872	1381	1374	1261	1023	1105	780	778	1279
34	2004	979	575	1749	618	873	1340	1058	573	860	680	821	904	1009	821	568	771	469	819	1096

B. Temperature profile in the basin (36 Years Average for the period 1969-2004)

Sl. No.	Month	Maximum Temperature (°C)	Minimum Temperature (°C)	Mean Temperature (°C)
1	January	22.85	8.49	15.67
2	February	27.74	13.23	20.49
3	March	31.51	15.62	23.56
4	April	36.63	20.91	28.77
5	May	38.47	24.39	31.43
6	June	36.58	25.48	31.03
7	July	32.46	24.61	28.54
8	August	31.4	24.14	27.77
9	September	31.9	23.1	27.5
10	October	31.87	19.27	25.57
11	November	28.62	13.7	21.16
12	December	24.48	9.38	16.93

Annexure III: Sub-basin wise drinking water facilities

A. Drinking Water Facilities					
Sl. No.	**Sub Basin**	**District**	**Wells**	**Tubewells**	**Handpumps**
1.	Above Ramganga Confluence Sub Basin	Chamoli	73	3	2
2.	Above Ramganga Confluence Sub Basin	Meerut	36	159	609
3.	Above Ramganga Confluence Sub Basin	Saharanpur	83	132	1189
4.	Above Ramganga Confluence Sub Basin	Garhwal	103	11	25
5.	Above Ramganga Confluence Sub Basin	Shahjahanpur	1406	384	2078
6.	Above Ramganga Confluence Sub Basin	Bijnor	179	157	2001
7.	Above Ramganga Confluence Sub Basin	Hardoi	1645	402	1748
8.	Above Ramganga Confluence Sub Basin	Hardwar	12	17	486
9.	Above Ramganga Confluence Sub Basin	Jyotiba Phule Nagar	81	164	906
10.	Above Ramganga Confluence Sub Basin	Moradabad	184	315	1469
11.	Above Ramganga Confluence Sub Basin	Muzaffarnagar	36	200	843
12.	Above Ramganga Confluence Sub Basin	Tehri Garhwal	0	0	0
13.	Above Ramganga Confluence Sub Basin	Bageshwar	41	0	22
14.	Above Ramganga Confluence Sub Basin	Etah	945	425	1453
15.	Above Ramganga Confluence Sub Basin	Kinnaur	0	0	14
16.	Above Ramganga Confluence Sub Basin	Farrukhabad	269	172	866
17.	Above Ramganga Confluence Sub Basin	Rudraprayag	88	0	23
18.	Above Ramganga Confluence Sub Basin	Bulandshahr	0	0	0
19.	Above Ramganga Confluence Sub Basin	Aligarh	382	513	1156
20.	Above Ramganga Confluence Sub Basin	Almora	22	4	47
21.	Above Ramganga Confluence Sub Basin	Pithoragarh	38	1	7
22.	Above Ramganga Confluence Sub Basin	Uttarkashi	3	0	1
23.	Above Ramganga Confluence Sub Basin	Ghaziabad	93	280	509
24.	Above Ramganga Confluence Sub Basin	Budaun	573	281	1719
25.	Above Ramganga Confluence Sub Basin	Dehradun	74	75	110
26.	Banas Sub Basin	Chittaurgarh	1816	898	1838
27.	Banas Sub Basin	Neemuch	591	254	577
28.	Banas Sub Basin	Sikar	752	246	738
29.	Banas Sub Basin	Bhilwara	1301	227	1285
30.	Banas Sub Basin	Jaipur	1631	471	1629
31.	Banas Sub Basin	Udaipur	1813	365	1830
32.	Banas Sub Basin	Nagaur	961	692	465

33.	Banas Sub Basin	Sawai Madhopur	660	152	627
34.	Banas Sub Basin	Bundi	648	210	696
35.	Banas Sub Basin	Ajmer	827	138	846
36.	Banas Sub Basin	Karauli	667	314	650
37.	Banas Sub Basin	Tonk	806	76	792
38.	Banas Sub Basin	Dausa	872	553	883
39.	Banas Sub Basin	Rajsamand	802	193	807
40.	Bhagirathi and others (Ganga Lower) Sub Basin	Godda	0	0	0
41.	Bhagirathi and others (Ganga Lower) Sub Basin	Haora	36	668	78
42.	Bhagirathi and others (Ganga Lower) Sub Basin	North Twenty Four Parganas	4	1536	212
43.	Bhagirathi and others (Ganga Lower) Sub Basin	Kishanganj	0	0	0
44.	Bhagirathi and others (Ganga Lower) Sub Basin	Araria	0	0	0
45.	Bhagirathi and others (Ganga Lower) Sub Basin	Giridih	0	0	0
46.	Bhagirathi and others (Ganga Lower) Sub Basin	Hugli	78	1793	324
47.	Bhagirathi and others (Ganga Lower) Sub Basin	Kolkata	0	0	0
48.	Bhagirathi and others (Ganga Lower) Sub Basin	Uttar Dinajpur	340	1446	115
49.	Bhagirathi and others (Ganga Lower) Sub Basin	Jamui	0	0	0
50.	Bhagirathi and others (Ganga Lower) Sub Basin	Nadia	81	1179	231
51.	Bhagirathi and others (Ganga Lower) Sub Basin	Sahibganj	0	0	0
52.	Bhagirathi and others (Ganga Lower) Sub Basin	South Twenty Four Parganas	0	0	0
53.	Bhagirathi and others (Ganga Lower) Sub Basin	Barddhaman	449	1891	1240
54.	Bhagirathi and others (Ganga Lower) Sub Basin	Darjiling	332	260	246
55.	Bhagirathi and others (Ganga Lower) Sub Basin	Maldah	0	0	0
56.	Bhagirathi and others (Ganga Lower) Sub Basin	Medinipur	4199	7790	2791
57.	Bhagirathi and others (Ganga Lower) Sub Basin	Purnia	0	0	0
58.	Bhagirathi and others (Ganga Lower) Sub Basin	Bankura	2669	3167	554
59.	Bhagirathi and others (Ganga Lower) Sub Basin	Dumka	0	0	0
60.	Bhagirathi and others (Ganga Lower) Sub Basin	Jalpaiguri	588	594	316
61.	Bhagirathi and others (Ganga Lower) Sub Basin	Katihar	0	0	0
62.	Bhagirathi and others (Ganga Lower) Sub Basin	Murshidabad	182	1660	432
63.	Bhagirathi and others (Ganga Lower) Sub Basin	Banka	0	0	0
64.	Bhagirathi and others (Ganga Lower) Sub Basin	Dakshin Dinajpur	238	1085	564
65.	Bhagirathi and others (Ganga Lower) Sub Basin	Madhepura	0	0	0
66.	Bhagirathi and others (Ganga Lower) Sub Basin	Birbhum	625	1977	475
67.	Bhagirathi and others (Ganga Lower) Sub Basin	Bhagalpur	0	0	0
68.	Bhagirathi and others (Ganga Lower) Sub Basin	Deoghar	0	0	0

69.	Bhagirathi and others (Ganga Lower) Sub Basin	Pakaur	0	0	0
70.	Bhagirathi and others (Ganga Lower) Sub Basin	Supaul	0	0	0
71.	Chambal Lower Sub Basin	Shivpuri	1270	258	1269
72.	Chambal Lower Sub Basin	Sheopur	371	234	487
73.	Chambal Lower Sub Basin	Auraiya	660	74	749
74.	Chambal Lower Sub Basin	Agra	430	249	870
75.	Chambal Lower Sub Basin	Dhaulpur	0	0	0
76.	Chambal Lower Sub Basin	Sawai Madhopur	660	152	627
77.	Chambal Lower Sub Basin	Morena	738	139	691
78.	Chambal Lower Sub Basin	Etawah	445	20	683
79.	Chambal Lower Sub Basin	Bhind	864	315	822
80.	Chambal Lower Sub Basin	Karauli	667	314	650
81.	Chambal Lower Sub Basin	Baran	743	440	869
82.	Chambal Lower Sub Basin	Guna	1744	415	1890
83.	Chambal Upper Sub Basin	Chittaurgarh	1816	898	1838
84.	Chambal Upper Sub Basin	Jhalawar	1188	152	1172
85.	Chambal Upper Sub Basin	Neemuch	591	254	577
86.	Chambal Upper Sub Basin	Bhilwara	1301	227	1285
87.	Chambal Upper Sub Basin	Ratlam	791	440	994
88.	Chambal Upper Sub Basin	Shajapur	896	305	1017
89.	Chambal Upper Sub Basin	Dewas	724	528	1007
90.	Chambal Upper Sub Basin	Mandsaur	815	252	829
91.	Chambal Upper Sub Basin	Dhar	860	575	1384
92.	Chambal Upper Sub Basin	Bundi	648	210	696
93.	Chambal Upper Sub Basin	Indore	256	472	591
94.	Chambal Upper Sub Basin	Ujjain	699	647	1015
95.	Damodar Sub Basin	Haora	36	668	78
96.	Damodar Sub Basin	Puruliya	2340	2237	63
97.	Damodar Sub Basin	Lohardaga	0	0	0
98.	Damodar Sub Basin	Ranchi	0	0	0
99.	Damodar Sub Basin	Giridih	0	0	0
100.	Damodar Sub Basin	Hugli	78	1793	324
101.	Damodar Sub Basin	Pashchimi Singhbhum	0	0	0
102.	Damodar Sub Basin	Purbi Singhbhum	0	0	0
103.	Damodar Sub Basin	South Twenty Four Parganas	0	0	0
104.	Damodar Sub Basin	Hazaribagh	0	0	0

105.	Damodar Sub Basin	Barddhaman	449	1891	1240
106.	Damodar Sub Basin	Medinipur	4199	7790	2791
107.	Damodar Sub Basin	Bokaro	0	0	0
108.	Damodar Sub Basin	Bankura	2669	3167	554
109.	Damodar Sub Basin	Dumka	0	0	0
110.	Damodar Sub Basin	Palamu	0	0	0
111.	Damodar Sub Basin	Kodarma	0	0	0
112.	Damodar Sub Basin	Baleshwar	1030	0	2490
113.	Damodar Sub Basin	Deoghar	0	0	0
114.	Damodar Sub Basin	Dhanbad	0	0	0
115.	Damodar Sub Basin	Chatra	0	0	0
116.	Gandak and others Sub Basin	Aurangabad	0	0	0
117.	Gandak and others Sub Basin	Saran	0	0	0
118.	Gandak and others Sub Basin	Darbhanga	0	0	0
119.	Gandak and others Sub Basin	Godda	0	0	0
120.	Gandak and others Sub Basin	Purba Champaran	0	0	0
121.	Gandak and others Sub Basin	Samastipur	0	0	0
122.	Gandak and others Sub Basin	Bhojpur	0	0	0
123.	Gandak and others Sub Basin	Giridih	0	0	0
124.	Gandak and others Sub Basin	Khagaria	0	0	0
125.	Gandak and others Sub Basin	Nalanda	0	0	0
126.	Gandak and others Sub Basin	Patna	0	0	0
127.	Gandak and others Sub Basin	Jamui	0	0	0
128.	Gandak and others Sub Basin	Kushinagar	690	153	1485
129.	Gandak and others Sub Basin	Sahibganj	0	0	0
130.	Gandak and others Sub Basin	Sheikhpura	0	0	0
131.	Gandak and others Sub Basin	Hazaribagh	0	0	0
132.	Gandak and others Sub Basin	Gopalganj	0	0	0
133.	Gandak and others Sub Basin	Gaya	0	0	0
134.	Gandak and others Sub Basin	Jehanabad	0	0	0
135.	Gandak and others Sub Basin	Dumka	0	0	0
136.	Gandak and others Sub Basin	Katihar	0	0	0
137.	Gandak and others Sub Basin	Munger	0	0	0
138.	Gandak and others Sub Basin	Pashchim Champaran	0	0	0
139.	Gandak and others Sub Basin	Siwan	0	0	0
140.	Gandak and others Sub Basin	Palamu	0	0	0

141.	Gandak and others Sub Basin	Banka	0	0	0
142.	Gandak and others Sub Basin	Mahrajganj	0	0	0
143.	Gandak and others Sub Basin	Lakhisarai	0	0	0
144.	Gandak and others Sub Basin	Kodarma	0	0	0
145.	Gandak and others Sub Basin	Begusarai	0	0	0
146.	Gandak and others Sub Basin	Bhagalpur	0	0	0
147.	Gandak and others Sub Basin	Deoghar	0	0	0
148.	Gandak and others Sub Basin	Muzaffarpur	0	0	0
149.	Gandak and others Sub Basin	Nawada	0	0	0
150.	Gandak and others Sub Basin	Vaishali	0	0	0
151.	Gandak and others Sub Basin	Chatra	0	0	0
152.	Ghaghara Confluence to Gomti confluence Sub Basin	Azamgarh	1178	803	3614
153.	Ghaghara Confluence to Gomti confluence Sub Basin	Ballia	1249	515	1741
154.	Ghaghara Confluence to Gomti confluence Sub Basin	Barabanki	1722	517	1754
155.	Ghaghara Confluence to Gomti confluence Sub Basin	Saran	0	0	0
156.	Ghaghara Confluence to Gomti confluence Sub Basin	Chandauli	1304	175	1277
157.	Ghaghara Confluence to Gomti confluence Sub Basin	Mau	290	213	1444
158.	Ghaghara Confluence to Gomti confluence Sub Basin	Rohtas	0	0	0
159.	Ghaghara Confluence to Gomti confluence Sub Basin	Ambedkar Nagar	772	504	1608
160.	Ghaghara Confluence to Gomti confluence Sub Basin	Faizabad	1023	536	1182
161.	Ghaghara Confluence to Gomti confluence Sub Basin	Varanasi	1209	493	1233
162.	Ghaghara Confluence to Gomti confluence Sub Basin	Bhojpur	0	0	0
163.	Ghaghara Confluence to Gomti confluence Sub Basin	Buxar	0	0	0
164.	Ghaghara Confluence to Gomti confluence Sub Basin	Ghazipur	2056	690	2534
165.	Ghaghara Confluence to Gomti confluence Sub Basin	Mirzapur	1653	226	1651
166.	Ghaghara Confluence to Gomti confluence Sub Basin	Sultanpur	2267	1099	2394
167.	Ghaghara Confluence to Gomti confluence Sub Basin	Kaimur (Bhabua)	0	0	0
168.	Ghaghara Confluence to Gomti confluence Sub Basin	Jaunpur	3012	356	3163
169.	Ghaghara Confluence to Gomti confluence Sub Basin	Sonbhadra	0	0	0
170.	Ghaghara Sub Basin	Azamgarh	1178	803	3614
171.	Ghaghara Sub Basin	Chamoli	73	3	2
172.	Ghaghara Sub Basin	Ballia	1249	515	1741
173.	Ghaghara Sub Basin	Barabanki	1722	517	1754
174.	Ghaghara Sub Basin	Saran	0	0	0
175.	Ghaghara Sub Basin	Deoria	448	206	1889
176.	Ghaghara Sub Basin	Mau	290	213	1444

177.	Ghaghara Sub Basin	Ambedkar Nagar	772	504	1608
178.	Ghaghara Sub Basin	Faizabad	1023	536	1182
179.	Ghaghara Sub Basin	Shahjahanpur	1406	384	2078
180.	Ghaghara Sub Basin	Sant Kabir Nagar	912	128	1324
181.	Ghaghara Sub Basin	Udham Singh Nagar	0	0	0
182.	Ghaghara Sub Basin	Bageshwar	41	0	22
183.	Ghaghara Sub Basin	Gorakhpur	1307	416	2645
184.	Ghaghara Sub Basin	Kheri	1270	378	1637
185.	Ghaghara Sub Basin	Kushinagar	690	153	1485
186.	Ghaghara Sub Basin	Balrampur	658	92	773
187.	Ghaghara Sub Basin	Basti	2265	595	3073
188.	Ghaghara Sub Basin	Gopalganj	0	0	0
189.	Ghaghara Sub Basin	Siddharthnagar	0	0	0
190.	Ghaghara Sub Basin	Bahraich	1035	147	1135
191.	Ghaghara Sub Basin	Pilibhit	356	60	1183
192.	Ghaghara Sub Basin	Sitapur	0	0	0
193.	Ghaghara Sub Basin	Siwan	0	0	0
194.	Ghaghara Sub Basin	Almora	22	4	47
195.	Ghaghara Sub Basin	Champawat	22	0	2
196.	Ghaghara Sub Basin	Mahrajganj	0	0	0
197.	Ghaghara Sub Basin	Nainital	12	179	35
198.	Ghaghara Sub Basin	Pithoragarh	38	1	7
199.	Ghaghara Sub Basin	Shrawasti	618	46	650
200.	Ghaghara Sub Basin	Gonda	1496	199	1746
201.	Gomti Sub Basin	Azamgarh	1178	803	3614
202.	Gomti Sub Basin	Barabanki	1722	517	1754
203.	Gomti Sub Basin	Faizabad	1023	536	1182
204.	Gomti Sub Basin	Shahjahanpur	1406	384	2078
205.	Gomti Sub Basin	Varanasi	1209	493	1233
206.	Gomti Sub Basin	Hardoi	1645	402	1748
207.	Gomti Sub Basin	Rae Bareli	1554	668	1641
208.	Gomti Sub Basin	Allahabad	2626	657	2667
209.	Gomti Sub Basin	Ghazipur	2056	690	2534
210.	Gomti Sub Basin	Kheri	1270	378	1637
211.	Gomti Sub Basin	Pratapgarh	2053	320	2130
212.	Gomti Sub Basin	Pilibhit	356	60	1183

213.	Gomti Sub Basin	Sultanpur	2267	1099	2394
214.	Gomti Sub Basin	Sitapur	0	0	0
215.	Gomti Sub Basin	Jaunpur	3012	356	3163
216.	Gomti Sub Basin	Lucknow	609	213	806
217.	Gomti Sub Basin	Unnao	1577	493	1638
218.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Bhopal	394	241	501
219.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Chittaurgarh	1816	898	1838
220.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Jhalawar	1188	152	1172
221.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Neemuch	591	254	577
222.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Sehore	843	460	982
223.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Bhilwara	1301	227	1285
224.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Rajgarh	1448	370	1603
225.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Shivpuri	1270	258	1269
226.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Sheopur	371	234	487
227.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Kota	645	443	698
228.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Sawai Madhopur	660	152	627
229.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Shajapur	896	305	1017
230.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Dewas	724	528	1007
231.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Mandsaur	815	252	829
232.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Bundi	648	210	696
233.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Indore	256	472	591
234.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Tonk	806	76	792
235.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Vidisha	1406	215	1466
236.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Ujjain	699	647	1015
237.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Baran	743	440	869
238.	Kali Sindh and others up to Confluence with Parbati Sub Basin	Guna	1744	415	1890
239.	Ramganga Sub Basin	Chamoli	73	3	2
240.	Kosi Sub Basin	Darbhanga	0	0	0
241.	Kosi Sub Basin	Purba Champaran	0	0	0
242.	Kosi Sub Basin	Samastipur	0	0	0
243.	Kosi Sub Basin	Araria	0	0	0
244.	Kosi Sub Basin	Khagaria	0	0	0
245.	Kosi Sub Basin	Madhubani	0	0	0
246.	Kosi Sub Basin	Saharsa	0	0	0
247.	Kosi Sub Basin	Purnia	0	0	0
248.	Kosi Sub Basin	Katihar	0	0	0

249.	Kosi Sub Basin	Sitamarhi	0	0	0
250.	Kosi Sub Basin	Madhepura	0	0	0
251.	Kosi Sub Basin	Begusarai	0	0	0
252.	Kosi Sub Basin	Bhagalpur	0	0	0
253.	Kosi Sub Basin	Muzaffarpur	0	0	0
254.	Kosi Sub Basin	Supaul	0	0	0
255.	Kosi Sub Basin	Sheohar	0	0	0
256.	Ramganga Sub Basin	Garhwal	103	11	25
257.	Ramganga Sub Basin	Shahjahanpur	1406	384	2078
258.	Ramganga Sub Basin	Bijnor	179	157	2001
259.	Ramganga Sub Basin	Hardoi	1645	402	1748
260.	Ramganga Sub Basin	Jyotiba Phule Nagar	81	164	906
261.	Ramganga Sub Basin	Kannauj	343	235	667
262.	Ramganga Sub Basin	Moradabad	184	315	1469
263.	Ramganga Sub Basin	Udham Singh Nagar	0	0	0
264.	Ramganga Sub Basin	Bageshwar	41	0	22
265.	Ramganga Sub Basin	Kheri	1270	378	1637
266.	Ramganga Sub Basin	Farrukhabad	269	172	866
267.	Ramganga Sub Basin	Pilibhit	356	60	1183
268.	Ramganga Sub Basin	Almora	22	4	47
269.	Ramganga Sub Basin	Bareilly	329	96	1824
270.	Ramganga Sub Basin	Champawat	22	0	2
271.	Ramganga Sub Basin	Nainital	12	179	35
272.	Ramganga Sub Basin	Rampur	190	120	1077
273.	Ramganga Sub Basin	Budaun	573	281	1719
274.	Sone Sub Basin	Aurangabad	0	0	0
275.	Sone Sub Basin	Saran	0	0	0
276.	Sone Sub Basin	Jashpur	727	13	741
277.	Sone Sub Basin	Katni	1001	68	1064
278.	Sone Sub Basin	Korba	682	28	658
279.	Sone Sub Basin	Mandla	1065	61	1073
280.	Sone Sub Basin	Rohtas	0	0	0
281.	Sone Sub Basin	Lohardaga	0	0	0
282.	Sone Sub Basin	Dindori	818	16	788
283.	Sone Sub Basin	Shahdol	1355	54	1309
284.	Sone Sub Basin	Bhojpur	0	0	0

285.	Sone Sub Basin	Patna	0	0	0
286.	Sone Sub Basin	Raigarh	877	505	1367
287.	Sone Sub Basin	Garhwa	0	0	0
288.	Sone Sub Basin	Jabalpur	643	225	970
289.	Sone Sub Basin	Koriya	606	4	627
290.	Sone Sub Basin	Rewa	2327	768	2156
291.	Sone Sub Basin	Gumla	0	0	0
292.	Sone Sub Basin	Satna	1710	612	1617
293.	Sone Sub Basin	Surguja	1678	72	1652
294.	Sone Sub Basin	Jehanabad	0	0	0
295.	Sone Sub Basin	Umaria	573	69	552
296.	Sone Sub Basin	Palamu	0	0	0
297.	Sone Sub Basin	Sidhi	1662	172	1560
298.	Sone Sub Basin	Kaimur (Bhabua)	0	0	0
299.	Sone Sub Basin	Sonbhadra	0	0	0
300.	Sone Sub Basin	Chatra	0	0	0
301.	Sone Sub Basin	Bilaspur	1421	428	1416
302.	Tons Sub Basin	Chandauli	1304	175	1277
303.	Tons Sub Basin	Katni	1001	68	1064
304.	Tons Sub Basin	Allahabad	2626	657	2667
305.	Tons Sub Basin	Rewa	2327	768	2156
306.	Tons Sub Basin	Panna	857	130	875
307.	Tons Sub Basin	Satna	1710	612	1617
308.	Tons Sub Basin	Mirzapur	1653	226	1651
309.	Tons Sub Basin	Chitrakoot	507	101	505
310.	Tons Sub Basin	Sidhi	1662	172	1560
311.	Tons Sub Basin	Sonbhadra	0	0	0
312.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Chandauli	1304	175	1277
313.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Firozabad	307	380	765
314.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Kanpur Dehat	894	246	942
315.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Meerut	36	159	609
316.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Varanasi	1209	493	1233
317.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Hardoi	1645	402	1748
318.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Kannauj	343	235	667
319.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Muzaffarnagar	36	200	843
320.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Rae Bareli	1554	668	1641

321.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Allahabad	2626	657	2667
322.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Etah	945	425	1453
323.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Fatehpur	1279	373	1316
324.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Kanpur Nagar	779	312	881
325.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Pratapgarh	2053	320	2130
326.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Sant Ravidas Nagar Bhadohi	0	0	0
327.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Hathras	307	265	620
328.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Farrukhabad	269	172	866
329.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Kaushambi	701	404	725
330.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Mirzapur	1653	226	1651
331.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Bulandshahr	0	0	0
332.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Aligarh	382	513	1156
333.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Ghaziabad	93	280	509
334.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Jaunpur	3012	356	3163
335.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Mainpuri	0	0	0
336.	Upstream of Gomti confluece to Muzaffarnagar Sub Basin	Unnao	1577	493	1638
337.	Yamuna Lower Sub Basin	Bhopal	394	241	501
338.	Yamuna Lower Sub Basin	Firozabad	307	380	765
339.	Yamuna Lower Sub Basin	Jalaun	861	193	884
340.	Yamuna Lower Sub Basin	Katni	1001	68	1064
341.	Yamuna Lower Sub Basin	Kanpur Dehat	894	246	942
342.	Yamuna Lower Sub Basin	Sehore	843	460	982
343.	Yamuna Lower Sub Basin	Datia	483	71	498
344.	Yamuna Lower Sub Basin	Raisen	1127	366	1305
345.	Yamuna Lower Sub Basin	Shivpuri	1270	258	1269
346.	Yamuna Lower Sub Basin	Sheopur	371	234	487
347.	Yamuna Lower Sub Basin	Auraiya	660	74	749
348.	Yamuna Lower Sub Basin	Agra	430	249	870
349.	Yamuna Lower Sub Basin	Banda	648	101	666
350.	Yamuna Lower Sub Basin	Damoh	1055	116	1052
351.	Yamuna Lower Sub Basin	Kannauj	343	235	667
352.	Yamuna Lower Sub Basin	Allahabad	2626	657	2667
353.	Yamuna Lower Sub Basin	Etah	945	425	1453
354.	Yamuna Lower Sub Basin	Fatehpur	1279	373	1316
355.	Yamuna Lower Sub Basin	Jhansi	714	50	729
356.	Yamuna Lower Sub Basin	Hamirpur	494	86	495

357.	Yamuna Lower Sub Basin	Jabalpur	643	225	970
358.	Yamuna Lower Sub Basin	Kanpur Nagar	779	312	881
359.	Yamuna Lower Sub Basin	Rewa	2327	768	2156
360.	Yamuna Lower Sub Basin	Hathras	307	265	620
361.	Yamuna Lower Sub Basin	Panna	857	130	875
362.	Yamuna Lower Sub Basin	Satna	1710	612	1617
363.	Yamuna Lower Sub Basin	Morena	738	139	691
364.	Yamuna Lower Sub Basin	Chhatarpur	1013	20	957
365.	Yamuna Lower Sub Basin	Etawah	445	20	683
366.	Yamuna Lower Sub Basin	Kaushambi	701	404	725
367.	Yamuna Lower Sub Basin	Lalitpur	655	12	670
368.	Yamuna Lower Sub Basin	Mahoba	391	3	385
369.	Yamuna Lower Sub Basin	Sagar	1729	203	1746
370.	Yamuna Lower Sub Basin	Tikamgarh	836	53	809
371.	Yamuna Lower Sub Basin	Aligarh	382	513	1156
372.	Yamuna Lower Sub Basin	Bhind	864	315	822
373.	Yamuna Lower Sub Basin	Chitrakoot	507	101	505
374.	Yamuna Lower Sub Basin	Vidisha	1406	215	1466
375.	Yamuna Lower Sub Basin	Guna	1744	415	1890
376.	Yamuna Lower Sub Basin	Gwalior	528	75	549
377.	Yamuna Lower Sub Basin	Mainpuri	0	0	0
378.	Yamuna Lower Sub Basin	Narsimhapur	378	271	975
379.	Yamuna Middle Sub Basin	Firozabad	307	380	765
380.	Yamuna Middle Sub Basin	Sikar	752	246	738
381.	Yamuna Middle Sub Basin	Jaipur	1631	471	1629
382.	Yamuna Middle Sub Basin	Auraiya	660	74	749
383.	Yamuna Middle Sub Basin	Agra	430	249	870
384.	Yamuna Middle Sub Basin	Bharatpur	689	589	627
385.	Yamuna Middle Sub Basin	Dhaulpur	0	0	0
386.	Yamuna Middle Sub Basin	Faridabad	315	292	358
387.	Yamuna Middle Sub Basin	Sawai Madhopur	660	152	627
388.	Yamuna Middle Sub Basin	Gautam Buddha Nagar	116	156	358
389.	Yamuna Middle Sub Basin	Etah	945	425	1453
390.	Yamuna Middle Sub Basin	Hathras	307	265	620
391.	Yamuna Middle Sub Basin	Mathura	541	316	689
392.	Yamuna Middle Sub Basin	Etawah	445	20	683

393.	Yamuna Middle Sub Basin	Gurgaon	573	530	454
394.	Yamuna Middle Sub Basin	Alwar	1117	689	1153
395.	Yamuna Middle Sub Basin	Bulandshahr	0	0	0
396.	Yamuna Middle Sub Basin	Aligarh	382	513	1156
397.	Yamuna Middle Sub Basin	Karauli	667	314	650
398.	Yamuna Middle Sub Basin	South	0	0	0
399.	Yamuna Middle Sub Basin	Ghaziabad	93	280	509
400.	Yamuna Middle Sub Basin	Dausa	872	553	883
401.	Yamuna Upper Sub Basin	Karnal	98	379	380
402.	Yamuna Upper Sub Basin	Meerut	36	159	609
403.	Yamuna Upper Sub Basin	Saharanpur	83	132	1189
404.	Yamuna Upper Sub Basin	Sikar	752	246	738
405.	Yamuna Upper Sub Basin	Solan	255	136	483
406.	Yamuna Upper Sub Basin	East	0	0	0
407.	Yamuna Upper Sub Basin	Jaipur	1631	471	1629
408.	Yamuna Upper Sub Basin	Rohtak	147	143	142
409.	Yamuna Upper Sub Basin	South West	0	0	0
410.	Yamuna Upper Sub Basin	Faridabad	315	292	358
411.	Yamuna Upper Sub Basin	Hardwar	12	17	486
412.	Yamuna Upper Sub Basin	Muzaffarnagar	36	200	843
413.	Yamuna Upper Sub Basin	Tehri Garhwal	0	0	0
414.	Yamuna Upper Sub Basin	Gautam Buddha Nagar	116	156	358
415.	Yamuna Upper Sub Basin	Sirmaur	197	77	191
416.	Yamuna Upper Sub Basin	Rewari	293	261	219
417.	Yamuna Upper Sub Basin	Yamunanagar	25	101	109
418.	Yamuna Upper Sub Basin	Jind	278	261	270
419.	Yamuna Upper Sub Basin	Kinnaur	0	0	14
420.	Yamuna Upper Sub Basin	Kurukshetra	30	344	355
421.	Yamuna Upper Sub Basin	North West	0	0	0
422.	Yamuna Upper Sub Basin	Jhajjar	185	164	152
423.	Yamuna Upper Sub Basin	New Delhi	0	0	0
424.	Yamuna Upper Sub Basin	North	0	0	0
425.	Yamuna Upper Sub Basin	Baghpat	0	0	0
426.	Yamuna Upper Sub Basin	Gurgaon	573	530	454
427.	Yamuna Upper Sub Basin	Alwar	1117	689	1153
428.	Yamuna Upper Sub Basin	Central	0	0	0

429.	Yamuna Upper Sub Basin	Panipat	74	127	148
430.	Yamuna Upper Sub Basin	Shimla	136	1	69
431.	Yamuna Upper Sub Basin	Uttarkashi	3	0	1
432.	Yamuna Upper Sub Basin	South	0	0	0
433.	Yamuna Upper Sub Basin	West	0	0	0
434.	Yamuna Upper Sub Basin	Ghaziabad	93	280	509
435.	Yamuna Upper Sub Basin	Mahendragarh	316	263	92
436.	Yamuna Upper Sub Basin	Dehradun	74	75	110
437.	Yamuna Upper Sub Basin	Sonipat	211	219	272
438.	Yamuna Upper Sub Basin	North East	0	0	0

Source : Census Data 2001

Annexure IV: Inventory of surface water resources

A. List of Dams with surrogate information												
Sl. No.	Name of Dam	River	Type of Dam	Year of completion	Catchment Area (Sq.km.)	Length of dam (m)	Max height above foundation (m)	Gross storage capacity (MCM)	Live storage capacity (MCM)	Type of spillway	Submergence Area (Th Ha)	Purpose
1	Abhaypura	Bhimlat	Earthen	1976	126.89	1340	17.75	7.44	7.27		0.187	IR
2	Adner	Local nala	Earthen	1911	26.92	1280	12.2	7.44	7.193		0.188	IR
3	Adwa	Adwa	Earthen	1978	640	7906	20.48	57.77	33.1	Other	1.667	IR
4	Agar Agari	Local nala	Earthen	1991	8.54	1676	11.5	2.301	2.108		0.0855	IR
5	Ahraura	Garai	Earthen	1955	220	1219.5	22.87	60.56	58.24	Other	10.12	IR
6	Ajabnagar	Local nalla	Earthen	1989		1500	16.65	2.14	1.971		0.1018	N.A.
7	Ajan	Ajan	Earthen	1989	83	518.3	39.02	26.68	24.71	Chute	0.344	IR
8	Akhajhiri	Akhajhiri	Earthen	1973	77.7	2055	15.4	11.71	9.87		0.431	IR
9	Akhetpur	Local nala	Earthen	1983	1.5	358	16.05		1.1		0.0315	IR
10	Alnia	Alnia hukud	Earthen/Gravity/Masonry	1960	210.43	1753	14.63	45.71	44.974	Ogee	1.28	IR
11	Amadi		Earthen	1927	14.8	1280	14.8	6.04	5.621			IR
12	Amahi	Local nala	Earthen	1917	53.406	2700	14.63	11.27	10.66		0.3	IR,WS
13	Amanat	Amanat	Earthen			869	41	107.19	81.45			IR
14	Ambabarod	Local nala	Earthen	1980	5.18	289.156	17.84	1.017	0.911		0.0277	IR
15	Amhar	Local nala	Earthen	1985		1271	13.14	9.067	8.124		0.0985	IR
16	Amjhar	Local nala	Earthen	1988	10.89	768	13.94	1.84	1.579		0.0345	IR
17	Amjhari (Ncfl)	Local nala	Earthen	1975	4.38	356	16.56	1.345	1.246		0.217	N.A.
18	Amkoi	Murgura nala	Earthen	1982	19	1680	14.3	6.29	5.615		0.0147	IR
19	Amlabardia	Local nala	Earthen	1982	2.1	175.5	16.6	0.441	0.3894		0.01417	IR
20	Amrabad	Local nala	Earthen	1978	6.21	894	16.46	2.65	2.48		0.1466	IR
21	Amrity		Earthen	1965		166.16	16.65	5.132	5.058			IR
22	Amua	Local nala	Earthen	1975	7.5	811	10.36	1.121	1.001		0.0349	IR
23	Anjanwa	Anjanwa	Earthen	1981	36.25	1341.46	16.25	6.17	5.53	Chute		IR
24	Anoo	Local nala	Earthen	1968	2.05	667.5	14.3	0.82	0.753			IR
25	Anraj	Arraj	Earthen		98.42	731.52	27.74	30.426	26.9083	Ogee	0.40485	IR
26	Antalwasa	Local nala	Earthen	1908	39.08	1560	11.89	5.83	4.943		0.216	IR

27	Anwasa	Local nallah	Earthen	1981		860	13.84	2.82	2.723		7.8118	IR
28	Aoda (Awda)	Seep	Earthen	1934	236	1158	16.7	55.7	40.05		0.8185	IR
29	Arjun	Arjun river	Earthen	1957	285	5200	25.88	68.35	62.97		1.8	IR
30	Arnia Bahadarpur	Gandhi	Earthen	1980	83	1859	18.9	25.23	22.35		8.146	IR
31	Arwar	Khari	Earthen/Gravity/Masonry	1957	1150	5250	18.28	47.91	47.77	Ogee	1.88	IR
32	Asawati	Local nala	Earthen	1988	6.45	412.5	15.785	1.035	0.87958		0.03429	IR
33	Ashok Nagar (Tulsi Sarovar)	Local nala	Earthen	1976		911.35	11.8	1.593	1.206		0.1181	IR
34	Atari	Local nala	Earthen	1975	6.99	720	19.15	0.226	0.188		0.0929	IR
35	Atawara	Banas	Earthen	1961	81.66	2671	10.36	5.235	5.09	Other	0.142	IR
36	Aunjhar	Aunjhar	Gravity / Masonry	1930		1056	17.6	6.116	5.947			IR
37	Babhani Khand	Banki	Earthen		8.81	822.96	13.1	2.3143	2.1564			IR
38	Bachara		Earthen	1980		660	15	7.39	7.39		0.144	IR
39	Badauli	Local nalla	Earthen	1991		600	18.64	2.25	2.139		0.0688	IR
40	Badgaon	Berach	Earthen	1973	1698.3	5202	18.75	31.5	30.02	Ogee	0.979	IR
41	Badua	Badua	Earthen	1965	480	457.32	56.66	128.34	109.83	Other	1.1335	IR
42	Bagadih	Local nala	Earthen		6.37	330	15.55	2.005	1.766		0.0112	IR
43	Bagan		Earthen	1983	1.89	570	22.29	0.917	0.892		0.028	IR
44	Bagharru	Bagharru	Earthen		60	2255	15	12.516	10.353	Other	0.4168	IR
45	Baghel Khand	Jamunahwa	Earthen	1957		3200	15.46	2.72	2.49		0.161	IR
46	Bagla	Local nala	Earthen	2001	20.72	990	13.88	3.5	2.95			IR
47	Bagolia	Berach	Earthen	1956	232.2	3079	12.7	19.43	18.86	Other	0.35	IR
48	Bah	Bah	Earthen		560	1590	25.87	86.4	76.52	Other	1.956	IR
49	Bahniakhedi	Local nala	Earthen	1983	4.4	1050	14	1.226	1.112		0.0371	IR
50	Baigul	Baigul and Sukhi	Earthen	1968	300	15300	13.7	85	68.15		2.693	IR
51	Bairar	Local nala	Earthen	1996	32.68	1950	11.33	6.45	5.7			IR
52	Baisly	Local nala	Earthen	1919	1140	2134	12.19	21.678	15.056		1.07	IR
53	Bajrang Garh	Sivani	Earthen			1590	12.3	2.01	1.85		2.253	IR
54	Baliya	Local nala	Earthen	1986	8.41	640	14.02	2.554	2.33			IR
55	Balui	Local	Earthen			2900	14.1	6.034	5.784			IR
56	Balwantpura	Local nala	Earthen	1968	7.8	681	12.05	1.732				IR
57	Bamera	Local nala	Earthen	1984	9.35	225	23.7	2.83	2.749		0.0559	IR
58	Ban Sagar	Sone	Earthen/Gravity/Masonry	2006	19000	1019.9	67.5	6370	5166		56.428	HE, WS,IR
59	Banakiya	Local nallah	Earthen	1962		2555	12.92	9.44	9.27		0.55	IR

60	Banchor		Earthen	1964	14.76	310	19.65	7.644	7.219		0.1635	IR
61	Bandia	Negri	Earthen	1994	36.24	1285	25.55	14.76	13.43		0.3104	IR
62	Banjari Kalan	Local	Earthen			1470	14.1	1.105	0.978			IR
63	Banki	Banki	Earthen	1984		1134	43.6	18.4	17.055			IR
64	Bankipur	Local nala	Earthen	1988		855	12.1	0.202	0.185		0.0637	IR
65	Bankuiya	Local nala	Earthen	1971	4.06	1320	10.45	1.358	1.288		0.082	IR
66	Bansichikhli	Local nala	Earthen	1990	3.92	579	16.07	2.56	2.36		0.0601	IR
67	Banskheda	Local nala	Earthen	2002		915	19.75	3.484	3.071		0.09668	IR
68	Baradapura	Banas	Earthen			1950	9.13	1910	1900		0.0082	IR
69	Barana Bamori	Local nala	Earthen	1968	10.71	780	11.9	1.072	0.686			IR
70	Baranadi		Earthen	1967	16.83	220.98	19.51	5.65	4.54		0.121	IR
71	Barbaspur		Earthen	1990	11.52	450	11.72	3.11	2.685		0.0281	IR
72	Barchar	Barchar	Earthen	1986	51.89	546	28.4	17.18	16.56		0.357	IR
73	Baretha Bund	Yamuna	Earthen			1200	16.31	52.66	49.53		1.356	IR
74	Barhi	Mahuaghat	Earthen	1981	11.91	1057.66	12.8	3.42	3.21	Chute	0.1028	IR
75	Bari Mansarowar	Local nalla	Earthen	2000		363.25	14.75	9.48	8.42		0.374	IR
76	Barkachha	Local	Earthen	1975		570	19	1.742				IR
77	Barkhedi	Local nala	Earthen	1976	4.14	792.68	18.18	1.25	1.158		0.0347	IR
78	Barkhedi Siloki	Local nala	Earthen	1983	15.4	1410	21.65	3.742	3.372		0.1102	IR
79	Barkheri	Local nalla	Earthen	1985		889	25.44	1.6	1.47		0.0521	IR
80	Barnai	Barnai	Earthen		290.4	2010	24.72	14.76	13.72	Ogee	0.247	IR
81	Barnar		Gravity / Masonry		2615.9	282.7	76.75	80.21	70.77		0.375	IR
82	Barodia		Earthen	1961	37	2506	12.19	6.223	5.827		0.0238	IR
83	Barota	Local nalla	Earthen	1986		555	14.15	0.502	0.471		0.0485	IR
84	Barrach	Local nala	Earthen	1961	15.84	497	12.08	1.588	1.581		0.044	IR
85	Barwa		Earthen	1967	10	2815	21.03	24.9	17.63	Ogee	0.6475	IR
86	Barwar	Bora nala	Earthen	1923		2233	20.4	33.78	31.65		10.064	IR
87	Barwatola		Earthen	1957		1050	16.77	2.058	1.27		7.7	IR
88	Basaura	Local nala	Earthen	1986	3.36	516	12.8	0.866	0.818		0.0226	IR
89	Baskund	Baskund	Earthen	1984	16.9	67.07	17.68	1.234	0.928	Chute	0.06	IR
90	Basni	Local nala	Earthen	1979	1.93	676	15	0.857	0.793		0.103	IR
91	Bassi		Earthen	1987	453.2	1044	36	23.2	20.24	Other	0.28	IR
92	Basundni	Khari	Earthen	1981		6615	15.59	8.92	8.35		1.142	IR
93	Batane	Batane	Earthen	1990	220.15	2011.68	24.08	64.197	56.29		1.336	IR
94	Batra	Local nalla	Earthen	2002		1500	15.91	7.24	6.88		0.17	IR
95	Batre	Batare	Earthen	1954	10.36	748.48	19.33	3.16	2.9747			IR

96	Baur		Earthen	1967	310	9500	17.98	103.4	98.34	Ogee	1.6258	IR
97	Belhara		Earthen	1981		1188	12.53	3.5	3.32	Ogee	0.0915	IR
98	Belharna	Belharna	Earthen	1987	41	411.58	30.1	15.555	14.57		0.268	IR
99	Beniganj	Beni	Earthen	1974	77	3000	22.3	27.58	26.22		0.762	IR,WS
100	Benthali/ Bethli	Bethali	Earthen/Gravity/Masonry	1965	143.35	3000	22.66	31.61	29	Ogee	0.09	IR
101	Bhagwan Pur		Earthen	1965		4400	11.28	9.77	8.836		40.1044	N.A.
102	Bhaijiya	Local nala	Earthen	1987	2.34	630	11.9	0.626	0.568	Ogee		IR
103	Bhainsakhedi	Chhotikali	Earthen	1979	69.4	1275	17.72	7.56	5.11		0.251	IR
104	Bhainsora	Marhwa nala	Earthen	1926	57	1850.61	11.26	19.83				IR
105	Bhairwa	Bhera	Earthen		129.6	2469.5	29.57	27.17	21	Ogee	0.42	IR
106	Bhaisatori		Earthen	2002	43.08	1350	18.46	8.86	8.25		0.281	IR
107	Bhaisawar	Khatiari	Earthen	1978		2165	16.92	9.98	9.388		0.198	IR
108	Bharoli	Local nala	Earthen	1916	125	1676	12.19	2.07	1.816		0.0932	IR
109	Bharra	Local nala	Earthen	1984	2.23	210	10.2	6.21	5.27		0.052	IR
110	Bhawanikheda	Local nala	Earthen	1991	6.2	330	11.37	2.45	2.282		0.0955	IR
111	Bhawanipur	Local nala	Earthen	1981	10.38	1116	12.93	0.25	0.21			IR
112	Bhensrod		Earthen		16.18	1860	10.06	2.55	2.311		0.1705	IR
113	Bhimlat	Bhimlat	Earthen/Gravity/Masonry	1958	101	624	13.42	10.82	10.7	Ogee	0.2507	IR
114	Bhimsagar		Earthen/Gravity/Masonry	1997	340	161.58	31.4	76.6	72.53	Ogee	1.96	IR,WS
115	Bhimtal		Gravity / Masonry	1883	17.12	137	16.16	4.61	3.54	Chute	0.06325	IR
116	Bhirata	Local nala	Earthen	1986	3.2	950	10.56	0.881	0.813		0.0477	IR
117	Bhitrigarh	Niwar	Earthen	1965	13.55	259	19.4	5.25	5.022		0.109	IR
118	Bhonhari	Local nala	Earthen	1969	18.38	767	16.46	0.886	0.781			IR
119	Bhonka	Bhonka	Earthen	1951		2012	15.3	8.5	2.3			IR
120	Bhopal Sagar	Berach	Earthen	1936	214.9	2073	28	18.57	18.42	Other	0.819	IR
121	Bhopali	Local nala	Earthen	1968		900	12.19	1.1359	1.122			IR
122	Bhulsi	Local nala	Earthen	1986		720	18.1	0.865	0.86			IR
123	Bhursatoli	Local nala	Earthen	1986		600	11.15	0.4311	0.4061		0.0129	IR
124	Bila	Bilasi	Earthen/Gravity/Masonry	1973	148.66	1432.56	30.02	55.7	51.9		1.074	IR
125	Bilas	Bilas	Earthen	1996		4650	19.7	28.88	26.7		0.65	IR
126	Bilasi	Bilasi	Earthen	2001	56	169.8	19.98	23.41	19.34	Chute	0.58276	IR
127	Birpur	Local nala	Earthen	1908	60.63	2255	13.49	5.469	5.462		0.1792	IR
128	Birsinghpur	Johilla	Earthen/Gravity/Masonry	1988	1634.8	47.5	42	171	90		18.5	HE,WS
129	Bisalpur	Banas	Earthen/Gravity/Masonry	1999	27726	574	39.5	1095.8	1040.95	Ogee	21.836	IR,WS
130	Bisanda	Bisandha	Earthen	1992	15.51	141	23.5	6.539	5.983		0.102	IR
131	Bisonia	Local nala	Earthen	1975	7.51	549	12.19	2.094	1.921			IR

132	Bohita	Kantoor	Earthen	1987	3.7	390	16.92	17.96	17.46		0.039	IR
133	Borda	Local nallah	Earthen	1979		1580	11.7	5.04	4.16		0.301	IR
134	Bori	Local nala	Earthen	1992	3.88	703	15.63	1.147	1.054		0.038	IR
135	Boudha	Agrawa/ konar	Earthen	1978	5.178	609.26	15.85	1.66	1.568	Other		IR
136	Buchara		Earthen	1889		1297	19	16.64	15.09		1.22	IR
137	Budhna	Budhna	Earthen	1995	56.96	1980	23.63	15.11	13.84	Ogee	0.255	IR,WS
138	Budwa	Local nala	Earthen	1972		558	30.45	9.22	8.61		0.203	IR
139	Buksa	Baksa	Earthen	1982	31.23	2667.67	18.78	12.19	11.03	Chute	0.273	IR
140	Bundika Gothra	Mej river	Earthen	1957		2613.94	20.14	18.97	18.92		0.224	IR
141	Burdha	Telera	Earthen	1904	334.13	450	6.41	28.97	28.83	Other	1.025	IR
142	Burha	Local nala	Earthen	1969	47.9	1410	15.84	10.85	10.377	Ogee	0.4391	IR
143	Burhai	Pathro	Earthen			5760	29.23		174.46			IR
144	Burlai	Local nala	Earthen	1974	11.48	821.6	20.72	2.86	2.426		0.0673	IR
145	Butanduba		Earthen	1985	12.95	365.85	22.56	4.39	4.1	Ogee		IR
146	Chacha Kheri	Sivani	Earthen	2006		1030	12.44	1.66	1.48		0.0648	IR
147	Chainpur	Local nala	Earthen		6.34	1262	10.84	2.484	2.321		0.0878	IR
148	Chamat	Local nala	Earthen	1986		630	18.63	0.028	0.027		0.0182	IR
149	Chambleshwar	Local nala	Earthen	2002	102.7	2820	16.01	2.03	1.31		0.4085	IR
150	Chandan	Chandan	Earthen	1968	5490	1555	40.4	157.23	135.74	Chute	1.081	IR
151	Chandania	Local nala	Earthen	1964	2.56	72	16.8	1.228	1.11		0.04572	IR
152	Chandapatha	Local nala	Gravity / Masonry	1918	72.52	2145	13.81	7.78	7.775		0.213	IR,WS
153	Chanderi	Local nala	Earthen	1986	15.54	1954.5	17.14	7.179	5.415		0.1904	IR
154	Chandra Nagar	Local nala	Earthen	2005		285	20.909	3.414	2.785		0.0593	IR
155	Chandra Prabha	Chandrapraba	Earthen	1966	260	1600	22.25	113.26	93.445	Ogee	5.3364	IR
156	Chandrabhaga	Chandrabhaga	Earthen	1958	388	488	10.52	9.96		Ogee	0.576	IR
157	Chandrana	Banganga	Earthen	1871		3764	18.3	5.49	4.93		0.438	IR
158	Chandrawal	Chandrawal	Earthen	1973	235.7	5765	10	34.731	30.665	Ogee	11.92	IR
159	Chandsen Bheru		Earthen						14.7			IR
160	Chanti	Local nala	Earthen	1985		208	16.6	0.41	0.39			IR
161	Chaparwara	Banas	Earthen	1894		4328	13.41	35.04	34.18		8.073	IR
162	Chapper	Local nala	Earthen	1980	6.8	743.9	14.1	3.794	3.544		0.116	IR
163	Charkhari		Earthen	1982	4.86	465	20.34	1.4	1.279		0.048	IR
164	Chatania Ghat	Kuljhiri nala	Earthen	1980	6.35	365.76	19.81	1.445	1.33	Ogee		IR
165	Chauli	Chauli	Earthen	2006	220	2075	21.25	47.15	41.87	Ogee	1.355	IR,WS
166	Chhapani	Local nala	Earthen	1980	3.1	645	18.78	0.495	0.42		0.014	IR
167	Chhapari		Earthen	1967	2.02	1219	12.97	1.4	1.273			IR

168	Chhapi	Chhapi	Gravity / Masonry	2005	800	312	34.4	82.57	73.57	Other	1.085	IR,WS
169	Chhapi	Chhapi	Earthen	1972		1829	17.08	15.74	13.54		0.4825	IR
170	Chhewla		Earthen	1985	2.59	465	18	1.267	1.207		0.0277	IR
171	Chhota Palgi	Local nala	Earthen	2000		435	17	0.297	0.278		0.0064	IR
172	Chhotakidhar	Local nala	Earthen			1020	14.17	1.07	0.695		0.0675	IR
173	Chhoti Deori	Bearma	Earthen	1919	3.07	445	12.05	0.84	0.77			IR
174	Chhuhiya	Local nala	Earthen	1963	5.11	645	12.1	0.568	0.546			IR
175	Chikalwar		Earthen					11.32	10.96			IR
176	Chillar (MP)	Chillar	Earthen	1972	98.42	2866	30.48	34.79	31.11	Ogee		IR
177	Chiniya	Local nala	Earthen	1987		325	15.2	0.47	0.44		0.0141	IR
178	Chinnod	Local nala	Earthen	1991	14.33	465	15.51	2.013	1.668		0.092	IR
179	Chiraha	Local nala	Earthen	1976		533	15.46	1.245	1.145		0.0379	IR
180	Chiraipani	Local nala	Earthen	1913	11.52	1575	11.95	2.7	2.517		0.046	IR
181	Chirka	Dhengura	Earthen	1985	27.44	1046.07	22.13	7.79	7.17			IR
182	Chithara	Local nala	Earthen	1981	2.29	720	13.02	1.462	1.37		0.0417	IR
183	Chitron	Local nala	Earthen	1979	1.36	480	16.6	1.11	0.932	Ogee	0.03065	IR
184	Chittaurgarh		Earthen	1985	159	11000	15.3	42.5	38.794	Ogee	0.65587	IR
185	Chittoli	Sabi	Earthen	1950		533	19.5	24.53	24.37		0.445	IR
186	Chourasiya		Earthen	1968		1097.22	12.47	1.7558	1.6176		0.0645	IR
187	Chunabhatti	Chunabhatti	Earthen		8.29	716.28	10.67	2.29	2.07	Other		IR
188	Dahod		Earthen	1958	52	780	13.73	19.364	17.665		0.604	IR
189	Dalka Banda	Local nala	Earthen	1982	4.1	268	17.25	1.32	1.235		0.26	IR
190	Danro	Danro	Earthen	1985	47.9	1371.6	22.37	17.22	14.8118			IR
191	Darki	Local nala	Earthen	1986		562.5	13.39	1.7303	1.6113		0.0332	IR
192	Daroli	Kenkra nalla	Earthen	1962	38	1341	22.08	4.86	4.6		0.1433	IR
193	Datia	Local nala	Earthen	1977	7.28	75	19.45	2.7	2.44		0.112	IR
194	Dedla	Local nala	Earthen	1986		630	16.83	1.557	1.481			IR
195	Deep Sagar	Local nala	Earthen		5.53	400	12.02	1.56	0.41			IR
196	Deopur	Local nala	Earthen	1981	2.7	603	15.31	0.92	0.817		0.0281	IR
197	Deopura	Nahari	Earthen	1981		1127	23	8.18	7.6		0.18	IR
198	Deori	Local	Earthen	1978		930	21	2.227	2.011			IR
199	Deori	Local nala	Earthen		12.95	360	18.25	4.76	4		0.122	IR
200	Deori	Local nala	Earthen	1982	5.18	556	14.97	1.109	0.986		0.0355	IR
201	Deorikheda	Local nala	Earthen	2001	4.35	845	13.21	1.33	1.225		0.0415	IR
202	Depalpur	Banaria nalla	Earthen	1931	103.56	3240	10.05	22.46	13.39		0.834	IR
203	Deri	Local nala	Earthen		8.93	750	10.07	2.37	1.47			IR

204	Devendra Sagar	Sukta nalla	Earthen	1975	37	3513	18	12.85	12.08		0.246	IR
205	Devikheda	Local nala	Earthen	1982	34.95	701	21.33	6.45	5.55		0.1874	IR
206	Devliya/ Deoriya	Local nalla	Earthen	1982		250	16.1	2.38	2.38		0.24	IR
207	Dhab	Local nala	Earthen	1978		504	12.8	0.155	0.121		0.0154	IR
208	Dhabla Dewan	Local nala	Earthen	1982	14.75	1249.68	16.23	2.66	2.3		0.0891	IR
209	Dhamdhusar	Charua	Earthen	1958	8.29	1100	10.05	2.577	2.435		0.1108	IR
210	Dhamni No. I	Local nala	Earthen	1986		570	11.98	0.459	0.363		0.0152	IR
211	Dhamnod (MP)	Local nala	Earthen	1981	7.76	540	12.21	1.52	1.341		0.049	IR
212	Dhankai	Dhankai nala	Earthen	1979	3.37	810.77	10.55	0.8554	0.79			IR
213	Dhanmarahi	Local nala	Earthen		8	772	16	6.089	5.515			IR
214	Dhapora	Local nala	Earthen	1913	31.08	1687.5	12.5	6.234	6.154		0.203	N.A.
215	Dharam Sagar	Local nala	Earthen	1972	33.6	300	13.71	12.09	11.89			IR
216	Dhauliganga	Dhauli ganga	Rockfill		1400		56	6.2	1.54			HE
217	Dheel	Morel	Earthen	1911		1670	27.62	25.23	25.23		1.62	IR
218	Dhenkwan		Earthen	1985	1.4	1700	20.85	9.9	8.57	Other	0.135	IR
219	Dhora	Kiccha	Earthen	1960	140	9610	14.63	47.544	44.25	Other	1.541	IR
220	Diggalpahari	Ashabani	Earthen	1975	10.63	426.72	10.37	0.888	0.592			IR
221	Dindoli	Banas	Earthen									IR
222	Dinora	Local nala	Earthen	1907	51.2	3109	12.19	2.05	0.13144			IR
223	Domti Kokra	Moral/ gandi	Earthen	1989		3840	27	76.4	65.7		2.057	IR
224	Dongia	Garai	Earthen	1918	74	2012	15.3		28.32	Other	0.708	IR
225	Dongri	Pahuj	Earthen	1986		2760	15.3	9.92	8.32		1.92	IR
226	Doraha	Utawali	Earthen	1983	49.21	875	25	18.06	15.58	Other	0.4959	IR
227	Dorai	Brahmani	Earthen	1995		1050	14.83	8.5	8.26		0.195	IR
228	Doura	Local nala	Earthen	1987		630	25.09	0.74	0.696		0.0227	IR
229	Dudhi	Dudhi	Earthen		119.14	3570	12.5	26.66	20.81	Other	0.57	IR
230	Dudiyankhera	Local nala	Earthen	1980		801	21.09	2.6	2.45			IR
231	Dugari		Earthen					1.81	1.78			IR
232	Dulaki	Lilajan	Earthen	1971	0.0685	1067	16.76	1.974	1.8266			IR
233	Dumduma	Local nala	Earthen	1967	5.18	990	24.49	4.16	1.919			IR
234	Dunguna	Local nala	Earthen	1984	22.01	206	14.08	2.35	1.83		0.03	IR
235	Durgawati	Durgawati	Earthen		6260	1615.4	46.3	287.7	257.5	Chute	2.3413	IR
236	Fateh Sagar	Berach	Earthen/Gravity/Masonry	1889	20.64	793	21	12.085	6.99	Other	0.242	IR
237	Fatehpur	Local nala	Earthen	1975	3.367	640	17.1	0.808	0.736		0.0257	IR
238	Fatehpur	Local nala	Earthen	1984		3810	14.6	1.224	1.032			IR
239	Gadola	Local nala	Earthen	1964		1650	10.97	5.07	4.98		0.215	IR

240	Gagnai	Local nala	Earthen	1972		330	14.65	2.81	2.543		0.0353	IR
241	Gagrin	Ahu	Earthen		580	2535	25.48	84.91	79.4	Ogee	1.35	IR
242	Gaighat	Baghara										N.A.
243	Galai Sagar		Earthen									IR
244	Galwa	Galwa	Earthen	1960		5442	16.35	48.74	47.26		1.759	IR
245	Galwania		Earthen						11.34			IR
246	Gambhir (PHE)	Gambhir	Earthen/Gravity/Masonry	1991	1152	1230	32	637.2	6.372		0.99	WS
247	Gambhiri	Gambhiri	Earthen	1958	1036	3840	21	64.57	58.96		2.057	IR
248	Gandhi Sagar	Chambal	Gravity / Masonry	1960	23025	514	62.17	73.22	67.97		6	HE,IR
249	Ganeshpura	Local nala	Earthen	2003	14.68	536	16.4	2.148	1.787		0.0719	IR
250	Gangpur		Earthen	2007		1110	16.4	0.198	0.162		0.0566	IR
251	Gararda	Gararda	Earthen	2010	337.75		31.76	44.38	41.94	Ogee	0.431	IR
252	Garethia		Earthen	1991	51.52	2438.42	14.9	14.822	12.68		0.534	IR
253	Garhi	Damodar	Earthen		490	1830	22.33	112.07	87.44		2.25	IR
254	Garhwa	Garhwa	Earthen	1975		980	13	2.255	1.841			IR
255	Geolari	Local nala	Earthen	1966	5.5	579	19.44	1.529	1.435		0.0632	IR
256	Ghaghra	Ghaghra	Earthen/Gravity/Masonry	1957	31.59	94.51	19.82	9.13	6.661			IR
257	Ghatera		Earthen	1956	15.54	1560	14.6	3.58	3.481		0.1041	IR
258	Ghoghatpur	Local nala	Earthen	2003	8.58	435	20.3	3.881	3.358		0.073	IR
259	Ghooga	Local	Earthen			520	16	3.596	1.1			IR
260	Ghoora	Local nala	Earthen		9.32	854	10.97	3.499	3.123			IR
261	Ghoora	Local nala	Earthen	2000		840	11	3.294				N.A.
262	Ghorapachhar	Ghorapachar	Earthen	1986	34.6	1841	23.42	12.41	11.57		0.2059	IR
263	Ghori		Earthen	1915		1584	13.87	13.79			31.4196	IR
264	Ghunghutta	Ghunghutta	Earthen			242	31.5			Ogee		IR
265	Girgity		Earthen	1966		4800	15.18	9.25			25.738	IR
266	Godaghat		Earthen	1980	2.49	450	16.78	0.71	0.66		0.024	IR
267	Godaghat	Local nala	Earthen	1930	13.44	1740	18.4	4.63	4.3		0.1619	IR
268	Gointha	Local	Earthen	1992		500	13.55	0.885				IR
269	Gonda	Gonda	Earthen	1954	5.26	1006.09	13.41	1.98	1.71	Other		IR
270	Gonda	Local nala	Earthen	1979	1.58	823	11	0.48	0.387		0.162	IR
271	Gopalpura (MP)	Local nala	Earthen	1954	24.58	792.48	18.9	5.657	5.269		0.2007	IR
272	Gopalpura	Chambal	Earthen/Gravity/Masonry	1980		1880	17.43	32.6	31.9		0.629	IR
273	Gosunda	Banas	Earthen/Gravity/Masonry		4600	639.5	23	75.47	67.05		2.339	IR
274	Govind Sagar	Shahzad river	Earthen	1953		3606	18.29	96.8	50.11		24.788	IR
275	Govindgarh	Bihar nadi	Earthen	1970	15.5	5230	21.34	11.96	9.41		0.3073	IR

276	Govindpura	Local nala	Earthen	1992	2.95	526	16.43	0.797	0.76		0.02431	IR
277	Govta	Manali	Earthen/Gravity/Masonry	1955	259	335	18	10.47	6.85	Other	2.415	IR
278	Gudha		Earthen	1958	744.96	2760	25	95.65	93.7	Ogee	1.859	IR
279	Gulandi	Gulandi	Earthen				17.14	21	17			IR
280	Gularia	Gularia stream	Earthen	1966		3200	11	0.33	0.329		0.305	IR
281	Gunta	Gunta nala	Earthen	2003	168.5	5200	29.5	24.77	24.5	Ogee	1.10693	IR
282	Guradia Roopchand	Local nala	Earthen	1984	5.18	1050	10.97	1.725	1.608		0.0631	IR
283	Guradia Surdas	Kali sindh	Earthen	1997	10.1	425	16.58	3.18	2.911			IR
284	Guradiat	Local nala	Earthen	1997	3.16	267	13.98	1.031	0.811		0.024	IR
285	Gurma	Gurma nalla	Earthen	1974	139	3762	33.5	39.16	36.05		0.955	IR
286	Gurtara	Local nala	Earthen	1988	2.07	633	15.6	0.65	0.6		0.02294	IR
287	Gwal Sagar	Local nala	Earthen	1968	29.1	137	20.73	10.248	6.688		0.2816	IR
288	Gyaraspura	Local nala	Earthen	1979	7.35	1127.76	12.8	3.164	3.114		0.07878	IR
289	Hamja Kheri	Sivani	Earthen	2002		1120	25.93	5.48	4.63		0.134	IR
290	Hanumata	Hanumata	Earthen	2007	561.8	984.62	19	7030	5021			IR
291	Harduamudar	Local nala	Earthen	1917	6.35	585	12.75	1.59	1.457	Ogee	0.0498	IR
292	Haripura		Earthen	1975	294.4	7980	10.98	28.32	27.61	Ogee	1.1613	IR
293	Harish Chandra Sagar		Earthen						72			IR
294	Harithone	Local nala	Earthen	1981	6.87	732	12.19	10	9.929	Ogee	0.046	IR
295	Harratola	Butti/shadol	Earthen	1984	7.77	405	21.03	14.22	12.22	Ogee	0.03723	IR
296	Harridih	Local nala	Earthen	1962	1.3	630	14.36	0.304	0.272	Ogee	0.1206	IR
297	Harsi	Parwati	Earthen	1917	1880	2134	29.26	238.09	224.45	Ogee	2.523	IR
298	Harsora/ Harsora Bund		Earthen						7.81			IR
299	Hathaikheda	Ajnar	Earthen	1960	36.9	1581	17.1	16.277	15.216	Ogee	0.00233	IR,WS
300	Hatupur	Local nala	Earthen	1975	5.5	705	12.8	1.24	1.073	Ogee		IR
301	Hedapura	Local nala	Earthen	1979	5.47	953	13.8	2.134	2.06	Ogee	0.0862	IR
302	Himmatgarh	Local nalla										IR
303	Hinauti	Col nala	Earthen	1964		995	10.67	6.147	4.38		0.4921	IR
304	Hindlot	Local nallah	Earthen				19.7	22.6	20.38			IR
305	Hingonia	Banas/ bandi	Earthen	1862		1950	19.2	7.5	7.5			IR
306	Hirapur	Dehar nadi	Earthen	1984	4.2	762.19	15.68	1.588	1.488	Ogee	0.0742	IR
307	Hirawar	Local nala	Earthen	1978	3.44	575	13.14	1.06	0.9941	Ogee	0.0376	IR
308	Hiru	Hiroo	Earthen	1982	25.89	970.788	18.3	6.232	5.345	Chute		IR

309	Ichari	Tons	Gravity / Masonry	1972	4900	155	59.25	6.09	5.11	Other	0.07983	HE
310	Ichhawar	Ajnal	Earthen	1981	5.7	1890	14.47	2.09	1.84	Ogee	0.065	IR
311	Imalia	Local nala	Earthen	1979	3.77	899	10.28	0.616	0.518	Ogee	0.0244	IR
312	Imlikheda	Local nala	Earthen	2000	4.92	1020	11.7	1.519	1.394	Ogee	0.0546	IR
313	Jabera	Jamunha nalla	Earthen	1959	16.36	1587	20.03	4.05	3.39		0.1821	IR
314	Jagannathpur	Local nala	Earthen	1976		840	16.05	4.116	3.881		0.069	IR
315	Jaguwa	Bhadar	Earthen	1921	53.41	1368	13.26	4.81	4.507		0.147	IR
316	Jaisamand	Banganga	Earthen/Gravity/Masonry	1910		1671	10.6	26.95	24.91		10	IR
317	Jaiwanti		Earthen	1928		3352	15	9.43	9.146		8.1	IR
318	Jajone	Local nala	Earthen	1968	17.35	480	18.6	6.88	6.33			IR
319	Jalheridhana	Local nala	Earthen	1958	7.34	355	14.2	1	0.72			IR
320	Jalkund	Jalkund	Earthen	1968	9.47	631.1	15.99	3.085	2.77	Chute	0.069	IR
321	Jamakheri	Local nala	Earthen	1915	255.62	2790	12.19	4.53	4.361		0.187	IR
322	Jambar	Local nala	Earthen	1964	3.37	330	11.195	1.32	1.26		0.0708	IR
323	Jamdih	Local nala	Earthen	1972		615	10.06	0.53	0.36		0.0236	IR
324	Jamini	Jamni	Earthen	1973	410	6400	26.22	92.49	84.023	Ogee	24.7235	IR
325	Jamonia	Local nala	Earthen	1938	24.59	2160	14.12	12.496	11.327			IR
326	Jamrani	Gola	Gravity / Masonry		450	465	130.6	208.6	21	Ogee	0.45	IR
327	Jamunhai	Local nala	Earthen	1975	2.87	1185	16.02	0.897	0.82			IR
328	Jamunia	Jamunia	Earthen	1954	29.28	1067.1	17.38	3	2.582	Ogee		IR
329	Jamunia	Local nala	Earthen	1981	6.67	1740	14.06	4.21	3.92		0.162	IR
330	Jamuniya Rao	Local nala	Earthen	1972	2.72	1007.28	10.05	0.776	0.749		0.03	IR
331	Jarmora	Jarmora nalla	Earthen	1980	31.79	2130	17.54	18.75	17.34		0.5	IR
332	Jawahar Sagar	Chambal	Gravity / Masonry	1973	268800	395.19	36	67.84	52	Ogee	1.0705	HE,IR
333	Jawahargarh	Local nala	Earthen/Gravity/Masonry	1899	106	1052	10.67	3.823	3.433		0.2183	IR
334	Jawari		Earthen	1968	2.88	450	12	1.16	1.059		0.0357	IR
335	Jetpura	Unli	Earthen	1978	129.5	585	21.8	18.56	16.38		0.43	IR
336	Jhadol	Local nalla	Earthen	1980	128.46	870	16.5	10.38	9.28	Ogee	0.47	IR
337	Jhaloni	Local nala	Earthen	1913	37.81	540	13.5	3.864	3.793		0.173	IR
338	Jhalpi	Local nala	Earthen	1975		1050	15.05	0.862	0.754		0.0106	IR
339	Jhamdhar	Local nala	Earthen	1992	5.1	235	17.37	1.522	1.399		0.043	IR
340	Jhingo	Local nala	Earthen	1984		690	12.1	1.05	0.89		0.0311	IR
341	Jhirgiri	Jhirgiri nalla	Earthen	1990		1396	14.35	4.69	3.923		0.1475	IR
342	Jilheti	Local nala	Earthen	1990	0.77	480	16.76	0.87				IR
343	Jirgo	Jirgo		1958	400	6704	29.88	150.85	132.72	Other	30.72	IR
344	Job	Job	Earthen	1977	42.24	1616	18.9	12	12	Chute	0.024	IR

345	Jogendra	Jogendra	Earthen	1970		1313	10.04	1.422				IR
346	Johila		Earthen	1978	22.55	1234.7	30.28	8.53	8		0.142	IR
347	Jojharpur	Local nala	Earthen	2000	6.48	927	11.95	2.73	2.576		0.083	IR
348	Juggar	Juggar banas	Earthen	1957		1585	21	35.02	34.35			IR
349	Junapani	Local nala	Earthen	2003	9.14	815	12.01	1.58	1.35		0.0418	IR
350	Kabrai		Earthen	1955	70	2300.2	18.24	13.22	11.944	Other	0.505	IR
351	Kacchal	Kacchal	Earthen		83	3150	18.76	19.33	16.4	Ogee	0.53738	IR
352	Kacheri Feeder	Local nala	Earthen	1972	4.14	178	10.96	1.105	0.975		0.0523	IR
353	Kachhod	Local nala	Earthen	2004		270	16.9	0.231	0.226		0.0072	IR
354	Kachnoda		Earthen	2012	358.9	4100	18.9	69	54.64	Ogee	2.09164	IR
355	Kadna	Local nala	Earthen	2004		165	21.6	1.5	1.34		0.023	IR
356	Kadodia	Local nala	Earthen	1957	5.7	840	10.06	1.105	1.065		0.0337	IR
357	Kailash Ghati	Kailash ghati	Earthen	1980	17.612	183	25.9	3.5716	3.152	Chute	0.102	IR
358	Kakarhai	Local nala	Earthen	1969	2.28	1440	12.67	0.618	0.564			IR
359	Kaketo	Parwati	Gravity / Masonry	1934	1035.6	1047	37.64	80.51	79.18		0.89069	IR
360	Kala Bhata	Khari	Earthen	1958	66.8	979	14.06	4.24	3.87	Other	0.145	IR
361	Kaladeh	Local nallah	Earthen	1964		526	15.75	1.71	1.55		0.055	IR
362	Kalakh Sagar	Local nallah	Earthen	1883			13	20	16.44			IR
363	Kalakho		Earthen						10.82			IR
364	Kaliasote	Kaliasote	Earthen	1988	381.38	1080	34.25	35.39	34.41	Ogee	0.5295	IR
365	Kalisil	Kali Sindh	Earthen	1956		2560	24.39	41.7	37.24			IR
366	Kalisindh		Earthen						54.37			IR
367	Kalrewa	Local nala	Earthen	1981	1.3	570	11.68	1.36	1.275		0.022	IR
368	Kalyanpura	Local nala	Earthen	1985	10.1	900	11.33	2.68	2.448		0.0934	IR
369	Kamera	Local nala	Earthen	1910	24.6	1584	12	3.37	3.07		0.142	IR
370	Kanari	Local nala	Earthen	1986	2.56	1005	14.41	0.6	0.428		0.032	IR
371	Kanchan	Kanchan	Earthen	1979	73.3	232	40.27	25.45	21.85		0.515	IR
372	KangsabatiKumari	Kasai		1965	3600	10400	41	1053.5	917		12.288	IR
373	Kanhaiya	Local nala	Earthen	1969	2.14	1200	15.52	1.037	0.975			IR
374	Kankerkheda	Utawali	Earthen	1988	22.58	2040	12.8	4.259	4.015		0.1602	IR
375	Kanota	Dhoond	Earthen	2001	4020	2201	18.75	14.15	12.42		0.41	IR
376	Kanyakheri	Local nalla	Earthen	1987		3656	10.5	4.3	3.81		0.232	IR
377	Karanpather	Local nala	Earthen	1987	1.85	450	19.42	0.41	0.36		0.01045	IR
378	Karawani	Dararika	Earthen	1967	7.77	295.66	18.59	3.55	3.26	Other	0.05504	IR
379	Kargara	Local	Earthen	1978		1410	16.84	1.515	1.195			IR
380	Karhi	Local nala	Earthen	1977	13.83	540	17.38	4.76	4.528		0.0736	IR

381	Karmodia	Barna	Earthen	1975	8.91	286.51	16.06	5.288	4.558		0.077	IR,PS
382	Karoli	Local nala	Earthen	1985	9	480	14.76	1.645	1.432		0.0309	IR
383	Kartama	Local nala	Earthen	1987		650	14	1.12	1.07		0.0281	IR
384	Kasturipura	Local nala	Earthen	1968	3.18	1051.56	11.89	0.999	0.932		0.0372	IR
385	Kathotia	Local nala	Earthen	2001	1.1	600	10.6	1.115	0.926		0.0096	IR
386	Kazikhedi	Kharkhara	Earthen	1978	31.07	1419	22.78	7.547	6.862		0.6854	IR
387	Keolari		Earthen	1966		2836.58	11.73	7.67	7.23			IR
388	Keoti	Local nala	Earthen	1988		615	10.63	0.066	0.028		0.0065	IR
389	Kerwan	Kerwan	Earthen	1976	65	396.5	22.6	25.026	22.6		0.4824	IR
390	Kesho	Kesho	Earthen		126.5	2052	14.57	22.48	16.46	Chute	0.526	IR
391	Keshopur	Local nala	Earthen	1916	7.157	1432	10.82	2.41	2.369		0.01078	IR
392	Kethan	Kethan	Earthen	1975	64.75	900	25.36	19.157	17.574		0.369	IR
393	Khadda	Local nala	Earthen	2002	2	1100	26.13		0.567		0.01	IR
394	Khaikheda	Local nala	Earthen	1984	1.94	675	12.5	0.736	0.685		0.0232	IR
395	Khairman	Henga nala	Earthen	1958		3020	10.6	5.051	1.447			IR
396	Khaliba	Local nala	Earthen	1988		660	11.95	1.5	1.352		0.0535	IR
397	Khameri Bagsari	Local nala	Earthen	1983	3.88	780	17.15	1.48	1.378		0.6315	IR
398	Khandeha	Dasrath nala	Earthen	1929		1200	19.9	26.94	25.4			IR
399	Khankuria	Local nala	Earthen	1915	2.59	690	10.28	0.703	0.635		0.022	IR
400	Khanpura	Local nala	Earthen	1907	15.54	720	14.45	4.27	3.85		0.10645	IR,WS
401	Khapatia	Borera	Earthen	1916		806	16	8.08	5.047		1.26	IR
402	Kharad	Banganga	Earthen	1877		305	29.5	11.8	8.35			IR
403	Khargpur Lake	Man	Earthen	1876	160	221.04	26.53	16.511	16.28		0.384	IR
404	Khari	Khari	Earthen	1957	704	2391	17.67	38.94	33.28	Other	0.884	IR
405	Kharjir (Khajuri)	Local nala	Earthen	1974		98	12.29	15.13	14		0.0783	IR
406	Kheria Punawali	Local nala	Earthen	1978	17.78	1067	10.82	1.8			0.1	IR
407	Khirihata	Local	Earthen	1992		178	10.77	2.12	1.581			IR
408	Khitoli		Earthen	1977	13.68	686	13.88	1.6	1.538		0.0358	IR
409	Khudia	Khudia river	Earthen	1971	111.37	1227.12		23.704	21.714	Ogee		IR
410	Khunal (Khunsi)	Local nala	Earthen	1980		274	10.97	4.74	4.41			IR
411	Khurera	Local nala	Earthen	1969	11.52	330	17.01	2.666	2.398		0.1074	IR
412	Kishanpura	Local nala	Earthen	1976	14	950	13.3	2.493	2.158		0.115	IR
413	Kodia	Local nala	Earthen	1986	3.57	225	31.38	1.25	1.165		0.027	IR
414	Kohar Gaddi		Earthen	1930		2820	10.5	12.543	10.98		0.3107	IR
415	Kohira	Kohira	Earthen/Gravity/Masonry	1962	87.8	265.24	16	28.333	25.5	Ogee	0.526	IR
416	Koinari	Local nala	Earthen	1980		1110	11.28	1.62	0.94		0.058	IR

417	Koka	Local nala	Earthen	1985	8.19	222	22.9	3.19	3.058		0.0492	IR
418	Kolmahadeo	Kolmahadev	Earthen	1966	11.52	157	19.2	5.7	4.7	Chute	0.138	IR
419	Konajhir	Local nala	Earthen	1940	3.496	1200	11.07	1.035	1.005		0.114	IR
420	Konar	Konar	Earthen/Gravity/Masonry	1955	997.1	3806.65	48.77	336.76	276.36		2.315	IR
421	Koncha	Koncha	Earthen	1973	124.1	3169.93	29.87	21.65	18.81		0.638	IR
422	Koop	Local nala	Earthen	1977	8.8	1500	11.5	2.476	2.343		0.0836	IR
423	Kota	Local	Earthen	1960		549	14.63	1.983				IR
424	Kota	Local nala	Earthen	1910		914	12.34	4.493	4.106		0.18525	IR
425	Koteshwar	Bhagirathi	Gravity / Masonry		7700	300.5	97.5	88.9	35	Ogee	0.25	HE
426	Kothari Stage I	Banas	Earthen/Gravity/Masonry	1984	2176	4326	25.4	26.03	21.5	Ogee	0.76	IR
427	Kotra Khambha		Earthen	1915		806	18	3.75	3.03		3.4	IR
428	Kotwal	Asan	Earthen	1914	1036	1158	19.98	91.55	90.382		1.839	IR
429	Koyalkhedi	Local nala	Earthen	1980	20.48	960	13.1	2.675	2.36			IR
430	Kuba Khurd	Local	Earthen	1988		1675	10.33	1.201				IR
431	Kulgarhi	Durha	Earthen	1972	27.74	1437	18.59	9.4	8.761		0.175	IR
432	Kulwa	Local nala	Earthen	1967	0.89	585	10.76	0.62	0.551		0.0225	IR
433	Kumedi		Earthen	1968	15.36	549	13.71	5.653	3.255			IR
434	Kumharwara	Local nala	Earthen	1983	17.22	657	17.22	0.653	0.532		0.0372	IR
435	Kunwarpur	Local nalla	Earthen	1976		297	24.38	16.76	15.68			IR
436	Kushalpura	Dudhi	Earthen		610	2530	22.64	63.691	46.446	Other	0.69273	IR
437	Kutni Feeder	Kutni	Earthen/Gravity/Masonry		470	2175	30.36	132.84	114.54	Other		IR
438	Lachura		Earthen/Gravity/Masonry	1910		542.3	14.94	20.64				IR
439	Ladki/ Larki	Kothari	Earthen	1966		581	12.28	3.79	2.77		0.1199	IR
440	Laduna	Local nala	Earthen	1988	8.83	1410	15.85	2.963	1.812		0.1164	IR
441	Lakhnoute	Local nala	Earthen	1983	5.38	420	17.1	1.47	1.34		0.04647	IR
442	Lakhunder	Lakhunder	Earthen	2000	82.95	2385	20.42	32.15	30.65	Ogee	0.78	IR
443	Lakhwar	Yamuna	Earthen/Gravity/Masonry		2080	451	204	580	333		0.965	HE,IR
444	Lali	Local	Earthen	1970		1030	10.69	0.776				IR
445	Lanchi	Local nala	Earthen	1986		750	10	0.77	0.73		0.0234	IR
446	Lapti		Earthen	1984	2.75	960	17.13	1.508	1.442		0.0312	IR
447	Larpur	Larpur nala	Earthen	1994	29.53	93	16.1	6.13	6.1	Other	0.356	IR
448	Lassaria	Dai	Earthen	1982		4325	20.15	11.5	10.65		0.264	IR
449	Lasur	Local nala	Earthen	1979	8.8	457.32	16.55	1.2	1.02844		0.0321	IR
450	Latar		Earthen	1976	10.48	1380	15.09	3.08	2.722		0.11329	IR
451	Laxmikheda	Local nala	Earthen	1989	45.34	1230	22.29	4.08	3.56		0.154	IR
452	Left Banki	Left banki	Earthen	1980	18.12	1499.42	14.32	5.075	4.75			IR

453	Lhasi	Lhasi	Earthen				17.58	30.8	28.3			IR
454	Lilgi		Earthen	1960	11.2	960	13.7	2.209	2.01		0.046	IR
455	Lokpal Sagar	Local nala	Earthen	1909	3.03	2130	10	0.637				IR
456	Lolki	Local nala	Earthen	1985	6.14	576	10.1	1.35	1.186		0.0564	IR
457	Longerpura	Local nala	Earthen	1984	4.14	253.44	11.26	1.315	1.222		0.0387	IR
458	Longit	Local nala	Earthen	1987		450	15.85	0.7	0.54		0.0193	IR
459	Loni	Local nala	Earthen	1965	30.57	2379	11.38	4.75	3.8			IR
460	Lotia	Chondhi	Earthen	1978	37.75	762.2	19.74	5.51	4.84	Ogee		IR
461	Lower Khajuri		Earthen/Gravity/Masonry	1949		640	18	120.37				IR
462	Lower Sakarwara	Local nala	Earthen	1919	7.12	1097	11.62	3.482				IR
463	Luharia/ Loharia	Local nallah	Earthen	1984		1950	11.6	2.92	2.83		0.1547	IR
464	Luti	Local nala	Earthen	1982		690	16.76	0.441	0.371		0.0093	IR
465	Machhariya	Natyan nalla	Earthen	1982	7.12	334	18.68	3.27	2.984		0.0939	IR
466	Madan Sagar	Kulwara nalla	Earthen	1966	46.63	960	18.28	12.85	12.23			IR
467	Madarkha Bandhi	Local nala	Earthen	1964	10.25	2130	10	1.07	0.911		0.04	IR
468	Madhar		Earthen	2003	58.28	690	16.11					IR
469	Madho Sagar	Banganga	Earthen	1887		274	23.77	22.58	22.58		0.705	IR
470	Madikheda (Mohini Sagar)	Sindh	Gravity / Masonry	2008	5500	1072	61.9	901.81	834.83	Ogee	5.67991	HE,IR
471	Mahan	Mahan	Gravity / Masonry	2009	420	182.5	46	104.61	100.13	Ogee	1.68853	IR
472	Mahuar	Mahuar	Earthen		462.78	1915.5	21.98	73.5	65.03			IR
473	Mahuwa Khera		Earthen	1999	1.25	1280	11.8					N.A.
474	Majhgaon	Nagrar nalla	Earthen	1979	22.53	617.18	19.2	8.2	7.4		0.16277	IR
475	Majhgawan (MP)	Local nala	Earthen	1914	7.18	1112.8	14.88	4.05	3.85		0.1022	IR
476	Majhgawan	Gunchi nala	Earthen	1917	202	1402	19.43	26.8			0.83	IR
477	Makhani	Local nala	Earthen	1968	2.58	296	10.05	1	0.939		0.0273	IR
478	Makroda	Negri	Earthen	1980	174.1	825.39	30.5	46.593	40.983		0.847	IR
479	Mala	Sun nadi	Earthen	1929	161.3	2518	16.76	19.96	16.87			IR
480	Malavar	Local nala	Earthen	1982	2.85	762	11.58	1.081	1.006		0.029	IR
481	Malay	North koel	Earthen	1985	107.72	1684.15	28.8	32.345	28.549			IR
482	Man Sarowar	Chambal	Earthen	1957		1355	26	14.01	12.69		0.465	IR
483	Mandal	Local nalla	Earthen	1973	108	1825	26	13.87	11.88		0.621	IR
484	Maneri	Bhagirathi	Gravity / Masonry	1984	4024	127	39	0.6	0.504	Ogee		HE
485	Mangalsar		Earthen					19.02	15.97			IR
486	Manikheda		Earthen	1992		108	13.71	3.808	3.502		0.1156	IR
487	Manki	Local nala	Earthen	2002	2.589	655	13.21	0.789	0.728		0.026	IR

488	Manohar Thana		Earthen					294.3	265.5			IR
489	Mansurwari	Sukchain nalla	Earthen	1978	30.72	945	24.58	13.28	12.16		0.18	IR,WS
490	Maoroli Bund		Earthen						0.91			IR
491	Marhi	Semra nadi	Earthen	1981	38	285	29	14.243	12.723		0.0865	IR
492	Masanjor JH	Mayurakshi	Earthen	1955	1860	630	36.9	614	546.4	Ogee	0.00943	HE,IR
493	Masarra	Local nala	Earthen	1984		585	15.34	0.198	0.172		0.013	IR
494	Mashi	Bandi/ mashi	Earthen/Gravity/Masonry	1969		2103	13.44	48.14	35.11		1.574	IR
495	Mataji ka Kheda		Earthen						11.07			IR
496	Matatila		Earthen	1958	20435	6300	45.72	963.9	850.63	Ogee	12.787	HE,IR
497	Matrakundia/ Matrikundia/ Matrikundial	Banas	Earthen/Gravity/Masonry	1991	3415	9270	22.07	50.65	49.97		1.6	IR
498	Mau	Local nala	Earthen	1976	14.72	690	15.18	2.089	1.734		0.0985	IR
499	Maudaha (Swami Brahmanand)		Earthen	2003	1692	3480	32.6	200	13.9	Ogee	5.439	IR
500	Mauganj	Local nala	Earthen	1972		1463	17.72	3.819	3.4		0.1396	IR
501	Mausandha		Earthen	1917	5.18	1073	11.93	1.393	1.236		0.1	IR
502	Mehroi	Sone	Earthen	1990	16	808.25	20.79	5.206	4.706		1.42	IR
503	Meja	Belan	Earthen	1987	2000	2000	40	303.12	300.725		2.96725	IR
504	Meja	Kothari	Earthen/Gravity/Masonry	1958	1652	1270	19.2	84.06	83.51		2.65	IR
505	Modia Mahadev	Local nalla	Earthen	1980		625	16.53	3.08	2.88		0.1507	IR
506	Mohari (MP)	Local nala	Earthen	1916	16.77	1221	12.2	2.67	2.363		0.1094	IR
507	Mola		Earthen	1956	46.54	667.57	25	13.05	11.7		0.215	IR
508	Moliyakhedi	Local nala	Earthen	1980	2.33	930	12.25	0.565	0.49921		0.03	IR
509	Momanpura	Local nala	Earthen	1916	19.2	1470	11	4.23	4.1			IR
510	Moondla	Local nala	Earthen	1984	5.18	1127.76	10.97	1.727	1.589		0.065	IR
511	Moonjwar	Local nala	Earthen	1969	9.83	810	13.71	5.87	5.636		0.14039	IR
512	Moosakhand	Karmnasa	Earthen	1967	1500	2967	33.53	113.25	113.25	Other	2.16871	IR
513	Morasagar	Banas	Earthen	1978		5273	25	12.88	12.83		0.585	IR
514	Morel	Morel	Earthen	1959		805	22.5	75.65	70.65		1.567	IR
515	Morwan	Gameri	Earthen	1959	62.16	1133.85	31.08	16.46	15.76		0.321	IR
516	Morwy	Morwe	Earthen	1960	58.9	533.53	25.56	14.98	12.37	Ogee	1.62	IR
517	Moti Sagar		Earthen					12.54	12.45			IR
518	Motipura	Local nala	Earthen	1984	4.76	840	11.8	0.85	0.776		0.0269	IR
519	Motipura	Local nallah	Earthen/Gravity/Masonry	1999		940	14.65	1.17	1.11			IR
520	Mudia Kheri	Local nala	Earthen		9	716	18.1	4.736	4.408		0.0815	IR

521	Muirpur	Local	Earthen	1992		581	15.3	1.454	1.183			IR
522	Mundliya Kheri	Bhaga	Earthen	1950		1893	12.5	4.41	4.36			IR
523	Mundri	Local nala	Earthen	2000	14.75	960	12.75	3.554	2.421		0.0998	IR
524	Murliya	Local nalla	Earthen	1968	111.4	2280	24.65	9.63	8.46	Other	0.549	IR
525	Murtia	Local	Earthen	1977		1135	18.26	2.453	2.052			IR
526	Nagda (MP)	Shipra	Earthen	1977	8.38	1590	17.68	2.586	2.328		0.008	IR
527	Nagda	Nagda nalla	Earthen	1964		2866	27.24	1.845	1.698			IR
528	Nagdagajora	Local nala	Earthen	1911	47.16	210	10.98	3.58	3.191		0.358	IR
529	Nagdi	Nagdi	Earthen	1959		1165	15.08	5.75	5.09		0.1602	IR
530	Nagi	Nagi	Earthen	1958	41.44	1884	113.5	10.803		Shaft	0.425	IR
531	Nagri	Local nala	Earthen	2002	2.98	369	19.63	0.972	0.9		0.0876	IR
532	Nagwa	Karmanasa	Earthen	1950	469	2810.19	20.31	154.48	104.11			IR
533	Nahar Sagar	Local nalla	Earthen	1909	539	4685	12.11	24.67	20	Other	1.554	IR
534	Naharkheda	Local nala	Earthen	1980	7.77	1425	11.4	1.6943	1.497		0.14245	IR
535	Nainawad	Local nala	Earthen	1987		570	12.19	0.83	0.742		0.0234	IR
536	Naktara	Amra	Earthen	1980	13.85	1290	14.8	3.49	3.001		0.1071	IR
537	Nakti (Bihar)	Nakti	Earthen	1980	44.444	990.85	23.61	13.97	12.79	Chute	0.364	IR
538	Nalajhiri	Local nala	Earthen	1991	3.11	604	13.41	1.062	1.03		0.0336	IR
539	Nalkari	Nalkari	Earthen	1968		3074	36	107				IR
540	Nanak Sagar		Earthen	1962	570	19200	16.5	209.7	172.69		4.9	IR,WS
541	Nanauti	Local	Earthen	1963		1400	13.71	340.28				IR
542	Nand Samand	Banas	Earthen/Gravity/Masonry	1958	8391.6	1292	18.38	21.225	20.63	Ogee	0.443	IR
543	Nandanwara	Bargi nadi	Earthen/Gravity/Masonry	1964	231.36	250	17.68	26.795	19.608			IR
544	Nando	Local nala	Earthen	1983	2.9	878	30.72	0.8	0.73		0.0186	IR
545	Nanukhedi	Local nala	Earthen		11.39	808	22.18		1.473			IR
546	Narayan Sagar		Earthen					704	700			IR
547	Naren	Naren	Earthen	1981	61.44	3567	29.85	20.55	18.328		0.8217	IR
548	Narkola	Local nala	Earthen	1994		457	17.75	2.603	2.344		0.0465	N.A.
549	Narola	Local nala	Earthen	1916	33.28	2148	10.02	3.24	3.0872		0.1354	IR
550	Narson	Narson	Earthen	1988		2340	14.33	2.86				IR
551	Naugarh	Karmnasa	Earthen	1956	362.6	5975	18.9	99.05	87.73			IR
552	Navratan Sagar	Local nallah	Earthen	2000		1160	13.26	2.26	2.039		0.6382	IR
553	Nawadhi	Local nala	Earthen	1982		900	12.1	0.868	0.797		0.0315	IR
554	Needar	Odher	Earthen	1990		2713	12.96	8.85	7.89		0.35	IR
555	Newari	Local	Earthen			1218	15.44	1.25	0.98			IR
556	Noonpani	Local nala	Earthen	1952	4.65	670	12.15	0.75	0.7			IR

557	North Koel	North koel	Earthen		2885	343	67.86	1170	960	Ogee	7.12	HE,IR
558	Obra	Rihand	Earthen/Gravity/Masonry	1970	546.5	2000	29	211.05				HE,IR
559	Ohen	Ohan	Earthen/Gravity/Masonry	1961	140	2527	24.08	38.35	37.78	Ogee	0.648	IR
560	Orai	Orai	Earthen	1973	220.1	1365	24.38	35.287	32.82	Ogee	0.623	IR
561	Orhni	Orni	Earthen	2000	150	686	23.774	5.156	4.4591	Chute	0.9555	IR
562	Pachanpura	Erau	Earthen	1990		905	14.7	9.48	9.288		0.251	IR
563	Pachawal	Local nala	Earthen	1982		660	19	0.588	0.562		0.0097	IR
564	Pachki Baori	Began	Earthen	1957		954	19	5.6	5.6			IR
565	Pachni	Pachni	Earthen	2008		165	21.6		0.976		0.0054	IR
566	Pachwara Lake	Local	Earthen/Gravity/Masonry	1694		208	13.72	6.15	5.85			IR
567	Padar	Local nala	Earthen	1969	3.5	1509	10.7	1.285	1.2			IR
568	Padaria	Local nala	Earthen	2004	3.24	720	12.19	0.942	0.863		0.0276	IR
569	Pagara	Asan	Earthen/Gravity/Masonry	1927	520	1683	27	120.53	113.4		1.373	IR
570	Pahari	Local nalla	Earthen/Gravity/Masonry	1912		580.95	10	47.8	46			IR
571	Pahuj	Pahuj	Earthen/Gravity/Masonry	1909		2040	10.67	18.25	18.21			IR
572	Paibala Pura	Mej river	Earthen	1957		3644.52	14.63	10.2	10.07		0.41	IR
573	Palgi	Local nala	Earthen	1986		540	15.03	1.19	1.1		0.0319	IR
574	Panchana	Gambhiri	Earthen/Gravity/Masonry	1977	6216	1207.8	33.19	59.45	52.64	Ogee	1.453	IR
575	Panchat Hill	Damodar	Earthen/Gravity/Masonry	1959		6777	48	1497.5	1327.17		0.15338	HE, WS,IR
576	Panchkhero	Panchkhero	Earthen		64.76	2182	19.33	15.16	12.08		0.389	IR
577	Pandarwa	Pandarwa	Earthen	1983	14.24	193.55	21.8	3.8141	3.5302		0.107	IR
578	Parariya	Local nala	Earthen	2003			11.15	3.58				IR
579	Parbati	Parbati	Earthen/Gravity/Masonry	1963		2318	28.11	115.2	102.8		2.304	IR
580	Parichha	Betwa	Earthen/Gravity/Masonry	1886		1174.59	16.77	78.76	77.17			IR
581	Paronch	Paronch	Earthen	1980	84	243.84	22.7	18.98	15.77	Ogee	34.353	IR
582	Parshukhedi	Local nala	Earthen	1981	6.91	510	14.24	1.37	1.212		0.05056	IR
583	Pasla	Local nalla	Earthen	1978		750	10.5	2.058	0.58		0.0172	IR
584	Patan (Deosagar)	Local nalla	Earthen	1956		503.53	13.4	6.93	6.86		0.2026	IR
585	Patharai	Pathari and Sukhnai	Earthen	2002	150	3800	18	123.77	78.5	Ogee	0.594	IR
586	Pathargawan	Local nala	Earthen	1988		428	15.31	1.03	0.96		0.023	IR
587	Patiyal	Banas	Earthen	1992		765	13.9	1.708	1.529		0.03701	IR
588	Patloi	Patloi	Earthen	2012	38	952.4	14	5.55	4.21		0.182	IR
589	Pehsari	Mowar	Earthen	1984	83	2150	24.05	44.25	16.92			IR,WS
590	Phoodra	Local nala	Earthen	2002	3.36	892	11.43	1.038	0.95		0.0365	IR

591	Phulwaria	Tilaiya	Earthen	1988	181.3	1135	25.66	59.34	50.74	Chute	0.953	IR
592	Pili	Pili	Earthen	1968	163.35	1540	19	55.3	54.275		1.198	IR
593	Pillowa	Sankh	Earthen/Gravity/Masonry	1914	251.42	658	13.79	16.315	9.645		0.67125	IR
594	Pipariya Jugraj	Local nala	Earthen	1959	6.04	797	11.27	0.51	0.43		0.0283	IR
595	Piplad	Piplad	Earthen	2011	35	4277	15.77	24.14	21.5	Other	0.8031	IR,WS
596	Piplai	Local nala	Earthen	1998	4.76	418	17.04	1.92	1.8		0.0347	IR
597	Pipliyakumar	Banganga	Earthen	1978	45.34	894	25.87	11.21	10.12		0.2632	IR
598	Piploda	Local nala	Earthen	1966	30.41	580.18	21.03	4.758	4.32		0.105	IR
599	Piplyakala		Earthen	2002	26.8	975	20.38	4.824	4.174		0.12	IR
600	Pirha	Local nala	Earthen	1976		640	16.98	0.722	0.621		0.0176	IR
601	Poiadonger	Local nala	Earthen	1956	9.32	751	19.255	2.197	2.0612		0.01074	IR
602	Pondi	Local nala	Earthen	1987		823	12.6	0.49	0.471		0.0291	IR
603	Pondi	Local nala	Earthen	2001	0.97	930	12	0.74			0.0106	IR
604	Pongri	Local nala	Earthen	1981	3.07	570	15.65	0.9	0.81		0.02952	IR
605	Pradodah	Local nala	Earthen	1987		270	13.55	1.06	1.01		0.0255	IR
606	Punasi	Ajoy	Earthen		277	2133.6	21.54	149.8	113.5	Chute	2.418	IR
607	Putliwar	Local nala	Earthen	1979	6.37	129.57	13.51	5.25	4.95		0.14944	IR
608	Putta	Local nala	Earthen	1980		870	17.93	1.595	1.108		0.029	IR
609	Raipura		Earthen	1930		3509	13	12.453	6.289			IR
610	Raipura	Local nala	Earthen	1958	3.89	1415.38	10.3	1.307	1.245		0.055	IR
611	Rajgarh	Local nala	Earthen	1914	11	640	10.37	22.7	2.26		0.064	IR
612	Rajghat	Betwa	Earthen/Gravity/Masonry	2000	16128	11200	43.5	2172	1945	Ogee	1.7	HE, WS,IR
613	Rajghat Sagar		Earthen	2003	472	1680	25.5	96	80			WS
614	Rajiv Sagar (Maksudangarh)	Bhader	Earthen	2002	65.65	700	27.19	17.675	16.13		0.2475	IR
615	Rajkhar	Local stream	Earthen	1957		970	14.94	1.7				IR
616	Rajli	Local nala	Earthen	2003	4.1	790	10.38	1.468	1.43		0.0259	IR
617	Rajsamand	Gomti banas	Earthen	1676	5231.8	5585.05	39.2	107.1	98.71	Other	2.125	IR,WS
618	Ram Garh	Banqanga	Earthen/Gravity/Masonry	1903		1143	26	58.97	58.97			IR,WS
619	Ram Sagar (MP)		Earthen	1963	46.62	474	13.41	5.866	5.744		0.26	IR,WS
620	Ram Sagar	Parbati	Earthen	1905		5273	13.44	27.85	26.41			IR
621	Ramchandrapur	Local nala	Earthen	2003		355	14.2	1.028	0.746		0.0274	IR
622	Ramganga	Ramganga	Earthen	1974	3100	630	127.5	2448	2195.5	Chute	8.143	HE,IR
623	Ramova	Local nala	Earthen	1931	75.11	384	21.33	12.96	12.83		0.8533	IR
624	Rampa	Local nala	Earthen	1977	3.24	990	15.83	1.028	1		0.0435	IR

625	Rampur	Negi	Earthen	1917		1646	24.38	15.038	14.184		0.4337	IR
626	Rampur	Goinghawa	Earthen	1958		3820	10.5	10.5	9.227		0.4994	IR
627	Rampur Kalyangarh	Local	Earthen	1925		1000	13	1.85	1.17			IR
628	Rampur Pindaria	Local	Earthen	1974		1260	10.3	1.212				IR
629	Rampura	Local nala	Earthen	1989	5.12	656	12.02	1.627	1.498		0.1498	IR
630	Rampurakhurd	Parwati	Earthen	1992	54	948.76	23.32	13.81	11.83	Ogee	0.3988	IR
631	Ranapratap Sagar	Chambal	Gravity / Masonry	1970	248610	1143	53.9	2898.7	1566.52	Ogee	19.829	HE,IR
632	Rangwan		Earthen	1957	830	2073	27.4	164.31	155.177	Other	2.591	IR
633	Ratapani	Godmedi	Earthen	1965	25.9	439	20.11	15.146	14.58		0.293	IR
634	Ratheli	Local nala	Earthen	1976	2.45	1290	18.17	0.95	0.915		0.0333	IR
635	Ratona	Local nala	Earthen	1924	5.09	1097	10.08	0.618	0.597			IR
636	Rechhai	Local nala	Earthen	1910	5.18	1390	10.05	1.74	1.67		0.077	IR
637	Rehti	Rehti	Earthen		53	1590	15	10.968	9.042	Other	0.45107	IR
638	Rihand	Rihand	Gravity / Masonry	1962	13263	932	91.46	10600	8900		4.608	HE,IR
639	Rohini	Rohini	Earthen	1983		1647	17.82	12.11				IR
640	Rondh		Earthen						0.99			IR
641	Rupaniyakhal	Local nala	Earthen	1997	90.88	820	18.3	13.57	11.305		0.0396	IR
642	Ruparel	Ruparel	Earthen	2004		955	16.42	9.7	8.74		0.213	IR
643	Ruthai (Gopi Krishna Sagar)	Local nala	Earthen	1985	249.12	670	40.15	85.01	78.106			WS
644	Sadwa		Earthen			387	20.48	1.96				IR
645	Sagad	Sagar	Earthen		450	2977.5	27.13	93.7	78.9	Other	16.5925	IR
646	Sagasoti	Local nala	Earthen	1975		900	12.67	0.781	0.695		0.0203	IR
647	Sagonikala		Earthen	2004		1005	18.8	2.37				IR
648	Sahibkhedi	Surasa	Earthen	1981	60.52	3450	17.72	12.46	10.33	Other	0.398	IR
649	Sainthal Sagar	Banganga	Earthen	1898		4180	21.94	13.705	12.8			IR
650	Sajnam		Earthen	1990		4524	22.34	83.5	74.85		23.75	IR
651	Saktesh Garh	Local	Earthen	1989		880	15.66	3.286	2.341			IR
652	Salaiya	Barsoti	Earthen			990	18.6	22.82	19.06			IR
653	Salarpur	Kardia	Earthen	1960		2975	11	4.02	3.483			IR
654	Samarsingha	Local nala	Earthen	1917	33.04	1380	11.88	6.09	5.476		0.214	IR
655	Samrat Ashok Sagar	Halali	Earthen	1997	699	945	29.57	252.8	226.09		5.259	IR,WS
656	Sanjay Sagar	Gomukh	Earthen	1985	124.3	630	31.82	37.5	35.16	Chute	0.487	IR
657	Sankal Khera	Local nalla	Earthen			1700	20.9	3.17	3.08		0.0616	IR

658	Sanwaria Sarover/ Sanwaryasrowar/ Sanwariya	Erau	Earthen	1997		2362	11.08	5.41	5.18		0.264	IR
659	Sapahi	Local nala	Earthen	1976	4.66	228	17.68	2.2	2.077		0.0383	IR
660	Sarai	Local nala	Earthen	1987	1.29	640	14.32	0.68	0.648		0.0206	IR
661	Sarai Garh	Local	Earthen	1970		735	10.82	0.735				IR
662	Saran Kheri	Jahugiya	Earthen	1983		1143	14.83	6.23	5.78			IR
663	Sarda Sagar	Sharda	Earthen	1962	127	2220	16.15	405.92	330.1		5.765	IR
664	Sareri/ Sareru	Mansi	Earthen	1957	558	6336	13.1	55.78	55.07	Ogee	1.8	IR
665	Sarra	Katni	Earthen	1896	29.5	743.71	13.4	3.378	2.763		0.101	IR
666	Sarro	Dhonnai	Earthen	1973	7.63	120	22.62	2.78	2.6		0.0578	IR
667	Sarwankheda	Local nala	Earthen	2001	9.25	870	12.19	1.884	1.76		0.0828	IR
668	Sawan Bhado		Earthen	2001	146	4285	29.8	30	27.85	Ogee	0.4125	IR
669	Sawra- Kuddu	Ravi						1.36	0.998		0.05029	HE
670	Sawsara	Local nala	Earthen	1982	1.91	555	15.315	1.226	1.179		0.02768	IR
671	Semariya	Local nala	Earthen	2002	1.2	620	11.62		0.95		0.0113	IR
672	Semraha	Local nala	Earthen	2007		595	19.75	0.285	0.264		0.161	IR
673	Semrakudri	Local nala	Earthen	1966	4.27	1037	10.66	1.61	0.68			IR
674	Semri	Local	Earthen	1989		666	14.8	1.983				IR
675	Sendpa	Local nala	Earthen	1966	66.88	442	15.85	7.95	7.47		0.1741	IR
676	Shahjad		Earthen	1992		4160	18	130	96.06		29.93	IR
677	Shakargarh	Local nalla	Earthen	2000		2156	15.97	4.306	3.81		0.057	IR
678	Shamsherpura	Puchi	Earthen	1992	20.73	915	16.1	7.264	6.52		0.1865	HE,IR
679	Sheel Ki Dungri	Banas	Earthen	1990		2042	19.8	4.16				IR
680	Sher	Local nala	Earthen	1979	11.7	180	17	3.532	2.997		0.0506	IR
681	Shiv-Sagar	Local nalla	Earthen	1993		299	22.7	2.094	2.05		0.0312	IR
682	Sidhi	Local nala	Earthen	1966	20.01	233	45.5	6.863	6.367		0.102	IR
683	Silibari	Roop rail	Earthen	1956		4024	15	5.63	5.465		1.7	IR
684	Silised		Earthen					13.93	12.12			IR
685	Silkheda	Local nala	Earthen	1985	9.32	870	12.31	3.07	2.83		0.0233	IR
686	Siloda	Local nala	Earthen	1916	35	2225	10.87	4.28	3.85		0.225	IR
687	Simariya No. I	Local nala	Earthen	1976	25.9	2610	14.17	4.308	4.15		0.971	IR
688	Simrar		Earthen	1964	43.5	498.7	25.6	12.94	12.2		0.459	IR
689	Sindhwarni	Man	Earthen			125.76	21.34	58.6	42.8		0.7	IR
690	Singhpur	Local nala	Earthen	1962	10.19	1010	12.2	2.771	2.113		0.081	IR
691	Siori Lake	Siori	Earthen	1911		2306	13.94	7.82	7.6			IR

692	Sirsa	Koil	Gravity / Masonry	1953	54.37	780	11.89	7.381	7.206		0.02789	IR
693	Sirsi	Bakhar nala	Earthen	1958		3808	21.34	215	195		3.0149	IR
694	Sividog	Local nala	Earthen	1986		645	13.4	0.9101	0.815		0.0209	IR
695	Soniyana	Local nallah	Earthen			3060	11.7	6.8	6.23		0.292	IR
696	Sonkachhar	Local nala	Earthen			510	17.76	0.487	0.434			IR
697	Srikhandi	Srikhandi	Earthen	1965		205.8	16.65	4.92	3.35			IR
698	Styanagar	Local nala	Earthen	1989		840	15	0.8	0.75		0.0195	IR
699	Sudhari Nala	Sudhari nala	Earthen			396.34	16.46	1.38	1.11			IR
700	Sugathan		Earthen			2040	21.12	23.24	18.26			IR
701	Sukha	Local nala	Earthen	1984	11.352	450	15.61	2.582	2.422		0.1034	IR
702	Sukhra	Sukhara nala	Earthen	1909		1158	12.2	7.36	7.26			IR
703	Sunder	Sunder	Earthen	1976		1554.48	35.67	30.903	25.75		0.49776	IR
704	Surkhi	Local nala	Earthen	1982	10.77	1170	20.33	3.83	3.47		0.0627	IR,WS
705	Surwal	Gambhir	Earthen	1958		3390	32	22.88	21.71		0.985	IR
706	Suryodi	Surjudi nala	Earthen/Gravity/Masonry	1974	21.37	487.68	12.5	2.9	1.48	Ogee	0.08822	IR
707	Sushil/ Soshila Sagar	Local nalla	Earthen	1991		430	12.84	2.2	1.98		0.069	IR
708	Suswar	Local	Earthen			1400	14.03	3.03	2.607			IR
709	Swaroop Sagar	Sisarma	Earthen/Gravity/Masonry	1560	141.9	660	22	13.67	9	Other	0.418	WS
710	Tahlay	Tahlay	Earthen				15	190	153.7			IR
711	Takli	Takli	Earthen				16.68	40	36			IR,WS
712	Tanda	Local nala	Earthen	1989	3.36	720	14.59	0.9762	0.8942		0.03505	IR
713	Tandikhurd	Local nala	Earthen	2002	5.9	718	18.79	1.407	1.256		0.062	IR
714	Tanjara	Local nala	Earthen	1988		225	18.34	0.79	0.61		0.0218	IR
715	Tartora	Local nala	Earthen	1988		429	16.1	1.821	1.405		0.036	IR
716	Tatko	Tatko	Earthen	2013	190	1468	15	10.33	6.5		0.203	IR
717	Teergarh	Local nala	Earthen	2001			14.85	7.915				N.A.
718	Tehraka	Local nala	Earthen	1964	24.36	1860	12.08	5.35	4.79			IR
719	Tehri	Bhagirathi	Earthen/Gravity/Masonry		75110	575	260.5	3540	2614.87	Chute	4.2	HE,IR
720	Tejgarh	Local nala	Earthen	1961	32.59	747	31.69	6.79	5.72			IR
721	Tekanpur	Local nala	Earthen	1895	64.75	975	16.47	8.293	7.438		0.278	IR,WS
722	Temrain		Earthen	1973	4.27	503.05	12.8	1.38	1.3			IR
723	Tenughat	Damodar	Earthen	1978	4480.7	6492.24	50.61	1024.7	814.8	Ogee	6.23482	HE,IR
724	Thara	Local nala	Earthen	1995	5.18	396	12.05	1.35			0.0487	IR
725	Tigra	Sankh	Earthen/Gravity/Masonry	1917	414.24	1524	24.079	130	120		1.9319	IR,WS
726	Tikara	Local nala	Earthen	1983	2.71	518	20.76	0.889	0.824		0.0234	IR

727	Tilaiya	Barakar	Gravity / Masonry	1953	984.2	366	29.7	395.09	319.78		7.446	HE,IR
728	Tillar	Tillar	Earthen	1987	174	2220	26.54	52.197	45.347	Other	0.9752	IR
729	Titora	Local nallah	Earthen	1982		749	12	1.36	1.23		0.0475	IR
730	Torai	Torai	Earthen			647.7	24.4	24.8	21.1			IR
731	Tordi Sagar	Sohadra	Earthen	1887	272	1722	14.1	47.14	47.11	Other	55.48	IR,PS
732	Trikunda	Local nala	Earthen	1975		510	11.52	0.283	0.2654		0.0084	IR
733	Turga	Local nala	Earthen	1999		350	16.68	1.17	1.097		0.0251	IR
734	Udai Sagar	Berach	Earthen/Gravity/Masonry	1585	477	315	24.4	31.13	27.59	Other	0.77	IR
735	Uliya	Local nala	Earthen	1991		600	24.58	2.148	2.007		0.035	IR
736	Umargarh	Local nala	Earthen	1978	0.79	180	26.85	0.9			0.0207	IR
737	Ummed/ Umaid Sagar (Baran)	Khari	Earthen			4800	10.67	17.77	17.77		1.1655	IR
738	Ummed/Umed/ Umaid Sagar (Bhilwara)	Local nalla	Earthen/Gravity/Masonry	1917	407	5166	10.67	18.61	18.59	Other	1.974	IR
739	Umrar	Umrar	Earthen	1978	3400	995	27.76	18.9	16.7		0.343	IR
740	Uncha	Local nallah	Earthen	1984		1800	14	2.605	2.515		0.1176	IR
741	Upper Chraipani	Local nala	Earthen	1994	16.16	568	16.16	1.28	1.224		0.0443	IR
742	Upper Kaketo	Parwati	Earthen		800	3672	16.8	53.258	52.288	Ogee	1.46192	IR
743	Upper Khajuri	Chandauli and Shibati	Earthen	1958	95	2313	24.88	44.74	37.834		11.3172	IR
744	Upper Kiul	Kiul	Earthen	2004	284.9	3673	30.48	98.1	84.53	Ogee	1.23	IR
745	Upper Sakarwara		Earthen	1919		945	33.8	1.761	1.7	Ogee		N.A.
746	Urmil	Urmil	Earthen	1994	440	4799	25.56	116.6	111.5		2.575	IR
747	Urmila Sagar	Parbati	Earthen	1905		3020	12.32	16.22	15.14			IR
748	Veer Sagar	Local nala	Earthen	1970	22.8	420	26.83	26.15	14.46			IR
749	Vijaipur	Local	Earthen	1983		570	14.3	0.559				IR
750	Wagon	Wagon	Earthen/Gravity/Masonry	1984	3070	3048	14	40.67	37.55		1.6	IR
751	Yashvant Sagar (Corporation)	Gambhir	Earthen	1939	485	1850	18	15.963			0.04855	WS
752	Afzalgarh Dam		Earthen									IR
753	Aklera Sagar Dam	Chambal	Earthen									IR,WS
754	Bakreshwar Dam											
755	Bandhu Dam	Bandhu	Earthen			1605						IR
756	Bara Mandira	Baramandira	Earthen	1977		853						IR
757	Barabhum Dam	Nagasai	Earthen	1991		1529						IR

758	Barwa Sagar Dam	Barwa Nala	Earthen			1067						IR
759	Beko Dam		Earthen	1990		914						IR
760	Dangrajhore Dam		Earthen	1982		580						IR
761	Dhandhraul Dam		Earthen	1917		7305						IR
762	Futiary Dam		Earthen			768						IR
763	Ganeshpur Dam											
764	Ghaghar Dam											
765	Golamarajore Dam	Golamarajore	Earthen	1989								IR
766	Hansapur Dam											
767	Hinglow Irrigation Scheme Dam		Earthen	1976		1158						IR
768	Kanjan Dam											
769	Kumari Dam		Earthen/Gravity/Masonry	1984		1068						IR
770	Lipania Dam		Earthen			750						IR
771	Maithon Dam	Barakar	Earthen	1957		4426		217	142			HE,WS
772	Maliarajore Irri. Scheme Dam		Earthen	1978		2682						IR
773	Moutorejore Dam		Earthen/Gravity/Masonry	1990		1151						IR
774	Nachan Irri. Scheme Dam		Earthen	1977		853						IR
775	Paraga Irri. Scheme Dam		Earthen	1979		737						IR
776	Ragura Dam		Gravity/Masonry	1976		1189						IR
777	Sali Dam	Sali	Earthen	1985		1494						IR
778	Saparajore Dam		Earthen	1982		328						IR
779	Saprar Dam		Earthen	1952		3000						IR
780	Taragonia Irri. Scheme Dam		Earthen	1987		716						IR
781	Tasai Dam											IR

B. List of Barrages/Weirs/Annicuts with surrogate information							
Sl. No.	**Name of Barrage/Weir/Annicut**	**River**	**Length (m)**	**Height upto crest (m)**	**Catchment area (Th. ha.)**	**Design flood discharge (Cumecs)**	**Purpose**
1	Adri Weir	Adri	0			0	IR
2	Adwa Barrage		113.5			3530	IR
3	Ajoy Barrage	Ajay	275			10000	IR
4	Andhra Weir	Andhra Khad	15			0	HE,IR
5	Angoori Barrage	Angoori River	0			0	HE,IR
6	Anraj Weir	Arraj	0			0	IR
7	Asan Barrage	Asan	288	395.95	720	2.5	HE
8	Bagara Weir	Baghara	43			0	IR
9	Bakreswar Barrage		91			750.4	HE,IR
10	Banbasa Barrage	Sarada	603.5	9.146	15000	19821	HE
11	Banganga Barrage	Banganga	116	0.92		2264	IR
12	Barriarpur Weir	Ken	712			0	NA
13	Batane Pick-up Barrage	Batane	95.12			2690.5	IR
14	Batane Weir	Batane	0			0	IR
15	Batre Weir	Batre	32.004			254.85	IR
16	Behar Barrage	Beehar	0			0	HE
17	Bhatta Weir	Bhatta	21.5			0	HE
18	Bhimgoda Barrage	Ganga	453.5		230000	17400	HE,WS,IR
19	Bhora Weir	Jhamarla	22.86			0	FC
20	Bhutan Barrage	Barron Nadi	0			0	HE,IR
21	Bila Nadi Weir	Bila	137.16	7.01		0	IR
22	Birha Weir	Shankh	48.77	3.05		444.57	IR
23	Bishunpur Weir	Phuljhar	23.77	0.914		464.4	IR
24	Brahmani Barrage	Brahmani	126			0	IR
25	Chako Weir	Chako	115.82			920.3	IR
26	Chanken Weir		0			0	IR
27	Chhariyari Weir	Yamuna	30.48009			0	IR
28	Dadupur Barrage	Yamuna	167.6			708	N.A.
29	Dakai Weir		0			0	IR
30	Dakpatthar Barrage	Yamuna	516.92	18.38	8300	14160	HE
31	Daruwa Weir	Darhwa	60.96			601.73	FC

32	Dauk Barrage		68			320	IR
33	Dhadhar Barrage	Dhadhar	138	2.434		2012	IR
34	Dhawa Weir	Dhawa	0			0	IR
35	Dhela Barrage	Dhela River	140.78			1048	IR
36	Dhukwan Weir	Betwa	1171.9	18.67		15177	IR
37	Duni Barrage		157.26			1982	IR
38	Durgapur Barrage	Damodar	692.2	12		15574	IR
39	Durgawati Weir (Kudra)	Durgawati	0			0	IR
40	Dwaraka Barrage	Dwaraka	83.82			1132	IR
41	Farakka Barrage	Ganga	2240			0	IR
42	Gandak Barrage	Gandak	739			24070	HE,IR
43	Gangau Weir	Ken	0	16.15		13723	IR
44	Ghaghari Weir	Ghaghari	40.84	0.46		421.92	IR
45	Ghogha Weir	Chandan	312.4			4528	IR
46	Gidheshwar Weir	Kiul	396.24			112.26	IR
47	Giri Barrage	Giri	161.24	619.352		0	HE
48	Girija Barrage	Ghaghra	716			22200	FC,IR
49	Gobai Barrage		93.27			1428	IR
50	Gokhula Weir	Gokhula	0			283.17	IR
51	Gokul Barrage		555			9500	IR
52	Gola Barrage	Gola River	81	4.2	6500	3250	HE,IR
53	Golai Weir		73.76	1.2192		354.63	IR
54	Gomti Barrage	Gomti	202.5			4246	FC,WS
55	Gumani Barrage	Gumani	79.55			4062.9	IR
56	Hamida Barrage		0			0	
57	Harhi Weir	Harhi	0			0	IR
58	Harna North Weir	Harna	43.28			217	IR
59	Harna South Weir	Harna	38.1			191	IR
60	Hathini Kund Barrage		360			0	IR
61	Hindan Barrage		162			2833	IR
62	Husainpur Weir	Garai	0			0	IR
63	Ikoria Weir	Chandan	244			2830	IR
64	Jalalpur Weir	Morar	0			0	IR
65	Jinjoy Weir	Jinjoy	60.96			849.5	IR
66	Joshiyara Barrage	Bhagirathi	81	33.1	4400	142	HE
67	Jugra Weir	Pakwa Nala	106.68	1.186		283.2	IR

68	Kajhia Weir	Kajhia	164.6			1104.2	IR
69	Kamla Weir	Kamla	292.53	1.52		3965	IR
70	Kanakbigha Weir	Yamuna	49.99			481.39	
71	Karantola Weir	Domani	24.38			0	IR
72	Karihari Weir	Karihari	0			0	IR
73	Katha Pathar Barrage	Yamuna	196	8	21000	8000	HE,IR
74	Kawaldag Weir	Panda	57.91	1.22		424.75	IR
75	Kerwan Weir	Kerwan	64.62			452	IR
76	Kho Barrage		203			2833	IR
77	Khudia Weir	Khudia	54.9			0	IR
78	Kiccha Barrage	Kiccha	91.25			1982.2	IR
79	Kohira Weir	Kohira	26.22			0	IR
80	Kopai Barrage	Kopai	66			849	IR
81	Kosi Barrage	Kosi River	139.5	20.85	1900	5094	HE,IR
82	Kota Barrage	Chambal	551.69		27443	0	HE,IR
83	Kota Trench Weir	Dabka River	20			482	HE,IR
84	Kulthi Weir		0			0	IR
85	Kundghat Weir	Bahuar	34.7			0	IR
86	Kutipisi Weir	Kewta Nadi	46.65	4.57		184.08	IR
87	Lakhani Devi Diversion Weir		0			0	IR
88	Latifshah Weir	Karmanasa	217.68	14.33		0	IR
89	Left Banki Weir	Banki	72.54	2.44		1291.3	IR
90	Libari / Bharthuanandan Weir	Bhutahi	54.86			243.52	IR
91	Lilajan Weir	Lilajan	367.28			2459.3	IR
92	Lokain Weir	Lokain(Falgu)	73.15			0	IR
93	Lower Kararbar Weir	Kararwar	25.91			254.85	IR
94	Lower Khajuri Weir		0			0	IR
95	Lower Kiul Weir	Kiul	202.5			6000	IR
96	Lower Morhar Weir	Morhar	289.56			3341.4	IR
97	Lower Sarda Barrage	Sharda	408			11400	IR
98	Madhya Ganga Barrage (Chaudhary Charan Singh Barrage)		621			17600	IR
99	Mahabodhi Weir	Lilajan	0			0	IR
100	Mahananda Barrage	Mahananda	182.88			2265	HE,IR
101	Mandai Weir	Falgu	305			5500	IR
102	Maneri Bhalii Barrage	Bhagirathi	0	39		0	HE,IR
103	Mohamadganj Barrage	North Koel	814.75			24000	IR

104	Mohini Weir	Sindh	2619	21.86		26460	IR
105	Morwe Weir	Morwe	0			0	IR
106	Munahra Weir	Balan	114	2		439	IR
107	Nagwa silhati Weir		0			0	IR
108	Nakti Nala Weir	Nakti Nallah	25.6	1.52		254.85	IR
109	Narora Barrage	Ganga	922.43			14165	IR
110	New Okhla Barrage	Yamuna	743.11			8495	IR
111	Noon Weir	Noon River	0			160	IR
112	Pagla Weir	Pagla	79.25	1.62		849.5	IR
113	Paimar Barrage	Paimar	0			0	IR
114	Panchane Weir	Panchana	230	1.21		3988.7	IR
115	Parichha Weir	Betwa	1171.3	16.77		21547	IR
116	Parwan Weir	Chambal	0			0	IR
117	Parwati Weir	Chambal	0			0	IR
118	Paura Weir (Sakri)	Sakri	0			0	IR
119	Phika Barrage	Phika	107.87			524	IR
120	Phulwariya Weir	Phulwaria	25.6	1.52		291.66	IR
121	Piri Weir	Piri Nala	51.21			538.81	IR
122	Punpun Barrage	Punpun	178			4300	IR
123	Ramganga Barrage	Ramganga	408			7365	FC,IR,HE
124	Ramghat Weir	North Koel	45.72	1.83		410.59	IR
125	Ramnagar Barrage		0			0	
126	Rapti Barrage	Rapti	284.5			4990	IR
127	Retam Barrage	Retam	1820			3815	IR
128	Sadabah Weir	Jinjoy	70.1	1.52		220.87	IR
129	Sali Weir	Damodar	0			0	N.A.
130	Samoha Weir	Mahuar	0	17		7425	IR
131	Sank Weir	Sank River	0			146.8	IR
132	Sarswatia Weir	Sarswatia	35.05			346.88	IR
133	Saryu Barrage		243.5			4600	IR
134	Singhpur Barrage	Urmil	240.5	212.205		7528	IR
135	Sone Barrage	Sone	1407		69000	40470	HE,IR
136	Sonre Weir	Sonre	51.82			475.72	IR
137	Sukhnia Weir	Sukhnia	0			0	IR
138	Surara Weir	Suar	0			0	IR
139	Tamak Lata Barrage	Dhauliganga	62.5	16	20000	2950	HE,IR

140	Tanakpur Barrage	Sarada	475.3	8.9		188.7	HE
141	Tapovan Vishnugad Barrage	Dhauliganga	113	26	3100	4100	HE
142	Tarafeni Barrage		0			934.31	IR
143	Tilpara Barrage	Mayurakahi	309			8490	IR
144	Tons Barrage	Tons/ Tamasa	347			13868	HE
145	Tons Weir		500			12000	IR
146	Triveni / Tribeni Weir		121.92	0.7		985.43	IR
147	Uderasthan Weir	Falgu	336	1		5210	IR
148	Ukalia Anicut	Sindh	518			0	IR
149	Upper Jamuna /Yamuna Weir	Yamuna River	0			541.42	IR
150	Upper Kararbar Weir	Kararwar	0			0	IR
151	Upper Morhar Diversion Weir	Morhar	195.07			2945	IR
152	Usri Weir	Usri	40	1.51		0	IR
153	Uttmahi Weir	Sarswatia	39.62			319.98	IR
154	Vibhadra / RishiKesh Barrage	Ganga	312	11.5	21000	0	HE
155	Vishnu Prayag Barrage	Alaknanda	63	17	1100	65	HE
156	Yamuna Weir	Satbahini	0			0	IR

C. Major/Medium irrigation projects with surrogate information

Sl. No.	Name of Project	Type	River	Tributary	Status	Year of Completion	GCA (Th ha)	CCA (Th ha)	UIP (Th ha)	District/S Benefitted
1	Abhaypura (bhimlat)	Medium	Chambal		Completed	1958		3.4		Bundi
2	Adri canal	Medium	Ganga	Adri	Completed			0.83	1	Aurangabad
3	Adwa dam project	Major	Garai	Adwa	Completed	1984		21.77	16.98	Mirzapur, Sonbhadra, Allahabad And Kaushambi
4	Afzalgarh	Medium			Completed			0		Bijnore
5	Agra canal _Haryana	Major		Yamuna	Completed			64.4	41.32	
6	Agra canal _Uttar Pradesh	Major	Yamuna	Yamuna	Completed	1873		260.6	167.12	Agra and Mathura
7	Ahraura dam	Medium	Garai		Completed	1955		13.79	13.67	Mirzapur And Sonbhadra
8	Ajan (kukurjhap)	Medium	Ajan	Ajan	Completed			4.26	5.11	Munger
9	Ajan lower	Medium	Chambal	Banganga	Completed			8.42		Bharatpur
10	Ajan upper	Medium			Completed			6.4		Bharatpur

11	Ajoy barrage (siktia)	Major	Ajoy	Ajoy	Completed	1992	51.82	41.34	40.51	Deoghar, Dumka
12	Akhajhiri	Medium	Sindh	Akhajhiri	Completed	1973	2.19	2	2	Shivpuri
13	Aliganj	Major			Completed	1987		85.8	38.7	Lakhimpur - Kheri
14	Alnia	Medium		Chambal	Completed	1972		7.88	5.69	Kota
15	Amkoi	Medium	Murgura Nala	Murgura	Completed	1978	0.76	0.75	0.6	Satna
16	Anjanwa resevoir	Medium	Ganga	Anjanwa	Completed	1981	3.07	1.96	3.83	Chatra
17	Anraj	Medium	North Koel	Arraj	Completed		6.35	4.12	5.4	Garhwa
18	Aoda	Medium	Seep	Seep	Completed	1934	11.34	8.5	4.9	Morena
19	Arjun dam	Medium		Arjuna	Completed			59.77	15.11	Hamirpur, Mahoba
20	Arnia bahadarpur	Medium	Chambal	Gandhi	Completed	1993	4.09	2.8	2.8	Ujjain
21	Arwar	Medium	Banas	Khari	Completed	1957		7.39	5.5	Bhilwara
22	Ataria/ atarai	Medium			Completed			2.28		Alwar
23	Atawara	Medium			Completed	1961		1.17	0.5	Bhilwara
24	Augasi pump canal	Major	Yamuna	Yamuna	Completed			13.36	12.7	Banda And Chhatrapati Sahuji Maharaj Nagar
25	Augmentation canals	Major	Yamuna		Completed			0	54	Ambala Kkr, Kurukshetra
26	Auranga	Major	North Koel	Auranga	Ongoing		108.62	65.18	55.42	Palamu
27	Babhanikhand	Medium	North Koel	Banki	Completed		0.89	0.62	0.65	Garhwa
28	Badaun	Major		Ramganga	Ongoing		66.88	53.5	37.45	Badaun And Bareilly
29	Badua	Major		Badua	Completed			45.58	55.02	Bhagalpur, Munger
30	Bagoliya	Medium	Banas	Berach	Completed	1956		3.68	1.94	Udaipur
31	Bah	Medium	Bahuda	Bah	Ongoing		12.78	9.89	17.81	Vidisha
32	Bakhar marihan feeder	Medium			Completed			4.7	2.07	Mirzapur And Sonbhardra
33	Balmiki (ohen) sarovar	Medium			Completed			23.28	5.12	Chhatrapati Sahuji Maharaj Nagar
34	Bandhu	Medium	Kangsabati	Kangsabati	Completed	1966		1.82	2.43	Purulia
35	Bandia nalla	Medium	Bandia nalla	Negri	Completed	1998	2.5	2.25	2.5	Guna
36	Banganga canal	Major	Banganga		Completed	1956		17.83	6.24	Basti, Siddharth Nagar And Sant Kabir Nagar
37	Bansagar canal (up) irrigation project	Major	Sone	Sone	Ongoing		347.35	232.44	150.13	Allahabad, Mirzapur, Kaushambi And Sonbhadra
38	Bansagar dam _Bihar	Major	Sone	Sone	Completed			0		Bhojpur
39	Bansagar dam _Madhya Pradesh	Major		Sone	Completed			0		
40	Bansagar dam _Uttar Pradesh	Major			Completed			0		Allahabad, Kaushambi, Mirzapur, Sonebhadra
41	Bansagar unit - ii	Major	Sone	Sone	Ongoing		267.1	199	249.36	Rewa, Shahdol, Sidhi, Satna

42	Barabhum	Medium	Kangsabati	Kangsabati	Completed			2.02		Purulia
43	Baranadi	Medium	Ganga	Baranadi	Completed	1967		1.21	5.45	Dumka
44	Barchar	Medium	Barchar	Barchar	Completed	2001	2.61	2.35	2.35	Sidhi
45	Baretha/ bareth bund	Medium	Gambhir		Completed			2.8		Bharatpur
46	Bargi diversion	Major	Narmada	Narmada	Ongoing			245	377	Jabalpur, Satna, Rewa, Katni
47	Barhi	Medium	Ganga	Mahuaghat	Completed	1981	1.27	0.74	1.27	Hazaribag
48	Bariyarpur left bank canal	Major	Ken	Ken & kutni	Ongoing		58.3	44.8	43.85	Chhatarpur, Raigarh
49	Barnai	Medium		Barnai	Completed	2006	4.48	2.85	2.39	Sarguja
50	Barnar	Major		Barnar	Ongoing		32.98	22.4	25.4	Jamui
51	Barodia	Medium	Chambal	Chambal	Completed	1975		1.3	0.9	Rajgarh
52	Barrage and irrigation system of DVC	Major	Damodar	Damodar	Completed			426	394	Bankura, Burdwan, Hooghly, Howrah
53	Barwa dam	Medium	Barwa nala	Bora nala	Completed	1967		24.25	5.46	Banda, Chhatrapati Sahuji Maharaj Nagar
54	Bassi	Medium	Banas	Corailberach	Completed	1992		3.17	2.18	Chittorgarh
55	Batane canal	Medium	Batane	Batane	Completed			7.09	6	Aurangabad
56	Batane _Bihar	Major		Batane	Ongoing			10.47	12.13	Aurangabad, Gaya
57	Batane _Jharkhand	Major	Punpun	Batane	Ongoing			1.66		Palamu, Aurangabad(Bihar)
58	Bateshwarasthan pump ph-i _Bihar	Major	Ganga	Ganga	Ongoing		37.75	22.66	27.6	Bhagalpur
59	Bateshwarsthan pump canal _Jharkhand	Major		Ganga	Ongoing			0		Godda, Bhagalpur
60	Batre _Jharkhand	Medium	Ganga	Batare	Completed			1.94		Daltonganj, Palamu
61	Baudha	Medium	Ganga	Agrawa	Completed	1978	0.89	0.36		Hazaribagh
62	Baur _Uttar Pradesh	Medium			Completed			0		Rampur
63	Baur _Uttrakhand	Medium	Baur	Baur	Completed	1967		0	18.93	Udham Singh Nagar
64	Beewer feeder canal	Medium	Kali nadi		Completed	1999		81.51	9.8	Etah, Mainpuri, Farukkhabad, Sonbhadra
65	Beko	Medium	Dwarakeshwar	Kangsabati	Completed	2009		1.21	2.51	Purulia
66	Belan - tons canal	Major		Belan	Completed	1961		0	41.08	Mirzapur, Sonbhadra, Kaushambi And Allahabad
67	Belan bhakhar	Medium		Belan	Completed			9.96	5.7	Mirzapur And Sonbhardra
68	Belharna	Medium		Belharna	Completed			2.7	2.7	Gaya
69	Beniganj	Medium	Khurar	Khurar	Completed	1974	6.8	6.3	4.2	Chatarpur
70	Berai canal	Medium	Dwarkeswar		Completed			3	3.63	Bankura
71	Bethli/ bethali	Medium	Chambal	Bethali	Completed	1995	4.75	4.32	5.03	Baran
72	Bevar feeder canal	Major	Kali nadi		Completed	1999		9.8		Mainpuri, Etah And Farrukhabad

73	Bhagwatgarh sagar	Medium			Completed			0.8		Sawai Madhopur
74	Bhainsakhedi	Medium	Chhotikali	Chhotikali	Completed	1993	0.95	0.9	0.9	Ujjain
75	Bhainswar	Medium	Khatiari	Khatiari	Completed	1978	4.89	3.3	2.6	Satna
76	Bhairawa	Medium	Ganga		Ongoing		8.55	4.52	4.85	Hazaribag (Ramgarh)
77	Bhander canal _Madhya Pradesh	Major	Betwa	Betwa	Completed	1999	125.01	109.97	44.54	Datia, Bhind
78	Bharatpur feeder _rajasthan	Medium			Completed			2	1.28	Bharatpur
79	Bharthu nandna	Medium	Falgu	River bhutahi	Ongoing			2.5	3	Jehanabad
80	Bhaunrat dam	Medium	Jamini		Ongoing			7.9		Lalitpur
81	Bhim sagar	Medium	Chambal	Ujjar	Completed	1997	13.26	9.99	7.9	Jhalawar
82	Bhitrigarh	Medium	Niwar	Niwar	Completed	1970	2.19	1.1	1.18	Jabalpur
83	Bhopauli pump canal	Major			Completed	1969		35.78	24.29	Varanasi, Chandauli,Bhadohi
84	Bhoura bandh	Medium		Jhamarla	Completed	1974	2.11	1.8		
85	Bhupal sagar	Medium	Banas	Berach	Completed	1936		3.87		Chittorgarh
86	Bijnore canal	Major			Completed	1894		0	16.59	Moradabad And Bijnore
87	Bilanadi	Major	Dhasan		Completed	1973	27.72	21.1	12.27	Sagar, Chattarpur
88	Bilas	Medium	Chambal	Parwati	Completed	1995		5.12	5.86	Baran/ Kota
89	Bilasi	Medium		Bilasi	Completed		4.29	3	4	Bhagalpur (Amarpur Block)
90	Bisalpur	Major	Banas	Banas	Completed	2007	96.28	84	81.8	Tonk,Sawai Madhopur, Ajmer, Beawar, Kishangarh, Jaipur
91	Bisanda	Medium	Bisandha		Completed	1992	1.11	1.01	1.05	Sidhi
92	Bishan /biran samand	Medium			Completed			0		Sawai Madhopur
93	Bishunpur	Medium	North Koel	Phuljhar	Completed		1.63	1.07	0.5	Gumla
94	Bishunpur	Medium			Completed			0.51		Gumla
95	Boochara bandh	Medium	Sabi	Local nala	Completed	1889		2.64		Jaipur
96	Budhna nalla	Medium	Budhna nalla	Budhna	Completed	1997	3.25	2.6	3.25	Shivpuri
97	Buksa	Medium	Ganga	Baksa	Completed	1982	4.43	3	4.5	Chatra, Hazaribag
98	Bundi ka gothra	Medium	Chambal	Mej	Completed	1957		6.59		Bundi
99	Burdha/ bardha	Medium			Completed			3.85		Bundi
100	Butanduba	Medium	Ganga		Completed		1.62	0.8	0.73	Daltonganj
101	Chako	Medium	Chako	Chako	Completed		3.24	1.92	1.62	Chatra, Palamu
102	Chambal lift irrigation project	Major	Chambal		Completed	2000		62	60.21	Agra And Etawah
103	Chambal _Madhya Pradesh	Major	Chambal	Chambal	Completed	1982	364.44	328	250.9	Sheopur, Bhind, Morena
104	Chambal_Rajasthan	Major	Chambal	Chambal	Completed			229.86	213	Kota
105	Chandan _Bihar	Major		Chandan	Completed	1978	127.9	90	71	Bhagalpur
106	Chandan _Jharkhand	Major		Chandan	Completed			0		Godda

107	Chandra prabha dam	Medium			Completed	1960		11.21		Varanasi,Chandauli,Bhadohi
108	Chandrawal dam	Medium			Completed	1973	25.48	19.04	5.41	Hamirpur And Mahoba
109	Chandsen bheru	Medium	Banas	Banas	Completed			2.6		Tonk
110	Chataniyaghat	Medium	Ganga		Completed	1980	0.42	0.18		Garhwa
111	Chauli	Medium	Chambal	Chauli	Completed	2006	8.47	7.79	8.96	Jhalawar
112	Chausa pump canal	Medium		Ganga	Completed			5.5	9.94	Bhojpur/Buxar
113	Chhaparwada	Medium	Banas	Local nala	Completed			11.74		Jaipur
114	Chhapi	Medium	Chhapi	Chappi	Completed	2005	13.22	9.38	12.6	Jhalawar
115	Chhapi	Medium	Chappi	Chapi	Completed	1974	3.06	2.93	2	Rajgarh
116	Chhariyari	Medium		Yamuna river	Completed		6.4	3.24		Jahanabad
117	Chillar	Medium	Chillar	Chillar	Completed	1973	10.5	5.3	3.4	Shajapur
118	Chillimal pump canal	Medium		Yamuna	Completed			8.93	7.77	Banda And Chhatrapati Sahuji Maharaj Nagar
119	Chirka	Medium	Kanhar	Dhengura	Completed			1.75	1.17	Garhwa
120	Chittaurgarh reservoir	Major	Ghaghra		Completed	1997	24.37	22.85	16.09	Balarampur And Gonda
121	Choral irrigation project	Medium	Choral	Choral	Completed	1997	4.98	3.9	4.95	Indore
122	Chordanda	Medium		Surhar	Completed		0.81	0.48	0.48	Palamu
123	Dalmau Pump Canal Stage - I & II	Major			Completed			73.88		Varanasi, Chandauli And Sant Ravidas Nagar
124	Danro	Medium		Danro	Completed	1985	5.87	4.1	3.24	Garhwa
125	Daroli	Medium	Kenkra Nalla	Kenkra nala	Completed	1967	2.37	1.4	1.3	Damoh
126	Daruwa	Medium		Darhwa	Completed	1970		1.63		Deoghar
127	Denkwa dam	Major			Completed			2.28	1.31	Mirzapur And Sonbhadra
128	Deokali pump canal stage - I	Major	Ganga		Completed			28.4	21.9	Ghazipur
129	Devender nagar	Medium	Sukta nalla	Sukuia	Completed	1975	3.54	3.4	2.4	Panna
130	Dhankai	Medium	North Koel		Completed	1979	0.32	0.22	0.19	Garhwa
131	Dhasan canal	Major			Completed	1894		97.17	31.91	Hamirpur And Mahoba
132	Dhauajore	Medium	Karo		Completed	1971		1.01	4.37	Deoghar
133	Dheel sagar	Medium	Banas	Morel	Completed	1939		5.94		Sawai Madhopur
134	Dhoba pump canal	Medium			Completed			6.4	4.05	Mirzapur And Sonbhadra
135	Dhuwa medium project	Medium	Dhawa	Dhawa	Completed			2.5	3	Aurangabad
136	Diggalpahari	Medium	Mayurakshi		Completed	1975	0.79	0.64		Dumka
137	Dimu	Medium	Kangsabati	Kangsabati	Completed			0.43		Purulia
138	Dindoli	Medium			Completed			2.06		Chittorgarh
139	Dohrighat pump canal	Major	Ghaghara		Completed			55	44	Azamgarh, Ballia And Mau
140	Dohrighat sahyak	Major	Ghaghra		Completed	1981		57.3		Azamgarh, Ballia And Mau

141	Dongri	Medium			Completed			1.92		Jhansi
142	Doon canal	Medium		Ganga	Completed	1863		0		
143	Doraha	Medium	Utawali	Utawali	Completed	1992	3.96	3.65	2.83	Sehore
144	Dudhi	Medium	Dudhi	Dudhi	Completed	1998	5.71	4.23	4.81	Raigarh
145	Dugari	Medium	Chambal	Chambal	Completed			2.25		Bundi
146	Dulki	Medium	Lilajan		Completed	1971	2.7	0.52	0.62	Chatra
147	Durgavati	Major	Durgawati	Durgawati	Ongoing		40.13	37.8	36.32	Rohtas, Kaimur(Babhua)
148	East baigul _Uttar Pradesh	Major			Completed			16.61	13.58	Bareilly, Pilibhit
149	East baigul _Uttrakhand	Major	Ganga	Baigul	Completed	1969		0		Nainital, Udhamsingh Nagar
150	Eastern ganga canal	Major	Ganga	Ganga	Completed	2010	301	233	105	Bijnor
151	Eastern yamuna canal	Major	Yamuna		Completed	1854		221	191.34	Saharanpur, Muzzafarnagar, Meerut And Baghpat
152	Eklera sagar	Medium			Completed			13.39		Baran
153	Fateh sagar	Medium			Completed			2.44		Udaipur
154	Futiary	Medium	Kangsabati	Kangsabati	Ongoing			0.96	1.5	Purulia
155	Gagrin	Medium	Chambal	Ahu	Ongoing		10.16	7.94	7.94	Jhalawar
156	Galai sagar	Medium			Completed			0		Sawai Madhopur
157	Galwa bund	Medium	Banas	Banas	Completed	1960		13.39		Tonk
158	Gambhiri	Medium	Banas	Gambhiri	Completed	1956		9.79		Chittorgarh
159	Gandak canal _Uttar Pradesh	Major	Gandak	Gandak	Completed	1994	539	395	332	Deoria, Padrauna, Maharajgunj And Gorakhpur
160	Gandak _Bihar	Major	Gandak	Gandak	Completed			1001	1186	East Champaran, Saran, Siwan, West Champaran,Gopalganj, Vaishali,Muzzafarpur, Samastipur
161	Gararda /grarda	Medium		Mangli	Ongoing			9.19	9.01	Bundi
162	Garhi	Medium	Damodar	Garhi	Ongoing			0		Chatra
163	Gej	Medium		Gej	Completed	2001	5.44	3.2	4.42	Sarguja
164	Ghaggar canal project	Major		Ghaghar	Completed	1917		0		Allahabad, Mirzapur,Sonbhadra
165	Ghaghari	Medium	North Koel		Completed		2.59	1.52	1.21	Palamu
166	Ghaghra	Medium	Ganga	Ghaghra	Completed	1957	3.08	2.16		Hazaribagh
167	Ghunghutta (shyam)	Medium		Ghunghutta	Completed	2002	10.25	9.24	13.05	Sarguja
168	Giri	Medium	Yamuna	Giri	Completed		6.48	5.26	4	Sirmour
169	Gobai barrage	Medium	Damodar	Gabai / gowai	Completed	1983	13.27	4.64	5.35	Dhanbad
170	Gokhula	Medium		Gokhula	Completed	1985		2.26		Gaya
171	Golai	Medium	Barakar		Completed	1967	1.71	1.32	1.2	Chatra
172	Golamarajore	Medium	Kangsabati	Kangsabati	Ongoing			0.8	1.76	Purulia

173	Gonda	Medium	Damodar	Gonda	Completed	1954	1.42	0.52		Hazaribagh
174	Gopad lift irrigation project	Medium	Gopad	Gopad	Completed		5.62	4.27	5.7	Sidhi
175	Gopalpura	Medium	Chambal	Chambal	Completed	1978		4.88	2.99	Baran/ Kota
176	Gopalpura	Medium	Chambal	Chambal	Completed	1975	1.38	0.8	0.81	Mandsaur
177	Govindgarh	Medium		Local nalla	Completed	1970		1.4	1.1	Rewa
178	Govta	Medium			Completed			1.62		Bhilwara
179	Gudha	Medium	Chambal	Mej	Completed	1958	18.14	10.9		Bundi
180	Gularia dam	Medium			Completed	1968		0		Allahabad And Kaushambi
181	Gumani barrage	Major	Ganga		Ongoing		34.23	22.92	16.19	Sahibganj, Pakur
182	Gunta nalla	Medium	Yamuna		Completed		11.6	9.8	3.88	Banda, Chhatrapati Sahuji Maharaj Nagar And Chirakoot Dham Karwi
183	Gurgaon canal _Haryana	Major		Yamuna	Completed			131	81	Gurgaon, Faridabad
184	Gurgaon canal _rajasthan	Major			Completed			46.9	28.2	Bharatpur
185	Gurma & flood dy.	Medium	Gurma	Gurma nalla	Completed	1980		7	6.28	Rewa
186	Gyanpur pump canal	Major	Ganga		Completed			62.3	65.42	Mirzapur, Allahabad, Bhadohi And Varanasi
187	Hanumata	Medium	Kangsabati	Kangsabati	Ongoing	2007	4.03	2.22	6.25	Purulia
188	Harhi	Medium	Sone		Completed	1954	1.7	1.01		Palamu
189	Haripur _Uttar Pradesh	Major			Completed	1969		0		
190	Haripur	Medium	Ganga		Completed	1975		0	19.99	
191	Harishchandra sagar	Major	Chambal	Chambal	Completed			17.98		Jhalawar
192	Harna	Medium		Harna	Completed			7.6		Godda
193	Harsi	Major	Parvati	Parwati	Completed	1937		68.39	30.2	Gwalior
194	Harsora/ harsora bund	Medium	Sabi		Completed			2.24		Alwar
195	Hinglow	Medium	Ajay	Ajay	Completed			12.65		Birbhum
196	Hingonia	Medium	Banas	Banas	Completed			2.53		Jaipur
197	Hiru	Medium	Ganga	Hiru	Completed	1982	2.33	0.93	1.09	Chatra, Hazaribagh
198	Jabera	Medium	Jamunha	Jamunha	Completed	1961		1.1	0.9	Damoh
199	Jahangirganj branch	Medium			Completed			0	13.61	Ambedkar Nagar
200	Jaisamand (alwar) irrigation project	Medium	Ruparail	Ruparail	Completed			4.79		Alwar
201	Jamni dam _Uttar Pradesh	Medium	Jamini	Jamini	Completed	1973		55.11	11.27	Jhansi And Lalitpur
202	Jamni rbc _Madhya Pradesh	Medium	Jamni	Jamni	Completed	1976	3.79	3	2.4	Tikamgarh
203	Jamrani Multipurpose project_Uttar Pradesh	Major	Ramganga		Ongoing			0		Rampur, Bareilly

204	Jamrani Multipurpose project_Uttrakhand	Medium	Ganga		Ongoing			150.03	60.6	Nainital
205	Jamunia	Medium	Ganga		Completed	1957	1.17	0.84	0.67	Hazaribagh
206	Jarauli pump canal	Major	Yamuna		Completed	2002		64.5	39.75	Fatehpur, Allahabad, Kaushambi
207	Jarmora	Medium	Jarmora Nalla	Jarmora nalla	Completed	1980	6.84	3.4	3	Rewa
208	Jetpura	Medium	Banas	Banas	Completed	1977		3.73	2.19	Bhilwara
209	Jhadol	Medium	Banas	Banas	Completed	1980		5.58	4.08	Bhilwara
210	Jinjoy weir scheme	Medium	North koel	Jinjoy	Completed		4.86	3.64	2.79	Palamu
211	Jirgo	Medium			Completed	1960		13.14	10.24	Mirzapur And Sonbhadra
212	Job	Medium		Job	Completed	1978	4.16	2.06	2	Nawada
213	Johila	Medium	Johilla	Johilla	Completed	1981	1.77	1.6	1.3	Shahdol
214	Jugger	Medium	Gambhir	Juggarbana	Completed	1956		5.93		Karauli/ Sawai Madhopur
215	Jugra	Medium	Damodar	Pakwa nala	Completed	1952	0.83	0.48		Hazaribagh
216	Jui lift irrigation project	Major	Yamuna		Completed			30.16	18.7	Ambala, Bhiwani
217	Kabrai lake	Medium	Kulharni	Arjun	Completed	1955	78.33	70.99	2.33	Hamirpur And Mahoba
218	Kachnoda dam	Major	Sajnam and banai river (dhasan river)	Sajnam	Completed	2012	12.5	11.7	10.85	Lalitpur
219	Kajhia	Medium		Kajhia	Completed			0.2	0.35	Godda
220	Kala bhata	Medium			Completed			0.61		Udaipur
221	Kalakh sagar	Major	Banas	Banas	Completed	1883		10.96		Jaipur
222	Kalakho	Medium	Banganga	Banganga	Completed			3.4		Dausa
223	Kaliasote	Medium	Kaliasote	Kaliasote	Completed	2001		4.59	6.19	Bhopal, Raisen
224	Kalisil	Medium	Chambal	Kalisindh	Completed			4.7		Karauli/ Sawai Madhopur
225	Kamla	Major		Kamla	Completed	1970		28.33	25.49	Madhubani
226	Kanak bigha	Medium		Yamuna	Completed			2.16	2	Jahanabad
227	Kanchan	Medium	Kanchan	Kanchan	Completed	1985	5.06	3.9	3.8	Sidhi
228	Kangsabati	Major	Kangsabati	Subernarekha	Completed		558.6	396.05	302.92	Bankura, Hoogly, Midnapur
229	Kanhar	Major	Kanhar	Pagan	Ongoing		37.32	26.09	27.9	Mirzapur And Sonebhadra
230	Karantola	Medium			Completed	1966	0.61	0.4		Sahibganj
231	Karihari	Medium		Karihari	Completed			4.04	3.04	Jamui
232	Karrior	Medium	Kangsabati	Kangsabati	Completed			0.49		Purulia
233	Kawaldag	Medium		Panda	Completed		2.53	1.77	1.21	Garhwa
234	Kazikhedi	Medium	Kharkhara	Kharkhara	Completed	1993	2.08	1.64	1.26	Ujjain
235	Ken canal	Major		Ken	Completed	1915		229	75.22	Banda And Chitrakoot
236	Keolari	Medium	Keolari		Completed	1965		14.39	4.1	Hamirpur And Mahoba

237	Kerwal sagar	Medium			Completed			0		Tonk
238	Kerwan	Medium	Kerwan	Kerwan	Completed	1975	6.84	5.3	4.05	Bhopal, Raisen
239	Kesho	Medium	Barakar	Kesho	Ongoing			3.8	3.56	Hazaribagh, Kodarma
240	Kethan	Medium	Kethan	Kethan	Completed	1995	5.12	4	2.5	Vidhisha
241	Khairabera	Medium	Kangsabati	Kangsabati	Completed	2010	1.24	0.52	2.12	Purulia
242	Khara canal	Medium	Yamuna	Yamuna river	Completed			12.47	7.5	Saharanpur
243	Kharad	Medium			Completed			4.07		Jaipur
244	Khari feeder	Medium			Completed			7.69		Udaipur
245	Khari	Medium	Banas	Khari	Completed	1957		6.48		Bhilwara
246	Khatima	Medium	Ganga	Sharda	Completed			16.24	9.33	Udham Singh Nagar
247	Khera	Medium	Banas	Banas	Completed			3.06		Rajsamand
248	Khudia irrigation scheme	Medium	Khudiya	Khudia river	Completed	1971	4.43	3.6	4.32	Dhanbad
249	Kishanpur pump canal	Major			Completed			38.64		Allahabad And Kaushambi
250	Kohira dam	Major		Kohira	Completed	1962	26.6	19.68	13.45	Kaimur
251	Kolmahadeo	Medium	Bhusari	Kolmahadev	Completed	1966		0.73	0.7	Nawada
252	Konar	Major	Damodar	Konar	Ongoing		93.82	56.29	64.74	Hazaribagh, Giridih
253	Koncha	Medium	Koncha	Koncha	Completed	1983		3.8	3.8	Vidhisha, Guna, Ashok Nagar
254	Kosi Barrage and Eastern Canal	Major	Kosi River	Kosi	Completed			612	735	Purnea, Katihar
255	Kosi irrigation _Uttar Pradesh	Major			Completed	1987		130.46	91.5	Rampur, Moradabad
256	Kosi irrigation _uttarakhand	Major			Completed			0		Udham Singh Nagar
257	Kothari	Medium	Banas	Banas/ kothri	Completed	1990		8.27	5.21	Bhilwara
258	Kulgarhi	Medium	Durha	Durha	Completed	1973	5.6	2.3	2.1	Satna
259	Kulthi weir	Medium			Completed			2.33	2.8	Nalanda
260	Kumari	Medium	Ganga	Kangsabati	Completed			3.64		Purulia
261	Kundghat	Medium		Bahuar	Ongoing			7.92	9.5	Jamui
262	Kunwarpur	Medium	Local Nalla		Completed		6.73	6.5	10.5	Sarguja
263	Kushalpura	Medium	Dudhi	Dudhi	Ongoing		7.03	6.3	7.54	Rajgarh
264	Kutipisi	Medium	Ganga		Completed		1	0.4	0.4	Hazaribagh
265	Kwano pump canal	Medium			Completed			0	8.59	Basti, Siddharth Nagar And Sant Kabir Nagar
266	Lakhunder	Medium	Lakhunder	Lakhunder	Completed	2000	8.71	6.1	8.3	Sajapur
267	Lakhwar multipurpose project_Uttar Pradesh	Major		Yamuna	Ongoing			0	33.78	Saharanpur, Muzzafarnagar, Meerut And Ghaziabad
268	Lakhwar multipurpose project_Uttrakhand	Medium	Ganga	Yamuna	Ongoing			0	33.78	Saharanpur, Mujaffarnagar, Meerut, Ghaziabad

269	Lalitpur dam _Madhya Pradesh	Medium		Shahzad	Completed			0	0.73	
270	Lalitpur dam _Uttar Pradesh	Medium			Completed	1953		40.3	7.58	Jhansi
271	Lassaria	Medium	Banas	Dai	Completed			2.08		Ajmer
272	Left banki Reservoir Irrigation Project	Medium	North Koel	Left banki	Completed	1980	2.43	1.76	1.2	Garhwa
273	Left banki weir irrigation project	Medium	North Koel	Left banki	Completed		20.15	5.27	6.08	Garhwa
274	Lilajan	Major		Lilajan	Completed	1958		16.77	11.92	Gaya
275	Lilji /lilgi	Medium	Lilligi nalla	Lillgi nalla	Completed	1968		0.8	0.6	Satna
276	Lipaniajore	Medium	Kangsabati	Kangsabati	Completed			1.25		Purulia
277	Lokine	Medium		Lokain (falgu)	Completed		7.1	3.75	4.5	Nalanda
278	Lotia	Medium	Ganga	Chondhi	Completed	1981	2.28	1.62	1.49	Hazaribagh
279	Lower ganga canal	Major	Ganga	Ganga	Completed	1878		1200	527.74	Kanpur,Etah, Mainpuri, Itawa, Fatehpur, Firozabad, Kannauj, Kaushambi,Auraiya Farrukhabad, Bulandsahar
280	Lower karrabar	Medium	Sone	Kararbar	Completed			0.5		Palamu
281	Lower kiul valley	Major		Kiul	Completed	1965		23.43	25.92	Jamui, Lakhisarai
282	Lower morhar	Major		Morhar	Completed	1962		20.83	25	Gaya
283	Madho sagar	Medium	Banganga	Banganga	Completed			3.23		Dausa/ Jaipur
284	Madho tanda	Major			Completed			32	17.6	Pilibhit
285	Madhya ganga canal Ph - II	Major	Ganga	Ganga	Completed		255.23	225.43	146.52	Bareilly, Badaun, Bijnore, Jp Nagar And Moradabad
286	Madhya ganga canal stage - I	Major	Ganga	Ganga	Completed			249	178	Bulandshahar, Aligarh, Agra, Etah, Mainpuri, Ghaziabad And Mathura
287	Mahabodhi	Medium		Lilajan	Completed	1964		2.4	2.4	Gaya
288	Mahan (gulab sagar)	Major	Mahan	Mahan	Ongoing		21.37	14	19.74	Sidhi
289	Mahuar	Medium	Mahuar	Mahuar	Ongoing		16.29	9.5	13.78	Shivpuri , Gwalior
290	Majhgaon	Medium	Nagrar Nalla	Nagrar nalla	Completed	1982	2.1	1.4	1.6	Mandla
291	Makroda	Medium	Negri	Negri	Completed	1998	15.77	8.8	10.55	Guna
292	Mala	Medium	Sone	Sone	Completed	1929	2.88	2	3.7	Damoh
293	Malay	Medium	North Koel	North Koel	Completed	1985	8.59	7.78	8.26	Palamu
294	Mandai	Medium		Falgu	Ongoing			3.5	3.5	Nalanda, Jehanabad, Gaya, Patna
295	Mandal	Medium		Local nalla	Completed			1.15		Bhilwara

296	Mangalsar	Medium			Completed			0		Alwar
297	Mansarovar	Medium	Chambal	Chambal	Completed	1957		3.06		Sawai Madhopur
298	Mansurwari	Medium	Padariya Nala	Sukchain nalla	Completed	1982	3.44	3.26	1.8	Sagar
299	Marhi	Medium	Semra Nadi	Semra	Completed	1981	1.8	1.6	2	Sidhi
300	Mashi	Medium	Banas	Bandi	Completed	1960		6.98		Tonk
301	Matatila Dam (including old Betwa Canal)_Uttar Pradesh	Major	Yamuna	Betwa river	Completed	1964		422.6	199.1	Jhansi, Jalun, Hamirpur, Mahoba And Gwalior
302	Maudaha dam	Major		Birma	Completed		44.6	41.12	28.23	Hamirpur, Rath, Mahoba And Jalalpur
303	Mayurakshi lbc_Jharkhand	Medium	Mayurakshi	Mayurakshi	Completed	1957	10.15	8.1	10.15	Dumka
304	Mayurakshi _west bengal	Major	Ganga		Completed	1985		226.63	250.86	Birbhum, Burdwan, Murshidabad
305	Mehroi	Medium	Sone	Dewadhara	Completed	1982	1.05	0.8	0.8	Shahdol, Umariya
306	Meja dam	Major	Tons		Completed		58.02	71.05	35.34	Mirzapur And Allahabad
307	Meja feeder	Medium			Completed			9.92	9.43	Bhilwara
308	Meja	Medium	Banas		Completed	1956		18.62		Bhilwara
309	Midnapur canal	Major	Kangsabati	Kangsabati	Completed	1871		35		Midnapur
310	Mola	Medium	Betwa	Mola	Completed	1962	4.58	3.6	2.3	Ashok Nagar
311	Moosakhand dam _Uttar Pradesh	Major	Karmansa	Karmansa	Completed	1969		17.33	22.29	Varanasi And Bhadohi
312	Morasagar/ moran sagar	Medium	Banas	Banas	Completed			7.22		Sawai Madhopur
313	Morel bundh	Medium	Banas	Morel	Completed	1956		21.4		Sawai Madhopur/ Dausa
314	Morwa	Medium		Morwe	Completed			4.6	5.9	Munger
315	Morwan	Medium	Gameri	Gameri	Completed	1961	5.83	2.7	2.7	Mandsur
316	Motisagar	Medium	Banas	Banas	Completed			2.16		Tonk
317	Moutorejore	Medium	Kangsabati	Kangsabati	Ongoing			0.89	2.08	Purulia
318	Munhara barrage	Medium	Balan	Balan	Ongoing			3.42	5.04	Madhubani
319	Murlia	Medium			Completed			2.41		Chittorgarh
320	Musakhand dam (Karmanasa irrigation project)_Bihar	Medium		Karmanasa	Completed		22.02	10.11	11.74	Rohtas
321	Nagda nalla	Medium		Nagda nalla	Completed	1964	4.15	3	3	Tikamgarh
322	Nagi	Medium		Nagi	Completed			1.2	1.55	Munger
323	Nagwa dam	Major		Karnassa	Completed			0		Sonebhadra
324	Naktara	Medium	Amra	Amra nalla	Completed	1982	0.94	0.9	0.51	Satna
325	Namano	Medium		Banas	Completed	1958		7.88		Udaipur
326	Nanak sagar _Uttar Pradesh	Major	Deoha river	Sarda	Completed	1962		0		Bareilly, Pilibhit

327	Nanaksagar _uttarakhand	Major		Deoha	Completed	1962		0		Bareilly, Nainital, Pilibhit And Banbasa
328	Nand samand	Medium	Banas		Completed	1958		7.89		Rajsamand
329	Nandanwara	Medium	Bargi Nadi	Bargi nadi	Completed	1964	2.82	2.6	1.8	Tikamgarh
330	Narainpur pump canal	Major	Ganga		Completed		80.4	67	24.29	Mirzapur, Sonebhadra, Varanasi, Chandauli And Ghazipur
331	Narayan sagar	Medium	Chambal	Banas	Completed	1968		4.09		Ajmer
332	Narayan sagar	Medium			Completed			0		Ajmer
333	Naren	Medium	Naren	Naren	Completed	1996		3.6	3.88	Vidisha
334	Naugarh dam	Major	Karmanasa	Karmanasa	Completed			27.32	41.32	Varanasi And Chandauli
335	Needar	Medium			Completed			1		Sawai Madhopur
336	North koel _Bihar	Major	North koel	North koel	Ongoing		124.27	111.8	104.7	Gaya, Aurangabad (Bihar), Palamu (Jharkhand)
337	North koel _Jharkhand	Major	Ganga	North koel	Ongoing		176	12.47		Palamu, Aurangabad (Bihar)
338	Orai dam	Medium	Banas	Berach	Completed			9.86		Chittorgarh
339	Orni	Medium	Orni	Orni	Completed		12.83	7.44	9.72	Banka
340	Pagara	Medium	Asan	Asan	Completed	1927		0	22.3	Bhind
341	Pagla	Medium		Pagla	Completed	1974	2.83	1.05		Pakur
342	Paimar barrage	Medium		Paimar	Completed			6.17	7.4	Nalanda, Jahanabad
343	Panch khero	Medium	Barakar		Ongoing		5.31	3.08	3.08	Hazaribagh, Giridih
344	Panchana	Medium	Yamuna	Gambhir	Completed	2004	11.17	9.99	10.61	Karauli/ Sawai Madhopur
345	Panchane	Medium		Panchana	Completed			7.08	8.5	Jehanabad, Gaya
346	Pandarwa	Medium	North Koel	Pandarwa	Completed	1983	1.05	0.72	0.67	Garhwa
347	Parallel lower ganga canal	Major			Completed			857	90	Allahabad, Kaushambi, Kanpur City, Kanpur Dehat, Farrukhabad, Mainpuri, Etawah And Auraiya
348	Parbati (dholpur)	Medium	Parbati	Parbati	Completed			24.67		Dhaulpur
349	Parga	Medium	Kangsabati	Kangsabati	Completed			0.73		Purulia
350	Paronch	Medium	Paronch	Paronch	Completed	1997	3.35	2.57	2.15	Shivpuri
351	Parwan lift irrigation project	Medium	Chambal	Chambal	Completed			8.18	5.8	Baran/ Kota
352	Parwan pickup weir (a) Irrigation Project	Medium	Chambal	Chambal	Completed			6.17		Baran/ Jhalawar
353	Parwati Pickup weir Irrigation Project	Major	Chambal	Chambal	Completed			12.55		Baran
354	Pathrai dam	Medium	Dhasan	Pathrai and sukhnai	Completed		3.77	3.51	3	Jhansi
355	Patloi	Medium	Patloi	Kangsabati	Ongoing		3.26	1.54	3.32	Purulia

356	Phulwaria	Medium	Tilaiya	Tilaiya	Completed	1990	16.39	9.72	9.6	Nawada (Garhwa)
357	Phulwaria	Medium	North Koel	Phulwaria	Completed		0.91	0.63		Garhwa
358	Pili dam _Uttar Pradesh	Medium	Pili, baneli and dhara rivers	Pili	Completed	1968		7.36	4.04	Bijnore, Moradabad
359	Pili dam _Uttrakhand	Medium	Ganga		Completed			0		Udhamsingh Nagar
360	Pipalpura	Medium			Completed			1.87		Bundi
361	Piplad	Medium			Proposed		5.86	4.69	6.33	Jhalawar
362	Piplia kumar	Medium	Banganga	Banganga	Completed	1973	1.76	1.64	1.47	Shajapur
363	Piri	Medium	North Koel	Piri nala	Completed		2.87	1.21	1.17	Palamu
364	Providing Kharif Channel in Hindon Krishi Doab	Major	Hindon		Completed	2004	33.91	31.42	11.6	Muzzaffarnagar, Baghpat And Saharanpur
365	Punasi	Major	Bagirathi	Ajoy	Ongoing		43.28	30.33	24.29	Dumka, Deoghar
366	Punpun barrage	Major	Ganga	Punpun	Ongoing		17.1	13.68	13.68	Patna, Gaya, Jahanabad
367	Rajghat canal	Major	Yamuna	Betwa	Completed	2007		270	138.66	Lalitpur, Hamirpur, Mahoba
368	Rajghat canal unit - II	Major	Betwa	Betwa	Completed		274.93	121.4		Ashok Nagar, Shivpuri, Datia, Bhind, Tikamgarh
369	Rajghat dam irrigation project_Uttar Pradesh	Major		Betwa	Completed			0		Lalitpur, Jalaun, Jhansi
370	Rajghat dam _Madhya Pradesh	Major	Betwa	Betwa	Completed	2000		0		
371	Rajsamand	Medium	Banas		Completed	1671		10.44		Udaipur/ Rajsamand
372	Ram sagar	Medium		Prabati	Completed	1905		4.33		Dholpur
373	Ramchandrapur	Medium	Kangsabati	Kangsabati	Completed			2.05		Purulia
374	Ramganga	Major	Ganga	Ramganga	Completed			1201.9	591.11	Saharanpur, Muzaffarnagar, Meerut, Bulandshahar,Eta, Aligarh, Mathura, Agra, Kanpur, Etah, Mainpuri, Farukhabad
375	Ramgarh	Medium	Banganga		Completed			0		Jaipur
376	Ramghat	Medium	North Koel		Completed		1.27	0.89	0.89	Palamu
377	Rampur canal	Major			Completed			0	17.63	Rampur
378	Rampurakhurd	Medium	Parwati	Parwati	Completed	2001	7.29	4.13	3.32	Sehore
379	Rangwan dam project_Uttar Pradesh	Major		Banne nala	Completed			0	37.63	Banda
380	Rangwan high level canal _Madhya Pradesh	Major	Banne	Bannel nala	Completed	1992	23.5	15	17.1	Chhatarpur
381	Ranichak	Medium	Kangsabati	Kangsabati	Ongoing			0	1.53	Midnapur
382	Rehti	Medium	Rehti	Rehti	Proposed		2.58	2.2	2.91	Sagar And Vidisha

383	Retam barrage	Medium		Retam	Completed	2011		3.35	3.36	Mandsour
384	Rewari lift stage - II irrigation project	Major		Yamuna	Ongoing	1992		31.9	8	Gurgaon, Rewari, Jhajjar
385	Rohilkhand canal	Major			Completed	1894		53.6		Bareilly And Jp Nagar
386	Rohini project	Medium	Rohini		Completed			2.42	3.3	Lalitpur
387	Sadabah	Medium	North Koel		Completed		2.2	2	0.77	Palamu
388	Sagad	Medium	Sagar	Sagar	Ongoing		11.97	9.7	12.5	Vidisha
389	Saharajore	Medium	Kangsabati	Kangsabati	Completed	1961		5.06		Purulia
390	Sahibkhedi	Medium	Surasa	Surasa	Completed	1993	1.91	1.74	1.4	Ujjain
391	Sainthal sagar	Medium	Banganga	Sawa	Completed	1998		3.27		Dausa
392	Sajnam dam	Medium		Sajnam	Completed	1990		10.21	7.26	Lalitpur
393	Sakri lower valley	Major		Sakri	Completed			23.4	28.08	Gaya, Nawada, Munger
394	Sakrigali pump canal	Medium			Completed			1.85	2.6	Sahibganj
395	Salaiya	Medium	Barakar		Ongoing			0	2.67	Hazaribagh
396	Sali	Medium	Damodar	Damodar	Completed			2.23		Bankura
397	Sali reservoir	Medium	Damodar	Damodar	Completed			0.57		Bankura
398	Samrat ashok sagar	Major	Halali	Halali	Completed	1997	37.42	27.92	37.64	Vidisha, Raisen
399	Sanjay sagar (gomukh)	Medium	Gomukh	Gomukh	Completed	1997	9	6.1	8.05	Guna
400	Saprar	Medium			Completed	1956		0	17	Jhansi
401	Saraswatia	Medium	North Koel		Completed		2.36	1.2	0.77	Garhwa
402	Sarda canal _Uttar Pradesh	Major			Completed	1926		1462	725.02	Pilibhit, Nainital, Bareilly, Hardoi, Sitapur, Unnao, Raebareli, Lucknow, Barabanki, Shahjahanpur, Lakhimpur Kheri
403	Sarda canal _uttarakhand	Major		Sarada	Completed			0		
404	Sarda sagar stage I_Uttar Pradesh	Major	Chauba	Sarda	Completed	1957		0		Pilibhit
405	Sarda sagar stage II_Uttar Pradesh	Major	Chauba	Sarda	Completed	1962		0		Pilibhit
406	Sareri/ sarori	Medium	Banas	Banas	Completed	1957		9.71		Bhilwara
407	Sarju pump canal	Major			Completed			24.41	24.41	Bahraich And Shravasti
408	Saryu nahar pariyojana	Major	Ghaghra	Saryu	Completed	2012	1600	1200	1404	Bahraich, Shrawasti, Sant Kabir Nagar, Balarampur, Basti, Gonda, SiddarthNagar, Maharajganj, Gorakhpur
409	Sawan bhadon	Medium	Chambal	Aru	Completed	2001	6.96	5.85	5.85	Kota
410	Sewani lift irrigation project	Major	Yamuna	Yamuna	Completed	1985		73.56	43	Bhiwani, Hissar

411	Shahganj	Medium			Completed			0		Mirzapur And Sonbhadra
412	Shahzad	Major	Shahzad River		Completed			16	20.24	Lalitpur
413	Shamsherpura	Medium	Puthi	Puthi	Completed	1992	2.44	2.2	1.1	Rajgarh
414	Sharda sahayak	Major	Sharda	Sharda	Completed		0	1522	1750	Lucknow, Lakhimpur Kheri, Raibareily, Barabanki, Pratapgarh, Allahabad, Sultanpur, Faizabad, Ballia, Ghazipur, Sitapur, Jaunpur,
415	Sikri bund/ sikari	Medium			Completed			17.45		Bharatpur
416	Silised	Medium			Completed			0		Alwar
417	Sindh phase - I	Major	Sindh	Sindh	Ongoing	2008	26.01	25.9	40.86	Gwalior, Shivpuri
418	Sindh phase - II	Major	Sindh	Sindh	Ongoing		172.42	98.25	162.1	Datia,Shivpuri, Gwalior, Bhind
419	Sindhwarni	Medium	Ganga	Man	Ongoing			9.88	10.27	Munger
420	Singhpur	Medium	Ken	Urmil	Ongoing			6	10.2	Chhatarpur
421	Sirsi barundha feeder	Medium			Completed	1958		8.67	6.07	Mirzapur, Sonbhadra
422	Sone canals	Major	Sone	Sone	Completed	1879	704	560	347.02	Bhojpur, Rohtas, Patna, Jahanabad, Gaya, Aurangabad
423	Sone high level canal	Major	Sone	Sone	Completed		184	139	111.36	Rohtas, Aurangabad, Gaya, Jahanabad
424	Sone pump canal	Major	Sone	Sone	Completed	1992		93.65	66.27	Mirzapur And Sonebhadra
425	Sonepur	Medium	Ganga	Dhaulia	Completed	1974	52.76	1.36		Godda
426	Sonre	Medium			Completed		3.57	2	2.35	Palamu
427	Suara canal	Medium		Suar	Completed			3	3.6	Rohtas
428	Subernarekha barrage	Major	Subernareka		Ongoing			110.3	136.01	Midnapur
429	Suheli	Major			Completed	1987		36.42	17.5	Lakhimpur Kheri
430	Sunder	Medium	Ganga	Sunder	Completed		14.6	8.5	10.5	Godda
431	Surajgarh pump canal	Medium	Ganga	Harohar	Completed		4.58	4.3	3.3	Munger
432	Surwal	Medium	Banas	Banas	Completed	1956		4.85		Sawai Madhopur
433	Suryodi	Medium			Completed	1974	0.97	0.85		Pakur
434	Sutlej Yamuna Link (SYL) canal _Haryana	Major			Ongoing			1883		Whole Haryana
435	Suvankar dangra	Medium	Dwarkeswar	Damodar	Completed			2	2.43	Bankura
436	Swaroop sagar	Medium	Ahar		Completed	1933		0		Udaipur
437	Takli	Medium	Chambal	Chambal	Ongoing			7.39	7.39	Kota
438	Tanda pump canal	Major			Completed			0		Faizabad
439	Taragonia	Medium	Kangsabati	Kangsabati	Completed			0.9		Purulia
440	Tatko	Medium		Kangsabati	Ongoing	2013	5.44	2.02	3.49	Purulia

441	Teesta barrage, phase -I, irrigation project	Major		Teesta	Ongoing			342.3	527	Darjeeling,Malda, Jalpaiguri, Coochbihar,North Dinajpur, South Dinajpur
442	Tehri irrigation project	Major		Bhagirathi	Completed			0	270	Saharanpur, Mujaffarnagar
443	Temrain	Medium	North Koel		Completed	1973	1.28	0.35	0.35	Palamu
444	Tenughat	Medium	Damodar	Damodar	Completed	1978		0.95	0.92	Bokaro
445	Tigra dam	Medium	Sankh		Completed	1929		10.1	3.2	Gwalior
446	Tilaiya - dhadhar	Major	Damodar	Dhadhar	Ongoing		53.69	35.23	31.7	Gaya, Nawada
447	Tillar	Medium	Tillar	Tillarkhamai	Completed	1997	10.22	8.27	6	Shajapur
448	Tons pump canal	Major	Tons		Completed	1969		0		Allahabad, Kaushambi
449	Tordi sagar	Medium	Banas	Sohadra	Completed	1887		13.96		Tonk
450	Trans- kalyani	Medium			Completed			0		Barabanki, Sultanpur, Azamgarh, Mau And Mirzapur
451	Triveni	Medium		Triveni	Completed		6.47	3.79		Godda
452	Tumaria _Uttrakhand	Major	Ganga	Dhela	Completed			0	16.19	Udham Singh Nagar
453	Tumaria reservoir _Uttar Pradesh	Medium			Completed			0		Moradabad
454	Turga	Medium	Kangsabati	Kangsabati	Completed			0.71		Purulia
455	Udai sagar	Medium	Banas		Completed	1585		4.65		Udaipur
456	Uderasthan	Major		Falgu	Completed			38.35	38.35	Jahanabad, Gaya, Nalanda
457	Umaid sagar	Medium	Chambal	Chambal	Completed		5.04	4.94		Baran
458	Umarahat pump canal phase - I	Medium	Yamuna		Completed			4.86	3.96	Kanpur City, Kanpur Dehat, Firozabad, Etawah, Aurallya
459	Umrar	Medium	Umrar	Umrar	Completed	1981		2.3	2.43	Umariya
460	Upper Ganga Canal	Major	Ganga	Ganga	Completed		5000	924	699.09	Saharanpur, Muzzafarnagar, Meerut, Ghaziabad, Agra, Bulandshahar,Aligarh,Etah Mathura, Mainpurim,Bijnore
461	Upper jamuna/yamuna	Medium		Yamuna river	Completed			2.62	2.9	Gaya
462	Upper kaketo	Medium	Parwati	Parwati	Ongoing			3.42	3.42	Gwalior
463	Upper khajuri	Medium		Chandauli and shibati	Completed	1962		8.13	3.96	Mirzapur
464	Upper kiul	Major	Ganga	Kiul	Completed	2004	20.83	16.67	19	Jamui, Munger
465	Upper morhar	Major	Morhar	Morhar	Completed	1958		5.72	6.3	Gaya
466	Upri karabar	Medium		Kakarbar	Completed			2.16		Palamu
467	Urmil dam _Uttar Pradesh	Major		Ken	Completed	1994	34.36	6.81	4.77	Mahoba, Hamirpur (UP) And Chattarpur (MP)

468	Urmil RBC _Madhya Pradesh	Medium	Urmil	Urmil	Completed	2003	13.65	9.72	7.69	Chhatarpur
469	Urmila sagar	Medium	Parbati	Parbati	Completed			2.9		Dholpur
470	Usri	Medium	Usri	Usri	Completed		1.78	0.54	0.45	Giridih
471	Uttmahi	Medium	North Koel		Completed		1.49	1		Garhwa, Palamu
472	Wagon	Medium	Banas		Completed	1992	12.8	8.27	10.56	Chittaurgarh
473	Western Kosi Canal	Major	Kosi	Kosi	Ongoing		304.9	203	234.8	Madhubani, Darbanga, Samastipur
474	Western Yamuna Canal	Major	Yamuna	Yamuna	Completed	1892		436	436	Bhiwani, Jind, Karnal, Rohtak, Hissar, Ambala, Sonepat
475	Yamuna	Medium			Completed			0.73		Palamu
476	Yamuna pump canal	Major			Completed			33.79	37.15	Allahabad And Kaushambi
477	Zamania pump canal	Major			Completed	1969		20.2	18.21	Ghazipur
478	Zamania pump scheme (larma)	Medium	Karamnasa	Karamnasa	Ongoing			19.4	30.09	Kaimur (Babhua)

D. Lift Irrigation projects with surrogate information

Sl. No.	Name of Project	Off take point	Type of pump	No. of pumps	Horse power of pumps	Lift (m)	Discharge (Cumec)
1	Augasi Lift Irrigation Scheme	River		4	800	35.00	1500.00
2	Bateshwarasthan Lift Irrigation Scheme I Stage - II	Reservoir	Centrifugal	12	7 nos. of 850 H.P. 5 nos. of 1800 H.P.	29.00	27.20
3	Bateshwarasthan Lift Irrigation Scheme Phase - I Stage - I	River	Centrifugal	12	6 nos of 850 H.P. and 6 nos of 1800 H.P.	23.00	27.20
4	Bhupali Lift Irrigation Scheme	River					
5	Chambal Lift Irrigation Scheme Stage - I	River		4		26.40	17.00
6	Chambal Lift Irrigation Scheme Stage - II	River		4		31.10	17.00
7	Chausa Lift Irrigation Scheme	River					
8	Chillimal Lift Irrigation Scheme	River		4	495	30.00	3.40
9	Dalmau Lift Irrigation Scheme Stage - I And Stage - II	River					
10	Deokali Lift Irrigation Scheme	Canal	Centrifugal	10			3.40
11	Dhakranalla Lift Irrigation Scheme Ph - I Stage - I	River		7	500	15.40	8.61
12	Dhakranalla Lift Irrigation Scheme Ph-II Stage - I	Canal		4	410	15.39	2.83
13	Dhakranallah Lift Irrigation Scheme Ph - I Stage - II	Canal		6	450	13.11	6.80
14	Dhoba Lift Irrigation Scheme	River		5			0.75
15	Dohrighat Lift Irrigation Scheme			12	60,75	17.50	16.98

16	Dohrighat Lift Irrigation Scheme	Canal		10	75	17.50	19.10
17	Gola Lift Irrigation Scheme	River		6	1663		10.19
18	Gopad Lift Irrigation Scheme	River		5	1825	21.17	3.00
19	Gyanpur Lift Irrigation Scheme						38.22
20	Jarauli Lift Irrigation Scheme	River		8	66000 KVA		11.32
21	Jawarhar Lal Nehru Lift Irrigation Scheme JLN Canal - III	Canal				7.00	
22	Jawarhar Lal Nehru Lift Irrigation Scheme JLN Canal -IV	Canal				7.00	
23	Jawarhar Lal Nehru Lift Irrigation Scheme JLN Canal - V	Canal				7.00	
24	Jawarhar Lal Nehru Lift Irrigation Scheme JLN Canal -VI	Canal				7.00	
25	Jawarhar Lal Nehru Lift Irrigation Scheme JLN Canal -VII	Canal				7.00	
26	Jawarhar Lal Nehru Lift Irrigation Scheme JLN Canal VIII	Canal					
27	Karamnasa Lift Irrigation Scheme	River		5	Pump1 (2 nos.)-500, Pump2(3 nos)-840		16.14
28	Kishanpur Lift Irrigation Scheme						
29	Kwano Lift Irrigation Scheme	River					
30	Larma Lift Irrigation Scheme	River					
31	Narainpur Lift Irrigation Scheme	Reservoir		16	17480 KVA		118.00
32	Parwan Lift Irrigation Scheme	River					
33	Renhat Lift Irrigation Scheme	Canal					
34	Sarju Lift Irrigation Scheme	Canal					
35	Sarju Lift Irrigation SchemeStage - II	Canal					
36	Sone Lift Irrigation Scheme	River		12	22000 KVA		660.00
37	Sone Lift Irrigation Scheme Stage - II	Canal					
38	Sone Lift Irrigation Scheme Stage - III	Reservoir					
39	Sone Lift Irrigation SchemeStage - IV	Canal					
40	Surajgarh Lift Irrigation Scheme	River		2	400 H.P.		3.40
41	Tanda Lift Irrigation Scheme						
42	Tons Lift Irrigation Scheme	River		12			17.00
43	Umarahat Lift Irrigation Scheme	River		3			0.71
44	Yamuna Lift Irrigation Scheme	River					
45	Zamania Lift Irrigation Scheme	River					

E. Power house and projects with surrogate information									
Sl. No.	Power House	Hydro Electric project	Type of Development	Position	Altitude above MSL (m)	No. of Turbines/ Units	Total Installed Capacity (MW)	Minimum Draw Down Level (m)	Number of Penstocks
1	Andhra Power House	Andhra Hydroelectric Project	Run of the river with small pondage	Dam Toe	1775	3	16.95		1
2	Bansagar Tons I Power House	Bansagar Hydroelectric Project	Run of the river with small pondage	Surface	107	3	315	277	4
3	Bansagar Tons II Power House	Bansagar Hydroelectric Project	Canal Drop	Canal Drop	303	2	30	311.92	2
4	Bansagar Tons III Power House	Bansagar Hydroelectric Project	Storage	Dam Toe	304	3	60	323.1	3
5	Bansagar Tons IV Power House	Bansagar Hydroelectric Project	Storage	Dam Toe		2	20	329.86	2
6	Birsinghpur Power House	Birsinghpur Hydroelectric Project	Storage	Dam Toe	445	1	20	471	1
7	Chibro Power House	Yamuna Hydroelectric Project	Run of the river	Under Ground		4	240	638	4
8	Chilla Power House	Garhwal Rishikesh Chilla Hydroelectric Project	Run of the river	Surface		4	144	333	4
9	Dakrani Power House	Yamuna Hydroelectric Project	Run of the river	Dam Toe	375	3	33.75	452	3
10	Dhalipur Power House	Yamuna Hydroelectric Project	Run of the river	Surface		3	51	449.8	3
11	Dhauliganga Power House	Dhauliganga Hydroelectric Project	Run of the river	Under Ground		4	280	1330	4
12	Eastern Gandak Canal Power House	Eastern Gandak Hydroelectric Project	Canal Drop	Canal Drop	105	3	15		
13	Galogi Power House	Galogi Hydroelectric Project	Run of the river	Dam Toe		2	3	1366.51	3
14	Gandhi Sagar Power House	Chambal Hydroelectric Project	Storage	Dam Toe	356	5	115	381	5
15	Giri (Majri) Power House	Giri Hydroelectric Project	Run of the river	Under Ground	432	2	60	612.6	2
16	Jawahar Sagar Power House	Chambal Hydroelectric Project	Run of the river with small pondage	Dam Toe	267.07	3	99		3

17	Khara Power House	Khara Hydroelectric Project	Run of the river with small pondage	Surface		3	72		3
18	Khatima Power House	Khatima Hydroelectric Project	Canal Drop	Canal Drop		3	41.4		
19	Khodri Power House	Yamuna Hydroelectric Project	Tailrace	Dam Toe		4	120	638	4
20	Koldam Power House	Koldam Hydroelectric Project	Run of the river	Surface		4	800	625	4
21	Kosi (East Canal) Power House	Kosi Hydroelectric Project	Canal Drop	Canal Drop	70	4	20		
22	Koteshwar Power House	Koteshwar Hydroelectric Project	Run of the river	Under Ground	618.5	2	200	598.5	4
23	Kulhal Power House	Yamuna Hydroelectric Project	Run of the river	Surface		3	30	398	3
24	Madhikheda Power House	Madhikhera Hydroelectric Project	Storage	Under Ground		3	60	320.05	3
25	Maithon Power House	Damodar Valley Corporation Hydroelectric Project	Storage	Under Ground		3	63.2	132.5	3
26	Maneri Bhalli Stage - II Power House	Maneri Bhali Stage - II Hydroelectric Project	Run of the river with small pondage	Surface		4	304	1103	4
27	Massanjore Power House	Massanjore Hydroelectric Project	Storage	Dam Toe		2	4		1
28	Matatila Power House	Matatila Hydroelectric Project	Storage	Dam Toe	288.65	3	30.6	295.85	3
29	Mohammudpur Power House	Mohammudpur Hydroelectric Project	Canal Drop	Canal Drop		3	9.3		
30	Nirgajini Power House	Nirgajini Hydroelectric Project	Canal Drop	Canal Drop		2	5		2
31	North Koel Power House	North Koel Hydroelectric Project	Run of the river	Dam Toe		2	24		2
32	Obra Power House	Obra Hydroelectric Project	Storage	Dam Toe		3	99		3
33	Panchet Hill Power House	Damodar Valley Corporation Hydroelectric Project	Pumped Storage	Dam Toe	115	2	80	119.5	
34	Patheri Power House	Patheri Hydroelectric Project	Canal Drop	Canal Drop		3	20.4		3
35	Rajghat Power House	Rajghat Hydroelectric Project	Storage	Dam Toe	347	3	45	361.5	3
36	Ramganga Power House	Ramganga Hydroelectric Project	Storage	Dam Toe		3	198	317	3
37	Rana Pratap Sagar Power House	Chambal Hydroelectric Project	Storage	Dam Toe	302	4	172	343	4
38	Rihand Power House	Rihand Hydroelectric Project	Storage	Dam Toe		6	300	235.6	6
39	Singoli Bhatwari Power House	Singoli Bhatwari Hydroelectric Project	Run of the river	Surface		3	99	1009	
40	Sone Eastern Link Canal Power House	Sone Hydroelectric Project	Canal Drop	Canal Drop		2	3.3		
41	Sone Western Link Canal Power House	Sone Hydroelectric Project	Canal Drop	Canal Drop		4	6.6		

42	Subernrekha-I Power House	Subernarekha Hydroelectric Project	Storage	Dam Toe	440	1	65	579.5	1
43	Tanakpur Power House	Tanakpur Hydroelectric Project	Run of the river	Dam Toe		3	94.2		3
44	Tangnu Romai Power House	Tangnu Romai Hydroelectric Project	Run of the river	Surface		2	44		3
45	Teesta Canal Fall - I	Teesta Canal Falls	Run of the river	Canal Drop		3	22.5		
46	Teesta Canal Fall - II	Teesta Canal Falls	Canal Drop	Canal Drop		3	22.5		
47	Teesta Canal Fall - III	Teesta Canal Falls	Canal Drop	Canal Drop		3	22.5		
48	Tehri Stage - I Power House	Tehri Hydroelectric Project	Storage	Under Ground		4	1000		4
49	Tehri Stage - II Power House	Tehri Hydroelectric Project	Pumped Storage	Under Ground		4	1000	745	
50	Thilot (Maneri Bhali-I) Power House	Maneri Bhali - I Hydroelectric Project	Run of the river with small pondage	Surface		3	90	1286.5	3
51	Tilaiya Power House	Damodar Valley Corporation Hydroelectric Project	Storage	Dam Toe		2	4		
52	Vishnuprayag Power House	Vishnuprayag Hydroelectric Project	Run of the river	Under Ground		4	400	2269.5	4
53	Western Yamuna Canal Power House- A	Western Yamuna Canal Stage - I Hydroelectric Project	Canal Drop	Canal Drop	315	3	48		
54	Western Yamuna Canal Power House- B	Western Yamuna Canal Stage - I Hydroelectric Project	Canal Drop	Canal Drop	315	3	48		
55	Western Yamuna Canal Power House- C	Western Yamuna Canal Stage - I Hydroelectric Project	Canal Drop	Canal Drop	315	3	48		
56	Western Yamuna Canal Power House- D	Western Yamuna Canal Stage - II Hydroelectric Project	Canal Drop	Canal Drop		2	14.4		

A. ERM projects with surrogate information

Sl. No.	Name of Project	River	Status	Districts Benefitted	Purpose
1	Raising Meja Dam		Completed	Mirzapur, Sonbhadra, Allahabad, Kaushambi	IR
2	New Okhla Barrage		Completed		IR
3	Raising Nahar Sagar	Banas	Completed	Bhilwara	IR
4	Modernisation of DVC	Damodar	Ongoing	Bankura, Burdwan, Hoogly, Howrah	IR
5	Modernisation of Meja	Meja	Completed	Bhilwara	IR
6	Remodeling Agra Canal		Completed	Agra, Firozabad, Mathura	IR
7	Extension of Ohen Canal		Completed	Banda, Chhatrapati Sahuji Maharaj Nagar	IR

8	Extension of Tumaria Canal		Completed	Nainital	IR
9	Modernization Of Agra Canal	Yamuna	Completed	Faridabad, Agra And Mathura	IR
10	Umrahat Pump Canal Phase II		Ongoing	Kanpur Dehat	IR
11	Remodeling Bhimgoda Headworks		Completed		IR
12	Renovation of Kwano Pump Canal		Completed	Basti, Sidharth Nagar, Sant Kabir Nagar, Gorakhpur, Maharajganj	IR
13	Remodeling Eastern Yamuna Canal		Completed	Saharanpur	IR
14	Sone Canal Modernization Scheme	Sone	Ongoing	Bhojpur,Rohtas, Patna, Gaya, Buxar,Kaimur,Aurangabad,Arwal	IR
15	Arjun Sahayak ERM Scheme XI Plan	Dhasan	Ongoing	Mahoba	IR
16	Western Yamuna Canal Remodelling	Yamuna	Completed	Bhiwani, Karnal, Rohtak, Jind, Hissar, Ambala	IR
17	Modernisation Of Lahchura Head Works	Betwa	Completed	Hamirpur, Jhansi And Mahoba	IR
18	Modernisation of Eastern Yamuna Canal	Yamuna	Completed	Saharanpur, Baghpat, Merrut, Mujaffar Nagar	IR
19	Sone Barrage Remodelling And Link Canal	Sone	Completed	Bhojpur, Rohtas, Patna, Jahanabad, Gaya & Aurangabad	IR
20	Increasing Capacity of Upper Ganga Canal	Ganga	Completed	Bijnore	IR
21	Increasing Capacity of Deokali Pump Canal		Completed	Ghazipur	IR
22	Increasing Capacity of Zamania Pump Canal		Completed	Ghazipur	IR
23	Restoration of Sarda Sahayak Canal System	Sarda	Ongoing	Pilibhit, Barelly	IR
24	Extension of Ken Canal (78 miles channels)		Completed	Banda, Chhatrapati Sahuji Maharaj Nagar	IR
25	Restoration of Eastern Gandak Canal System	Gandak	Ongoing	W. Champaran, E. Champaran	IR
26	Increasing Capacity of Narainpur Pump Canal		Completed	Mirzapur, Sonbhadra, Chandauli, Ghazipur	IR
27	Restoration of Western Gandak Canal System	Gandak	Ongoing	Siwan, Gopalganj	IR
28	Modernisation of Gambhiri Irrigation Project	Banas	Completed	Chittorgarh	IR
29	Upper Ganga Irrigation Modernisation Project	Ganga	Completed		IR
30	Restoration/Improving intensity of Hardoi Branch		Ongoing	Unnao, Raibarelly, Luknow, Hurdoi, Pilibhit	IR
31	Rest. of Estn. Kosi Canal Sytm incl. rajpur canal	Kosi	Ongoing		IR

Annexure V: Inventory of Litholog well locations

Lithology in the Basin									
Sl. No.	Location	Depth Drilled (m)	Major Lithology	Static water level (m)	Discharge (lps)	Draw down (m)	No. of zones tapped	Total thickness of zones (m)	Major rock group
1	Adalpur Mes, Khaprail	156	Bouldary Formation(Bhabar)				4	55	Un-consolidated Sediments (Quaternary-Recent)
2	Adarsha Pally High School, Katwa Municipality	226.25	Alluvium	7.3	13	10	2	36	Un-consolidated Sediments (Quaternary-Recent)
3	Adarshapally	400.47	Alluvium	6.93	44.44	5	3	111	Un-consolidated Sediments (Quaternary -Recent)
4	Adrahati	31.75	Alluvium				1	6	Un-consolidated Sediments (Quaternary -Recent)
5	Ajaipur	115.9	Deccan Trap Basalt	20.6	8.5	25	1	25	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
6	Ajwain	146.4	Rohtas limestone & Shale	146.4					
7	Akiya Umaheda	189.1	Deccan Trap Basalt	28.38	1.5	7	1	0.9	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
8	Aldaunka	238.04	Clay mixed with Kankar						
9	Algaria	308.15	Alluvium		69.41	5	2	100.3	Un-consolidated Sediments (Quaternary -Recent)
10	Ali-brahman	178	Clay Gravel and Kankar	6.5			7	115	Un-consolidated Sediments (Quaternary -Recent)
11	Allaha-talab	201.3	Sirbu Shale Fractured	5.92	0.57	34	2	79	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
12	Allika	251	Clay, Sand, Gravel Quartzite	6			11	167.5	Un-consolidated Sediments (Quaternary -Recent)
13	Alot	179.05	Basalt & Vindhyan Sandstone	32.59	3	9	1	23	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
14	Amarpatan	202.1	Sirbu Shale & Sandstone	19.9	0.41	24	2	32	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
15	Amatara	201.3	Porcellanite stage & Shale	16.5			1	2	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
16	Ambah	122.5	Alluvium	16.13	11.8	1	6	80	Un-consolidated Sediments (Quaternary -Recent)
17	Amritpura	88.37	Alluvium & Vindhyan Sandstone	6.47	14.5	7	3	37	Un-consolidated Sediments (Quaternary -Recent)
18	Anara		Granite gneiss		1.11	15	1	2	Crystalline (Archaean-Pre-Cambrian)
19	Anchana	400.45	Alluvium				3	63	Un-consolidated Sediments (Quaternary -Recent)
20	Anchorage Camp Haldia	300					4	68.81	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)

21	Antri	305	Granite Weathered & Fractured	23.7	7.2		2	248	Crystalline (Archaean-Pre-Cambrian)
22	Anuppur	166.81	Talchir Sandstone	70.43	0.25	22	3	72	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
23	Apcar Garden	145.5	Gondwana (Panchet)	26.24	3.6		1	2	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
24	Arambagh	309.37	Alluvium	4.04	50.45	5	1	33.53	Un-consolidated Sediments (Quaternary -Recent)
25	Arusi	73.6	Alluvium Granite	13.47	54.07	5	3	23	Un-consolidated Sediments (Quaternary -Recent)
26	Asansol		Gondwana (Panchet)	17.45	6.93	18	2	20	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
27	Ashapur	51.35	Alluvium				1	6	Un-consolidated Sediments (Quaternary -Recent)
28	Ashok Vihar	300	Morar Shale	18	26	5	2	167	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
29	Ashokgar	201.3	Vesicular Basalt	45.5	3	19	1	18	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
30	Awas	203.5	Granite	3.06		9	1	2	Crystalline (Archaean -Pre-Cambrian)
31	Ayara	250	Alluvium				1	18	Un-consolidated Sediments (Quaternary -Recent)
32	Babugram		Granite gneiss	4.43	2.77	24	1	2.99	Crystalline (Archaean -Pre-Cambrian)
33	Badgar	191.25	Deccan Trap	48.77	2	22	2	162	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
34	Badha	252.19	Clay Kankar Sand Gravel	6			12	215	Un-consolidated Sediments (Quaternary -Recent)
35	Badshahpur	249.3	Clay Silty Clay mixed with Kankar	22.84	462	7	8	105	Un-consolidated Sediments (Quaternary -Recent)
36	Bagan	337.36	Alluvium		58.86	5	4	119.7	Un-consolidated Sediments (Quaternary -Recent)
37	Baganpara/Haldia Oil Jetty	301	Quaternary/Tertiary Sediment		17.38	6	4	60.23	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
38	Bagdah	248.1	Alluvium	10.59	8.1	4	3	50	Un-consolidated Sediments (Quaternary -Recent)
39	Baghband Siberia		Alluvium				1	6	Un-consolidated Sediments (Quaternary -Recent)
40	Bagnan Bdo Complex	248.66	Alluvium	6.99	6.93	3			
41	Bahin	186.26	Clay, Sand, Gravel Quartzite	2.15			9	149.5	Un-consolidated Sediments (Quaternary -Recent)
42	Bahora Kalan	206.96	Clay mixed with Kankar						
43	Bajekhatura	350.21	Alluvium	1.69	22.7	8	1	18	Un-consolidated Sediments (Quaternary -Recent)
44	Bajrangarh	89.4	Vindhyan Sandstone	40.01	8	2	1	3.4	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
45	Bakho	232	Barakar Sandstone	12.36	2.51	10	5	115	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
46	Bakreswar Youth Hostel Compound	50	Granite gneiss	4.1	2		2	24	Crystalline (Archaean -Pre-Cambrian)
47	Baktarnagar	122.25	Gondwana (Raniganj)	14.25	7.2		2	15.2	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
48	Balapur	202.35	Alluvium		17		1	12	Un-consolidated Sediments (Quaternary -Recent)
49	Balbalia	553.69	Alluvium				12	364	Un-consolidated Sediments (Quaternary -Recent)
50	Baliapara Near Binoy Bhavan Shantiniketan	401	Older Alluvium & Tertiary Formation	14.56	42.86	9	8	262.9	Un-consolidated Sediments (Quaternary -Recent)
51	Balindi	250.3	Alluvium		20	4	1	16	Un-consolidated Sediments (Quaternary -Recent)

52	Balughata, Haldia	295.85	Quaternary/Tertiary Sediment				3	85	Un-consolidated Sediments (Quaternary -Recent)
53	Bamankhali	524.98	Alluvium				3	48	Un-consolidated Sediments (Quaternary -Recent)
54	Bamori	208.8	Basalt	9.53	1.78	17	8	161.7	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
55	Banamallichatta	200	Quaternary Sediments		9.5		1	18	Un-consolidated Sediments (Quaternary -Recent)
56	Bandha	184	Slate	5.94					
57	Bandhwari	136.8	Weathered/ fractured Quartzite	12.48	48	22	5	81	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
58	Banhera	300	Par Quarzite	41.5	7.2		1	6	Crystalline (Archaean -Pre-Cambrian)
59	Banihari	104.3	Clay Sand mix with Kankar & weathred Quartzite	10.61	871	1	1	68.14	Un-consolidated Sediments (Quaternary -Recent)
60	Bankola	153.39	Gondwana (Raniganj)						
61	Bannabagram	343	Quaternary sediments	0.95	33.95	12	3	68	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
62	Barai	50.5	Shale	5.65	1		1	2	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
63	Bara-kalan	123.7	Alluvium & Vindhyan Sandstone	25.52	48.95	5	5	61	Un-consolidated Sediments (Quaternary -Recent)
64	Barasoni		Hornblende gneiss	6.29	2.77	9			
65	Barbodh	203.45	Basalt Vesicular				1	8	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
66	Barcheka	90.4		9.39	7.33	7	3	42	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
67	Bargar	200	Basalt Vesicular	120.2	0.84	14	1	11	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
68	Barhi	188.7	Alluvium & Vindhyan Sandstone	35.46	14.2	11	2	57	Un-consolidated Sediments (Quaternary -Recent)
69	Barka Alimuddin	109	Weathered/ fractured Quartzite	11.5	200	1	4	55	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
70	Barodi	203	Sandstone & Shale	14.5	2		1	5	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
71	Baruipur	400.06	Alluvium		24.1	9	4	70	Un-consolidated Sediments (Quaternary -Recent)
72	Barukhera	203.12	Deccan Trap	84	72		1	7	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
73	Barwah	130.1	Vindhyan Sandstone	12.58	4.9	40	1	3	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
74	Barwan	200.85	Deccan Trap Basalt	23.15	1.2				
75	Basaniha	171.5	Basalt/ Lameta	39.38			1	36	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
76	Basari	73	Gondwana Sandstone Shale	10.29	8.2	14	5	27	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
77	Bastua	156	Sandstone	3.6	9.07	27	4	107	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
78	Begamganj	178.05	Basalt	10.16	8.48	1	3	83.1	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
79	Begunbari	254.18	Tertiary				1	6	Un-consolidated Sediments (Quaternary -Recent)
80	Belia Primary School	209	Quaternary/Tertiary Sediment	9.13	3.67	7	4	45	Un-consolidated Sediments (Quaternary -Recent)
81	Belma	69.5	Alluvium & Granite	8.73	27.75	9	3	53.5	Un-consolidated Sediments (Quaternary -Recent)

82	Belpukur	245.5	Alluvium				1	18	Un-consolidated Sediments (Quaternary -Recent)
83	Benakar	280	Alluvium / Tertiary				2	33.5	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
84	Bengal Paper Mill, Ballavpur	107.05	Gondwana (Raniganj)	3	6.5	8	2	47	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
85	Beohari-ii	302	Lameta Shale/ Upper Gondwana Sandstone	8.5	16	40	2	97	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
86	Berachampa	334.64	Alluvium		53.02	8	2	138.8	Un-consolidated Sediments (Quaternary -Recent)
87	Berasia	177.55	Basalt	15.33	4.17	6	1	23.55	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
88	Berigopalpur	159.9	Alluvium				1	24	Un-consolidated Sediments (Quaternary -Recent)
89	Beur	211.53	Quaternary Alluvium						
90	Bhadanpur	50.1	Rohtas limestone & Shale	5.59	17	17	2	29	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
91	Bhadas	164.28	Clay with Gravel				3	67.32	Un-consolidated Sediments (Quaternary -Recent)
92	Bhadon	183	Vindhyan Sandstone	12.62	1	46	1	6	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
93	Bhadoura	301.5	Sandstone		0.05		13	197	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
94	Bhagawanpur	250	Tertiary sediments				2	54	Un-consolidated Sediments (Quaternary -Recent)
95	Bhaisanwan	202.4	Sandstone	53	2.2	17	2	71	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
96	Bhaluka	250.9	Alluvium				1	24	Un-consolidated Sediments (Quaternary -Recent)
97	Bhandoli	232	Kankar Sand Gravel Clay	15.65			8	154	Un-consolidated Sediments (Quaternary -Recent)
98	Bharoli	118.75	Alluvium & Basic Rock	26.06	3.42	2	1	6	Intrusive (Archaean -Pre-Cambrian)
99	Bhatar	80.2	Alluvium	10.63	11.79	4	2	30	Un-consolidated Sediments (Quaternary -Recent)
100	Bhatjangla	305.8	Alluvium		61.51	4	2	114	Un-consolidated Sediments (Quaternary -Recent)
101	Bhaundsi	115	Weathered/ fractured Quartzite	3.35	75	35	3	34	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
102	Bhejri	122.1	Basalt/ Lameta	31.68	4.7		1	5.35	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
103	Bhojpur		Vindhyan Sandstone						
104	Bhopal University	49	Deccan Trap & Vindhyan Sandstone with Shale intercalation	5.01	1.33	5	2	16.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
105	Bibagh	121.41	Basalt & Vindhyan Sandstone with Shale intercalation	110	1.18	33	2	25.99	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
106	Bihata	215.3	Sirbu Shale & Sandstone	18.4					
107	Bijha	175.11	Gondwana Sandstone	0.19	4	11	7	93	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
108	Bilaspur	103.2	Sand Silt Clay & Kankar	5	2661	6	7	61.5	Un-consolidated Sediments (Quaternary -Recent)
109	Binpur	145.5	Quaternary/Tertiary Sediment		9.44	4	3	85.5	Un-consolidated Sediments (Quaternary -Recent)
110	Biora	153.28	Basalt Jointed/ Fractured	39.75	2.8		3	33	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)

111	Birohi	252	Alluvium		4.5		4	43	Un-consolidated Sediments (Quaternary -Recent)
112	Bishne Ka Pura	84.3	Alluvium & Dolerite Sill	35.47	14.5	1	4	36	Un-consolidated Sediments (Quaternary -Recent)
113	Bishnupur	251.4	Tertiary sediments		12.56		2	26	Un-consolidated Sediments (Quaternary -Recent)
114	Bishnupur	304.8	Alluvium						
115	Bishnupur Sericulture Complex	182.35	Quaternary Alluvium	25.27	7	3	1	16	Un-consolidated Sediments (Quaternary -Recent)
116	Bishnupur Tourist Complex	162.7	Quaternary Alluvium	18.7	4.16	6	2	67	Un-consolidated Sediments (Quaternary -Recent)
117	Boda (Indira Colony)	117.3	Basalt	22.5	6	31	4	38.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
118	Bodhra	130	Quaternary Sediments		10.8		1	18	Un-consolidated Sediments (Quaternary -Recent)
119	Bondanga	384.17	Older Alluvium & Tertiary Formation		13.43	6	6	304.5	Un-consolidated Sediments (Quaternary -Recent)
120	Bongaon Bakshi Palli	216.3	Alluvium		2.36		1	6	Un-consolidated Sediments (Quaternary -Recent)
121	Boria	85	Deccan Trap	5.1	4.2		1	23.25	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
122	Boselva	203	Clay, Sand, Gravel Quartzite	19	1374	3	7	111	Un-consolidated Sediments (Quaternary -Recent)
123	Bosepukur/ Sonarpur	402.75	Alluvium		2.5	10	2	107	Un-consolidated Sediments (Quaternary -Recent)
124	Brahmanwar	70.1	Alluvium Limestone (dolomite)	6.16	14.67	38	1	20	Un-consolidated Sediments (Quaternary -Recent)
125	Brindabanpur	145.5	Quaternary/Tertiary Sediment	3.59	9.47		3	85.5	Un-consolidated Sediments (Quaternary -Recent)
126	Bud Bud	245.3	Tertiary				3	148	Un-consolidated Sediments (Quaternary -Recent)
127	Bude Donger	202.4	Sandstone & Shale	24.1	0.23				
128	Buniadpur	330.7	Alluvium	3.12	32.25	8	4	220	Un-consolidated Sediments (Quaternary -Recent)
129	Bunidpur	330.7	Alluvium		32.17	8	4	220.6	Un-consolidated Sediments (Quaternary -Recent)
130	Cassimbazar	258.8	Older Alluvium/ Tertiary	4.84	2.5	17	2	24.5	Un-consolidated Sediments (Quaternary -Recent)
131	CGWB Campus-III	305	Vindhyan Sandstone			1	4	60	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
132	Chajpur	458.89	Sand Silt Clay & Kankar	4	1741	16	22	406.5	Un-consolidated Sediments (Quaternary -Recent)
133	Chakdighi	36.4	Alluvium				1	6	Un-consolidated Sediments (Quaternary -Recent)
134	Chakdoba	122.25	Quaternary/Tertiary Sediment	5.63	0.63		1	1.52	Un-consolidated Sediments (Quaternary -Recent)
135	Chamaridol	153.3	Sandstone	9.23	1.82	27	3	27.2	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
136	Chandalhati	250	Alluvium		11.23	1	2	50	Un-consolidated Sediments (Quaternary -Recent)
137	Chandanwas	203.85	Silt Sand Kankar & Clay	2.8	687	9	15	119	Un-consolidated Sediments (Quaternary -Recent)
138	Chandhat	310.5	Clay Kankar Sand Gravel	19.4	746	3	13	240	Un-consolidated Sediments (Quaternary -Recent)
139	Chandu	208.7	Sand Clay mixed with Kankar	6			11	177	Un-consolidated Sediments (Quaternary -Recent)
140	Chandwasa	103	Deccan Trap Basalt	7.3	1.3	26	2	38	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)

141	Chaurai	78	Alluvium, Granite at 71.60 mbgl	16.79	14.2	21	2	16.5	Un-consolidated Sediments (Quaternary -Recent)
142	Chauraria Ka Pura	64	Alluvium & Vindhyan Sandstone	18.45			3	18	Un-consolidated Sediments (Quaternary -Recent)
143	Cheyama		Granite gneiss		0.08	8	1	19.06	Crystalline (Archaean -Pre-Cambrian)
144	Chhaensa	101.5	Clay, Sand, Gravel Quartzite	5			8	67	Un-consolidated Sediments (Quaternary -Recent)
145	Chhilro	107.2	Sand Clay weathered Quartzite	29.47	171	2	1	57	Un-consolidated Sediments (Quaternary -Recent)
146	Chinpai		Granite gneiss						
147	Chirana	461.77	Clay mixed with Sand				23	444	Un-consolidated Sediments (Quaternary -Recent)
148	Chorahata	142.3	Sirbu Shale & Bhander limestone	17.5	0.67	40	1	3	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
149	Chorolakalan	178.6	Deccan Trap	30	120		2	136	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
150	Chorpur	283	Sand Silt Clay & Kankar	4	4541	6	22	221.5	Un-consolidated Sediments (Quaternary -Recent)
151	Choumhon	135	Alluvium & Vindhyan Sandstone	26.1	4.07	12	5	78	Un-consolidated Sediments (Quaternary -Recent)
152	Chtri	203.5	Granite Gneiss	6.7		14	1	3	Crystalline (Archaean -Pre-Cambrian)
153	Churmura (Shallow)	167.54	Gondwana Sandstone	-0.45	5.83	16	3	55	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
154	Cluster-9 Res. Zone of Calcutta Port Trust/ Haldia	250	Quaternary/Tertiary Sediment		33.81	6	3	78	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
155	Dadasia-II	202	Clay, Sand, Gravel Quartzite	4.97	2612	6	4	98	Un-consolidated Sediments (Quaternary -Recent)
156	Dadlana	460	Sand Silt Clay & Kankar	4	605.8	20	13	221	Un-consolidated Sediments (Quaternary -Recent)
157	Dakhin Chatra	165.68	Alluvium		62.88	5	2	99.61	Un-consolidated Sediments (Quaternary -Recent)
158	Dakhin Durgapur	400.97	Alluvium	0.95	22.36	8	3	74	Un-consolidated Sediments (Quaternary -Recent)
159	Dangkarera	148.5	Granite Gneiss	12.98	3.4	27	2	132	Crystalline (Archaean -Pre-Cambrian)
160	Dankuni-II	304	Alluvium	3.71	30.9		5	89	Un-consolidated Sediments (Quaternary -Recent)
161	Daranda	350	Alluvium	11.07	18	4	5	55	Un-consolidated Sediments (Quaternary -Recent)
162	Daspur	400.07	Tertiary sediments		49		1	27	Un-consolidated Sediments (Quaternary -Recent)
163	Dawan	94.5	Alluvium Sandstone	9.31	2.6	37	4	48	Un-consolidated Sediments (Quaternary -Recent)
164	Dawana	168.66	Silt Clay Sand weathered Quartzite	21.6	769		6	163	Un-consolidated Sediments (Quaternary -Recent)
165	Dc Residence	218.15	Clay sity Clay Sand with Kankar	38.1	270	8	12	184	Un-consolidated Sediments (Quaternary -Recent)
166	Debagram	164.7	Alluvium	5.75	3.33	15	1	42.66	Un-consolidated Sediments (Quaternary -Recent)
167	Deenpura	161.78	Alluvium & Vindhyan Sandstone	24	45.8	6	5	74	Un-consolidated Sediments (Quaternary -Recent)

168	Dehgaon-II	200.4	Basalt & Vindhyan Sandstone	5.55	0.47	6	1	159	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
169	Dehrawara	203	Shale	11.3			1	5	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
170	Dengapara	294.2	Tertiary/ Older Alluvium		1.66	6	6	89	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
171	Depal	36.95	Quaternary Sediments				1	3	Un-consolidated Sediments (Quaternary -Recent)
172	Devri Hattai	183	Dolomite	2.66	0.85	41	3	108.5	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
173	Dhamr	112.8	Basalt Vesicular	13.1	2.5	18	1	6	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
174	Dhanvapur	201.59	Sand Clay mixed with Kankar	5			12	187	Un-consolidated Sediments (Quaternary -Recent)
175	Dharapara	304	Alluvium / Tertiary	5.74	8.7	13	2	116	Un-consolidated Sediments (Quaternary -Recent)
176	Dharwada	79	Basalt Vesicular	18.4	7.2	10	1	6	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
177	Dhauj	112	Clay Sand Gravel Kankar	5.2	973	9	15	97.3	Un-consolidated Sediments (Quaternary -Recent)
178	Dhaulagarh	115.4	Sandstone & Shale	10.86	16	41	3	96	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
179	Dhichri	201.3	Alluvium Shale	9.1	2.8	46	2	18	Un-consolidated Sediments (Quaternary -Recent)
180	Dhobaberia	329.39	Quaternary/Tertiary Sediment	6.34	20.1	8	7	248.0	Un-consolidated Sediments (Quaternary -Recent)
181	Dholtukri	511.5	Alluvium		24.69	7	6	421	Un-consolidated Sediments (Quaternary -Recent)
182	Diamind Harbour	304.7	Alluvium				3	132	Un-consolidated Sediments (Quaternary -Recent)
183	Dighal	308.15	Clay mixed with Kankar				12	228	Un-consolidated Sediments (Quaternary -Recent)
184	Digri	139.57	Quaternary/Tertiary Sediment	14.79	10.79		4	72	Un-consolidated Sediments (Quaternary -Recent)
185	Dingel	267.5	Alluvium	6.98	10		1	14	Un-consolidated Sediments (Quaternary -Recent)
186	Ditpur	241.14	Quaternary/Tertiary Sediment	2.36	20.1	11	4	69.88	Un-consolidated Sediments (Quaternary -Recent)
187	Dodhara	198.88	Clay mixed with Silt Sand						
188	Domkal	168.96	Alluvium		52.21	4	5	108.8	Un-consolidated Sediments (Quaternary -Recent)
189	Doni	203	Granite Gneiss	6	0.3		1	4	Crystalline (Archaean -Pre-Cambrian)
190	Dp Colony, Kumarpur	122.25	Gondwana (Panchet)		3.1		6	106.7	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
191	Durgachak	304.7	Quaternary/Tertiary Sediment		38.48	16	4	81.08	Un-consolidated Sediments (Quaternary -Recent)
192	Durgagar	185.3	Sandstone Fractured	58.5	5.5	15	1	3	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
193	Durganagar	206	Alluvium	3.65	11.35	3	3	45	Un-consolidated Sediments (Quaternary -Recent)
194	Egra	228.9	Quaternary/Tertiary Sediment		21.07	2	3	93.63	Un-consolidated Sediments (Quaternary -Recent)
195	Eklara	202.6	Basalt						
196	Falta	304.8	Alluvium						
197	Farakka Asha More	49	Older Alluvium/ Tertiary	10.79	0.5		1	2	Un-consolidated Sediments (Quaternary -Recent)
198	Fathepur	164.58	Tertiary sediments						

199	Fort Gloster/ Bauria	310.9	Alluvium	5.59	58.27	4	3	159	Un-consolidated Sediments (Quaternary -Recent)
200	Fulbari	168.63	Alluvium		20.73	8	6	103.7	Un-consolidated Sediments (Quaternary -Recent)
201	Gadwe Ki Goti	305	Alluvium & Morar Shale	28	43.2	4	3	124	Un-consolidated Sediments (Quaternary -Recent)
202	Gaighata High School	245	Alluvium	5.4	12.48	2	1	18	Un-consolidated Sediments (Quaternary -Recent)
203	Gairatganj	191.7	Basalt	5.29	9.5	5	4	18.6	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
204	Galsi	350.5	Quaternary sediments up to 50m & beyond Upper Tertiary	4.86	19.3	6	3	72	Un-consolidated Sediments (Quaternary -Recent)
205	Gamarbani-I	178	Quaternary Alluvium		27.5	13	4	120.4	Un-consolidated Sediments (Quaternary -Recent)
206	Gangasagar	336	Alluvium	0.61	37.78	12	7	112	Un-consolidated Sediments (Quaternary -Recent)
207	Gangle	229.35	Deccan Trap	4.29	0.5				
208	Garha	110.7	Vindhyan Sandstone	47.5	2.5	46	2	28	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
209	Garhakota	185	Sirbu Shale, Bhander Sand Stone, Ganurgarh Shale & Rewa Sandstone	11.69	0.67	28	1	16	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
210	Garoth	110	Basalt & Vindhyan Sandstone	8.3	1.7		1	10.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
211	Garouli	122.49	Deccan Trap Basalt						
212	Ghamouri	59	Alluvium	5.5	4.4	19	1	4	Un-consolidated Sediments (Quaternary -Recent)
213	Gharraut	229		7.45	378.5	3	1	2.25	Un-consolidated Sediments (Quaternary -Recent)
214	Ghasari	201	Granite Gneiss	9	0.2		1	2	Crystalline (Archaean -Pre-Cambrian)
215	Ghatta	125	Weathered/ fractured Quartzite	16.6	409	6	19	77.2	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
216	Ghoja		Alluvium				1	6	Un-consolidated Sediments (Quaternary -Recent)
217	Ghopari	39.8	Sandstone	12.69	11.44	4	3	128	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
218	Ghunwara	190.9	Alluvium, Sirbu Shale & Siltstone	2.83	0.15	9	2	93	Un-consolidated Sediments (Quaternary -Recent)
219	Ghurisa	229	Tertiary sediments						
220	Goalberia	589.5	Alluvium	0.95	57.8	15	8	85	Un-consolidated Sediments (Quaternary -Recent)
221	Goalpara Ward No-I	251.93	Alluvium	3.68	9.39	12	2	30	Un-consolidated Sediments (Quaternary -Recent)
222	Gobindpur	81.1	Quaternary Alluvium	4.5	31.28	8	2	22.8	Un-consolidated Sediments (Quaternary -Recent)
223	Gohar	103.5	Alluvium & Morar Shale	10.95	0.5		5	47	Un-consolidated Sediments (Quaternary -Recent)
224	Gohpura	88.85	Gondwana Sandstone/ Dolerite	-0.55	0.42	45	1	4	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
225	Gokarna	267.7	Tertiary/ Older Alluvium		3.46		3	50	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
226	Gokulgarh	153.5	Clay				4	94.27	Un-consolidated Sediments (Quaternary -Recent)
227	Gonara	30	Quaternary Sediments				1	6	Un-consolidated Sediments (Quaternary -Recent)
228	Gopalpur	112	Sandstone Fractured	64.06	6.5	2	1	3	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
229	Gopalpur	304.7	Quaternary Sediments				4	65.9	Un-consolidated Sediments (Quaternary -Recent)

230	Gopalpur Takaiya	168.8	Vindhyan Sandstone	39.2	7.1		3	64	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
231	Gopinathpir		Gondwana (Raniganj)						
232	Gorabazar	250.4	Older Alluvium/ Tertiary	6.88	10.03	2	1	15	Un-consolidated Sediments (Quaternary -Recent)
233	Gowa	200.72	Alluvium			16	1	18	Un-consolidated Sediments (Quaternary -Recent)
234	Goyala Buzurg	203.5	Deccan Trap	15.15	0.8	29	3	162	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
235	GSI	98	Deccan Trap & Vindhyan Sandstone with Shale intercalation	24.17	10.43	9	1	20	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
236	Gulbara	135.2	Gondwana Sandstone Dolomite	8.58	6.25	35	2	91	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
237	Gumai-gajantala	250	Quaternary/Tertiary Sediment		18.17	5	3	72	Un-consolidated Sediments (Quaternary -Recent)
238	Gumina	52.2		20	563	9	5	26.5	Un-consolidated Sediments (Quaternary -Recent)
239	Guradia Pratap	152.5	Basalt Vindhyan Sandstone	55.8	1.83	9	2	42.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
240	Hadia Rly. Terminal	365.8	Quaternary/Tertiary Sediment						
241	Haiki	156.25	Sandstone		10.25	40	3	109	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
242	Haldia Township						1	0	Un-consolidated Sediments (Quaternary -Recent)
243	Haldia Helipad	400	Tertiary sediments		25		2	45	Un-consolidated Sediments (Quaternary -Recent)
244	Haldia Oil Jetty	301	Quaternary/Tertiary Sediment		24.79	8	4	46.02	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
245	Hardlikalan	189.1	Basalt	3.95	4.93	55	2	47.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
246	Harscla	88.9	Deccan Trap	11.02	6.33	1	1	6.12	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
247	Harsinghpura	203.7	Sand Silt Clay & Kankar	7	2120	6	7	140	Un-consolidated Sediments (Quaternary -Recent)
248	Haryahera	148.15	Weathered/ fractured Quartzite	15			6	70	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
249	Hassangarh	370.24	Clay mixed with Kankar				17	225	Un-consolidated Sediments (Quaternary -Recent)
250	Hathangaon	84.18	Clay Gravel and Kankar	9.4	910	6	3	57	Un-consolidated Sediments (Quaternary -Recent)
251	Heria	132.14	Quaternary Sediments		8.33		1	12	Un-consolidated Sediments (Quaternary -Recent)
252	Hirapur	352	Kankar Sand Gravel Clay	16.6	613	3	14	327.5	Un-consolidated Sediments (Quaternary -Recent)
253	Hiri-I	85.71	Basalt	7.81	3.83	4	2	28	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
254	Hodal	221	Kankar Sand Gravel Clay	13.05	409	5	9	190	Un-consolidated Sediments (Quaternary -Recent)
255	Hometala	190.4	Older Alluvium	6.07	4	9	2	9	Un-consolidated Sediments (Quaternary -Recent)
256	Howrah Municipal Market	609.9	Alluvium	6.92	10	6	2	84.66	Un-consolidated Sediments (Quaternary -Recent)
257	Hussainpur	201	Alluvium	4.9	9.15	2	1	12	Un-consolidated Sediments (Quaternary -Recent)
258	Illambazar	350	Alluvium	14.49	15.75	8	2	38	Un-consolidated Sediments (Quaternary -Recent)

259	Inanpur		Sandstone	5.75	5.54	15	1	3	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
260	Indri	80	Weathered/ fractured Quartzite						
261	Indurkhi	83.85	Alluvium & Dolerites Sill	27.72	9.5	4	1	4.5	Un-consolidated Sediments (Quaternary -Recent)
262	IOC	284	Quaternary/Tertiary Sediment		22.64	6	4	83	Un-consolidated Sediments (Quaternary -Recent)
263	Isagarh	201.3	Vindhyan Sandstone Shale	21.8	4.1	10	2	101	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
264	Isapur-kheri	304.8	Clay mixed with Kankar				6	216	Un-consolidated Sediments (Quaternary -Recent)
265	Jagannathpur	351.77	Alluvium	2.4	6.2	6	1	15	Un-consolidated Sediments (Quaternary -Recent)
266	Jahangirpur	308.76	Clay mixed with Kankar				9	262	Un-consolidated Sediments (Quaternary -Recent)
267	Jahangirpur High School	250.82	Alluvium	3.21	10.6	7	2	27	Un-consolidated Sediments (Quaternary -Recent)
268	Jaisinghgar	303	Gondwana Sandstone	5.59	1.25	24	12	200	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
269	Jalaberia	350	Alluvium		6.26	12	2	61	Un-consolidated Sediments (Quaternary -Recent)
270	Jalchak	249.5	Tertiary sediments		65		4	77	Un-consolidated Sediments (Quaternary -Recent)
271	Jalerhat	60	Alluvium		3.32		1	12	Un-consolidated Sediments (Quaternary -Recent)
272	Jamgram	96	Gondwana (Barakar)	9	0.84		2	51.6	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
273	Jamu Colliery	90.4	Barakar Sandstone	13.65	14	13	8	49	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
274	Jaora Polytechnic	301.5	Basalt Vesicular & Fractured				1	54	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
275	Jarthal	165.55	Clay mixed with Sand and Kankar				2	38.03	Un-consolidated Sediments (Quaternary -Recent)
276	Jasia	307.31	Clay mixed with Kankar				13	231	Un-consolidated Sediments (Quaternary -Recent)
277	Jatipura	241.61	Basalt	8.83	1.77	10	3	70.1	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
278	Jaugram	40.85	Alluvium				1	6	Un-consolidated Sediments (Quaternary -Recent)
279	Jeewaji University	305	Morar Shale	21.97	12.2	5	2	266	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
280	Jemo	232.2	Older Alluvium/ Tertiary	9.06	5.5	4	2	9	Un-consolidated Sediments (Quaternary -Recent)
281	Jemua		Gondwana (Raniganj)						
282	Jhabwa	132.28	Clay mixed with Sand				2	98.76	Un-consolidated Sediments (Quaternary -Recent)
283	Jhajjar	314.55	Clay mixed with Kankar						
284	Jharda	96	Basalt & Vindhyan Slate basement	2.69	0.5	12	1	13	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
285	Jhina Nala	203.1	Bhander limestone & Ganurgarh Shale	12.24	2.58	18	1	5	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
286	Jhinguti	35.4	Alluvium				1	6	Un-consolidated Sediments (Quaternary -Recent)
287	Jiaganj	304.08	Alluvium		55.92	3	1	51.84	Un-consolidated Sediments (Quaternary -Recent)
288	Jigni	83.78	Alluvium	13.07	57.2	4			
289	Joithal	203	Trap	75	1.8		3	101	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)

290	Joypur	251.6	Tertiary sediments		12.6		3	90	Un-consolidated Sediments (Quaternary -Recent)
291	Joyrambati	227.4	Tertiary sediments		22.36		2	85	Un-consolidated Sediments (Quaternary -Recent)
292	Jugpur	152.4	Alluvium		53.46	3	1	79.25	Un-consolidated Sediments (Quaternary -Recent)
293	Junput	257.2	Tertiary sediments				2	26	Un-consolidated Sediments (Quaternary -Recent)
294	Jura	148.4	Alluvium, Bhander limestone & Ganurgarh Shale	11.3	0.21	13	3	69	Un-consolidated Sediments (Quaternary -Recent)
295	Juranpur	341.51	Alluvium		3.21	17	1	12	Un-consolidated Sediments (Quaternary -Recent)
296	Juraula	201.6	Sand Clay mixed with Kankar	11			13	141	Un-consolidated Sediments (Quaternary -Recent)
297	Jwalpapur	138.18	Basalt	4.9	2.8	27	2	54.9	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
298	Kadamtala Bsf Campus	211	Bouldary Formation	10.35	15.58	4	5	60	Un-consolidated Sediments (Quaternary -Recent)
299	Kadwaya	201.3	Basalt & Vindhyan Sandstone	40	3.8	21	2	113	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
300	Kakariya Chirkhan	143.3	Trap	8.53	10.1	58	4	128.8	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
301	Kakdwip	442	Alluvium		41.64	15	3	65.13	Un-consolidated Sediments (Quaternary -Recent)
302	Kalamad (Baraid)	179.1	Sandstone & Shale	14.56	0.25		1	4	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
303	Kaliaganj ITC	149.48	Alluvium	8.34	20	3	1	15	Un-consolidated Sediments (Quaternary -Recent)
304	Kalidanga Dristideep Siksha Niketan	64.8	Laterites & Rajmahal Trap	1.68	3		3	46	Residual Cappings (Cretaceous -Recent)
305	Kalipeeth	79.3	Basalt	44.4	5.5	14	1	22	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
306	Kalna	231	Alluvium						
307	Kalu Barkheri								
308	Kalyangarh, Ashoknagar	253.2	Alluvium	5.3	5	14	2	33	Un-consolidated Sediments (Quaternary -Recent)
309	Kami	79.5	Clay mixed with Gravel	4			6	45.5	Un-consolidated Sediments (Quaternary -Recent)
310	Kanchahia	82.52	Deccan Trap	5.67	4.3	13			
311	Kanchan Khedi	148.55	Basalt Vesicular & Fractured	12.7	3	62	3	110	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
312	Kanchuri	79.7	Alluvium	31.55	2	8	3	32	Un-consolidated Sediments (Quaternary -Recent)
313	Kanderwasa	203	Basalt Vesicular		0.03		1	13	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
314	Kandi Municipality	251.5	Older Alluvium/ Tertiary	10.74	4.88	2	2	133	Un-consolidated Sediments (Quaternary -Recent)
315	Kandra	250	Alluvium upto 50mbgl,Gondwana (Raniganj)		1070	20	4	92	Un-consolidated Sediments (Quaternary -Recent)
316	Kanke		Granite gneiss	4.97	0.97	10	1	2	Crystalline (Archaean -Pre-Cambrian)
317	Kantaberia	95.9	Tertiary	14.22	20.43	4	2	57	Un-consolidated Sediments (Quaternary -Recent)
318	Kantaberia	79.7	Tertiary				2	48.5	Un-consolidated Sediments (Quaternary -Recent)
319	Kanthi	400.55	Quaternary Sediments				1	6	Un-consolidated Sediments (Quaternary -Recent)
320	Kanyapur		Gondwana (Panchet)						
321	Kapasaria	400	Tertiary Sediments		28.4		2	106	Un-consolidated Sediments (Quaternary -Recent)

322	Karanpathar	153.13	Basalt/ Lameta	7.44	3		6	140.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
323	Karaundi	106.5	Basalt	14.1	1	20	3	49.56	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
324	Karedi	116.45	Basalt	19.98	13.25		4	78.45	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
325	Karkeli	202.55	Gondwana Sandstone	7.99	3.73	20	5	155	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
326	Kashipur		Garnetiferous schist		0.05		1	2.48	Crystalline (Archaean -Pre-Cambrian)
327	Kashipur	607.5	Alluvium	3.05	61.58	5	6	125	Un-consolidated Sediments (Quaternary -Recent)
328	Kasiya	203	Deccan Trap	100			3	115	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
329	Katni	70	Alluvium & Gondwana Sandstone	12.27	10.22	14	2	31	Un-consolidated Sediments (Quaternary -Recent)
330	Kaudiya Salaiya	118.2	Gondwana Sandstone	3.7	39	14	5	112	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
331	Kemokhedi	97.5	Alluvium	21.06	8.23		2	23	Un-consolidated Sediments (Quaternary -Recent)
332	Kendrya Gar	203.45	Trap Vesicular	10.4	7.5	30	1	9	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
333	Kenduara	227.08	Quaternary/Tertiary Sediment		19.31	13	4	75.6	Un-consolidated Sediments (Quaternary -Recent)
334	Kervasa	172	Basalt Fractured & vesicular	59.33	5	19	1	12	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
335	Kesiari	403.2	Tertiary sediments		12.15	4	2	60	Un-consolidated Sediments (Quaternary -Recent)
336	Khadawada	196	Basalt	3.56	0.2	12	1	0.7	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
337	Khagra	251.5	Older Alluvium/ Tertiary	7.27	11.5	2	1	18	Un-consolidated Sediments (Quaternary -Recent)
338	Khajuria	158.6	Basalt	5.62	8.2	3	4	146.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
339	Khaliawas	169.47	Sand and Clay	2.55	701	7	2	39.01	Un-consolidated Sediments (Quaternary -Recent)
340	Khamarkulla	330.38	Alluvium		60.74	7	3	137.8	Un-consolidated Sediments (Quaternary -Recent)
341	Khamkhera	143.89	Basalt & Vindhyan Sandstone						
342	Khanyan	192.79	Alluvium			15	2	28	Un-consolidated Sediments (Quaternary -Recent)
343	Kharsand Khurd	117.5	Trap Vesicular	13.12	0.3		1	15.3	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
344	Khayrasol	32	Granite gneiss		1.2		1	1	Crystalline (Archaean -Pre-Cambrian)
345	Khedli Brahaman	101.1	Clay mixed with Kankar				3	39.5	Un-consolidated Sediments (Quaternary -Recent)
346	Khejuri	401.37	Tertiary sediments		53.44		2	44	Un-consolidated Sediments (Quaternary -Recent)
347	Khejuria	103	Vindhyan Sandstone	51.4	7	6	1	14	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
348	Kheora	301	Sand Clay and Kankar	5	4541	7	17	264	Un-consolidated Sediments (Quaternary -Recent)
349	Khera Khajuria	203.1							
350	Kherikalan	350	Clay Sand Gravel Kankar	15	794	6	27	324.5	Un-consolidated Sediments (Quaternary -Recent)
351	Khilchipur	109.8	Basalt	8.61	5	6	3	55.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
352	Khirhani (Piparia)	73	Gondwana Sandstone	15.95	8.5	3	2	30	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
353	Khujner-II	171	Basalt	33.42	2.8	43	4	91	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
354	Khurd	94.85	Alluvium & Morar Shales	7.16	3.33	26	1	7	Un-consolidated Sediments (Quaternary -Recent)

355	Kirnahar	350	Older Alluvium & Tertiary Formation	4.07	1.66	18	3	14	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
356	Kirpalpur	50.8	Bhander limestone				1	22	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
357	Kishorenagar	30	Quaternary Sediments		1.1		1	6	Un-consolidated Sediments (Quaternary -Recent)
358	Kishupura	159	Alluvium & Vindhyan Sandstone				6	71	Un-consolidated Sediments (Quaternary -Recent)
359	Kona	307.85	Alluvium	10.57	58.65	5	3	186	Un-consolidated Sediments (Quaternary -Recent)
360	Kondal	182.75		2.91	900	7	4	22	Un-consolidated Sediments (Quaternary -Recent)
361	Korali	290.5	Kankar Sand Gravel Clay	13.85	745	4	14	239	Un-consolidated Sediments (Quaternary -Recent)
362	Kotar	142.3	Alluvium, Sirbu Shale, Bhander limestone & Ganurgarh Shale	9.5	0.58	35	1	18	Un-consolidated Sediments (Quaternary -Recent)
363	Kotasur	235	Older Alluvium & Tertiary Formation				2	100.9	Un-consolidated Sediments (Quaternary -Recent)
364	Koteshwar	274	Alluvium & Morar Shale	12.85	13.18	14	3	174	Un-consolidated Sediments (Quaternary -Recent)
365	Kotulpur	227.4	Tertiary sediments		22.36		2	80	Un-consolidated Sediments (Quaternary -Recent)
366	Krishnanagar	264.45	Alluvium	4.51	11.5	5	6	77	Un-consolidated Sediments (Quaternary -Recent)
367	Krishnanagar Mirik	73	Fractured Formation	0.71	7.3	18	2	47	Un-consolidated Sediments (Quaternary -Recent)
368	Kulana	230.73	Clay mixed with Kankar						
369	Kulberia	201.4	Quaternary Sediments		10		1	24	Un-consolidated Sediments (Quaternary -Recent)
370	Kulgachi	230.91	Alluvium	1.75	13.33	3	1	18	Un-consolidated Sediments (Quaternary -Recent)
371	Kulhari	202.2	Shale & Sandstone	19.26	2	39	1	3	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
372	Kulpi	311.4	Alluvium				3	89.03	Un-consolidated Sediments (Quaternary -Recent)
373	Kumarpur	250	Quaternary/Tertiary Sediment	19.82	4.48	3	7	143	Un-consolidated Sediments (Quaternary -Recent)
374	Kurali	601.7	Alluvium		35.98	5	5	142.97	Un-consolidated Sediments (Quaternary -Recent)
375	Kusmi	196.9	Sandstone & Shale of Gondwana formation		0.01		7	149	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
376	Ladusa	66.29	Deccan Trap Basalt	4.46	0.42				
377	Lakhakhera	92.8	Gondwana Sandstone	12.41	15.72	4	3	45	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
378	Lalchapar-II	261.05		5	2728	8	14	230.75	Un-consolidated Sediments (Quaternary -Recent)
379	Laskarhat	243	Alluvium	3.3	7.85	17	1	30	Un-consolidated Sediments (Quaternary -Recent)
380	Lasudia Ramth-I	184	Basalt	3.35	1.13	45	6	131.2	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
381	Laughata	350.6	Tertiary		6.61		5	200	Un-consolidated Sediments (Quaternary -Recent)
382	Limboda	153.1	Basalt	7.93	0.7		2	54.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
383	Loha	194.75	Trap Vesicular	50.4	6.3	24	1	10.25	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
384	Lohari	124.15	Vesicular Basalt	61.3	3		1	8	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)

385	Ludhawali	156.2	Sandstone & Shale	11.44	18.08	6	3	41	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
386	Lukwasa (Shallow)	28	Alluvium & Basalt	7.5	0.03		2	7	Un-consolidated Sediments (Quaternary -Recent)
387	Lukwasa-II	148.6	Basalt & Sandstone	5.4	0.1		1	8	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
388	Machalpur	152.5	Basalt	1.49	2.3	45	1	8	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
389	Machand	130.6	Alluvium	16.56	0.14	15	2	10	Un-consolidated Sediments (Quaternary -Recent)
390	Madhupur	232.5	Older Alluvium/ Tertiary	6.01	2.5	20	3	74	Un-consolidated Sediments (Quaternary -Recent)
391	Madhutali		Granite	3.93	0.33	18	1	2.49	Crystalline (Archaean -Pre-Cambrian)
392	Madwas	300.4							
393	Magurkhali	180	Alluvium		18	3	1	20	Un-consolidated Sediments (Quaternary -Recent)
394	Maharajpur	250.8	Alluvium/ Morar Shale	9.3	3.67	5	4	170.2	Un-consolidated Sediments (Quaternary -Recent)
395	Mahidpur	113.4	Basalt & Sandstone	36.8	8.7	8	1	9	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
396	Mahishadal	298.7	Quaternary/Tertiary Sediment				5	126.5	Un-consolidated Sediments (Quaternary -Recent)
397	Mahu	203.3	Basalt	3.75	2.2	44			
398	Mahua	164.75	Alluvium & Vindhyan Sandstone	23.04	8.38	2	2	164.8	Un-consolidated Sediments (Quaternary -Recent)
399	Mahula	254.26	Older Alluvium/ Tertiary	2.1	16		1	10	Un-consolidated Sediments (Quaternary -Recent)
400	Mahuwagaon	114.21	Sandstone	7.28	2.22		6	69	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
401	Maihar Stadium	201.3	Alluvium, Sirbu Shale, Bhander Lime stone & Ganurgarh Shale	27.1	0.52	31	2	52	Un-consolidated Sediments (Quaternary -Recent)
402	Maihar Town	202.3	Sribu Shale & silt stone	6.7	0.77	46	1	8	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
403	Maithna	50	Quaternary Sediments				2	22	Un-consolidated Sediments (Quaternary -Recent)
404	Majhagawan	251.69	Gondwana Sandstone & Cartoceams Shale	0.5	1.33	35	5	129	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
405	Majhgawan	183	Dolomite & Limestone		0.16				
406	Majna	50	Quaternary Sediments				1	9	Un-consolidated Sediments (Quaternary -Recent)
407	Makdon	132.8	Deccan Trap	38.29	120	21	1	12	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
408	Malab	201.92	Clay mixed with Kankar						
409	Manakpur	146.5	Sand Clay and Gravel	6	4164	6	11	131.8	Un-consolidated Sediments (Quaternary -Recent)
410	Manbazar		Granite gneiss		6.64	9	1	2	Crystalline (Archaean -Pre-Cambrian)
411	Mandawar-II	195.85	Deccan Trap/ Basalt	7.79	2.35	45	4	128.1	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
412	Mandilpur	280.51	Alluvium	10.57	58.27	5	4	102.0	Un-consolidated Sediments (Quaternary -Recent)
413	Mandirbazar	446.5	Alluvium						
414	Mangolkot	60	Alluvium	6.66	32.58	3	1	21	Un-consolidated Sediments (Quaternary -Recent)
415	Maniar	141.9	Sandstone & Shale	28.4	14	6	4	83	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)

416	Manikpara	178.8	Quaternary/Tertiary Sediment	16.5	7.34	4	2	70	Un-consolidated Sediments (Quaternary -Recent)
417	Mankar	250.5	Alluvium / Tertiary		1070	20	4	92	Un-consolidated Sediments (Quaternary -Recent)
418	Manora	114.49	Basalt	4.71	5.42	5	3	90	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
419	Manpur	158.16	Gondwana Sandstone	4.43	1.9	11	4	66	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
420	Marora	168.09	kanker mixed with Clay and Sand						
421	Masani	179.98	Clay mixed with Sand				2	170.9	Un-consolidated Sediments (Quaternary -Recent)
422	Mau	170.8	Deccan Trap/ Basalt	17.4	2.5	43	2	24	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
423	Mau (Kitti)	55.2	Alluvium Dolerite Sill	4.13	0.44	4	2	24	Un-consolidated Sediments (Quaternary -Recent)
424	Mayureswar	200.44	Older Alluvium & Tertiary Formation	9.32	3.5	17	1	15	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
425	Meopur	78.1	Alluvium & Granite	16.54	37.53		1	14	Un-consolidated Sediments (Quaternary -Recent)
426	Mewali	186.86	Basalt & Vindhyan Sandstone						
427	Milanpally High School Ward No-7	215.54	Alluvium	3.1	22.14	4	3	47	Un-consolidated Sediments (Quaternary -Recent)
428	Mirgauti	124	Rohtas Limestone & Shale	6.93	14.67	10	2	21.5	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
429	Mirhati High School	350.02	Alluvium	5.4	10.6	2	1	24	Un-consolidated Sediments (Quaternary -Recent)
430	Mirkheri	171.33	Deccan Trap Basalt	4.05	3.22	15	6	166.3	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
431	Mogalda		Granite gneiss				1	0	Crystalline (Archaean -Pre-Cambrian)
432	Mohamad Bazar	74	Granite gneiss	5.95	2		1	5	Crystalline (Archaean -Pre-Cambrian)
433	Mohammadpur Gujjar	79.3	Weathered/ fractured Quartzite	14			4	41	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
434	Mohanpur	129.4	Sand Silt Clay & weathered Quartzite	12.82	358		9	104.5	Un-consolidated Sediments (Quaternary -Recent)
435	Mohinipara	236	Alluvium	6.4	0.37	3	2	62	Un-consolidated Sediments (Quaternary -Recent)
436	Mohishila	95	Gondwana		0.5		2	64	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
437	Mondalhat	243.62	Alluvium		10	3	2	22	Un-consolidated Sediments (Quaternary -Recent)
438	Montore		Granite gneiss	3.78	2.21	13	2	16	Crystalline (Archaean -Pre-Cambrian)
439	Mormajra	303.28	Kankar Clay and Sand	3.88	3388	12	21	267	Un-consolidated Sediments (Quaternary -Recent)
440	Moti Mahal	280.6	Alluvium/ Morar Shale	16.87	8.8	18	3	121	Un-consolidated Sediments (Quaternary -Recent)
441	Motirampur	121.78	Quaternary/Tertiary Sediment		10		1	24	Un-consolidated Sediments (Quaternary -Recent)
442	Mudia Pahar	201.3	Morar Shale	25.9	11.6	7	4	163	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
443	Mugaberia	202.5	Tertiary sediments				1	18	Un-consolidated Sediments (Quaternary -Recent)
444	Mujeri	212	Clay, Sand, Gravel Quartzite	16.77	1487.5	4	8	181	Un-consolidated Sediments (Quaternary -Recent)
445	Mundla	178.2	Deccan Trap/ Basalt	26.51	7	15	3	95	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)

446	Mundlaram	203.45	Basalt Vesicular & Fractured	9.42	0.8	66	1	11	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
447	Musaidpur	200	Sand peeble and boulder	9	450	6	8	114	Un-consolidated Sediments (Quaternary -Recent)
448	Mustal	508.29	Tertiary Formation	3.27	45.23	13	6	259.8	Un-consolidated Sediments (Quaternary -Recent)
449	Nagda	201.6	Deccan Trap	17.5	342	30	2	27	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
450	Nagod	203.3	Alluvium, Sirbu Shale, Bhander Limestone, Ganurgarh Shale	29.8	3	34	3	56	Un-consolidated Sediments (Quaternary -Recent)
451	Nagrakonda Health Centre	36	Granite gneiss		2.3		1	1	Crystalline (Archaean -Pre-Cambrian)
452	Nagri/ Siuri-I Block	70	Granite gneiss	3.5	5.28	5	2	18	Crystalline (Archaean -Pre-Cambrian)
453	Nahara	433.12	Clay mixed with Sand				9	406	Un-consolidated Sediments (Quaternary -Recent)
454	Nai Sarai	136.35	Laterite, Basalt & Sandstone	8.24	3.91	12	2	37	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
455	Nakpul Village	160	Alluvium	1.65	8		1	24	Un-consolidated Sediments (Quaternary -Recent)
456	Nalvikhurd	306.2	Sand Silt Clay & Kankar	3.62	3785	12	2	30	Un-consolidated Sediments (Quaternary -Recent)
457	Nalwa	203.2	Trap Vesicular	14.72			1	12.2	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
458	Namkhana	312	Alluvium				5	96.2	Un-consolidated Sediments (Quaternary -Recent)
459	Namli	172.97	Basalt Vesicular	86	4.48		1	2.97	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
460	Nandavta	203.45	Basalt Vesicular & Fractured	28.3			1	18	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
461	Nanur	87	Gondwana (Raniganj)	5.35	5.06	3	4	29	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
462	Narayangarh	229.21	Tertiary sediments				3	58.21	Un-consolidated Sediments (Quaternary -Recent)
463	Narghat	300	Tertiary sediments				2	28	Un-consolidated Sediments (Quaternary -Recent)
464	Narrah	24.86	Quaternary Alluvium		2.3		1	9	Un-consolidated Sediments (Quaternary -Recent)
465	Narsinghgarh	201.6	Deccan Trap	2.75	96	52	1	9	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
466	Narsingpur Block	254.3	Older Alluvium/ Tertiary				1	11	Un-consolidated Sediments (Quaternary -Recent)
467	Narwar	200.1	Granite Gneiss	5.72	1.5	53	1	3	Crystalline (Archaean -Pre-Cambrian)
468	Nasirbas	153.62	Clay mixed with Sand				5	144.8	Un-consolidated Sediments (Quaternary -Recent)
469	Natagarh	250.09	Alluvium	10.7	11.03	3	1	20	Un-consolidated Sediments (Quaternary -Recent)
470	Nathupura	78.15	Weathered/ fractured Quartzite	23			4	44	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
471	Natungram	37	Quaternary Alluvium		2.3		1	6	Un-consolidated Sediments (Quaternary -Recent)
472	Naulatha	304.8	Sand Silt Clay & Kankar	6.16	3258	8	12	260	Un-consolidated Sediments (Quaternary -Recent)
473	Naval Selection Centre	91.17	Basalt Fractured & Vesicular	2.72	0.37	44			
474	Nawada Fatehpur	222.36	Sand Clay mixed with Kankar	16			9	167	Un-consolidated Sediments (Quaternary -Recent)
475	Nayagaon	203	Sandstone, Shale & Granite Gneiss	16	0.8	38	1	6	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
476	Negua	420.97	Tertiary sediments		65	7	4	77	Un-consolidated Sediments (Quaternary -Recent)

477	Nekpur	320	Clay Gravel and Kankar	4			11	241.5	Un-consolidated Sediments (Quaternary -Recent)
478	Neulia	167.9	Alluvium		62.19	3	3	140.31	Un-consolidated Sediments (Quaternary -Recent)
479	Nimpith	320.9	Alluvium						
480	Nirdi Panth	104.35	Deccan Trap	1.95	1.25	13	2	27.4	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
481	Nirtala	88.88	Deccan Trap Basalt	4.68	0.67	37	1	2	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
482	Nischintapur	49	Older Alluvium	3.55	1.2		1	4	Un-consolidated Sediments (Quaternary -Recent)
483	NIT NH-II	149	Clay, Sand, Gravel Quartzite	29.95	315	5	4	40	Un-consolidated Sediments (Quaternary -Recent)
484	NIT NH-III	118.5	Clay, Sand, Gravel Quartzite	34.97	200	4	7	66	Un-consolidated Sediments (Quaternary -Recent)
485	NIT NH-V	249.25	Clay, Sand, Gravel Quartzite	34.5	216	6	4	142	Un-consolidated Sediments (Quaternary -Recent)
486	Nityanandapur	165.68	Alluvium	19.9	13.5	10	3	86.71	Un-consolidated Sediments (Quaternary -Recent)
487	Nitynandapur	55	Alluvium				1	6	Un-consolidated Sediments (Quaternary -Recent)
488	Nizampur	202.5	Granite Gneiss		1.5	48	1	2.5	Crystalline (Archaean -Pre-Cambrian)
489	Nowada	305.1	Alluvium		45.61	6	1	45.6	Un-consolidated Sediments (Quaternary -Recent)
490	Nunhad	93.65	Alluvium & Vindhyan Sandstone	12.87	50.78	16	2	20	Un-consolidated Sediments (Quaternary -Recent)
491	Nurgarh	201	Sand Clay mixed with Kankar	15			10	116	Un-consolidated Sediments (Quaternary -Recent)
492	Obaidullaganj	125.38	Basalt & Vindhyan Sandstone				1	2.75	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
493	Onda Village	102	Quaternary Alluvium	9.78	6.42	9	3	29	Un-consolidated Sediments (Quaternary -Recent)
494	Orgram	61.9	Alluvium	18.25	35	3	2	22	Un-consolidated Sediments (Quaternary -Recent)
495	Pachhi-jatan	461.2	Clay mixed with Kankar				23	417	Un-consolidated Sediments (Quaternary -Recent)
496	Pachor	176.9	Deccan Trap/ Basalt	6.64	1	17	2	16	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
497	Padla	160.2		18	398	9	7	54.5	Un-consolidated Sediments (Quaternary -Recent)
498	Padojela	306.83	Bouldary Formation (Bhabar)	4.48	33.47	9	10	110.69	Un-consolidated Sediments (Quaternary -Recent)
499	Padora	101	Sandstone & Shale	16.8	3	2	1	3	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
500	Pahari	200.76	Sand klay mixed with Kankar	14	205	5	9	169	Un-consolidated Sediments (Quaternary -Recent)
501	Pairdoba	158.48	Quaternary Alluvium		34.44	12	4	60.96	Un-consolidated Sediments (Quaternary -Recent)
502	Pal Phanda	116.6	Trap Vesicular	25.9	20.5	27	2	64	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
503	Palri	39.5	Sand peeble and boulder				1	12	Un-consolidated Sediments (Quaternary -Recent)
504	Pammekhera	197.8	Sand peeble and boulder	5	295	6	21	190	Un-consolidated Sediments (Quaternary -Recent)
505	Panagarh	120	Alluvium / Tertiary						
506	Panchal	271.6	Quaternary Alluvium	2.8	24.61	10	4	218	Un-consolidated Sediments (Quaternary -Recent)
507	Panchgaon	130.5	Weathered Quartzite	44			3	68	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
508	Pangalthu	245	Kankar Sand Gravel Clay	5.3			9	204	Un-consolidated Sediments (Quaternary -Recent)
509	Panihar	274.5	Morar Shale	45.2	14.4		1	7.3	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
510	Panpatha	160	Gondwana Sandstone	0.43	2.13	52	5	65	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)

511	Papiaka	111.7	Weathered/ fractured Quartzite	20			6	48	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
512	Papond	28	Bijawar Sandstone						
513	Parosa Majra Rawatpura	104.2	Alluvium Vindhyan Sandstone	22.2	17	2	7	66	Un-consolidated Sediments (Quaternary -Recent)
514	Parsulia	172.3	Deccan Trap/ Basalt	-0.35	1.5	42	6	101.3	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
515	Parulia		Tertiary	0.54	22.85	7	2	36	Un-consolidated Sediments (Quaternary -Recent)
516	Pat	202.1	Deccan Trap		84		2	105	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
517	Patharchapri Data Babar Bagan	88	Granite gneiss	1.27	0.11		6	57.8	Crystalline (Archaean -Pre-Cambrian)
518	Patharia	171.39	Basalt	24.93	5	17	3	103.6	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
519	Patiram	327.75	Alluvium		61.87	7	2	26.25	Un-consolidated Sediments (Quaternary -Recent)
520	Paulpara	400.06	Alluvium						
521	Pawai	108.7	Alluvium Quartz Sandstone	21.48	50.78	4	3	29	Un-consolidated Sediments (Quaternary -Recent)
522	Phanda	309.46	Basalt	18.12	0.57	41	1	0.7	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
523	Phe Colony,Sharma Farm	281.9	Alluvium & Dolerite	10.72	20	3	3	202.5	Un-consolidated Sediments (Quaternary -Recent)
524	Phed, Ismail	109	Gondwana (Panchet)	17.12	46.8		2	51.2	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
525	Phoolpur (Baroda)	124.4	Granite Gneiss	4.02	0.05		1	2	Crystalline (Archaean -Pre-Cambrian)
526	Pilighata	193	Basalt	12.1	6		2	35	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
527	Pinana	308.76	Clay mixed with Kankar				16	277	Un-consolidated Sediments (Quaternary -Recent)
528	Pingla	95.6	Quaternary/Tertiary Sediment				1	12	Un-consolidated Sediments (Quaternary -Recent)
529	Pingleshwar	203.25	Deccan Trap	7.14	2	42	3	55	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
530	Pipliya-kalan	205.4	Deccan Trap/ Basalt	23.19	2.8	50	4	153.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
531	Pipraha	122.16	Basalt/ Lameta	30	6	20	1	10	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
532	Piprai	146.4	Basalt Fractured	32.1	11.5	13	1	14.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
533	Piprai	87	Alluvium	25.29	16.02	11			
534	Piragpura	114.65	Weathered Quartzite & Sand	15.24	683	6	7	67.5	Un-consolidated Sediments (Quaternary -Recent)
535	Piranpura	124.42					7	103	Un-consolidated Sediments (Quaternary -Recent)
536	Pirthla	290.5	Clay Kankar Sand Gravel	11.8			20	263.5	Un-consolidated Sediments (Quaternary -Recent)
537	Pohri	203.4	Shale & Sandstone	50	2.8	61	2	43	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
538	Porsa-I	107.43	Alluvium	18.32	33.7	4	2	54	Un-consolidated Sediments (Quaternary -Recent)
539	Porsa-II	117	Alluvium	17.98	30.83	5	1	32.5	Un-consolidated Sediments (Quaternary -Recent)
540	Potashpur	32.65	Quaternary Sediments		6.67		1	12	Un-consolidated Sediments (Quaternary -Recent)
541	Pratapdighi	30	Quaternary Sediments				1	6	Un-consolidated Sediments (Quaternary -Recent)

542	Pratappur	26.9	Quaternary Alluvium	4.5	3.75	6	1	6	Un-consolidated Sediments (Quaternary -Recent)
543	Prithipura	121.7	Alluvium & Morar Shale	12.42	23.9	19	2	20.5	Un-consolidated Sediments (Quaternary -Recent)
544	Raghunathpur	196.7	Tertiary				2	60	Un-consolidated Sediments (Quaternary -Recent)
545	Raghunathpur		Porphyritic granite		0.49	18	2	49.24	Crystalline (Archaean -Pre-Cambrian)
546	Raipur	159	Basalt Vesicular	12.6	5.64		1	6	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
547	Raisina	106	Weathered/ fractured Quartzite	18			6	72.5	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
548	Raja Gas Godown	305	Morar Shale	28.7	16.5	2	4	138.7	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
549	Rajakhedi	124	Basalt Fractured & vesicular	73	4	1	1	10	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
550	Rajaulka	244	Clay Kankar Sand Gravel		5		16	197.5	Un-consolidated Sediments (Quaternary -Recent)
551	Rajnagar	41	Granite gneiss		1.2		2	16	Crystalline (Archaean -Pre-Cambrian)
552	Rajnagar PHC Compound	52.5	Granite Gneiss	5.5	1.2		2	24	Crystalline (Archaean -Pre-Cambrian)
553	Rajnulan	145.51	Sandstone	26	0.69	24			
554	Rajpur	612.6	Alluvium						
555	Rajpura	185.32	Clay mixed with Kankar						
556	Ramgar	203.3	Rohtas limestone & Shale	203.3					
557	Ramkishorepur	200.01	Alluvium	5.97	10.42		1	9	Un-consolidated Sediments (Quaternary -Recent)
558	Ramkrishna Mission Asansol	84.2	Gondwana (Panchet)						
559	Ramkrishna Mission Ashram	250	Quaternary/Tertiary Sediment	6.38	7.25	7	2	140	Un-consolidated Sediments (Quaternary -Recent)
560	Ramnagar	146.64	Quaternary/Tertiary Sediment		10		1	15	Un-consolidated Sediments (Quaternary -Recent)
561	Rampur	203.3	Sirbu Shale, Bhander limestone & Ganurgarh Shale				1	3	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
562	Ramsagar	118.35	Quaternary Alluvium	18.8	8.33		2	47	Un-consolidated Sediments (Quaternary -Recent)
563	Ranihati	259.08	Alluvium	2.31	43.15	9	2	96.31	Un-consolidated Sediments (Quaternary -Recent)
564	Raoli	105.37	Clay and weathere Quartzite				2	18.28	Un-consolidated Sediments (Quaternary -Recent)
565	Rasmohini	242	Gondwana Sandstone/ Shale	4.77	15.67	15	2	104.5	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
566	Rathiwas	192.4	Sand Clay mixed with Kankar	11.4	632	9	15	167.5	Un-consolidated Sediments (Quaternary -Recent)
567	Ratibar	242	Basalt	47	0.15	2	3	145.22	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
568	Rawatpura (Sani)	80.62	Alluvium & Dolerites Sill	16.64	1.5	17	1	24	Un-consolidated Sediments (Quaternary -Recent)
569	Reshampura	51.2	Sandstone weathered	15.65	19	5	1	17	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
570	Rewas Deora-II	189.1	Basalt	9.87	0.58	18	3	35.73	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
571	Rinda	194.5	Deccan Trap Basalt	6.35	11.66		2	39.1	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
572	Rithuria	224.02	Clay mixed with Kankar						

573	Rivara	201.3	Rohtas limestone & Shale	201.3					
574	Rjoor	80.7	Alluvium	8.62	35.64	6	2	33	Un-consolidated Sediments (Quaternary -Recent)
575	Rohat	399	Clay mixed with Sand				17	349	Un-consolidated Sediments (Quaternary -Recent)
576	Rohtak (Stadium)	350.52							
577	Rojri	238.5	Deccan Trap	7.53	3.36	3	1	4.1	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
578	Rudranagar	605.17	Alluvium		23.93	12	3	74	Un-consolidated Sediments (Quaternary -Recent)
579	Runija	148.5	Trap Vesicular						
580	Rupatganj	306.1	Quaternary Alluvium	3.1	23.28	6	4	106.75	Un-consolidated Sediments (Quaternary -Recent)
581	Rupnagar Natoli	182.35	Clay Kankar Sand	32			17	175.5	Un-consolidated Sediments (Quaternary -Recent)
582	Rupur	254	Older Alluvium/ Tertiary	9.03	8.5	7	1	15	Un-consolidated Sediments (Quaternary -Recent)
583	Sabang	30	Quaternary Sediments				1	6	Un-consolidated Sediments (Quaternary -Recent)
584	Safedpura	118.75	Alluvium	32.5	8.3	12	2	27	Un-consolidated Sediments (Quaternary -Recent)
585	Sainthia	195.64	Alluvium	9	8.2	8	3	44	Un-consolidated Sediments (Quaternary -Recent)
586	Sakraya	110	Alluvium	28.27	11.8	10	2	8	Un-consolidated Sediments (Quaternary -Recent)
587	Salaheri	222.2	Clay mixed with Kankar						
588	Salarpur	203.5	Granite Gneiss	11	0.4	38	2	112	Crystalline (Archaean -Pre-Cambrian)
589	Salbari	153	Bouldary Formation (Bhabar)	3.33	16.7	15	4	118	Un-consolidated Sediments (Quaternary -Recent)
590	Salboni		Meta- sediments		3.21	19	1	5	Crystalline (Archaean -Pre-Cambrian)
591	Salboni	229.66	Quaternary/Tertiary Sediment	15.34	12.43	7	6	89.5	Un-consolidated Sediments (Quaternary -Recent)
592	Salda	198.12	Quaternary Alluvium/ Tertiary sediments						
593	Sandawata	210.3	Deccan Trap/ Basalt	8.06	2.6	29			
594	Sanjay Colony (Ballabgarh)	31.3	Clay, Sand, Gravel Quartzite	12.66	746	2	3	17	Un-consolidated Sediments (Quaternary -Recent)
595	Sanjeet	122	Basalt 0-120 & Vindhyan Shale at 120.0 mbgl	-0.35	2.17	63	2	6	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
596	Sanko	32.4	Alluvium				1	6	Un-consolidated Sediments (Quaternary -Recent)
597	Santhawari	61.62	Clay Gravel and Quartzite				6	38	Un-consolidated Sediments (Quaternary -Recent)
598	Santuri		Granite gneiss	2.79	0.97	6	1	1.87	Crystalline (Archaean -Pre-Cambrian)
599	Sarai	83	Sandstone	3.1	2.85	31	1	34	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
600	Sarangpur	110.8	Deccan Trap/ Basalt	63.2	10.5	45	1	9.1	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
601	Sarborimore		Sandstone	14.32	3.32	20	1	12	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
602	Sarwar	118.12	Basalt	20.66	4	30	3	102.4	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
603	Satanwara	166.25	Shale	16.85	0.5		2	37.15	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)

604	Satna	203.3	Sirbu Shale, Bhander limestone & Ganurgarh Shale	19.5	0.49	30	2	67	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
605	Satpara	172.39	Basalt	7.86	8.33	24	2	28.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
606	Sector-21 Huda	215.5	Clay Silty Clay mixed with Kankar	34.94	270	6	7	159	Un-consolidated Sediments (Quaternary -Recent)
607	Sector-25	251	Clay, Sand, Gravel Quartzite	16.2	1365	6	8	177	Un-consolidated Sediments (Quaternary -Recent)
608	Sector-29 Huda	229.86	Clay sity Sand with Kankar				13	177	Un-consolidated Sediments (Quaternary -Recent)
609	Sector-3 (Ballabgarh)	165	Clay, Sand, Gravel Quartzite	20.61	6629	6	10	136	Un-consolidated Sediments (Quaternary -Recent)
610	Sector-45 Huda	250	Clay sity Sand with Kankar	20.71	480	9	6	163	Un-consolidated Sediments (Quaternary -Recent)
611	Sector-56 Huda	236	Clay sity Sand with Kankar	17.78	480	6	8	121	Un-consolidated Sediments (Quaternary -Recent)
612	Sector-8	212	Clay, Sand, Gravel Quartzite	23.92	795	6	9	127	Un-consolidated Sediments (Quaternary -Recent)
613	Sector-9	212	Clay, Sand, Gravel Quartzite	24.89	1079	6	13	174	Un-consolidated Sediments (Quaternary -Recent)
614	Sehora	195.5	Granite Gneiss	7.32	0.3		1	2	Crystalline (Archaean -Pre-Cambrian)
615	Sehrai	59.9	Alluvium/ Sandstone	12.5	2.8	31	1	4	Un-consolidated Sediments (Quaternary -Recent)
616	Sethpukur	400.07	Alluvium		27.5	4	4	122	Un-consolidated Sediments (Quaternary -Recent)
617	Shadora	122	Sandstone Fractured	18.9	1.1	14	2	18	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
618	Shahjadpur	164.9	Sand Kankar Gravel and Clay		3259	11	3	92.05	Un-consolidated Sediments (Quaternary -Recent)
619	Shamaspur	224.03	Clay mixed with Kankar				3	173.73	Un-consolidated Sediments (Quaternary -Recent)
620	Shamgarh-I	97.6	Basalt		0.67	1	2	22	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
621	Shampura	201.3	Vindhyan Sandstone	12.95	1.8	49	1	6	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
622	Shankarpur	251	Tertiary sediments				2	54	Un-consolidated Sediments (Quaternary -Recent)
623	Shantiniketan	403	Older Alluvium & Tertiary Formation	9.17	26.8	8	12	254	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
624	Shekhpura	316.61	Sand Silt Clay & Kankar	5	1930	15	5	116.5	Un-consolidated Sediments (Quaternary -Recent)
625	Shivpuri	202	Sandstone & Shale	18	1.5		2	27	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
626	Shyam Basu Chak	414.5	Alluvium						
627	Shyamdihi	122.25	Gondwana		3.6				
628	Sikandar Kampu	190.25	Alluvium Shale	17.1	55	2	2	49	Un-consolidated Sediments (Quaternary -Recent)
629	Simlon	32.25	Alluvium				1	6	Un-consolidated Sediments (Quaternary -Recent)
630	Sinduria-i	29.6	Deccan Trap/ Basalt	27.88	10.4	2	2	19.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
631	Singarkone	31.75	Alluvium				1	6	Un-consolidated Sediments (Quaternary -Recent)
632	Singhan	142.4	Sandstone & Shale		0.5	48	1	10	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
633	Sirishberia	83.5	Achaeans	2	0.17		1	1	Crystalline (Archaean -Pre-Cambrian)
634	Sitamau	122	Basalt				1	1	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
635	Sitarampur	414.5	Alluvium						
636	Siuri	76	Granite gneiss		3.5		2	8	Crystalline (Archaean -Pre-Cambrian)

637	Siuri Jail	81	Granite gneiss	6.5	1.47		2	25	Crystalline (Archaean -Pre-Cambrian)
638	Sobhapur								
639	Sohagpur (Shallow)	195.08	Barakar Sandstone with intercalations of coal scans	8.95	1.2	36	4	44	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
640	Sohana	85	Weathered/ fractured Quartzite	14	170	9	1	23	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
641	Soja	305		305					
642	Sonakhali	209.94	Alluvium				2	83	Un-consolidated Sediments (Quaternary -Recent)
643	Sonamukhi	251.4	Quaternary Alluvium		10.5		2	35	Un-consolidated Sediments (Quaternary -Recent)
644	Sondhed	231.15	Clay Sand Gravel Kankar	9.6			21	214.5	Un-consolidated Sediments (Quaternary -Recent)
645	Sondhi	291.5	Clay mixed with Kankar	20	870	8	3	25	Un-consolidated Sediments (Quaternary -Recent)
646	Sonway	82.68	Deccan Trap	12.47	1.8	11	1	6.1	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
647	Sorili	193	Alluvium & Morar Shale	19.89	6.3	26	3	82	Un-consolidated Sediments (Quaternary -Recent)
648	Sri Chaitanya College, Habra	250.4	Alluvium	5.43	10.78	3	1	18	Un-consolidated Sediments (Quaternary -Recent)
649	Sripur	85	Gondwana (Barren Measures)	14	1.05		2	56	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
650	Srirampur	250.15	Alluvium	9.87	9.33	3	2	44	Un-consolidated Sediments (Quaternary -Recent)
651	Ssb Campus, Ranidanga	183	Bouldary Formation	8.34	20	3	5	98	Un-consolidated Sediments (Quaternary -Recent)
652	Sujwari	346	Clay Kankar Sand Gravel	20.13	1250	6	14	305	Un-consolidated Sediments (Quaternary -Recent)
653	Sukna	181	Bouldary Formation	2.91	1.5	20	7	101	Un-consolidated Sediments (Quaternary -Recent)
654	Sumarkhera	166.2	Trap	22.45	9	31	2	33.5	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
655	Suptha	120.15	Deccan Trap	120.1					
656	Suravisthan	350.81	Alluvium	4.17	19.17	2	3	33	Un-consolidated Sediments (Quaternary -Recent)
657	Surpura	171	Alluvium Vindhyan Sandstone	23.55	15.3	3	1	8	Un-consolidated Sediments (Quaternary -Recent)
658	Survaya	203	Sandstone,Shale & Granite	2.7	0.5	46	1	6	Consolidated Sediments (Pre-Cambrian -Devonian & other ages)
659	Sutahata	400	Tertiary sediments		25.3		2	40	Un-consolidated Sediments (Quaternary -Recent)
660	Swarnamoyee	251.2	Older Alluvium/ Tertiary	3.42	11.47	11	2	33	Un-consolidated Sediments (Quaternary -Recent)
661	Taharpur	351.51	Alluvium		6.68	5	1	24	Un-consolidated Sediments (Quaternary -Recent)
662	Tajpur	203	Basalt	27.1	1.2	30	2	35	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
663	Tajpur	152.4	Tertiary sediments						
664	Takenpur	274	Sandstone weathered	3.9	7.2		2	15	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
665	Takipur	304.08	Alluvium	2.97	48.06	5	3	67.59	Un-consolidated Sediments (Quaternary -Recent)
666	Talajuri		Garnetiferous schist		0.33	10	1	1.33	Crystalline (Archaean -Pre-Cambrian)
667	Talen	150.4	Deccan Trap/ Basalt						

668	Tamluk	249.55	Quaternary Sediments				3	46	Un-consolidated Sediments (Quaternary -Recent)
669	Tansar	156.25	Sandstone	19.5	1.73	20	3	88	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
670	Tarapur Dhuliyan	115.57	Older Alluvium/ Tertiary	2.82	27.89	4	3	66.5	Un-consolidated Sediments (Quaternary -Recent)
671	Tatulara	182.88	Tertiary sediments						
672	Tengra	452.6	Alluvium	1.84	39.87	17	4	207.65	Un-consolidated Sediments (Quaternary -Recent)
673	Thakurpara	205.29	Tertiary sediments		10	24	4	107	Un-consolidated Sediments (Quaternary -Recent)
674	Tharad	97.6	Basalt & Vindhyan Sandstone	11	1.83		1	6	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
675	Thatipur	298.9	Alluvium/ Morar Shale	14.55	20	1	2	253	Un-consolidated Sediments (Quaternary -Recent)
676	Thekraka	52.5	Clay Gravel and Kankar	5.12	850	5	4	37	Un-consolidated Sediments (Quaternary -Recent)
677	Thoo Kalan	116.5	Deccan Trap	51.6					
678	Thukral	178	Deccan Trap	41.5	270		1	28	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
679	Tikar	42	Sandstone	13.96	1.82	29	2	12.6	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
680	Tumboni	75	Rajmahal Trap	75					
681	Udaipur	201.3	Alluvium,Sirbu Shale, Bhander Lime stone & Ganurgarh Shale	13.1	0.87	52	3	164	Un-consolidated Sediments (Quaternary -Recent)
682	Udotgarh	141	Alluvium & Vindhyan Sandstone	26.92	12.42	4	5	46.5	Un-consolidated Sediments (Quaternary -Recent)
683	Uksa	302.79	Lameta Shales/ Upper Gondwana Sandstone	7.4	13.25	8	9	162	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
684	Uleta Hassanpur	205.18	Sand Clay mixed with Kankar	8			11	187.5	Un-consolidated Sediments (Quaternary -Recent)
685	Uluberia	590	Alluvium	1.71	9.97	6	4	232	Un-consolidated Sediments (Quaternary -Recent)
686	Unchagaon	303	Clay Gravel Kankar	9.5	462	2	18	265	Un-consolidated Sediments (Quaternary -Recent)
687	Unchehara	191.9	Alluvium, Sirbu Shale & Sandstone	14.6	0.25	15	1	14.6	Un-consolidated Sediments (Quaternary -Recent)
688	Unhel	191.25	Deccan Trap	17.42	2	25	3	119	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
689	Utawar	149.36	Clay, Sand, Gravel Quartzite	15			5	47.5	Un-consolidated Sediments (Quaternary -Recent)
690	Uttar Chirail	61.2	Alluvium				1	21	Un-consolidated Sediments (Quaternary -Recent)
691	Vidisha	110.29	Deccan Trap Basalt Vindhyan Sandstone	6.43	2.25	17	2	34.8	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)
692	Vijpur	64.5	Alluvium,Bundelkhand Granite	19.25	28.8	4	1	12	Un-consolidated Sediments (Quaternary -Recent)
693	Yakhera	158.5	Sandstone Fractured	18.5	2.6	34	1	10	Semi-Consolidated Sediments (Carboniferous -Pliocene & other)
694	Zirapur	158.6	Deccan Trap/ Basalt	12.49	5.2	36	2	35.8	Volcanic Flows & Inter-trapeans (Cretaceous -Eocene -Recent)

Annexure VI: Salient features of Hydro-Meterological Stations

A. Salient features of Hydro- meterological Stations									
Sl. No.	Name	Type	Independent River	Regional office	Division	Drainage area (Sq.km.)	Zero of Gauge (m)	Station bank	Status
1.	A.B. Road Crossing	GDSQ	Bhagirathi	K & G BO, Hyderabad	Wainganga Division, Nagpur			Left	Existing
2.	Agra (J.B)	G	Ganga	YBO, New Delhi	L Yamuna Div., Agra				Existing
3.	Agra (P.G)	GDSQ	Ganga		L Yamuna Div., Agra	49052	146.00	Right	Existing
4.	Ahirwalia	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	8030	53.00	Right	Existing
5.	Akbarpur	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	800	78.00	Left	Existing
6.	Aklera	GDSQ	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Left	Existing
7.	Ankinghat	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
8.	Araria	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	3937	45.41	Right	Existing
9.	Arnota	GD	Ganga	YBO, New Delhi	L Yamuna Div., Agra	8811	134.00	Left	Existing
10.	Auli-SHO		Ganga	IBO, Chandigarh	Snow Hyd. Shimla				Existing
11.	Auraiya	GDSQ	Ganga	YBO, New Delhi	L Yamuna Div., Agra	26133	99.00	Left	Existing
12.	Ayodhya	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	80889	85.00	Right	Existing
13.	Azamabad	GDSQ	Ganga	LGBO, Patna	M Ganga Div. V, Patna	943460	22.77	Right	Existing
14.	Azamgarh	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	4600	62.00	Left	Existing
15.	B.K. Ghat	G	Ganga		M Ganga Div. I, Lucknow	43804	131.24	Left	Existing
16.	Badrinath	GD	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	1285	3107	Right	Existing
17.	Bageshwar	GD	Ganga						Closed
18.	Baghpat	GD	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
19.	Baijnath			YBO, New Delhi					Existing
20.	Ballia	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	544355	45.00	Left	Existing
21.	Balpahari Barrage Site	G	Hooghly	B & B BO, Shillong	NEI Div. III, Itanagar	5348			Existing
22.	Balpahari Dam Axis	G	Hooghly	B & B BO, Shillong	NEI Div. III, Itanagar				Existing
23.	Balrampur	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	8219	98.00	Right	Existing
24.	Baltara	GDSQ	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	88480	25.75	Right	Existing
25.	Banbasa	G	Ganga		M Ganga Div. I, Lucknow	15820	214.00	Right	Existing
26.	Banda	GDSQ	Ganga	YBO, New Delhi	L Yamuna Div., Agra	27616	89.00	Left	Existing
27.	Bani	G	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
28.	Bansi	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	9575	77.28	Left	Existing

29.	Baranwada	GDSQ	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Left	Existing
30.	Bareilly	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
31.	Barkisuriya	GD	Hooghly		Damodar Div., Asansol	2680	286.86	Left	Existing
32.	Barod	GDSQ	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Left	Existing
33.	Basoda	GD	Ganga	YBO, New Delhi	L Yamuna Div., Agra	7525	386.83	Left	Existing
34.	Basti	GDQ	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	3005	76.94	Left	Existing
35.	Basua	G	Ganga		M Ganga Div. IV, Patna	108000	45.00	Left	Existing
36.	Bausan	GD	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
37.	Bazarsaw	GD	Bhagirathi	LGBO, Patna	L Ganga Div., Berhampur			Left	Existing
38.	Bedepara	G	Ganga	LGBO, Patna	L Ganga Div., Berhampur			Right	Existing
39.	Benibad	GD	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	6160	40.00	Left	Existing
40.	Berhait	GD	Ganga	LGBO, Patna	L Ganga Div., Berhampur			Right	Existing
41.	Berhampore	GDSQ	Bhagirathi	LGBO, Patna	L Ganga Div., Berhampur			Left	Existing
42.	Berinag			YBO, New Delhi					Existing
43.	Bewar	G	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
44.	Bhagalpur	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	939250	23.39	Right	Existing
45.	Bhatparani	GDQ	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	2255	64.09	Left	Closed
46.	Bhatpurwaghat	G	Ganga	UGBO, Lucknow					Existing
47.	Bhikiasen	G	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
48.	Bhind	GD	Ganga	YBO, New Delhi	L Yamuna Div., Agra	5568	119.00	Right	Existing
49.	Bhinga	GD	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	6151	114.00	Right	Existing
50.	Bhitaura	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
51.	Biogod	GD	Ganga	YBO, New Delhi				Right	Existing
52.	Birdghat	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	20093	66.70	Left	Existing
53.	Birpur	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	108000	67.67	Left	Existing
54.	Biswanathpur	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna				Existing
55.	Buxar	GDSQ	Ganga	LGBO, Patna	M Ganga Div. V, Patna	604630	50.72	Right	Existing
56.	Chandradeepghat	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	1100	84.00	Right	Existing
57.	Chandrapuri	G	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	1297	847.00		Existing
58.	Chanpatia	G	Ganga		M Ganga Div. IV, Patna	1464	68.80	Right	Existing
59.	Chapra	GDSQ	Ganga	LGBO, Patna	L Ganga Div., Berhampur			Left	Existing
60.	Chargharia	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	10160	44.44	Left	Existing
61.	Chatia	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	31520	62.00	Left	Existing
62.	Chhapra (Makhdumganj)	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	127825	43.33	Left	Existing
63.	Chhatnag (Allahabad)	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	463971	69.00	Left	Existing
64.	Chillaghat	G	Ganga		L Yamuna Div., Agra	356642	79.00	Right	Existing
65.	Chittogarh at River Berach	GDSQ	Ganga	YBO, New Delhi				Right	Closed

66.	Chittorgarh	GD	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Left	Existing
67.	Chopan	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	46198	155.00	Right	Existing
68.	Colonelganj	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	1842	94.91	Left	Existing
69.	D.P. Ghat	G	Ganga	LGBO, Patna	Damodar Div., Asansol	562	51.73	Left	Existing
70.	Dabri	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
71.	Dadri	GD	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
72.	Dalmau	G	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
73.	Dalten Ganj	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	8210	205.00	Right	Existing
74.	Darauli	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	124730	56.00	Left	Existing
75.	Delhi Rly Bridge	GDSQ	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi	18552	197.00	Right	Existing
76.	Deoprayag (B)	GDQ	Bhagirathi	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	7813	452.00	Right	Existing
77.	Deoprayag (G)	GDSQ	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	19600	443.00	Left	Existing
78.	Dhaneta	GD	Ganga	UGBO, Lucknow					Closed
79.	Dhansa	GD	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
80.	Dharamnagari	G	Ganga	UGBO, Lucknow					Existing
81.	Dharchula	G	Ganga	YBO, New Delhi	Planning & investigation, Faridabad				Existing
82.	Dhareri	GD	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Left	Existing
83.	Dheng Bridge	GDSQ	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	3790	65.00	Left	Existing
84.	Dhengra Ghat	GD	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	10160	30.00	Right	Existing
85.	Dholpur	GDSQ	Ganga	YBO, New Delhi	L Yamuna Div., Agra	138123	115.00	Left	Existing
86.	Dighaghat	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	844020	42.00	Right	Existing
87.	Duddhi	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	5169	200.00	Left	Existing
88.	Dumariaghat	GDS	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	38605	56.00	Right	Existing
89.	Durgapur Barrage	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	19554		Left	Existing
90.	Ekmighat	GDSQ	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	4197	38.50	Left	Existing
91.	Elginbridge	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	74713	97.57	Left	Existing
92.	English Bazar	GDQ	Ganga	LGBO, Patna	L Ganga Div., Berhampur			Left	Existing
93.	Etawah	GDSQ	Ganga	YBO, New Delhi	L Yamuna Div., Agra	98715	114.00	Left	Existing
94.	Farakka	GDSQ	Ganga	LGBO, Patna	L Ganga Div., Berhampur			Right	Existing
95.	Farakka (Feeder Canal)	GDSQ	Ganga	LGBO, Patna	L Ganga Div., Berhampur			Right	Existing
96.	Fatehganj (East)	GD	Ganga	UGBO, Lucknow					Closed
97.	Fatehgarh	GDSQ	Ganga	UGBO, Lucknow					Existing
98.	Gaighat	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	4594	124.50	Left	Existing
99.	Gaisabad	GD	Ganga	YBO, New Delhi	L Yamuna Div., Agra	6300	295.44	Right	Existing
100.	Galeta	GDQ	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi	4841	209.00	Right	Existing
101.	Galgalia	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna				Existing
102.	Gandhi Ghat	GDSQ	Ganga	LGBO, Patna	M Ganga Div. V, Patna	64630	40.00	Right	Existing

103.	Gandhisagar Dam	G	Ganga	YBO, New Delhi					Existing
104.	Gangpur Siswan	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	127000	51.00	Left	Existing
105.	Garhakota	G	Ganga	YBO, New Delhi	L Yamuna Div., Agra	1775	357.00	Right	Existing
106.	Garhamukteshwar	GDSQ	Ganga	UGBO, Lucknow					Existing
107.	Garrauli	GDSQ	Ganga	YBO, New Delhi	L Yamuna Div., Agra		195.00	Left	Existing
108.	Gaya	GDQ	Ganga	LGBO, Patna	M Ganga Div. V, Patna	3171	103.58	Right	Existing
109.	Ghat	GDQ	Ganga		M Ganga Div. I, Lucknow	3900	450.00	Right	Existing
110.	Ghazipur	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	524023	49.00	Left	Existing
111.	Gheropara	G	Bhagirathi		Damodar Div., Asansol	5960	34.00	Left	Existing
112.	Giridih (Seasonal)	G	Hooghly		Damodar Div., Asansol	630		Right	Existing
113.	Gokul Barrage	GQ	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
114.	Goverdheyghat	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	9950	348.00	Right	Existing
115.	Hajipur	G	Ganga		M Ganga Div. V, Patna	44830	44.50	Left	Existing
116.	Hamirpur	GDQ	Ganga	YBO, New Delhi	L Yamuna Div., Agra	276763	88.00	Right	Existing
117.	Hanskhali	GDQ	Hooghly	LGBO, Patna	L Ganga Div., Berhampur			Left	Existing
118.	Hanuman Chetty-SHO		Ganga	IBO, Chandigarh	Snow Hyd. Shimla				Existing
119.	Hardwar	G	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	23029	0.00	Right	Existing
120.	Harinkhola	GDS	Hooghly		Damodar Div., Asansol	21310	4.00	Right	Existing
121.	Haripur	G	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi			Left	Existing
122.	Harsil-SHO		Bhagirathi	IBO, Chandigarh	Snow Hyd. Shimla			Right	Existing
123.	Hathidah	GDSQ	Ganga	LGBO, Patna	M Ganga Div. V, Patna	904130	40.31	Right	Existing
124.	Hayaghat	GDSQ	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	12973	35.00	Right	Existing
125.	Hendgir	G	Ganga	LGBO, Patna	Damodar Div., Asansol	2770	361.86	Right	Existing
126.	Hetimpur	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	675	73.00	Right	Existing
127.	Indrapuri	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	66390	102.40	Left	Existing
128.	Islampur	GDQ	Bhagirathi	LGBO, Patna	L Ganga Div., Berhampur			Left	Existing
129.	Jahangirabad	GD	Ganga	UGBO, Lucknow					Closed
130.	Jainagar	GDSQ	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	2131	64.00	Right	Existing
131.	Jalalpur	GQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	119697	64.00	Right	Existing
132.	Jamalpur	GDS	Hooghly	LGBO, Patna	Damodar Div., Asansol				Existing
133.	Jamtara	GDSQ	Bhagirathi		Damodar Div., Asansol	2912	135.00	Right	Existing
134.	Japla	GDSQ	Ganga		M Ganga Div. V, Patna	65466	122.34	Right	Existing
135.	Jateion Barrage	G	Ganga	YBO, New Delhi					Existing
136.	Jauljibi	GD	Ganga		M Ganga Div. I, Lucknow	2150	600.00	Left	Existing
137.	Jaunpur	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	17667	65.00	Right	Existing
138.	Jhanjharpur	GDSQ	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	2945	44.33	Left	Existing
139.	Jhawa	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	12100	29.24	Right	Existing

140.	Jhokoo	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	5815	210.00	Right	Existing
141.	Jhulaghat	G	Ganga	YBO, New Delhi	Planning & investigation, Faridabad				Existing
142.	Joshimath	GD	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	4508	1375	Left	Existing
143.	Jubbal Sho-I		Ganga	IBO, Chandigarh	Snow Hyd. Shimla	4.86			Existing
144.	Jubbal Sho-II		Ganga	IBO, Chandigarh	Snow Hyd. Shimla	4.86			Existing
145.	Kachlabridge	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
146.	Kadirganj	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	1590	18.89	Right	Existing
147.	Kahalgaon	G	Ganga		M Ganga Div. V, Patna	942990	25.19	Right	Existing
148.	Kaimaha	G	Ganga	YBO, New Delhi	L Yamuna Div., Agra		210.57	Left	Existing
149.	Kakarahi	GD	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	4192	79.69	Right	Existing
150.	Kakardhari	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	5926	127.27	Right	Existing
151.	Kalagarh	G	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
152.	Kalanaur	GDQ	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
153.	Kalna (Ebb)	GDSQ	Bhagirathi	LGBO, Patna	L Ganga Div., Berhampur				Existing
154.	Kalna (Flow)	GDSQ	Bhagirathi	LGBO, Patna	L Ganga Div., Berhampur				Existing
155.	Kalpi	GD	Ganga	YBO, New Delhi	L Yamuna Div., Agra	264251	90.00	Right	Existing
156.	Kamtaul	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	1441	44.00	Left	Existing
157.	Kangsabati Dam	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	3629		Left	Existing
158.	Kannauj (Gurnatia)	G	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
159.	Kanpur	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
160.	Karanprayag	GD	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	2294	0.00	Left	Existing
161.	Karnal	GD	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
162.	Kasganj	GD	Ganga	UGBO, Lucknow					Closed
163.	Katwa (Purbast Hali)	GDSQ	Bhagirathi	LGBO, Patna	L Ganga Div., Berhampur			Left	Existing
164.	Khadda	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	37845	92.00	Right	Existing
165.	Khagaria	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	12180	28.00	Left	Existing
166.	Kharidwar	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	1286	128.60	Right	Existing
167.	Kharra	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	5500	394.00	Left	Existing
168.	Khatoli	GDSQ	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Left	Existing
169.	Khetikhan			YBO, New Delhi					Existing
170.	Kinjer	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	3810	61.68	Right	Existing
171.	Koelwar	GDSQ	Ganga	LGBO, Patna	M Ganga Div. V, Patna	71000	50.97	Left	Existing
172.	Konar Dam	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	997		Right	Existing
173.	Kora	GDQ	Ganga	YBO, New Delhi	L Yamuna Div., Agra	754.8	102.00	Left	Existing
174.	Kota	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	5900	155.00	Left	Closed
175.	Kufri-SHO		Ganga	IBO, Chandigarh	Snow Hyd. Shimla				Existing

176.	Kuldah Bridge	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	23276	234.00	Right	Existing
177.	Kursela	G	Ganga		M Ganga Div. IV, Patna	108000	23.00	Left	Existing
178.	Kushkarni	G	Ganga	LGBO, Patna	Damodar Div., Asansol	91	96.00	Left	Closed
179.	Labha	GDQ	Ganga	LGBO, Patna	L Ganga Div., Berhampur			Left	Existing
180.	Lakhisarai	GDQ	Ganga	LGBO, Patna	M Ganga Div. V, Patna	2619	38.26	Right	Existing
181.	Lalbegia Ghat	GD	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	6900	55.00	Right	Existing
182.	Lalganj	GDSQ	Ganga	LGBO, Patna	M Ganga Div. V, Patna	42520	45.37	Left	Existing
183.	Lalgarh	G	Ganga	LGBO, Patna	Damodar Div., Asansol	4884	45.28	Left	Existing
184.	Lalpur	GD	Ganga	YBO, New Delhi	L Yamuna Div., Agra	5929	106.00	Right	Existing
185.	Lucknow (Hanuman Setu)	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
186.	Maharo	GD	Maharo	LGBO, Patna	Damodar Div., Asansol	399	125.83	Left	Existing
187.	Mahidpur	GDSQ	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Right	Existing
188.	Mahua	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	1753	43.70	Left	Existing
189.	Maighat	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	30042	62.00	Left	Existing
190.	Maithon Dam	GD	Hooghly		Damodar Div., Asansol	5310		Right	Existing
191.	Mandawara	GD	Ganga	YBO, New Delhi				Right	Existing
192.	Manderial	GD	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Left	Existing
193.	Mandla	GD	Ganga	YBO, New Delhi	L Yamuna Div., Agra	22069	166.00	Right	Existing
194.	Maner	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	71265	43.00	Right	Existing
195.	Maniram	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	2730	68.00	Left	Existing
196.	Mankatha	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	14177	33.29	Left	Existing
197.	Marora	GD	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	2040	547.00	Left	Existing
198.	Masani	GD	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
199.	Massanjore Dam	GD	Bhagirathi	LGBO, Patna	Damodar Div., Asansol	1860		Left	Existing
200.	Mathura	G	Ganga		U Yamuna Div., New Delhi	47360	160.00	Right	Existing
201.	Matigara	GDSQ	Ganga	B & B BO, Shillong	L Brahmaputra Div., Jalpaiguri	260	119.00	Left	Existing
202.	Mawi	GDSQ	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
203.	Mejja Road	GDQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	17388	63.00	Right	Existing
204.	Mirzapur	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	485277	60.00	Right	Existing
205.	Mohammad Ganj	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	11019	141.28	Right	Existing
206.	Mohana	GDSQ	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi	27670	185.00	Right	Existing
207.	Mohana	GD	Ganga	YBO, New Delhi	L Yamuna Div., Agra	41054	109.00	Left	Existing
208.	Mohanpur	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	5777	22.25	Right	Existing
209.	Moradabad	GDQ	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
210.	Moradabad	G	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
211.	Motipur	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	1389	134.00	Right	Existing
212.	Mukhlishpur	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	5440	72.00	Left	Existing

213.	Munger	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	931390	32.00	Right	Existing
214.	Nahargarh	GD	Ganga	YBO, New Delhi	Chambal Div., Jaipur				Existing
215.	Naini	G	Ganga		L Yamuna Div., Agra	368302	70.00	Left	Existing
216.	Nandadih	GD	Hooghly		Damodar Div., Asansol	6125		Right	Existing
217.	Nandadih(HOIW)	GDS	Hooghly	B & B BO, Shillong	NEI Div. III, Itanagar	5348			Existing
218.	Nandkeshri	GD	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	1296	0.00	Left	Existing
219.	Narayan Ashram			YBO, New Delhi					Existing
220.	Narayanpur	G	Bhagirathi	LGBO, Patna	Damodar Div., Asansol	9085		Left	Existing
221.	Narhan	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	2550	63.00	Right	Existing
222.	Narora Barrage	G	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
223.	Naugaon	GD	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
224.	Naula	G	Ganga	UGBO, Lucknow					Closed
225.	Nautghat	G	Ganga	YBO, New Delhi	L Yamuna Div., Agra	25549	188.00	Left	Existing
226.	Neemsar	GDQ	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
227.	Nimoda	GD	Ganga	YBO, New Delhi					Closed
228.	Nutanhat	GDSQ	Bhagirathi	LGBO, Patna	Damodar Div., Asansol				Existing
229.	Pachauli	GDQ	Ganga	YBO, New Delhi	L Yamuna Div., Agra	6706	421.00	Left	Existing
230.	Palasipara	GD	Bhagirathi					Right	Existing
231.	Pali	GD	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Left	Existing
232.	Paliakalan	GDSQ	Ganga		M Ganga Div. I, Lucknow	17676	148.00	Left	Existing
233.	Palla	GDQ	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi	17324		Right	Existing
234.	Palmer Ganj	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	1280	61.68	Right	Existing
235.	Pancheshwar	GDS	Ganga	YBO, New Delhi	Planning & investigation, Faridabad				Existing
236.	Pancheshwar	G	Ganga	UGBO, Lucknow					Existing
237.	Panchet Dam	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	5478		Left	Existing
238.	Paonta	GDQ	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
239.	Phaphamau	G	Ganga	UGBO, Lucknow	MGD-III	96704	74.00	Right	Existing
240.	Pharsali			YBO, New Delhi					Existing
241.	Phephna	GD	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	7722	54.00	Left	Closed
242.	Phulberia	G	Ganga	LGBO, Patna	Damodar Div., Asansol	575	127.00	Right	Existing
243.	Pipli	GD	Ganga	YBO, New Delhi					Closed
244.	Poornagiri	GDS	Ganga	YBO, New Delhi	Planning & investigation, Faridabad				Existing
245.	Pratapgarh	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	8800	76.00	Right	Existing
246.	Pratappur	GDSQ	Ganga	YBO, New Delhi	L Yamuna Div., Agra	366522	70.00	Right	Existing
247.	Pupunki	GD	Hooghly		Damodar Div., Asansol	7844	149.00	Right	Existing
248.	Raibareli	GDQ	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
249.	Rajapur	GD	Ganga	YBO, New Delhi	L Yamuna Div., Agra	364552	65.00	Right	Existing

250.	Rajghat	G	Ganga	YBO, New Delhi	L Yamuna Div., Agra	16540	335.00	Right	Existing
251.	Rajmahal	G	Ganga	LGBO, Patna	L Ganga Div., Berhampur			Right	Existing
252.	Rameshwar	GDS	Ganga	YBO, New Delhi	Planning & investigation, Faridabad				Existing
253.	Ramgarh	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	1222		Left	Existing
254.	Ramnagar	GD	Ganga	UGBO, Lucknow					Closed
255.	Rampur	G	Ganga	UGBO, Lucknow	M Ganga Div. II, Lucknow				Existing
256.	Rangagora (Purihansa)	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	276	192.21	Right	Existing
257.	Regauli	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	16387	67.00	Left	Existing
258.	Rewaghat	G	Ganga	LGBO, Patna	M Ganga Div. V, Patna	42180	50.10	Left	Existing
259.	Rihand Dam	G	Ganga	UGBO, Lucknow		11350	236.00	Left	Existing
260.	Rishikesh	GDSQ	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	21794	0.00	Right	Existing
261.	Rudraprayag	GD	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	1644	0.00	Left	Existing
262.	Rudraprayag	GDSQ	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	9031	0.00	Left	Existing
263.	Rudraprayag Confluence	G	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	1644	0.00	Left	Existing
264.	Runisaidpur	G	Ganga		M Ganga Div. IV, Patna	6116	48.00	Right	Existing
265.	Rupaligarh	GDS	Ganga	YBO, New Delhi					Existing
266.	Rusera	G	Ganga		M Ganga Div. IV, Patna	10370	35.74	Left	Existing
267.	Sahibganj	G	Ganga	LGBO, Patna	Middle Ganga Division-V, Patna			Right	Existing
268.	Salavad	GD	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Right	Existing
269.	Salempur	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow				Existing
270.	Samasti Pur	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	12180	38.00	Right	Existing
271.	Sangod	GDQ	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Left	Existing
272.	Sanko Ghat	G	Bhagirathi	LGBO, Patna	Damodar Div., Asansol	2555	14.55	Left	Existing
273.	Sarangpur	GD	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Right	Existing
274.	Satna	G	Ganga	UGBO, Lucknow	MGD-III	1172	281.00	Left	Existing
275.	Saulighat	GD	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	1932	45.00	Right	Existing
276.	Seondha	GDSQ	Ganga		L Yamuna Div., Agra	16701	128.00	Left	Existing
277.	Shahijina	GDSQ	Ganga	YBO, New Delhi	L Yamuna Div., Agra	44023	88.00	Left	Existing
278.	Shahjadpur	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	93604	81.00	Left	Existing
279.	Shardanagar	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	18583	130.00	Right	Existing
280.	Sikander Pur	GDSQ	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	8510	46.22	Right	Existing
281.	Sikatia	G	Bhagirathi		Damodar Div., Asansol	2569	160.00	Left	Existing
282.	Silliguri (Champasari)	GDSQ	Ganga	B & B BO, Shillong	L Brahmaputra Div., Jalpaiguri	250	112.00	Right	Existing
283.	Simulia	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	646	203.00	Right	Existing
284.	Sirsa	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	482741	61.00	Right	Closed
285.	Sitamarhi	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	482930	61.00	Left	Existing
286.	Sonapur	GDSQ	Ganga	B & B BO, Shillong	L Brahmaputra Div., Jalpaiguri	750	72.00	Left	Existing

287.	Sonebarsha	G	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	390	78.00	Right	Existing
288.	Srinagar	G	Ganga	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	11332	0.00	Left	Existing
289.	Sripalpur	GDQ	Ganga	LGBO, Patna	M Ganga Div. V, Patna	11975	45.38	Right	Existing
290.	Sultanpur	GDQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	15481	76.00	Right	Existing
291.	Taibpur	GD	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	2507	60.00	Left	Existing
292.	Tajewala/ Hathnikund	G	Ganga	YBO, New Delhi					Existing
293.	Tal	GDSQ	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Left	Existing
294.	Tantloi	GD	Bhagirathi	LGBO, Patna	Damodar Div., Asansol	1431	90.27	Right	Existing
295.	Tawaghat	GD	Ganga		M Ganga Div. I, Lucknow	1225	1080	Right	Existing
296.	Tehri	GDSQ	Bhagirathi	UGBO, Lucknow	Himalayan Ganga Div., Dehradun				Closed
297.	Tehri - Zero Point Bridge	GDSQ	Bhagirathi	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	7208	580.00	Left	Existing
298.	Tejam			YBO, New Delhi					Existing
299.	Tenughat Dam	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	4481	249.02	Right	Existing
300.	Thal	GDQ	Ganga	UGBO, Lucknow					Closed
301.	Tijjam			YBO, New Delhi					Existing
302.	Tilaiya Dam	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	984		Left	Existing
303.	Tilpara Barrage	GD	Bhagirathi	LGBO, Patna	Damodar Div., Asansol	2909		Right	Existing
304.	Tonk	GDSQ	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Right	Existing
305.	Tons Aquaduct	G	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	16311	85.00	Right	Closed
306.	Tribeni	GDSQ	Ganga	LGBO, Patna	M Ganga Div. IV, Patna	37845	101.50	Left	Existing
307.	Trimohinighat	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	2355	74.48	Right	Existing
308.	Tuini (P)	GD	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
309.	Tuini (T)	GDQ	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi				Existing
310.	Tumri	GD	Ganga	YBO, New Delhi	Chambal Div., Jaipur				Existing
311.	Turtipar	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	113088	58.07	Right	Existing
312.	Tusuma	GD	Ganga	LGBO, Patna	Damodar Div., Asansol	1366	138.50	Left	Existing
313.	Udi	GDSQ	Ganga	YBO, New Delhi	L Yamuna Div., Agra	139972	102.00	Left	Existing
314.	Ujjain	GD	Ganga	YBO, New Delhi	Chambal Div., Jaipur			Left	Existing
315.	Uskabazar	G	Ganga	UGBO, Lucknow	M Ganga Div. I, Lucknow	2432	71.00	Right	Existing
316.	Uttarkashi	GDSQ	Bhagirathi	UGBO, Lucknow	Himalayan Ganga Div., Dehradun	4555	1095	Left	Existing
317.	Varanasi	GDSQ	Ganga	UGBO, Lucknow	M Ganga Div. III, Varanasi	489087	57.00	Left	Existing
318.	Yashwant Nagar	GDQ	Ganga	YBO, New Delhi	U Yamuna Div., New Delhi	1349	890.00	Right	Existing

B. Salient features of Flood-Forecasting Stations												
Sl. No.	Site Name	Met Sub Division	River	Type of Forecast	Base Station-1	Travel Time Base Station-1 (hrs)	Base Station-2	Travel Time Base Station-2 (hrs)	FRL (m)	Highest Flood Level (m)	Year of H.F.L	Mode of Collection
1	Agra	West Uttar Pradesh	Ganga	Level	Mathura	2-4				154.76	1978	Wireless/ Telemetry
2	Allahabad (Chatnag)	East Uttar Pradesh	Ganga	Level	Kanpur	30	Chillaghat	24		88.03	1978	Wireless/ Telemetry
3	Ankinghat	East Uttar Pradesh	Ganga	Level	Narora (D/s)	48	Bareilly	48		124.49	2010	Wireless/ Telemetry
4	Auraiya	West Uttar Pradesh	Ganga	Level	Etawah	21-24	Dhaulpur	15-36		118.19	1996	Wireless/ Telemetry
5	Ayodhya	East Uttar Pradesh	Ganga	Level	Elgin Bridge	18-24				94.01	2009	Wireless/ Telemetry
6	Ballia	East Uttar Pradesh	Ganga	Level	Varanasi	28	Jaunpur	28		60.25	2003	Wireless/ Telemetry
7	Balrampur	East Uttar Pradesh	Ganga	Level	Kakardhari	18-24				105.25	2000	Wireless/ Telemetry
8	Balthara	Bihar	Ganga	Level	Basua	24	Hayaghat	24		36.4	1987	Wireless
9	Banda	East Uttar Pradesh	Ganga	Level	Madla	12-18	Kaimaha	9-15		113.29	2005	Wireless/ Telemetry
10	Bansi	East Uttar Pradesh	Ganga	Level	Balrampur	18-24				85.82	1998	Wireless/ Telemetry
11	Bareilly	West Uttar Pradesh	Ganga	Level	Moradabad	28				162.88	1978	Wireless/ Telemetry
12	Basua	Bihar	Ganga	Level	Birpur	16				49.17	2010	Wireless
13	Benibad	Bihar	Ganga	Level	Runisaidpur	24				50.01	2004	Wireless/ Telemetry
14	Bhagalpur	Bihar	Ganga	Level	Gandhighat	32				34.2	2003	Wireless/ Telemetry
15	Buxar	Bihar	Ganga	Level	Allahabad	30				62.09	1948	Wireless/ Telemetry
16	Chatia	Bihar	Ganga	Level	Triveni	24				70.04	2002	Wireless
17	Chhapra	Bihar	Ganga	Level	Gangpur Siswan	16				54.59	1982	Wireless
18	Chillaghat	East Uttar Pradesh	Ganga	Level	Hamirpur	12				105.16	1978	Wireless/ Telemetry
19	Kahalgaon	Bihar	Ganga	Level	Gandhighat	38				32.87	2003	Wireless/ Telemetry
20	Dalmau	East Uttar Pradesh	Ganga	Level	Ankninghat	28	Kanpur	16		99.84	1973	Wireless/ Telemetry
21	Darauli	Bihar	Ganga	Level	Elgin Bridge	54	Gorakhpur	28		61.74	1998	Wireless
22	Delhi Railway Bridge	Haryana, Chandigarh,Delhi	Ganga	Level	Mawi	18-32				207.49	1978	Wireless/ Telemetry
23	Dengraghat	Bihar	Ganga	Level	Taibpur	24	Chargharia	24		38.09	1968	Wireless

24	Dhansa Regulator	Haryana, Chandigarh,Delhi	Ganga	Level	Dadri	48	Masani	48		213.58	1977	Wireless
25	Durgapur Barrage	Gangatic West Bengal	Ganga	Inflow	Varanasi	24	Maithon Dam	24	64.47	64.47	2011	Wireless/ Telemetry
26	Ekmighat	Bihar	Ganga	Level	Saulighat	24				49.52	2004	Wireless/ Telemetry
27	Elgin Bridge	East Uttar Pradesh	Ganga	Level	Katernighat	30-36	Shardanagar	30-36		107.56	2009	Wireless/ Telemetry
28	Etawah	West Uttar Pradesh	Ganga	Level	Agra	20-45				126.13	1978	Wireless/ Telemetry
29	Farakka Barrage	Gangatic West Bengal	Ganga	Level	Bhagalpur	36				25.14	1998	Wireless
30	Gandhisagar Dam	West Madhya Pradesh	Ganga	Inflow	Tal	12-21	Mahidpur	12-20	399.9	399.9	2011	Telemetry
31	Gangpur Siswan	Bihar	Ganga	Level	Turtipar	20				58.01	1983	Wireless
32	Ghazipur	East Uttar Pradesh	Ganga	Level	Allahabad	28	Sultanpur	30		65.22	1978	Wireless/ Telemetry
33	Gheropara	Gangatic West Bengal	Bhagirathi	Level	Jamtara	8-24	Sikata Barrage	8-24		43.94	1978	Wireless
34	Gorakhpur	East Uttar Pradesh	Ganga	Level	Bansi	18-24	Birdghat			77.54	1998	Wireless/ Telemetry
35	Hamirpur	East Uttar Pradesh	Ganga	Level	Auraiya	15				108.59	1983	Wireless/ Telemetry
36	Hanuman Setu	East Uttar Pradesh	Ganga	Level	Bhatpur waghat	48				110.85	1971	Wireless
37	Hardwar	West Uttar Pradesh	Ganga	Level	Deoprayag	9	Marora	6		296.3	2010	Wireless/ Telemetry
38	Harinkhola	Gangatic West Bengal	Hooghly	Level	Durgapur Barrage	20-26				14.58	1978	Wireless/ Telemetry
39	Hathidah	Bihar	Ganga	Level	Gandhighat	16				43.15	1971	Wireless/ Telemetry
40	Hayaghat	Bihar	Ganga	Level	Benibad	24	Ekmighat	24		48.96	1987	Wireless/ Telemetry
41	Hazipur	Bihar	Ganga	Level	Rewaghat	16				50.93	1948	Wireless
42	Inderpuri	Bihar	Ganga	Level	Chopan	12	Daltonganj	12		108.85	1975	Wireless
43	Jaunpur	East Uttar Pradesh	Ganga	Level	Sultanpur	24				77.74	1971	Wireless/ Telemetry
44	Jhanjharpur	Bihar	Ganga	Level	Jainagar	8				53.01	2004	Wireless
45	Jhawa	Bihar	Ganga	Level	Dhengraghat	16	Araria	16		33.51	1987	Wireless
46	Kalpi	West Uttar Pradesh	Ganga	Level	Etawah	21-27	Dhaulpur	15-42		112.98	1996	Wireless/ Telemetry
47	Kamtaul	Bihar	Ganga	Level	Sonebarsa	24				52.99	1987	Wireless/ Telemetry
48	Kangsabati Dam	Gangatic West Bengal	Ganga	Inflow	Simulia	24	Purihalsa	24	134.1	134.71	1978	Wireless
49	Kannauj	West Uttar Pradesh	Ganga	Level	Narora	48				126.78	2010	Wireless
50	Kanpur	East Uttar Pradesh	Ganga	Level	Fathegarh	24	Dabri	24		114.08	2010	Wireless/ Telemetry
51	Khadda	East Uttar Pradesh	Ganga	Level	Triveni	7				97.5	2002	Wireless
52	Khagaria	Bihar	Ganga	Level	Sikandarpur	24	Gandhighat	24		39.22	1976	Wireless
53	Koelwar	Bihar	Ganga	Level	Inderpuri					58.88	1971	Wireless
54	Kursela	Bihar	Ganga	Level	Basua	24	Hathidah	24		32.04	1998	Wireless
55	Lalbeghiaghat	Bihar	Ganga	Level	Chainpatia	24				67.09	1975	Wireless

56	Maithon Dam	Gangatic West Bengal	Hooghly	Inflow	Nandadih	24	Tilaiya Dam	24	150.9	151.79	1959	Wireless/ Telemetry
57	Maner	Bihar	Ganga	Level	Gandhighat	8				53.79	1976	Wireless
58	Massanjore dam	Jharkhand	Bhagirathi	Inflow	Maharo	24	Kusiyari	24	121.3	122.87	1999	Wireless/ Telemetry
59	Mathura	West Uttar Pradesh	Ganga	Level	Mohana	20-33				169.73	1978	Wireless/ Telemetry
60	Mawi	West Uttar Pradesh	Ganga	Level	Kalanur	18-30				232.45	1988	Wireless/ Telemetry
61	Mirzapur	East Uttar Pradesh	Ganga	Level	Dalmau	28	Chillaghat	34		80.34	1978	Wireless/ Telemetry
62	Mohana	East Uttar Pradesh	Ganga	Level	Garrouli	16-21	Nautghat	12-21		133.69	1983	Wireless/ Telemetry
63	Mohanpur	Gangatic West Bengal	Ganga	Level	Kangsabati Dam	24	D P Ghat	24		29.87	1978	Wireless
64	Moradabad	West Uttar Pradesh	Ganga	Level	Kalagarh	36				192.88	2010	Wireless/ Telemetry
65	Munger	Bihar	Ganga	Level	Gandhighat	24				40.99	1976	Wireless/ Telemetry
66	Sikandarpur	Bihar	Ganga	Level	Ahirwala(S)	22				54.29	1987	Wireless
67	Naini	East Uttar Pradesh	Ganga	Level	Chillaghat	18-24				87.99	1978	Wireless/ Telemetry
68	Narayanpur	Gangatic West Bengal	Bhagirathi	Level	Tilpara Barrage	41991				29.69	1995	Wireless
69	Narora Barrage	West Uttar Pradesh	Ganga	Inflow	Haridwar	48						Wireless
70	Panchet Dam	Jharkhand	Ganga	Inflow	Pupunki	24	Tenughat	24	132.6	132.89	1959	Wireless/ Telemetry
71	Dighaghat	Bihar	Ganga	Level	Allahabad	30	Patna	4		52.52	1975	Wireless
72	Patna/ Gandhighat	Bihar	Ganga	Level	Buxar	24	Darauli	24		50.27	1994	Wireless/ Telemetry
73	Phaphamau	East Uttar Pradesh	Ganga	Level	Kanpur	30	Chillaghat	24		87.98	1978	Wireless/ Telemetry
74	Rae-Bareilly	East Uttar Pradesh	Ganga	Level	Bani	48				104.81	1982	Wireless/ Telemetry
75	Rewaghat	Bihar	Ganga	Level	Chatia	20				55.41	1986	Wireless
76	Rishikesh	Uttarakhand	Ganga	Level	Deoprayag	8	Marora	5		341.72	1995	Wireless/ Telemetry
77	Rosera	Bihar	Ganga	Level	Sikandarpur	28				46.35	1987	Wireless
78	Sahibganj	Jharkhand	Ganga	Level	Bhagalpur	22				30.91	1998	Wireless
79	Sahjiana	East Uttar Pradesh	Ganga	Level	Mohana	18-24				108.67	1983	Wireless/ Telemetry
80	Samastipur	Bihar	Ganga	Level	Sikandarpur	20				49.38	1987	Wireless
81	Srinagar	Uttarakhand	Ganga	Level	Rudraprayag	6				536.85	1995	Wireless/ Telemetry
82	Sripalpur	Bihar	Ganga	Level	Kinjer	24				53.91	1976	Wireless
83	Tajewala	Haryana, Chandigarh,Delhi	Ganga	Inflow	Paonta	6						Wireless
84	Tenughat Dam	Jharkhand	Ganga	Inflow	Hendgir	24	Ramgarh	24	268.8	265.56	1985	Wireless/ Telemetry
85	Tilpara Barrage	Gangatic West Bengal	Bhagirathi	Inflow	Massanjore	24	Tantoloi	24	62.79	67.05	1978	Wireless/ Telemetry
86	Turtipar	East Uttar Pradesh	Ganga	Level	Ayodhya	30-36	Gorakhpur	30-36		66	1998	Wireless/ Telemetry
87	Varanasi	East Uttar Pradesh	Ganga	Level	Kanpur	48	Hamirpur	48		73.9	1978	Wireless/ Telemetry

Annexure VII: Inventory of water tourism sites

A. Water Tourism Sites in the Basin						
Sl. No.	**Name**	**Type**	**Waterbody**	**WB Relation**	**District**	**State**
1	Aanand Bag Palace	Fort	Bagmati River	Near by	Darbhanga	Bihar
2	Adibadri	Pilgrimage (Temple)	Somb River	Near by	Yamunanagar	Haryana
3	Ahirouli Mata Ahilya Mandir	Pilgrimage (Temple)	Ganga River	Near by	Buxar	Bihar
4	Akshardham Temple	Pilgrimage (Temple)	Yamuna River	On	East	Delhi
5	Almora	Hill Station	Kosi and Suyal Rivers	Near by	Almora	Uttarakhand
6	Amber Fort	Fort	Maoth Lake	On	Jaipur	Rajasthan
7	Amriti Dam	Dam	Amriti River	On	Jamui	Bihar
8	Asan Barrage	Barrage	Confluence of Eastern Yamuna Canal and Asan River	On	Dehradun	Uttarakhand
9	Badhkhal Lake	Lake	Badhkhal Lake	On	Faridabad	Haryana
10	Badrinath	Pilgrimage (Temple)	Alaknanda River	On	Chamoli	Uttarakhand
11	Bageshwar	Tourist Spot	Confluence of Saryu and Gomti	On	Bageshwar	Uttarakhand
12	Baidyanathdham Temple	Pilgrimage (Temple)	Ganga River	On	Deoghar	Jharkhand
13	Baijnath	Pilgrimage (Temple)	Confluence of Gomti & Ganga	On	Bageshwar	Uttarakhand
14	Bakkhali	Tourist Spot	Bay of Bengal	On	South Twenty Four Parganas	West Bengal
15	Bakreshwar	Pilgrimage (Temple)	Bakreshwar river	On	Birbhum	West Bengal
16	Bankey Bihari Temple	Pilgrimage (Temple)	YamunaRiver	Near by	Mathura	Uttar Pradesh
17	Barabar Hill And Caves	Caves	Falgu	Near by	Jehanabad	Bihar
18	Bari Dam	Dam	Bari dam	On	Chittaurgarh	Rajasthan
19	Bari Ka Talav	Lake	Bari ka Talav	On	Udaipur	Rajasthan
20	Belur Math Temple	Pilgrimage (Temple)	Hooghly River	Near by	Haora	West Bengal
21	Bhalswa Lake	Lake	Bhalswa Lake	On	North	Delhi
22	Bhandarej Step Well	Step Well	Bhandarej Step Well	On	Dausa	Rajasthan
23	Bhangarh	Pilgrimage (Temple)			Jaipur	Rajasthan
24	Bhartari Temple	Pilgrimage (Temple)			Alwar	Rajasthan
25	Bhimbetka	Caves	Ratapani Reservoir	Near by	Raisen	Madhya Pradesh
26	Bhimtal Hill Station	Hill Station	Bhimtal Lake	On	Nainital	Uttarakhand
27	Bhojeshwar Temple	Pilgrimage (Temple)	Betwa River	On	Rajgarh	Madhya Pradesh
28	Bhopal	Tourist Spot	Upper and Lower Lake	Near by	Bhopal	Madhya Pradesh
29	Bhowali	Hill Station			Nainital	Uttarakhand

30	Bihariji Temple	Pilgrimage (Temple)	Ganga River	Near by	Buxar	Bihar
31	Binsar	Major Tourist Spot			Almora	Uttarakhand
32	Birla Mandir	Pilgrimage (Temple)			New Delhi	Delhi
33	Bisalpur	Dam	Bisalpur Reservoir	On	Tonk	Rajasthan
34	Bodh Gaya	Pilgrimage (Temple)	Falgu River	On	Gaya	Bihar
35	Bundi Fort	Fort	Nawal Sagar Lake	Near by	Bundi	Rajasthan
36	Buxar Ka Qila	Fort	Ganga River	Near by	Buxar	Bihar
37	Chachai Waterfall	Waterfall	Bihad river	On	Rewa	Madhya Pradesh
38	Chail	Hill Station	Giri River	Near by	Solan	Himachal Pradesh
39	Chambal Garden	Tourist Spot	Chambal River	On	Kota	Rajasthan
40	Chamoli	Pilgrimage (Temple)	Alaknanda	On	Chamoli	Uttarakhand
41	Champawat	Tourist Spot	RamGanga River	Near by	Champawat	Uttarakhand
42	Chand Baori Step Well	Step Well	Chand Baori Step Well	On	Dausa	Rajasthan
43	Chandi Devi Temple	Pilgrimage (Temple)	Ganga River	On	Hardwar	Uttarakhand
44	Chandika Astahan	Pilgrimage (Temple)	Ganga River	Near by	Munger	Bihar
45	Chitrakoot	Pilgrimage (Temple)	Mandakini River	On	Satna	Madhya Pradesh
46	Chitrgupta Temple	Pilgrimage (Temple)	Ganga River	Near by	Patna	Bihar
47	Chittaurgarh Fort	Fort	Padmawati Pond	On	Chittaurgarh	Rajasthan
48	Chukhamba (Badrinath)	Peak			Chamoli	Uttarakhand
49	Chunar Fort	Fort	Ganga River	On	Mirzapur	Uttar Pradesh
50	Dakshineshwar Temple	Pilgrimage (Temple)	Hooghly River	Near by	North Twenty Four Parganas	West Bengal
51	Damdama Lake	Lake	Damdama Lake	On	Gurgaon	Haryana
52	Daragaah Hazrat Bibi Kamaal	Pilgrimage (Masjid)	Dardha River	Near by	Jehanabad	Bihar
53	Dehradun	Major Tourist Spot	Ganga and Yamuna River	On	Dehradun	Uttarakhand
54	Deo Kund (Suryakund Talab)	Pilgrimage (Temple)	Deo Kund	On	Aurangabad	Bihar
55	Deogarh	Pilgrimage (Temple)	Betwa River and Rajghat Reservoir	On	Lalitpur	Uttar Pradesh
56	Devalgarh	Major Tourist Spot	Alaknanda River	On	Garhwal	Uttarakhand
57	Devprayag	Pilgrimage (Temple)	Confluence of Alaknanda and Bhagirathi	On	Garhwal	Uttarakhand
58	Dhamekstupa	Pilgrimage (Temple)	Ganga River	Near by	Varanasi	Uttar Pradesh
59	Dhari Devi	Pilgrimage (Temple)	Alaknanda	On	Tehri Garhwal	Uttarakhand
60	Diamond Harbour	Natural Harbor	Hooghly River	On	South Twenty Four Parganas	West Bengal
61	Digghi Pokhar(lake)	Lake	Digghi Pokhar	On	Darbhanga	Bihar
62	Dunagiri	Peak			Chamoli	Uttarakhand

63	Durgapur Barrage	Barrage	Damodar River	On	Bankura	West Bengal
64	Dwarahat	Tourist Spot			Almora	Uttarakhand
65	Eklingji Temple	Pilgrimage (Temple)	Banas River	Near by	Rajsamand	Rajasthan
66	Fatehpur sikri	Fort	YamunaRiver	Near by	Agra	Uttar Pradesh
67	Fatehsagar Lake	Lake	Lake Fatehsagar	On	Udaipur	Rajasthan
68	Frazerganj	Tourist Spot	Bay of Bengal	On	South Twenty Four Parganas	West Bengal
69	Gagron Fort	Fort	Ahu and Kali Sindh river sangam	On	Kota	Rajasthan
70	Gaipernath Waterfall	Waterfall		On	Bundi	Rajasthan
71	Galtaji	Pilgrimage (Temple)	Galtaji	On	Jaipur	Rajasthan
72	Gandhi Smriti	Major Tourist Spot			New Delhi	Delhi
73	Ganga Sagar Lake	Lake	Ganga Sagar lake	On	Darbhanga	Bihar
74	Gangasagar	Pilgrimage (Temple)	Muriganga	Near by	South Twenty Four Parganas	West Bengal
75	Gangotri	Glacier	Ganga River	Near by	Uttarkashi	Uttarakhand
76	Gangotri	Pilgrimage (Temple)	Ganga River	On	Uttarkashi	Uttarakhand
77	Gauri Kund	Pilgrimage (Temple)	Gauri Kund lake	On	Rudraprayag	Uttarakhand
78	Gaya	Tourist Spot	Falgu River	Near by	Gaya	Bihar
79	Girija Mandir Of Rajnagar	Pilgrimage (Temple)	Kamala River	Near by	Madhubani	Bihar
80	Goddess Kali Temple	Pilgrimage (Temple)	Ganga River	Near by	Bhojpur	Bihar
81	Gogabil Lake / Gogabil Pakshi	Lake	Gogabil Lake	On	Katihar	Bihar
82	Gorakhnaththtemple	Pilgrimage (Temple)	Rohini River	Near by	Gorakhpur	Uttar Pradesh
83	Gurudwara Sri Guru Baag Sahib	Pilgrimage (Temple)	Ganga River	Near by	Patna	Bihar
84	Hanuman Garhi Ayodhya	Hill Station	Tallital	On	Faizabad	Uttar Pradesh
85	Har Ki Pauri	Pilgrimage (Temple)	Ganga River	On	Dehradun	Uttarakhand
86	Harahi Pokhar	Lake	Harahi Pokhar	Near by	Darbhanga	Bihar
87	Haridwar	Pilgrimage (Temple)	Ganga River	On	Hardwar	Uttarakhand
88	Hazarduari Palace	Fort	Bhagirathi River	Near by	Murshidabad	West Bengal
89	Hemkund Sahib	Pilgrimage (Temple)	HimGanga (Stream)	On	Chamoli	Uttarakhand
90	Hirannya Mountain	Tourist Spot	Ganga River	Near by	Munger	Bihar
91	Howrah Bridge	Museums / Monument	Hooghly River	On	Haora	West Bengal
92	Humayun's Tomb	Tourist Spot	Yamuna River	Near by	South	Delhi
93	India Gate	Museums / Monument	India Gate Lake	Near by	New Delhi	Delhi
94	J.K.temple Kanpur	Pilgrimage (Temple)	Ganga River	Near by	Kanpur Nagar	Uttar Pradesh
95	Jageshwar	Pilgrimage (Temple)	Nandini and Suabhi Streams	Near by	Almora	Uttarakhand
96	Jagmandir	Major Tourist Spot	Kishore Sagar	On	Kota	Rajasthan
97	Jain Mandir	Pilgrimage (Temple)	Chandan River	On	Banka	Bihar

98	Jaitak Fort	Fort	Yamuna River	Near by	Sirmaur	Himachal Pradesh
99	Jaitsagar	Lake	Jaitsagar Lake	On	Bundi	Rajasthan
100	Jal Mahal	Fort	Man sagar Lake	On	Jaipur	Rajasthan
101	Jal Mandir	Pilgrimage (Temple)	Jal Mandir	On	Nalanda	Bihar
102	Jama Masjid	Pilgrimage (Masjid)	Yamuna River	Near by	North	Delhi
103	Janki Temple	Pilgrimage (Temple)	Janki Kund	On	Sitamarhi	Bihar
104	Jantar Mantar	Museums / Monument			New Delhi	Delhi
105	Jhansi Fort	Fort	Betwa River	Near by	Jhansi	Uttar Pradesh
106	Jwalpa Devi Temple	Pilgrimage (Temple)	Nawalika River	On	Garhwal	Uttarakhand
107	Kafni Glacier	Glacier	Pindar River	On	Bageshwar	Uttarakhand
108	Kakolat Waterfall	Waterfall	Kakolat water fall	On	Nawada	Bihar
109	Kalinjar Fort	Fort	Yamuna River	Near by	Banda	Uttar Pradesh
110	Kamet	Peak	Suru & Karnali	Near by	Chamoli	Uttarakhand
111	Kandoliya	Pilgrimage (Temple)	Alaknanda	Near by	Garhwal	Uttarakhand
112	Karan Lake	Lake	Karan Lake	On	Karnal	Haryana
113	Karnaprayag	Pilgrimage (Temple)	Confluence of Alaknanda, Pindar	On	Chamoli	Uttarakhand
114	Kashi Vishwanath Temple	Pilgrimage (Temple)	Ganga	On	Varanasi	Uttar Pradesh
115	Kausani	Tourist Spot			Almora	Uttarakhand
116	Kedarnath	Pilgrimage (Temple)	Mandakini River	On	Rudraprayag	Uttarakhand
117	Keladevi	Pilgrimage (Temple)	Kalisil Nadi	On	Karauli	Rajasthan
118	Kempty Waterfall	Waterfall		On	Tehri Garhwal	Uttarakhand
119	Keoti Waterfall	Waterfall	Mahana river	On	Rewa	Madhya Pradesh
120	Keshoraipatan Temple	Pilgrimage (Temple)	Chambal River	Near by	Bundi	Rajasthan
121	Khajurao	Pilgrimage (Temple)	Ken River	Near by	Chhatarpur	Madhya Pradesh
122	Kharagpur Lake	Lake	Kharagpur Lake	On	Munger	Bihar
123	Khirsu	Major Tourist Spot	Alaknanda	Near by	Garhwal	Uttarakhand
124	Khurpa Taal	Lake	Khurpa Taal	On	Nainital	Uttarakhand
125	Kilbury	Major Tourist Spot	Naini Lake	On	Nainital	Uttarakhand
126	Kota Barrage	Barrage	Chambal River	On	Kota	Rajasthan
127	Kotdwar	Tourist Spot	Kho, Malini, and Sukhro Rivers	On	Garhwal	Uttarakhand
128	Kufri	Hill Station			Shimla	Himachal Pradesh
129	Kukrail Picnic Spot	Tourist Spot	Gomti River	Near by	Lucknow	Uttar Pradesh
130	Kyunkaleshwar Mahadev	Pilgrimage (Temple)	Alaknanda	Near by	Garhwal	Uttarakhand
131	Lansdowne	Major Tourist Spot			Garhwal	Uttarakhand
132	Laxman Jhula	Museums / Monument	Ganga River	On	Tehri Garhwal	Uttarakhand
133	Lohaghat	Tourist Spot	Lohawati	On	Champawat	Uttarakhand
134	Lord Shiva Temple,Bateshwar	Pilgrimage (Temple)	Ganga River	Near by	Bhagalpur	Bihar

135	Lotus Temple	Pilgrimage (Temple)			South	Delhi
136	Mahakaleshwar	Pilgrimage (Temple)	Rudra Sagarálake and Kshipra	Near by	Ujjain	Madhya Pradesh
137	Maharshi Mehi Ashram,Kuppaghat	Pilgrimage (Temple)	Ganga River	Near by	Bhagalpur	Bihar
138	Mahatma Gandhi Setu	Tourist Spot	Ganga River	On	Vaishali	Bihar
139	Mahavir Mandir	Pilgrimage (Temple)	Ganga River	Near by	Patna	Bihar
140	Maihar	Pilgrimage (Temple)	Tons River	Near by	Satna	Madhya Pradesh
141	Malhargarh	Fort	Retam River	Near by	Mandsaur	Madhya Pradesh
142	Manaiyadevi Temple	Pilgrimage (Temple)	MadanSagar	On	Mahoba	Uttar Pradesh
143	Mandar Parbat	Pilgrimage (Temple)	Sukhaniya River	Near by	Banka	Bihar
144	Mandarmani	Beach	Bay of Bengal	On	Medinipur	West Bengal
145	Mandrayal Fort	Fort	Needer Dam	Near by	Karauli	Rajasthan
146	Maner Dargah	Pilgrimage (Masjid)	Maner Dargah and Pond/ Lake	On	Patna	Bihar
147	Mangal Talab	Lake	Ganga River	Near by	Patna	Bihar
148	Mata Kali Temple	Pilgrimage (Temple)	Bakra river	Near by	Araria	Bihar
149	Matatila Dam	Dam	Matatila Reservoir	On	Lalitpur	Uttar Pradesh
150	Maya Devi Temple	Pilgrimage (Temple)	Ganga River	Near by	Hardwar	Uttarakhand
151	Mayapur	Pilgrimage (Temple)	Ganga River	Near by	Nadia	West Bengal
152	Menal Waterfall	Waterfall			Chittaurgarh	Rajasthan
153	Milam	Glacier	Goriganga River	On	Pithoragarh	Uttarakhand
154	Moti Jheel	Lake	Moti jheel	On	Purba Champaran	Bihar
155	Mukteshwar	Pilgrimage (Temple)			Nainital	Uttarakhand
156	Munger Fort	Fort	Ganga River	Near by	Munger	Bihar
157	Murali Pahad Mosque	Pilgrimage (Masjid)	Ganga River	Near by	Bhagalpur	Bihar
158	Mussoorie	Major Tourist Spot	Mussoorie Lake	On	Dehradun	Uttarakhand
159	Nabadwip	Tourist Spot	Confluence of Bhagirathi & Jalangi	Near by	Nadia	West Bengal
160	Nahargarh	Fort	Parwan River	Near by	Baran	Rajasthan
161	Naina	Peak	Mallital.	On	Nainital	Uttarakhand
162	Naini Lake	Lake	Naini Lake	On	North West	Delhi
163	Naini Lake	Lake	Naini Lake	On	Nainital	Uttarakhand
164	Nakuchia Tal	Major Tourist Spot	Nakuchia Tal Lake	On	Nainital	Uttarakhand
165	Nalanda	Tourist Spot	Panchane River	Near by	Nalanda	Bihar
166	Nanda Devi	Peak			Chamoli	Uttarakhand
167	Nandprayag	Pilgrimage (Temple)	Confluence of Nandakini & Alaknanda	On	Chamoli	Uttarakhand
168	Nanga Parvat	Peak			Chamoli	Uttarakhand
169	Nathdwara	Pilgrimage (Temple)	Banas River	Near by	Rajsamand	Rajasthan

170	National Zoological Park	Major Tourist Spot	Yamuna River	Near by	South	Delhi
171	Naulakha Mandir	Pilgrimage (Temple)	Naulakha Mandir and Pond	On	Begusarai	Bihar
172	Nawal Sagar	Lake	Nawal Sagar	On	Bundi	Rajasthan
173	Nehru Setu	Museums / Monument	Sone River	On	Rohtas	Bihar
174	Nirvana Stupa	Museums / Monument	Chhoti Gandak	Near by	Kushinagar	Uttar Pradesh
175	Nivedita Setu	Museums / Monument	Hooghly River	On	Haora	West Bengal
176	Old Fort (purana Qila) Lake	Lake	Old Fort (Purana Qila) Lake	On	New Delhi	Delhi
177	Orchha	Pilgrimage (Temple)	Betwa River	On	Tikamgarh	Madhya Pradesh
178	Paonta Sahib	Pilgrimage (Temple)	Yamuna River	Near by	Sirmaur	Himachal Pradesh
179	Pashupatinath Temple	Pilgrimage (Temple)	Shivna River	On	Mandsaur	Madhya Pradesh
180	Patal Bhuvaneshwar	Pilgrimage (Temple)	Mokshwar & Bhuvneshwarikund	On	Pithoragarh	Uttarakhand
181	Patliputra Karuna Stupa And Buddha Memorial Park	Major Tourist Spot	Ganga River	Near by	Patna	Bihar
182	Patna	Tourist Spot	Ganga River	On	Patna	Bihar
183	Pauri Garhwal	Major Tourist Spot	Alaknanda	Near by	Garhwal	Uttarakhand
184	Pichhola Lake	Lake	Pichhola Lake	On	Udaipur	Rajasthan
185	Pindari	Glacier	Pindari River	Near by	Bageshwar	Uttarakhand
186	Piran Kaliyar	Pilgrimage (Masjid)	Ganga River	Near by	Hardwar	Uttarakhand
187	Pithoragarh	Major Tourist Spot	Girthi, Keogad, Kali, Gori, Dhauli, Kutiyangti, Sarju, Ramganga	Near by	Pithoragarh	Uttarakhand
188	Pratapgarh Fort	Fort	Sai River	Near by	Pratapgarh	Uttar Pradesh
189	Pretshila Hill	Tourist Spot	Falgu River	Near by	Gaya	Bihar
190	Purnagiri Temple	Pilgrimage (Temple)	Kali River	On	Champawat	Uttarakhand
191	Qutab Minar	Museums / Monument			South	Delhi
192	Raj Ghat	Major Tourist Spot	Yamuna River	Near by	Central	Delhi
193	Raja Nahar Singh Palace	Fort			Faridabad	Haryana
194	Rajasamand Lake	Lake	Rajasamand Lake	On	Rajsamand	Rajasthan
195	Rajrappa Waterfall	Waterfall	Tenughat Reservoir	Near by	Bokaro	Jharkhand
196	Ram Jhula	Museums / Monument	Ganga River	On	Tehri Garhwal	Uttarakhand
197	Ramshila Pahaad And Temple	Pilgrimage (Temple)	Falgu River	Near by	Gaya	Bihar
198	Raneh Waterfall	Waterfall	Ken River	On	Panna	Madhya Pradesh
199	Ranikhet	Major Tourist Spot	Kosi River	Near by	Almora	Uttarakhand
200	Ranimahal	Fort	Betwa River	Near by	Jhansi	Uttar Pradesh
201	Ranthambhore Fort	Fort	Chambal River	Near by	Sawai Madhopur	Rajasthan
202	Red Fort	Fort	Yamuna River	Near by	North	Delhi
203	Red Fort (Agra)	Major Tourist Spot	Yamuna River	Near by	Agra	Uttar Pradesh
204	Renuka Lake	Lake	Beas River	Near by	Sirmaur	Himachal Pradesh

205	Rihand Dam	Dam	Rihand River	On	Sonbhadra	Uttar Pradesh
206	Rudraprayag	Major Tourist Spot	Alaknanda,Mandakini,Bhagirathi	On	Garhwal	Uttarakhand
207	Rumi Darwaza	Museums / Monument	Gomti River	Near by	Lucknow	Uttar Pradesh
208	Sadaquat Ashram	Pilgrimage (Temple)	Ganga	On	Patna	Bihar
209	Safdarjang Tomb	Major Tourist Spot			New Delhi	Delhi
210	Sagar Pokhara	Lake	Sagar Pokhara	On	Pashchim Champaran	Bihar
211	Sajjangarh	Fort	Lake Fatehsagar	Near by	Udaipur	Rajasthan
212	Sambhar Lake	Lake	Sambhar Lake	On	Nagaur	Rajasthan
213	Sanchi Stupa	Museums / Monument			Raisen	Madhya Pradesh
214	Sanjay Gandhi Jaivik Udyan	Tourist Spot	Ganga River	Near by	Patna	Bihar
215	Santragachi Jheel	Lake	Santragachhi jheel	On	Haora	West Bengal
216	Sattal	Hill Station	Sattal Lake	On	Nainital	Uttarakhand
217	Shahi Bridge	Museums / Monument	Gomti River	On	Jaunpur	Uttar Pradesh
218	Sher Shah Suri ' Tomb	Major Tourist Spot	Pond of Sher Shah Suri Tomb	On	Rohtas	Bihar
219	Shergarh Fort	Fort	Parwan River		Baran	Rajasthan
220	Shimla	Hill Station	Satluj River	Near by	Shimla	Himachal Pradesh
221	Shiva Temple Ajgaivinath	Pilgrimage (Temple)	Ganga River	Near by	Bhagalpur	Bihar
222	Shri Mahavirji	Pilgrimage (Temple)	Gambhir River	Near by	Karauli	Rajasthan
223	Shyamlatal	Major Tourist Spot			Champawat	Uttarakhand
224	Sidhbali Temple	Pilgrimage (Temple)			Garhwal	Uttarakhand
225	Siliserh Lake	Lake	Siliserh Lake	On	Alwar	Rajasthan
226	Simaria Ghat	Major Tourist Spot	Simaria Ghat	On	Begusarai	Bihar
227	Singheshwar Asthan	Pilgrimage (Temple)	Kosi River	Near by	Madhepura	Bihar
228	Sita Kund	Tourist Spot	Ganga River	Near by	Munger	Bihar
229	Son Prayag	Pilgrimage (Temple)	Confluence of Ganga & Mandakini	On	Rudraprayag	Uttarakhand
230	Sonepur	Tourist Spot	Gandak River	On	Saran	Bihar
231	Sri Krishna Vatika	Tourist Spot	Ganga River	Near by	Munger	Bihar
232	Sri Ram Rekha Ghat	Major Tourist Spot	Ganga River	Near by	Buxar	Bihar
233	Sun Temple	Pilgrimage (Temple)	Sun Temple Kund	On	Aurangabad	Bihar
234	Sunderbans	Tourist Spot	Ganga	On	North Twenty Four Parganas	West Bengal
235	Suntemple and Rahilasagar	Pilgrimage (Temple)	RahilaSagar	Near by	Mahoba	Uttar Pradesh
236	Surajkund	Major Tourist Spot			Faridabad	Haryana
237	Surya Kund	Pilgrimage (Temple)	Falgu River	Near by	Gaya	Bihar
238	Taj Mahal	Major Tourist Spot	YamunaRiver	Near by	Agra	Uttar Pradesh
239	Tajewala Barrage	Barrage	Yamuna River	On	Yamunanagar	Haryana

240	Takht Sri Patna Sahib	Pilgrimage (Temple)	Ganga River	Near by	Patna	Bihar
241	Tapan Dighi Lake	Lake	Tapan Dighi lake	On	Dakshin Dinajpur	West Bengal
242	Tarakund	Major Tourist Spot	Tarakund Lake	On	Garhwal	Uttarakhand
243	Tehri Dam	Dam	Tehri Reservoir	On	Tehri Garhwal	Uttarakhand
244	The Garden of Five Senses	Major Tourist Spot			South	Delhi
245	Tilyar Lake	Lake	Tilyar Lake	On	Rohtak	Haryana
246	Trishul (west)	Peak			Chamoli	Uttarakhand
247	Trisul	Peak			Chamoli	Uttarakhand
248	Triveni Ghat	Pilgrimage (Temple)	Ganga River	On	Dehradun	Uttarakhand
249	Triveni Sangam	Pilgrimage (Temple)	Ganga,Yamuna&Saraswati	On	Allahabad	Uttar Pradesh
250	Usri Waterfall	Waterfall	Usri River	On	Giridih	Jharkhand
251	Vaishali Garh	Major Tourist Spot	Gandak River	Near by	Vaishali	Bihar
252	Valley Of Flowers	Major Tourist Spot	Pushpavati River	Near by	Chamoli	Uttarakhand
253	Valmiki Ashram	Pilgrimage (Temple)	Ganga River	Near by	Kanpur Nagar	Uttar Pradesh
254	Vankhandeshwar Mahadev Temple	Pilgrimage (Temple)	Bagheinriver,Yamuna	Near by	Banda	Uttar Pradesh
255	Vasuki Taal	Lake	Vasuki Tal lake	On	Uttarkashi	Uttarakhand
256	Vidhyasagar Setu	Museums / Monument	Hooghly River	On	Haora	West Bengal
257	Vindhyavasini Temple	Pilgrimage (Temple)	Ganga River	On	Mirzapur	Uttar Pradesh
258	Vishnupad Temple	Pilgrimage (Temple)	Falgu River	Near by	Gaya	Bihar
259	Vivekananda Setu	Museums / Monument	Hooghly River	On	Hugli	West Bengal
260	World Peace Pagoda/	Major Tourist Spot	Abhishekh Puskarini	On	Vaishali	Bihar
261	Yamunotri	Pilgrimage (Temple)	Yamuna River	On	Uttarkashi	Uttarakhand

A. Wildlife Sanctuaries / National Parks in the Basin

Sl. No.	Name	Waterbody	WB Relation	District	State	Mammals	Birds	Reptiles
1	Askot Musk Deer Sanctuary	Ganga	Near by	Pithoragarh	Uttarakhand			
2	Bagdara	Banas	Near by	Sidhi	Madhya Pradesh	Panther, Blackbuck, Blue bull, Chinkara		
3	Ballavpur	Ajay	On	Barddhaman	West Bengal			
4	Bandhavgarh National Park (Tiger Reserve)	Sone and Johilla	Near by	Umaria	Madhya Pradesh	Tiger, Panther, Spotted Deer, Sambhar, Bison		Python

5	Barela Salim Ali Zubba Sahni Wildlife Sanctuary	Gandak	Near by	Muzaffarpur	Bihar			
6	Bassi Wildlife Sanctuary	Beradi	Near by	Chittaurgarh	Rajasthan			
7	Bethuadahari	Bhagirathi	On	Barddhaman	West Bengal			
8	Bhensrod Garh	Kali Sindh	Near by	Jhalawar	Rajasthan			
9	Bhimbandh Wildlife Sanctuary	Ganga	Near by	Munger	Bihar	Leopard, Sloth Bear, Indian Wolf, Four Horned Antilope	Peacock, Hornbill	Crocodile, Python
10	Chail Wildlife Sanctuary	Giri	Near by	Sirmaur	Himachal Pradesh	Leopard, Leopard Cat	Cheer Pheasant , Peacock	
11	Chandra Prabha			Mirzapur	Uttar Pradesh	Chinkara, Leopard Cat, Blackbuck	Peacock, Hornbill	Crocodile
12	Churdhar	Tons	On	Dehradun	Uttarakhand			
13	Dara Wildlife Sanctuary	Ranapratap Sagar	Near by	Kota	Rajasthan			
14	Daranghati Wildlife Sanctuary	Satluj River	Near by	Shimla	Himachal Pradesh	Leopard,Musk Deer, Ibex	Monal Pheasant, Peacock	
15	Dudhwa National Park (Tiger Reserve)	Suheli	Near by	Kheri	Uttar Pradesh	Blackbuck,Fishing Cat, Hispid Hare, Elephant, Leopard, Rhinoceros, Tiger, Swamp Deer	Peacock	Crocodile, Python
16	Gandhi Sagar Sanctuary	Chambal River	On	Neemuch	Madhya Pradesh	Panther, Blue Bull		Otter, Crocodile
17	Gangotri National Park	Ganga	Near by	Uttarkashi	Uttarakhand			
18	Gautam Buddha Wildlife Sanctuary	Falgu	Near by	Nawada	Bihar	Tiger, Sloth Bear, Chinkara		Crocodile
19	Ghatigaon			Gwalior	Madhya Pradesh			
20	Govind Pashuvihar	Tons River	Near by	Uttarkashi	Uttarakhand	Snow Leopard, Leopard Cat, Fishing Cat, Musk Deer, Serow, Thar, Leopard		
21	Guru Ghasidas National Park	Hasdeo	Near by	Koriya	Chhattisgarh	Tiger		
22	Hazaribagh			Hazaribagh		Tiger, Four Horned Antilope,Leopard, Hog Badgar, Ratel, Indian Wolf, Sloth Bear, Chinkara	Peacock	
23	Jamwa Ramgarh			Alwar	Rajasthan	Leopard		

24	Jim Corbett National Park (Tiger Reserve)	Ramganga	Near by	Garhwal	Uttarakhand	Tiger, Leopard, Fishing cat,Elephant	Peacock	Mugger, Gharial, Lizard, Python
25	Kaimur	Sone River	Near by	Rohtas	Bihar	Tiger, leopard, Sloth Bear, Four Horned Antelope, Chinkara, Indian Wolf	Peacock, Hornbill	Marsh Crocodile
26	Kalesar National Park	Yamuna	Near by	Yamunanagar	Haryana			
27	Kanwar Lake Bird Sanctuary	Burhi Gandak	Near by	Begusarai	Bihar			
28	Karera	Sind	Near by	Shivpuri	Madhya Pradesh	Blackbuck	Great Indian Bustard	
29	Katerniaghat	Ghaghara	On	Bahraich	Uttar Pradesh	Tiger,Blackbuck, Swamp Deer	Peacock	Python, Ghariyal, Mugger
30	Kedarnath	Mandakini	On	Rudraprayag	Uttarakhand			
31	Ken Ghariyal	Ken River	Near by	Chhatarpur	Madhya Pradesh			
32	Keoladeo Ghana National Park	Wetland	On	Bharatpur	Rajasthan	Blackbuck, Wild Dog, Civet	Siberian Crane, Cormarant Stork,Spoonbill, Qualis Coot	
33	Kishanpur	Gomati	On	Kheri	Uttar Pradesh			
34	Lawalong	Dhab River	Near by	Chatra				
35	Lothian Island Wildlife Sanctuary	Bay of Bengal	On	South Twenty Four Parganas	West Bengal			
36	Madhav National Park			Shivpuri	Madhya Pradesh			
37	Mahananda Wildlife Sanctuary	Teesta River	Near by	Darjiling	West Bengal			
38	Mahuadaur	North Koel	Near by	Palamu				
39	Mandla Plant Fossils National Park			Mandla	Madhya Pradesh			
40	Nagi Dam Bird Sanctuary	Ulai River	On	Jamui	Bihar			
41	Nahargarh			Jaipur	Rajasthan			
42	Nandadevi	Kali River	Near by	Pithoragarh	Uttarakhand			
43	Narendrapur	Hooghly	Near by	South Twenty Four Parganas	West Bengal			
44	Narsinghgarh	Parwati	On	Rajgarh	Madhya Pradesh			
45	National Chambal			Sheopur	Madhya Pradesh			

46	National Chambal	Yamuna	On	Agra	Uttar Pradesh			
47	National Gharial	Chambal	Near by	Bundi	Rajasthan			
48	Neoradehi			Damoh	Madhya Pradesh			
49	Palamau Tiger Reserve	Auranga	Near by	Palamu				
50	Palpur Kund			Sheopur	Madhya Pradesh			
51	Panna Tiger Reserve	Baghain River	On	Panna	Madhya Pradesh			
52	Panpatha	Mahanadi	Near by	Umaria	Madhya Pradesh			
53	Parmadan			Nadia	West Bengal			
54	Rajaji National Park	Ganga River	On	Dehradun	Uttarakhand			
55	Rajgir Sanctuary	Panchane River	Near by	Gaya	Bihar			
56	Ramgarh			Jaipur	Rajasthan			
57	Ramgarh Vishdhari Sanctuary	Jait Sagar	Near by	Bundi	Rajasthan			
58	Ramnabagan			Barddhaman	West Bengal			
59	Ranipur	Yamuna	Near by	Chitrakoot	Uttar Pradesh			
60	Ranthambore National Park (Tiger Reserve)			Sawai Madhopur	Rajasthan			
61	Renuka	Giri River	Near by	Sirmaur	Himachal Pradesh			
62	Sailana	Chambal	Near by	Ratlam	Madhya Pradesh			
63	Sajnaknali	Bay of Bengal	On	North Twenty Four Parganas	West Bengal			
64	Sariska Tiger Reserve			Alwar	Rajasthan			
65	Somerset	Kanhar	On	Surguja	Chhattisgarh			
66	Son Ghariyal	Sone River	On	Shahdol	Madhya Pradesh			
67	Sultanpur Bird Sanctuary	Wetland	On	Gurgaon	Haryana			
68	Talra	Pabar River	Near by	Shimla	Himachal Pradesh			
69	Tamorpingia			Surguja	Chhattisgarh			
70	Topchanchi			Bokaro				
71	Udaipur Bird Sanctuary	Gandaki	On	Pashchim Champaran	Bihar			
72	Valley Of Flowers	Alaknanda	Near by	Chamoli	Uttarakhand			
73	Valmiki Tiger Reserve Park	Gandak	Near by	Pashchim Champaran	Bihar			
74	Vanvihar National Park			Bhopal	Madhya Pradesh			
75	Vikramshila Dolphin Sanctuary	Ganga	On	Bhagalpur	Bihar			

Acronyms

AEZ	Agro-Ecological Zones
AIA	Annual Irrigated Area
AIBP	Accelerated Irrigation Benefits Programme
AWS	Automatic Weather Stations
BCM	Billion Cubic Metre
BIS	Bureau of Indian Standards
BOD	Biological Oxygen Demand
BR	Balancing Reservoir
BRB	Betwa River Board
BWA	Barrage Weir Anicut
CAZRI	Central Arid Zone Research Institute
CBIP	Central Board of Irrigation & Power
CCA	Culturable Command Area
CEA	Central Electricity Authority
CGWB	Central Ground Water Board
Ch	Chainage
CIWTC	Central Inland Water Transport Corporation
CPCB	Central Pollution Control Board
CSMRS	Central Soil & Materials Research Station
cumec	cubic metre per sec
cusec	cubic foot per sec
CWC	Central Water Commission
CWPRS	Central Water and Power Research Station
D	Discharge
DEM	Digital Elevation Model
DOS	Department of Space
DVC	Damodar Valley Corporation
EC	Electrical Conductivity
ERM	Extension, Renovation and Modernization
ETP	Effluent Treatment Plant
EW	Exploratory Well
FAO	Food and Agriculture Organization
FC	Flood Control
FF	Flood Forecasting
FMP	Flood Management Programme
FRL	Full Reservoir Level
G	Gauge
GCA	Gross Command Area
GD	Gauge and Discharge
GDQ	Gauge, Discharge and Water Quality
GDS	Gauge, Discharge and Sediment
GDSQ	Gauge, Discharge, Sediment and Water Quality
GFCC	Ganga Flood Control Commission
GIS	Geographical Information System
GOI	Government of India
GPI	Grossly Polluting Industries
GSC	Gross Storage Capacity
ha	Hectare
HE	Hydro-Electric
HFL	Highest Flood Level
HO	Hydrological Observation
hrs	Hours

I&CAD	Irrigation and Command Area Development
IBTL	Inter-Basin Transfer Link
IBWT	Inter-Basin Water Transfer
ICAR	Indian Council of Agricultural Research
ICPO	Irrigation-Cum-Power Outlet
IM	Moisture Index
IMD	Indian Meteorological Department
India-WRIS	India-Water Resources Information System
IR	Irrigation
IRS	Indian Remote Sensing
ISRO	Indian Space Research Organization
IWAI	Inland Waterways Authority of India
IWT	Inland Water Transport
km	Kilometre
LBC	Left Bank Canal
LGBO	Lower Ganga Basin Organization
LGP	Length of Growing Period
LISS	Linear Imaging Self-scanning Sensor
lps	Litres Per Second
LSC	Live Storage Capacity
LULC	Land Use Land Cover
m	metre
MAF	Million Acre Feet
MCM	Million Cubic metre
Mcum	Million Cubic metre
MDDL	Minimum Draw Down Level
mg/l	Milligram per Litre
MI	Minor Irrigation
MLD	Million Liters per Day
mm	Millimetres
MMIR	Major and Medium Irrigation
MOSDAC	Meteorological & Oceanographic Satellite Data Archival Centre
MoU	Memorandum of Understanding
MoWR	Ministry of Water Resources
MPN	Most Probable Number
MSL	Mean Sea Level
MU	Million Units
MW	Mega Watt
NA	Navigation
NBSS & LUP	National Bureau of Soil Survey & Land Use Planning
NEEPCO	North Eastern Electric Power Corporation Limited
NF	No Flow
NGRBA	National Ganga River Basin Authority
NHPC	National Hydro Power Corporation Limited
NRLD	National Register of Large Dam
NRSC	National Remote Sensing Centre
NW	National Waterway
NWDA	National Water Development Authority
NWDT	Narmada Water Disputes Tribunal
NWMP	Northern Water Monitoring Programme
NWP	National Water Policy
OW	Observatory Well
P	Precipitation
PET	Potential Evapotranspiration
pH	*puissance de* Hydrogen

ppm	parts per million
PS	Pisciculture
PW	Peizometre Well
Q	Water Quality
R&R	Rehabilitation and Resettlement
RBC	Right Bank Canal
RF	Rainfall
RRR	Repair, Renovation and Restoration
RRSC	Regional Remote Sensing Centre
RSC	Residual Sodium Carbonate
S	Sediment
SAC	Standing Advisory Committee
SAR	Sodium Absorption Ratio
SD	Sub Division
SMCS	Soil Moisture Control Section
SOI	Survey of India
Sq.km	Square Kilometres
SRTM	Shuttle Radar Topographic Mission
TAC	Technical Advisory Committee
TC	Total Coliform
TDS	Total Dissolved Solids
Th ha	Thousand Hectare
THDC	Tehri Hydro Development Corporation
TW	Tube well
UGBO	Upper Ganga Basin Organization
UIP	Ultimate Irrigation Potential
UJVNL	Uttarkhand Jal Vidyut Nigam Limited
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPJVNL	Uttar Pradesh Jal Vidyut Nigam Limited
UT	Union Territory
WB	Water Body
WFR	West Flowing Rivers
WMO	World Meteorological Organization
WS	Water Supply
YBO	Yamuna Basin Organization

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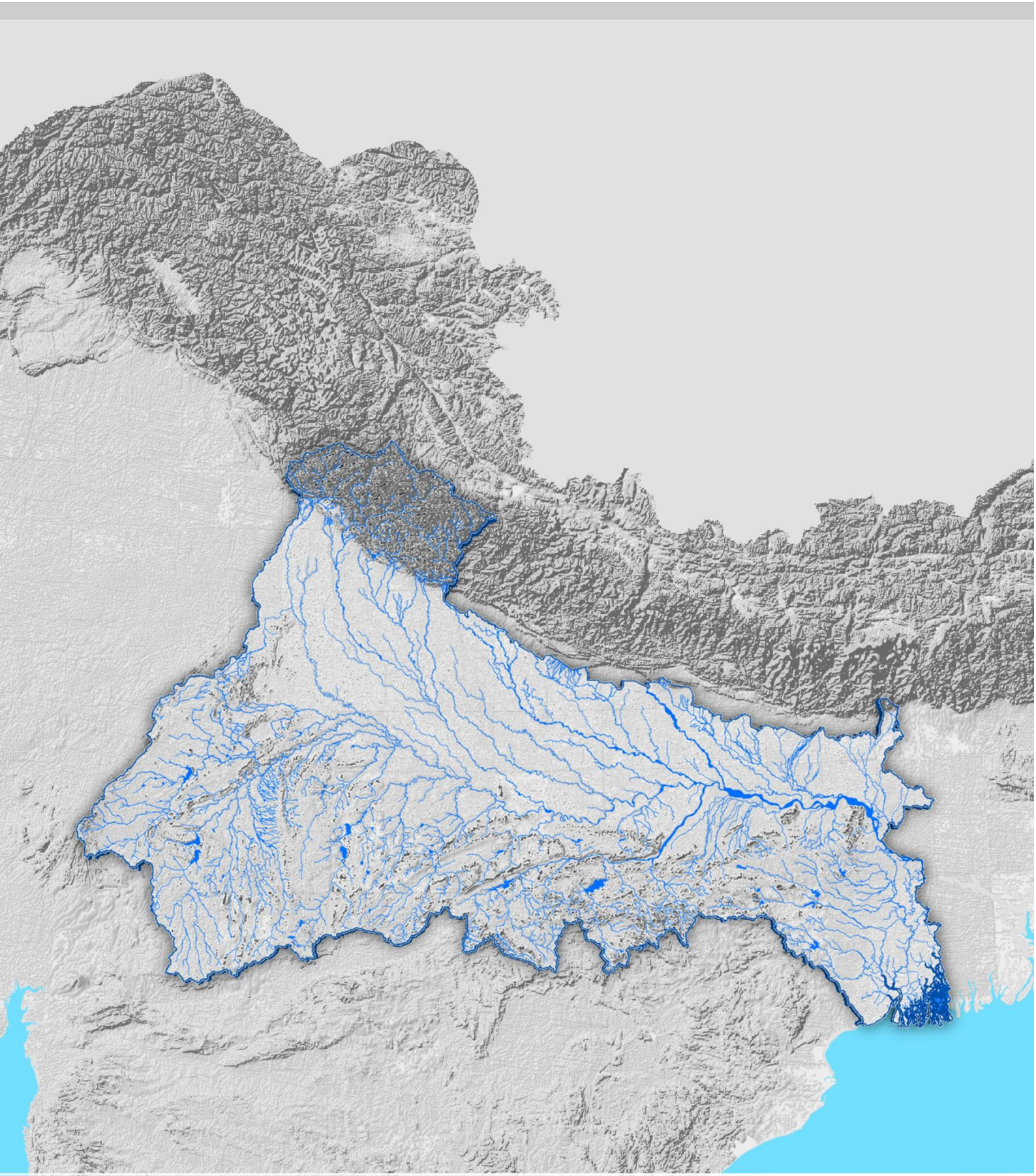

इंडिया-वारिस

India-WRIS

A Joint Project of CWC and ISRO

देश में जल संसाधन आँकड़ों का जनन व वेब सामर्थ्य
सूचना प्रणाली का क्रियान्वयन

Generation of Database and Implementation of Web Enabled Water Resources Information System (India-WRIS) in the Country