Urban River Management Plan

FROM VISION TO ACTIONS

Training of Trainers (ToT) Module

NAMAMI GANGE

National Institute of Urban Affairs

WATER & ENVIRONMENT VERTICAL

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A step by step guidance manual for conducting trainings on design and formulation of Urban River Management Plans (URMP)

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ABOUT THE DOCUMENT

The urban river corridor is a section of a river which directly remains under the influence of a city. It is a natural asset for the city and can greatly benefit it. Despite this, in most of the Indian cities, it carries polluted water with encroached floodplains, has lost beauty and bio-diversity, exhibits dwindling water flow, etc.

The cities are now looking for a solution to improve their rivers, but don't know exactly what they need to do. **Considering this, the National Mission for Clean Ganga (NMCG) and the National Institute of Urban Affairs (NIUA) have jointly prepared a tool in the form of the Urban River Management Plan (URMP) to help cities manage their rivers.** It moves beyond the conventional pollution abatement strategies, to provide avenues for **an integrated urban river management action by incorporating environment, social and economic aspects in a more systemic way as laid out by the URMP.**

India's first URMP has already been prepared for the Kanpur city in Uttar Pradesh using the URMP framework. It is envisaged that all 40 cities situated along the main stem of the Ganga River having population > 1 lakh will also prepare their URMPs in the near future. **In order to prepare the URMPs of all river cities in India, the officials who will be involved in making them will have to first understand it.**

The ATIs and number of other training institutes across India under an ambit of the Integrated Capacity Building Programme (ICBP) by the MoHUA conduct dedicated trainings for Government officials, and other practitioners who work for ULBs on various aspects related to national missions like AMRUT 2.0, SBM 2.0, Smart Cities Mission etc. **This document is for the faculties and trainers** of various institutes to understand what is URMP and how to train important stakeholders to prepare it. **It is a product of the collaborative project, Urban Rivers (URVERS) supported by the National Mission for Clean Ganga (NMCG), Ministry of Jal Shakti, Govt. of India.**

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"There is a need for new thinking for 'River Cities'. There is need for the residents of these cities to ask, 'What can we do for the rivers?'. Cities should be responsible for rejuvenating their rivers. It has to be done not just with the regulatory mindset but also with developmental and facilitatory outlook."

Hon'ble Prime Minister during the first meeting of National Ganga Council held on 14th December, 2019

ACRONYMS USED IN THE DOCUMENT

- **AMRUT :** Atal Mission for Rejuvenation and Urban Transformation
- **ATI :** Administrative Training Institute
- **FSSM :** Faecal Sludge and Septage Management
- **ICBP :** Integrated Capacity Building Program
- **MCQ :** Multiple Choice Questions
- **MoHUA :** Ministry of Housing and Urban Affairs
- **NMCG:** National Mission for Clean Ganga
- **NIUA:** National Institute of Urban Affairs
- **OSS :** Onsite Sanitation System
- **SDG:** Sustainable Development Goal
- **SLB:** Service Level Benchmark
- **ULB:** Urban Local Body
- **URMP:** Urban River Management Plan

KEY DEFINITIONS OF TERMS USED IN THE DOCUMENT

- **Active flood plain :** is an area on the both banks of a river that gets inundated by a flood having a mean recurrence interval of 2.33 year.
- **Afforestation :** is planting of trees to restore or re-establish forest cover.
- **Catchment :** is the entire land area whose runoff from rain, snow or ice drains into a water body or a water course (before the water course joins another river or discharges into a water body.)
- **Drain :** is a natural or artificially constructed channel of different shapes (circular, box, trapezoid) carrying the storm water during monsoon season.
- **Ecological Flow :** is the regime of flows required to maintain the ecological integrity of a river and the goods and services provided by it.
- **Ecology :** is the totality of relations between organisms and their environment. It includes the composition, distribution, amount, number and changing states of organisms within and among ecosystems.
- **Embankment :** is a raised wall of earth, stone or other material to hold back water within a water body or water course; it includes levees constructed on either side of a river as a flood protection measure.
- **Faecal Sludge or Septage :** are interchangeably used words for the raw or partially digested slurry that contains both solid and liquid waste that accumulates in onsite sanitation systems (OSS) e.g. septic tanks.
- **Floodplain :** is the land area susceptible to inundation by floodwater. These are the zones susceptible to inundation by a base flood including areas where drainage is or may be restricted by fabricated structures, which have been or may be covered partially or wholly by floodwater from the base flood.
- **Lake :** in terms of sizes lie between wetlands and ponds. Their catchments are large and may involve more than one catchment. They can be trans boundary too expanding beyond the delineated boundaries.
- **Nala :** is a local natural stream carrying water or (wastewater) that merges with higher order stream/river in the downstream.

- **Pan City :** is a term used in the manual to indicate interventions planned for the entire city and not limited to a particular area.
- **Pond/Waterbody :** is a depression on land or a lowland area that usually holds water or remains saturated through most of the year, such as a lake, tank, pond, marsh or swamp.
- **Return flow :** is a quantity of water to be discharged by the city into the river on voluntarily decided basis. The purpose is to ensure that the river water extracted by city for its demand is returned back to river to maintain minimum water flow and also benefit downstream cities for ensured water availability.
- **River :** is a Geomorphic unit that carries water fed through either rain or snow. The river flowing throughout year are termed as Perennial River, those that flow during monsoon season are termed as Non-perennial River.
- **Riparian Buffer :** is a longitudinal stretch of vegetation on either bank of a river. It acts as a shock absorber for the river and its aquatic ecosystem from detrimental developmental activities.
- **River Basin :** is the entire catchment (of a water body or watercourse) including the soil, water, vegetation and other natural resources in the area.
- **River Health :** is a measurement of how well is river able to sustain its natural properties, and provide a habitat for natural aquatic life to thrive.
- **Wetland :** is a shallow water body where there is permanent water logging. The ecosystem of wetlands supports wide variety of flora and fauna. Wetlands could be near coastal/estuarine environment or on mainland where rivers feed wetlands. Wetlands have multiple benefits for the city. Migratory birds often visit wetlands. Livelihoods are associated with wetlands.
Wetlands could cover small or vast areas of hundreds of square kilometers. There is an international convention called “Ramsar” devoted to wetland conservation.

Source: Pexels

1. INTRODUCTION

A River is a natural ecosystem and an asset for any city. But, while crossing through or passing close to any urban settlement, it is usually in an unhealthy state due to various reasons that includes city planning that ignores rivers, inadequate waste management provisions, lack of avenues to leverage river related economy and finally poor aasociation of people with the river.

With growing concerns of impacts of urbanization on rivers and subsequently on humans, managing urban river stretches is now given due attention in India. The National Institute of Urban Affairs (NIUA), Ministry of Housing and Urban Affairs (MoHUA) and the National Mission for Clean Ganga (NMCG), Ministry of Jal Shakti have jointly prepared a strategic framework for managing the urban river stretches in the Ganga River Basin. Based on this framework, India's first dedicated Urban River Management Plan (URMP) has been prepared for the Kanpur city of the Uttar Pradesh State.

It is envisaged that towns and cities along the main stem Ganga River basin with population >1 lakh will prepare URMPs. Also in India, around 300 Class I cities are river cities and should eventually adopt URMP framework in future. Therefore, it is important to build the understanding and capacities of city officials of both ULBs and para-statal agencies towards understanding URMP framework.

The national and the regional training institutes have a mandate of capacity building of all ULB/ para-statal officials to understand and implement various national missions. The URMP and its various objectives can be easily aligned with national Urban Missions like AMRUT 2.0, Smart Cities, NMCG, SBM 2.0, Jal Shakti Abhiyan, or any other state urban missions.

Thus, this ToT module is primarily designed to orient and build capacity of the faculties/trainers of Govt. training institutes (state ATIs), and also various organizations, NGOs with the objective to build capacities in riverine ecosystem and conduct training programs for holistic management of urban rivers.

1.1 Purpose of document

This reference manual serves as a guide book for the trainers/resource persons of various training institutes to organize URMP training for the relevant target audience. It contains information on URMP training requirements, the various modules that involve presentations and related exercises/activities.

Following are the **main objectives** of this manual:

- **To sensitize trainers and trainees on URMP frame work and its 10 Objectives.**
- **To facilitate trainers of ATIs and other institute to conduct URMP trainings.**
- **To enable city administrators, planners, engineers, health officials, other relevant officials to incorporate URMP visions in ongoing missions of city.**

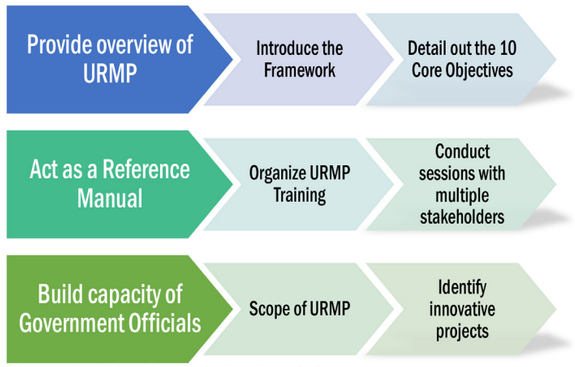


Figure 1: Objectives of URMP training

The URMP training would be instrumental in creating a systemic change in the way city rivers are mainstreamed into urban planning, design and management through improved understanding of the value of rivers among different decision-makers and stakeholders.

1.2 Target audience

This manual is prepared for the faculties /trainers of the institutes empanelled under Integrated Capacity Building Programme (ICBP) of MoHUA including state ATIs that regularly organize capacity building programs on thematic areas of urban planning, urban water & sanitation management, urban environment including rivers, waterbodies and urban finance.

This ToT manual is prepared to enable master trainers to train city officials to understand URMP framework, objectives and enable them to prepare URMP for their cities. Since the main purpose of URMP is to identify projects for each objective, the relevant trainees are planners, engineers, and to an extent decision makers from the city.

The training institute should ideally invite at least two officials from participant city with background in planning and engineering to better understand the URMP concept.

1.3 Structure of manual

This manual has two sections, A & B.

Section A covers the general requirements to conduct URMP training. It is flexible and training institutes are free to adopt the operational modalities by adhering to some non-negotiable aspects like selection of a suitably qualified trainer, the flow of the training etc. Therefore, this section includes information on how to select trainers, trainees, pre and post assessment of trainees, feedback sessions, and logistics planning etc.

Section B provides URMP modules covering 10 URMP objectives, monitoring & evaluation of URMP, financial options to implement URMP projects and case study of Kanpur URMP. Most of the sessions covered in this manual are presented in the following format.

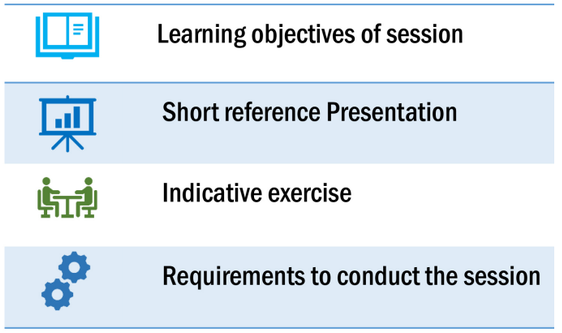


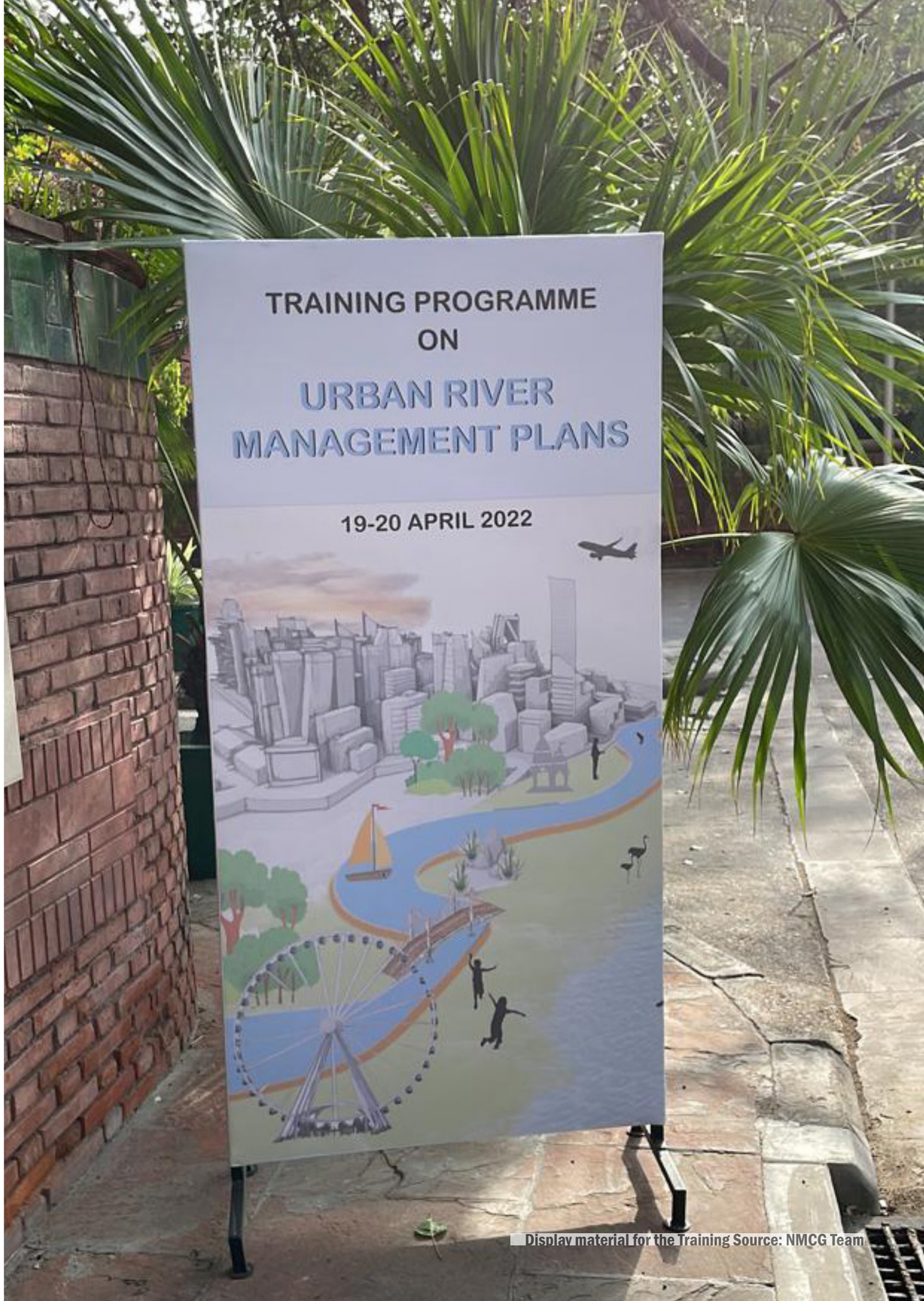
Figure 2: Format of URMP training session

1.4 Indicative Agenda

All sessions of URMP training can be comfortably conducted over 2 to 2.5 days of residential training. The following table shows a provisional training agenda for 2 days training. Given the flexibility of time, possibilities to organize field excursion visits to relevant projects in the vicinity can be explored in an additional half a day.

Time	Day 1 Sessions	Time	Day 2 Sessions
9.30 to 10.30	Registration/Inauguration formality	10.00 to 10.15	**Module 4: Rejuvenate waterbodies and wetlands**
10.30 to 11.00	Overview of training / Trainee introduction	10.15 to 11.15	Activity/Exercise: Waterbodies database / Prepare revival plan
11.00 to 11.15	Pre- training assessment	11.15 to 11.25	**Module 5: Riparian buffer along river banks**
11.15 to 11.35	**Rivers and urban development**	11.25 to 11.45	Activity/Exercise: Requirements (agencies/land/plan species etc.)
11.35 to 12.00	**Understanding URMP framework**	11.45 to 12.00	**Module 6 Eco friendly river fronts/ Leverage River economy**
12.00 to 12.20	Activity/Exercise: URMP and national missions	12.00 to 12.45	Activity/Exercise: Elements of eco-friendly riverfront (evaluate plan)
12.20 to 13.00	**Module 1: Floodplain regulation** Activity/Exercise: Provisions in your city	12.45 to 13.00	**Plenary discussions:** Recap of objectives covered
13.00 to 14.00	**Lunch break**		
14.00 to 14.15	Energizer/Experience sharing		
14.15 to 14.30	**Module 2: Pollution free rivers**	14.15 to 14.30	**Module 7: Citizen engagement: Awareness & Management**
14.30 to 15.30	Activity/Exercise: FSM- Co-treatment planning	14.30 to 15.30	Activity/Exercise: Know your river health: Macro-invertebrate
15.30 to 16.00	**Tea break**		
16.00 to 16.20	**Module 3: Reuse of wastewater/Maximize return flow**	16.00 to 16.20	**Module 8: Finance options and M&E framework for URMP**
16.20 to 17.00	Activity/Exercise – Potential avenues in your city	16.20 to 16.45	**Module 9: Case study: URMP Kanpur**
17.00 to 17.30	Feedback / Reflections	16.45 to 18.00	Post -training assessment / feedback/certificate distribution

Table 1: URMP Training: Provisional Agenda



Display material for the Training Source: NMCG Team

SECTION A:

How to organize URMP training?

2. Organizing URMP training

URMP is specific to managing urban river corridors under its 10 core objectives. This chapter gives an overview on how URMP trainings should be organized, what should be the qualifications of trainer/resource persons to conduct sessions, design of pre and post training assessments, feedback sessions and few useful logistics planning.

2.1 Link with MoHUA trainings OR separate

The Integrated Capacity Building Program (ICBP) by MoHUA is targeted towards upskilling of government officials, to make them understand and implement different urban missions. Under ICBP, all recognized training institutes across India are empanelled to conduct trainings for different thematic areas.

Currently, preparing URMP is not a mandatory requirement for cities under any dedicated mission with financial support from centre or state government. However, as per the River Ganga Authority Order not maintaining clean and healthy river by cities could result into legal actions by the NMCG. The URMP can assist the cities in fulfilling these conditions and restoring the rivers into healthy urban rivers.

Considering the fact that URMP is not part of any mission at present, its preparation and project implementation is synergised with the ongoing national missions like AMRUT 2.0, Smart City Mission, SBM-2, Jal Shakti Abhiyaan, 15th FC etc. of MoHUA and also with the programs of the Ministry of Jal Shakti. Additionally, the missions/ programs of individual States can also support URMP implementation. Therefore, all URMP training modules presented in this manual can be easily linked with the existing modules/capsules of training institutes.

Example of synergy of FSM training with ICBP trainings

Faecal Sludge Management trainings by ATI Nainital, Uttarakhand : NIUA with support of Bill and Melinda Gates Foundation (BMGF) prepared the Sanitation Capacity Building Platform (SCBP), a dedicated program to upscale capacity building of faecal sludge management for urban local bodies. NIUA developed the training content, ToT modules and transferred it to various training institutes. ATI, Nainital adopted the orientation modules and introduced them in the ongoing training programs under ICBP in Uttarakhand state. The institute integrated the modules within ongoing trainings and conducted dedicated training programmes on FSM for ULB officials of different cities of the Uttarakhand State.

2.2 Key factors for successful URMP training

2.2.1 Resource person/Trainer

Effectiveness of URMP training will depend on the selection of resource persons, their knowledge, and their ability to convey the content of the modules in an easy and understandable manner. Trainers will not only conduct the session with the module presentation but also lead associated activities/exercises. Trainer may or may not be an expert on the URMP topic being covered, however, the presentation skills of the trainers can make a difference in conveying the core idea of the module. Apart from covering the theory of the topic, trainer should be able to roll out exercises/ activities associated with the topics in innovative ways.

Following are desirable qualities of a good trainer for URMP sessions

- **Thoroughly prepare and understand the URMP topic covered**
- **Can communicate clearly**
- **Facilitate the discussions with trainees**
- **Satisfactorily cover questions asked and provides satisfactory feedback**

Though URMP is a specific training on the freshwater ecosystem it is related to integrated urban water resource management. It covers all aspects of river management like planning, infrastructure, waterbodies & wetlands, finance, monitoring and evaluation etc. The Following table provides indicative expertise of resources person to cover respective URMP sessions.

Following education qualifications and hands on experience in urban sector should be invited as resource persons:

- **Urban Planning / Infrastructure / Governance**
- **Natural resource management particularly freshwater systems (rivers, waterbodies)**
- **Water resource engineering**
- **Urban finance / Monitoring & Evaluation**

It will be quite useful if trainer is not purely from academics but is well aware of all the urban renewal missions, policies, environmental regulations, ministry orders (NMCG authority order) etc. functional aspects of ULBs, duties officials participating as trainees and para-statal agencies.

Additional skills of trainers on related software packages, innovations in execution of sessions, exercises, relevant case studies would be an add on. The trainers with such qualities will enrich the sessions and make them more effective and useful for trainees.

2.2.2 Selection of participant cities

URMP trainings are directly beneficial for the rivers cities. The cities may be situated right on the main spine of the river or its tributaries (e.g. Ganga River - Varanasi, Kanpur, Yamuna River- Delhi, Mathura) which merge with the main river spine in the downstream.(e.g. Ramganga tributary - Bareilly). Though the URMP trainings directly benefit the river cities, it does not mean that URMP training will not be useful for non-river cities as many of the URMP objectives cover urban water management aspects. Therefore, it is highly recommended that training institutes consider criterias like location of the city, city population, river related issues, potential of cities for river economy, cities with water risks etc. while calling the officials for the training.

2.2.3 Pre and post training assessment

The goal of the URMP training is to enhance knowledge, skill and transform attitude of the trainees towards rivers. Therefore, their assessment before and after the training is essential. The pre- and post-assessment of the trainees should be designed on the following principles:

- **Assessment should be simple and less time consuming**
- **Questions should be MCQ type**
- **Questions should be based on the content covered during the training**
- **It should not have any marking**

Trainees must exhibit and acknowledge knowledge increment in the post assessment feedback.

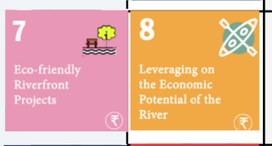
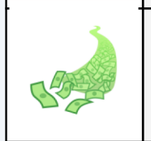
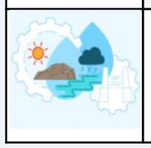
	URMP session	Preferred resource person
	Rivers and urban development	Should be able to narrate cities growth along river banks, urbanization impacts on rivers, give case example of river rejuvenation etc.
	Understanding URMP framework	Lead trainer of host institute
	Floodplain regulation	Expert on floodplains, urban planner
	Pollution free rivers	Civil/Environmental engineer with urban infrastructure projects experience
	Waterbodies and wetlands	Environmental planners, urban water specialist
	Riparian buffer along river banks	Environmental planner
	Optimize reuse of wastewater and maximize return flow	Environmental Engineer
	Eco-friendly River fronts/ Leverage economic potential of rivers	Environmental planner/urban infrastructure specialist
	Citizen engagement: Awareness & Management	Sociologist with experience in IEC development, experience in community engagement for urban projects
	Finance options and M&E framework for URMP	Urban finance, urban planning
	Case study: URMP Kanpur	Lead trainer from host institute

Table 2: URMP Training: Selection of Resource Persons

Following are few indicative questions for this. The trainers/institutes can frame their own sets and modes of conducting the test based on the URMP presentations.

Indicative questions for pre-training assessment

Q1. Which ministry is responsible to manage urban rivers?
A. B. C. D.

Q2. Which SDG deals with rivers?
A. B. C. D.

Q3. Which planning instrument deals with strategic growth of a city?
A. Master Plan B. City Development Plan
C. Regional Plan D. City Vision Document

Q4. Are waterbodies and wetlands part of river system?
Yes No

Q5. Which urban national mission(s) deals with waterbodies/wetland?

Indicative questions for post-training assessment

Q1. List any two URMP objectives related to the Environment element.

Q2. Which URMP objective deals with livelihood aspect related to urban river?

Q3. How URMP projects can be implemented?

Q4. List any two design principles of URMP.

2.2.4 Feedback sessions

Feedback from the participants can be captured at the end of every day as well as at the end of the training program. It is an important part of the training as it helps improve the quality and can also help in course corrections in the design of the ongoing training program to achieve better results. The feedback on the daily basis serves the purpose to check effectiveness of individual sessions whereas the feedback at the end of the training program can capture impact of the entire program. In general, the feedback sessions are kept general, qualitative or semiquantitative in nature. Feedback sessions must be:

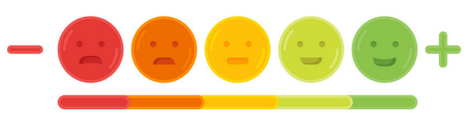
- **Short and less time consuming**
- **able to capture the perceptions of the participants**
- **provide options for the answers so participants can quickly share their feedback**
- **innovative and enjoyable and not boring**

Examples of Feedback Session

Conventional feedback – Conventionally, the feedback from the participants in the trainings is collected in the custom prepared forms with multiple-choice questionnaire (MCQ).
The MCQ can be designed as rating scales (1 to 5), or Excellent to Average (Satisfaction) with close ended questions.

Example of conventional feedback
Are you satisfied with the training session?
o Very satisfied
o Somewhat satisfied
o Neither satisfied nor dissatisfied
o Somewhat dissatisfied
o Very dissatisfied

Innovative feedback methods
Smiley feedback – This is a relatively new and popular concept for rating. It not only captures the perception of the participants but adds fun element to the feedback session.



Following emojis can be printed and used to evaluate the satisfaction level of the participants against every session/ exercise.

Energy meter – This is an innovative way to capture the feedback about the session. In this method instead of directly seeking data, energy level of the participants during the day is captured to gauge their attentiveness during the session.

An overall Training Feedback – The following table represents an indicative example to capture feedback on overall URMP training towards the end.

Session name	Content of session	Effectiveness of trainers	Exercise related to session if any	Improvement/suggestion on content improvement

Figure 3: Parameters for an effectively designed training session

2.3 Training requirements

While conventionally trainings have been held in offline/face to face mode, due to Covid 19 related travel restrictions, the online mode is also adopted and preferred now. However, from experience, its effectiveness in engaging the participants is not much as in person programs. The tools and approaches for the offline and online trainings need sperate arrangements and planning.

There are a lot many preparatory activities involved from start to end of any training program. Most of the professional training institutes are equipped and well aware of such preparation. Several of the these preparatory activities are quite necessary and unavoidable such as it is recommended that training material used in the URMP training be standardized with appropriate branding.

Following sections provide indicative preparatory requirements to conduct URMP trainings in the offline mode:

URMP training banner and standees - The banner of training program can be in print or digital format. It constantly reminds trainee about the theme of the training. The essential elements of banners are:

- **Logos of main /partners organizations usually placed on top right –** training institutes are requested to use the Namami Gange, NIUA logos by following the branding guidelines.
- **Recommended name of the URMP training:** Urban River Management Plan **–** Vision to Actions OR Managing Urban Rivers with URMP Framework OR URMP – A Tool to Manage Urban Rivers.
- **Date -** Single- or Two-days duration
- **Venue name**
- Any other information specific to training institutes

The size and placement of the banner can be decided as per the space availability/ LCD screen size etc. The design, color scheme and font sizes should be considered related to river theme while preparing banner for better visibility and aesthetics. Banners / Standee can be used as background of the group photographs. Depending on the location of the venue, standees can be placed to guide the participants to easily reach the the training room.

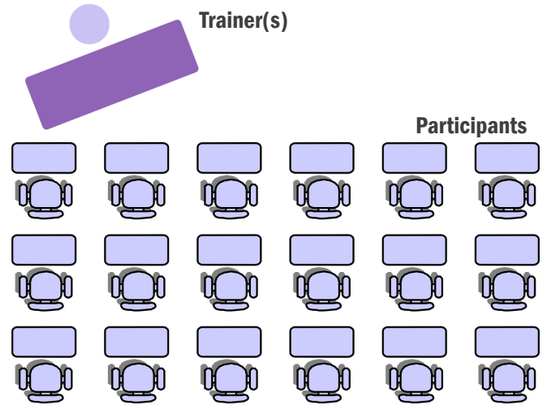
Training kit - The training kit is choice of institutes and can be basic or elaborate as per the budget. However, it should contain the following essential material:

- **Bag/Folder: Workshop Agenda, Lanyard with or without name of the trainee, Writing Pad/Diary, Pen, Pencil etc.**
- **Training booklet: Set of presentations, reference material during training (e.g. exercises, activities etc.)**
- **Study material (pen drive or hard copy) : URMP framework booklet, URMP Kanpur etc.**

Registration / attendance sheet – This is an important part for the documentation/ reporting, preparing certificates for trainees etc. The blank registration sheets can be used if the name of the trainee is not available in advance, if the same is available names can be printed and verified with participants to avoid name errors in the certificates. If the training program is for more than one day, separate registration sheet should be prepared for daily attendance. Registration sheet should also have logos and branding consistency. Example of the registration is given below for the reference purpose.

Name (CAPITAL)	Institute/Department	Contact details	Signature

Training room set-up – The training room set up is very essential to maintain the energy level of the trainees throughout the training program. Lighting and air conditioning are the most essential requirements for the training. The seating arrangement can be planned considering the training sessions, group exercises, and other activities planned in the training program. Most of the times Classroom type of set up is kept for the training room, however for making the training more engaging for learning, a flexible arrangement will be more effective.



Scenario 1: Classroom. Auditorium type seating

Scenario 2: Flexible/ Round table seating

Tools to conduct sessions

Innovative PPT Slides, group work, role play, Mentimeter for adding fun element, quiz, games, movies etc. shall be explored to engage the participants in diverse ways.

Certificate and Group photograph

At the end of a successful training, trainees should be handed over participation certificate. They can be prepared in advance and should be given on the last day of the training. The certificates must be signed by competent authorities involved in organizing the training program.

Arrangement for group photographs should be done. A banner or standee in the backdrop of the group photographs adds value.

Following should be fixed and ensured in the training room:

- **Placement of Banner**
- **Slide Projector, Projection Screen/Background, Slide changer/Pointer**
- **Audio-Visual set up, Internet Connectivity with backup arrangement etc.**

Logistic planning

The training institutes regularly conduct training programs. They must ensure the practice of conducting and providing quality training expereince. This can be valuable for the participants as well as trainining institutions themselves.

The trainees/participants invited for the training must be provided assistance from their arrival till their departure and should not face any issues. A short guidance note or briefing shall be provided to trainees about their logistic arrangements in advance for benefit and ease of the participants.

URMP Trainees Group photograph with the 10 objectives;Source: NMCG Team

SECTION B:

How to structure and design the URMP training?

3. URMP training: DAY 1

3.0 URMP Training Structure - Day 1

The URMP training is proposed for for the duration of two days and sessions are spread across 15 hrs. in which core sessions include approx. 13 hrs. and 2 hrs. have been accomodated for necessary breaks.

On the first day, around 90 minutes (1.5 hr) are spared for registration, introduction and other inauguration formalities related to the training including 30 minutes for the pre-training assessment session in which existing understanding of trainees is quickly assessed with simple MCQ questions. This helps in comparing the knowledge enhancement of trainees after URMP training in the post-assessment session.

The URMP framework is based on the core SDG principles of Environment, Social and Economic aspects having vision statements and elements for each of them. On the first day, the morning sessions mainly focus on sensitizing trainees on impacts of urbanization on rivers and how URMP concept and the framework help cities to manage urban rivers. It is essential for trainees to understand the 10 URMP objectives, therefore it is important to introduce these in the initial hours of the training followed up with interventions that can be planned around them.

In this manual all URMP objectives are presented in the sequence (1 to 10), however, in the provisional agenda indicated in Section A, sequence is given considering the importance of the relevant URMP objectives and collating them uder the larger umbrellas of Environment, Economic and Social. The proposed provisional agenda of the training (pg. no. 4) is ideal in terms of covering all the objectives effectively.

The day must end with feedback and reflections from the trainees on the session content, exercises covered, any specific change needed by trainees etc. as it will provide opportunity to modify the training approach for the remaining training sessions.

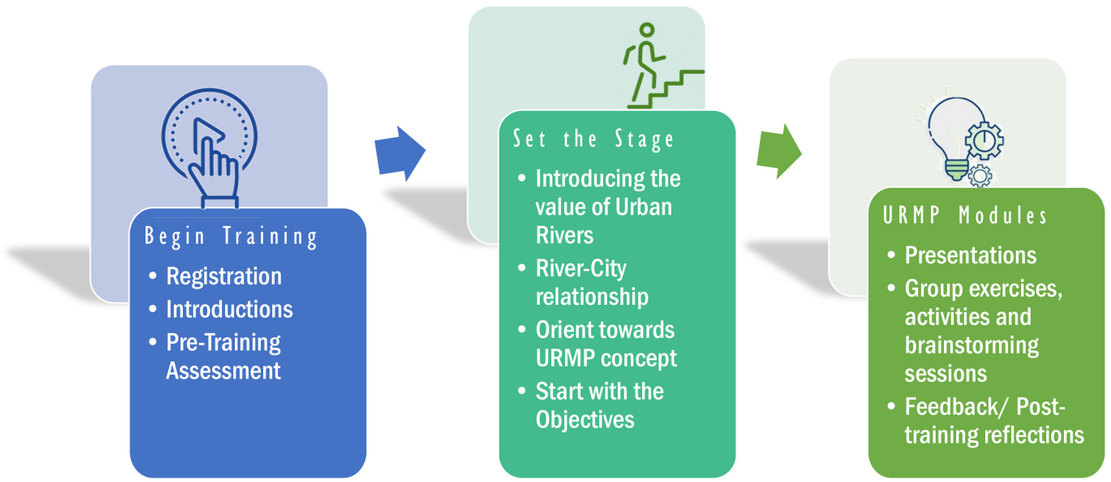


Figure 4: Broad Structure of the URMP Training

3.1 Opening URMP training

Duration – 60 min. (9.30 to 10.30)

Session Break up

Activity	Time	Materials / Methods
Registration	Ideally 15-20 min. before training	Registration sheet, training kit, study material, any special instruction sheets
Inaugural session	30 min	Head of host institute, chief guest, other dignitaries are invited to motivate trainees and officially open the URMP training

Attendance: Mostly the trainee's names will be available with the host institute in advance. The training coordinator/lead trainer should ensure that day wise registration / attendance sheets are prepared to mark attendance of the trainees. This would be used for reporting purpose. Name of the trainees in the sheet would help to prepare training certificates with correct names verified themselves by the trainees in the sheet.

Inauguration: To motivate the participants, the head of training institute/ chief guest/invited dignitary could be invited during inaugural ceremony. The inaugural ceremony should be short to ensure that the time for the main training session is not compromised.

Introduction and orientation of training program

Duration – 30 minutes (10.30 – 11.30 AM)

Session Break up

Activity	Time	Materials / Methods
Introduction of participants	20 min	Moderation by session facilitator, Ask trainees' Name, Institution, Designation, Role & Responsibility, Expectations from training Session should work as an ice-breaker for trainees
Introduction and orientation of URMP training, familiarize with training agenda	10 min	PPT slides, training agenda printed OR digital display of agenda
Pre-training assessment	30 min.	MCQ based assessment of participants covering URMP sessions.

Introduction of participants – This is important for the ice-breaking for trainees. To familiarize trainees with each other and trainers, following methods can be tried.

Self-introduction – Conventional approach in which trainees tell their names, institutions they belong to and their designations and responsibilities. Introducing the neighbor – To break the initial hesitation, lead trainer can ask trainees to introduce their neighbor instead of self-introduction.

Room mapping – This is an interesting method of introduction of the participants in which room space is an important aspect. Participants are asked to come and take position in the room in North, South, East, and West as per their city location. This can help in knowing the regional strength of trainees from various parts of state/ country and can help in planning sessions by including more relevant training content.

3.1.1. Explain training schedule

The lead trainer should run through the overall training agenda, provide overview of various sessions and methodology of the training. This will help trainees to get familiarize about the training sessions and prepare them for what they are going to learn.

3.1.2 Expectations from participants

While the introduction of the trainees, lead trainer can either randomly or individually ask about trainee's expectations and what specific aspect they want to learn. This could help trainers to brief the invited experts/resource persons to focus on specific expectations of the trainees.

3.1.3 Set the training rules

It is very essential that the trainees and trainers maintain the decorum of the training by following discipline throughout training. Basic rules like switching off mobile phones, respecting opinion of other trainees or other guidance can be conveyed by the lead trainer.

3.1.4 Orient participants to training campus

Since the trainees are from other parts, it is essential to orient them about training campus and mak them aware about the surroundings. They should be briefed about the water room, wash room and if possible, about the primary health facility availability in case of emergency. Information about local travel arrangements could also be beneficial for the trainees.

3.2 Training Sessions

Duration – 20 minutes

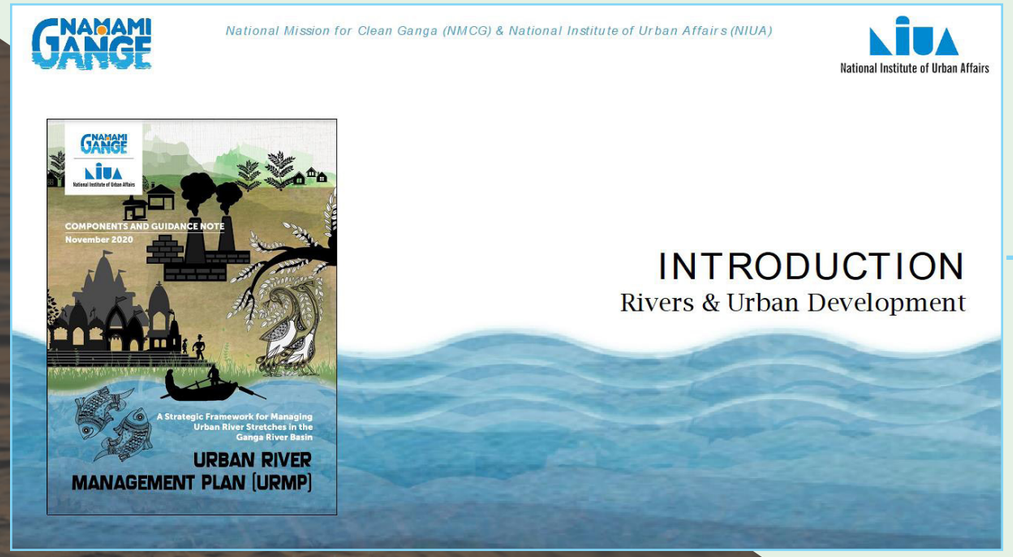
Session Break up

Activity	Time	Materials / Methods
Lecture on Rivers and urban development	5 min	PPT slides
Mentimeter Quiz Refer: https://www.mentimeter.com Login ID and password required Any other platform can be used available with institute	10 min	Internet connectivity for laptop/PC projecting quiz slides prepared in advance; PPT slides, Mobile phone with trainees. The trainer instructs participants to open Mentimeter in their mobile phones and provides code and start the quiz
Session summary	5 min.	Trainer do a plenary discussion with participants based on the results of the Mentimeter quiz OR trainees' perceptions about rivers and its situation

1: Rivers and Urban Development

Since the trainees might be from different education backgrounds, working in different departments involved in routine operation activities in the ULBs, the opening session is proposed to orient them on urbanization and urban-river connect.

To familiarize trainees on the topic and also for the interactive training, beginning is done with a short presentation on how cities have evolved on river banks, how rivers and cities are inter-connected (Refer Presentation). Since the Ganga River is most commonly known, as an ice-breaker a short quiz is proposed for the session to familiarize trainees on the facts and figures of the Ganga River basin, its importance etc. The table above gives the session break up.



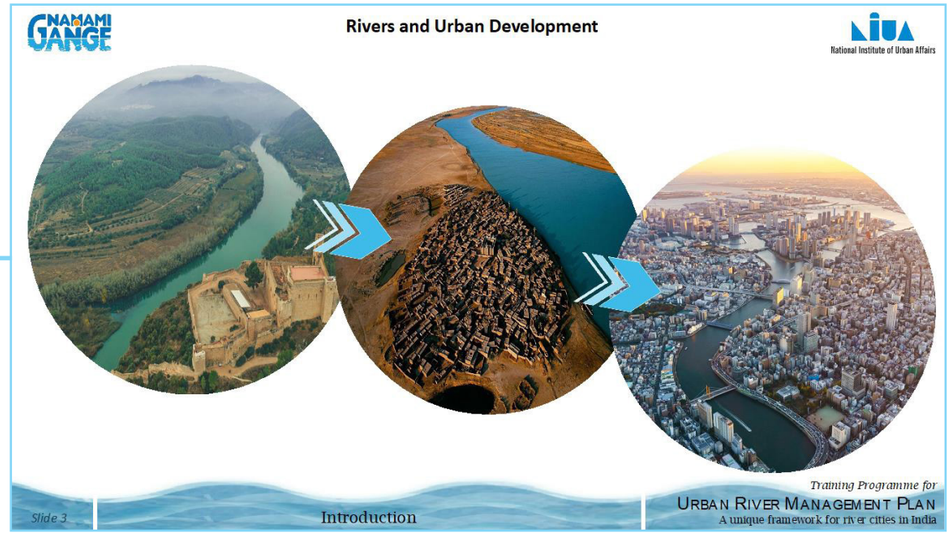
Learning objectives

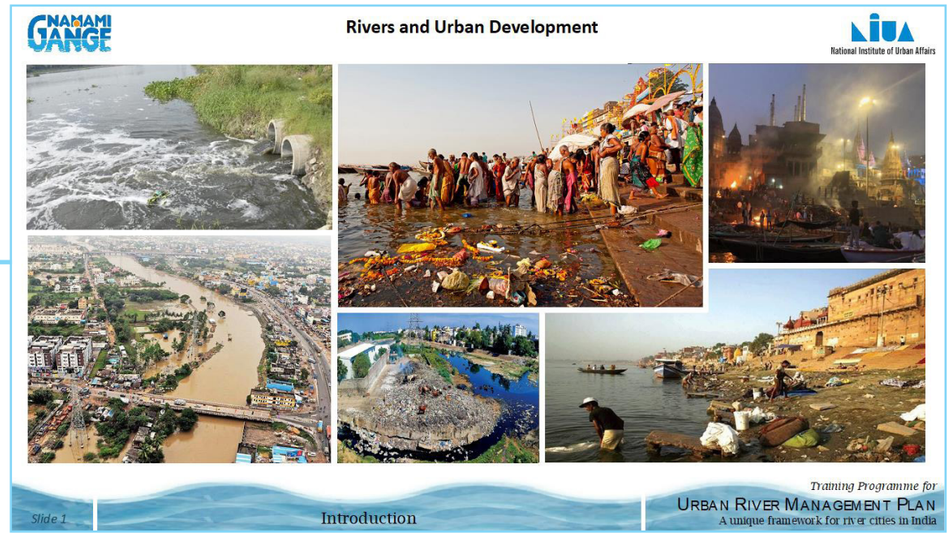
Trainees understand:

- **River-City Relationship**
- **Evolution of cities on river banks**
- **Key facts related to rivers - cities**
- **Known facts and figures related to the Ganga River basin**

Short Presentation

A short presentation with pictures of rivers and cities relationship is shown to the trainees. Narration of how cities have evolved on the river banks is discussed with participants. The presentation shows common issues of urban rivers like pollution, degraded biodiversity, loss of livelihood. To improve the health of urban rivers, best practice examples related to river management are shown which include green buffer areas (riparian zone) along river banks, water sensitive urban design concepts etc.





SESSION 1

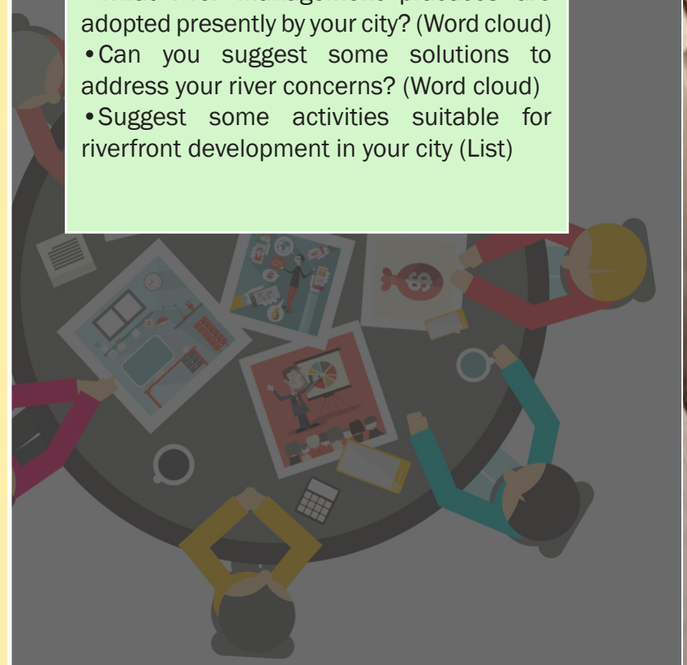
Indicative Exercises Example 1

Mentimeter Quiz

The Mentimeter (https://www.mentimeter.com) is widely used platform for the online trainings, webinars. After short presentation this ice-breaking activity as a quiz is very useful. Trainer will ask trainees to open mentimeter in their mobile phones and provide code to start the quiz. Following are some of the indicative questions based on which the mentimeter quiz can be prepared in advance. Trainer present the slides and ask trainees opinion.

Indicative question to prepare slides for quiz

- Which SDG covers water and sanitation improvement by 2030? (SDG 6)
- When is World Rivers Day celebrated every year? (4th Sunday of September)
- Which of the following river species has been declared as the National Aquatic Animal? (Freshwater Dolphins)
- Which country is located below sea level, is famous for the "Room for the River" project? (The Netherlands)
- The modern practice of Water Sensitive Urban Design was pioneered in which country? (Australia)
- Black water is a term used to denote? (Wastewater from toilets)



Indicative Exercises Example 2

Perception based – for building towards URMP needs, objectives and interventions, a certain narrative can be built by asking broader questions like:

- What are the major river challenges in your city? (Word cloud)
- What river management practices are adopted presently by your city? (Word cloud)
- Can you suggest some solutions to address your river concerns? (Word cloud)
- Suggest some activities suitable for riverfront development in your city (List)

Requirements to conduct the session

Short presentation, Mentimeter quiz prepared in advance, Internet connectivity, Slide projector, Seets, Post its, Markers etc.

Trainees taking part in the exercise; Source: NMCG Team

SESSION 1


TRAINING PROGRAMME
Training Programme on preparing URMPs
NAMAMI GANGE
NIUA
National Institute of Urban Affairs
WATER & ENVIRONMENT VERTICAL
Your Perspectives On Urban River Management
Management of Pollutants into the River
Understanding the Urbanisation around the river
Mapping Catchment of river
Mitigating the Impacts of cultural & religious activities on rivers
Restoring the economic utilities of rivers
Assessing the riverine ecosystems
Understanding Flora & fauna around the river basin
GANGA
Regulatory Mechanism Institution Framework
GOAL of URMP HEALTHY RIVERS THRU'
अविरल धारा निर्मल धारा
USING
• IOT DEVICES
• FSSM
Reuse & Recycle
Integration with local aquifers
Capacity Building
Stakeholder Participation
River Centric city planning
Cultural
Spatial
Social
River
Connectivity
Economy
Ecological
INTERVENTIONS
Reconnaissance Survey
Integration of River in spatial planning
Public Participation
REGULATION OF WATER QUALITY
ECOSYSTEM SERVICES OF RIVER (IN VALUE)
BEHAVIOUR CHANGE
Give teeth to POLICIES
FISCAL INCENTIVES in Implementation
MAINTAIN HYDROLOGY
MAINTAINING EQUILIBRIUM BETWEEN WATER DRAWN & DISCHARGE
ESTABLISHING/IMPROVING RIVER-PEOPLE CONNECT
RESTORING THE GLORY OF URBAN RIVERS
FOCUSSING ON IMPROVED RIVER HEALTH - IMPROVED BIODIVERSITY!
SYSTEMATIC PLAN B/W CITIES ON SAME RIVER

SESSION 1

2. Understanding the URMP Framework

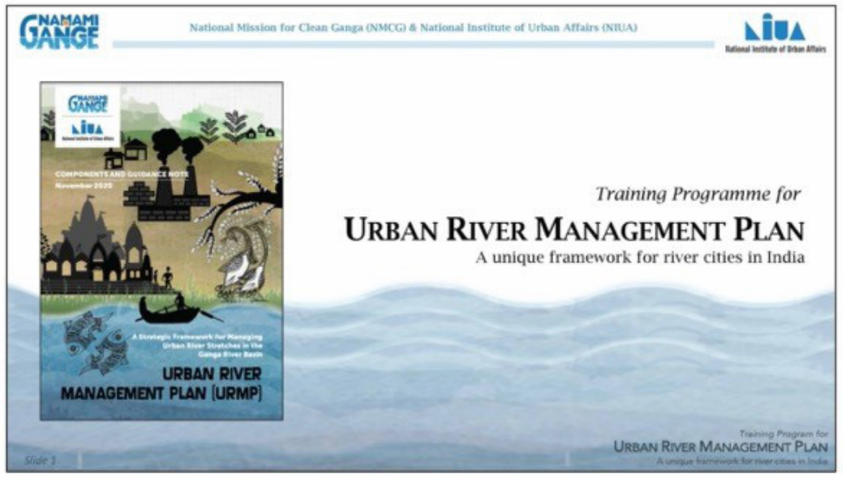
This is the most important session of URMP training program (Refer Presentation). It covers how URMP framework is conceptualized, its design philosophy, principles, legal sanctity etc. and benefits of URMP for the cities. The session explains theory of change brought with URMP concept to improve river-city relationship, with vision statements for each element proposed and elaborating on the scope of URMP. The 10 core URMP objectives are explained in detail.

Activity	Time	Materials / Methods
Lecture on of URMP concept and framework	20 min	PPT slides. Trainer will explain how URMP was conceptualized, theory of change, scope, etc. The trainer will run through 3 elements of URMP viz. Environment, Social and Economy, its vision and explain 10 core objectives to achieve URMP aim and explain how it helps to manage urban rivers.
Activity – I Synergy of URMP objectives	10 min	Flipchart/A0 size matrix. 5 groups (as per trainees' number) to be prepared for the activity. Print 5 tables (matrix) with two columns i.e., URMP objective and relevant national mission in city. For each group different URMP objectives can be provided. Trainees discuss in groups how they see linkage of URMP objectives with various missions being implemented in city, any relevant project planned in city that align with URMP objective.
Activity II Extension of Activity I – Align URMP projects with financial streams	10 min.	Additional finance option column can be added in Activity I. Facilitator will ask trainees to write which is most suitable finance source available (e.g. CSR, AMRUT etc.) to implement project for respective objective of URMP
Session summary	5 min.	Lead trainer of the session will summarize in plenary discussions and make sure the 10 core objectives are learnt by trainees.

Note: Activity I and II can be combined and given together in same table

Activities given in table are indicative. Resource person/trainer can also design map-based activity for most polluted cities in India, their primary reason (industry, tourism, urban planning etc.).

Another way is story telling: Are you from river city? What are issues in the city? Which objective is relevant for your city?



Learning objectives

Trainees understand:

- **URMP concept**
- **Theory of change: River-City connect**
- **Visions of URMP elements, and URMP scope**
- **Overview of 10 core objectives of URMP**

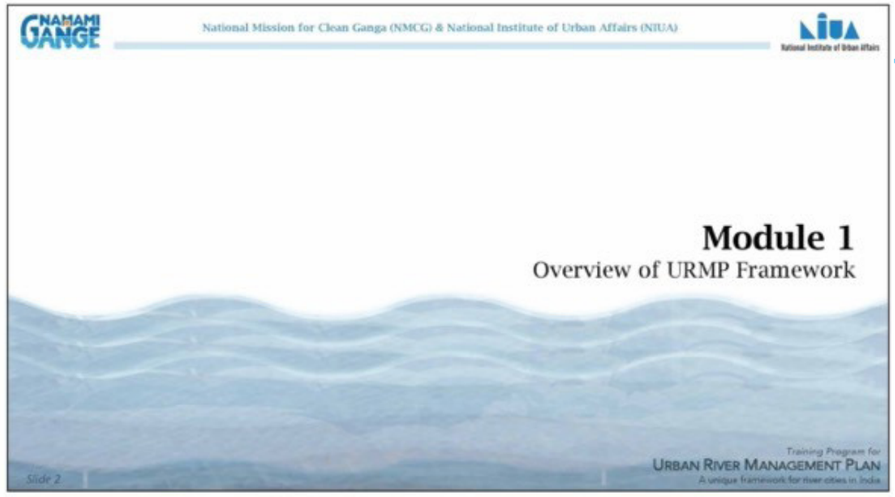
Short Presentation

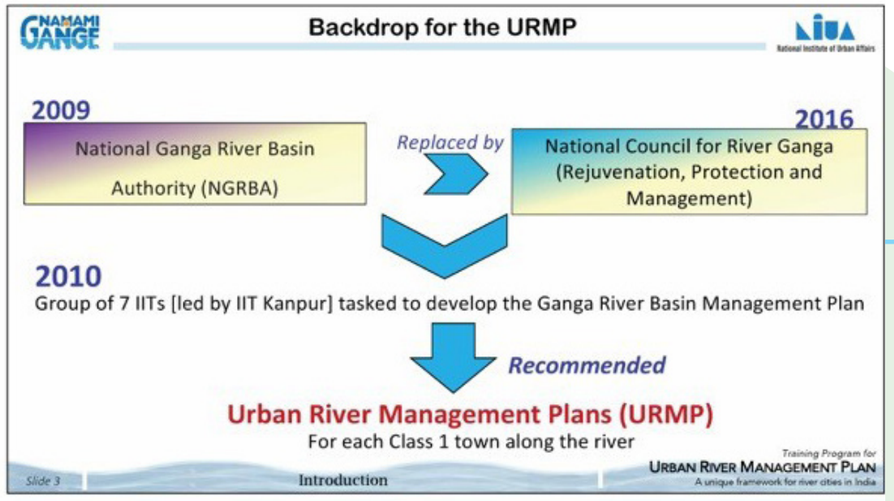
The presentation should explain backdrop of the URMP concept, and definition. Importance of URMP is conveyed in slides through two slides covering present day River-City connect in which trainers explain key water flows in urban set up and main consumption areas, sources of point and non-point pollutions etc. **The slides cover design principles of URMP framework, three key pillars of URMP and explain how they are connected with SDG principles.**

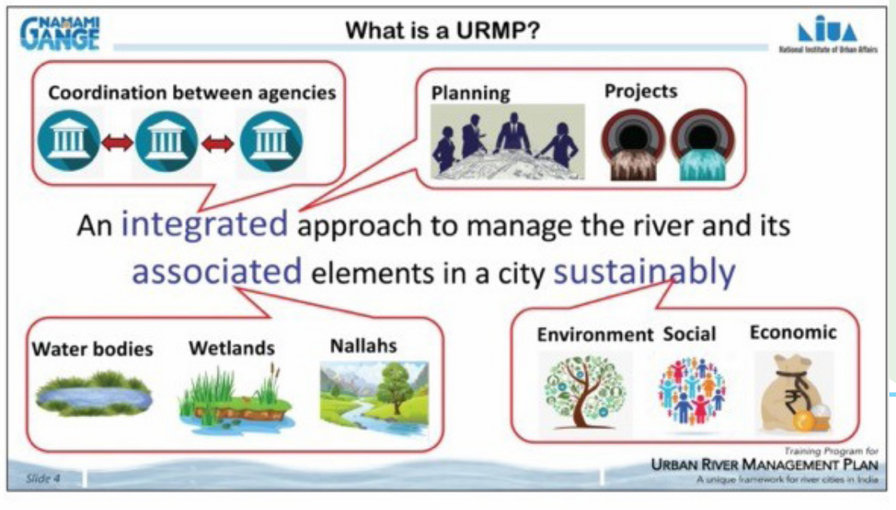
More time should be spent on slides explaining URMP framework, its objectives, and choice of cities to decide on interventions under each objective along with finance choice. Importantly the **message should be conveyed to trainees that URMP is not an additional burden for cities, but flexible enough to link with ongoing urban renewal missions and projects implemented by cities.** The trainer should interact with participants in between if there are good or bad examples from their cities related to the river.

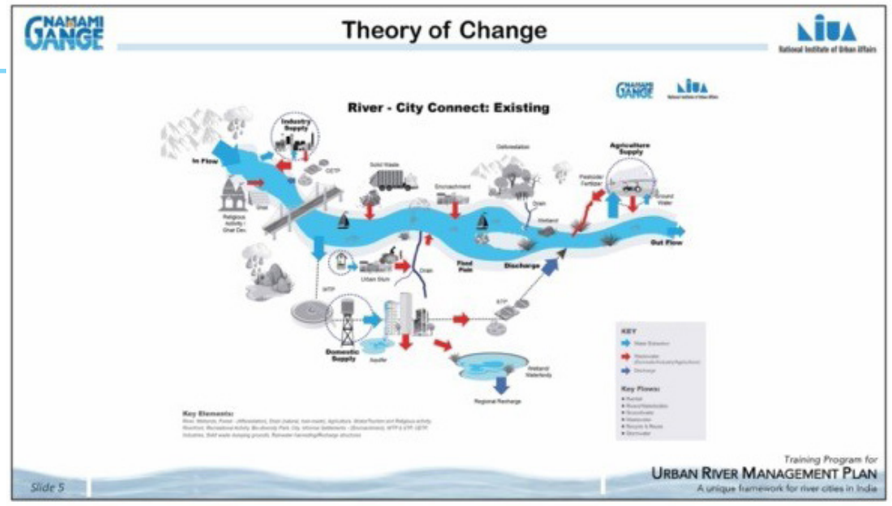
Trainer is expected to explain each URMP objective, its purpose and related definitions that makes trainees understand the inter-connectedness of each objective. For example, waterbodies and wetlands are connected with rivers by explaining about groundwater base flow merging in rivers.

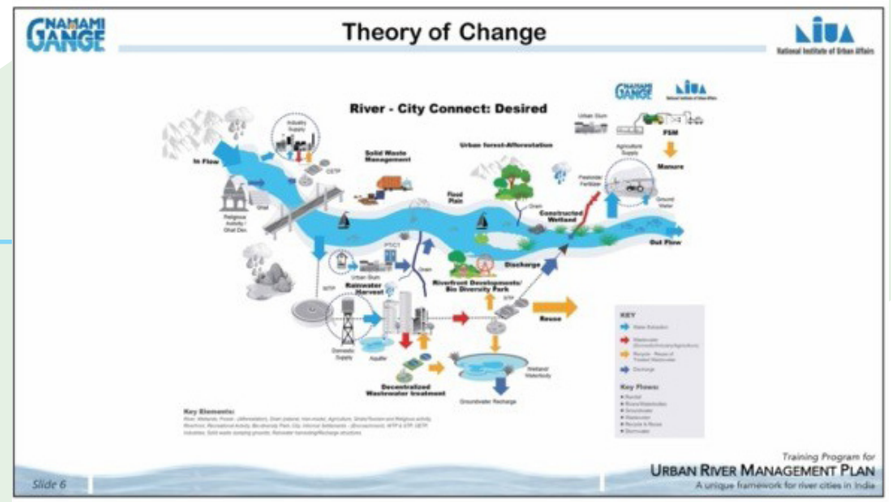
SESSION 2

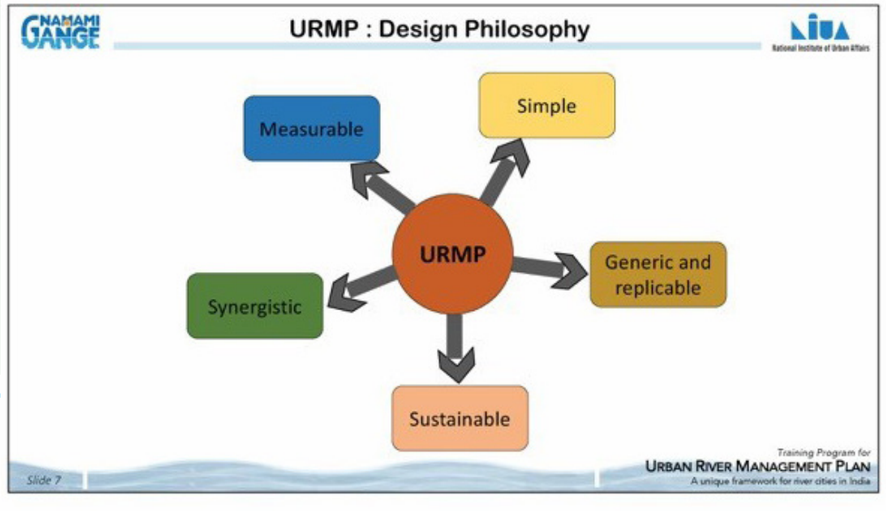

National Mission for Clean Ganga (NMCG) & National Institute of Urban Affairs (NIUA)
Module 1
Overview of URMP Framework
Slide 2
Training Program for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India


Backdrop for the URMP
2009
National Ganga River Basin Authority (NGRBA)
Replaced by
2016
National Council for River Ganga (Rejuvenation, Protection and Management)
2010
Group of 7 IITs [led by IIT Kanpur] tasked to develop the Ganga River Basin Management Plan
Recommended
Urban River Management Plans (URMP)
For each Class 1 town along the river
Slide 3
Introduction
Training Program for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India

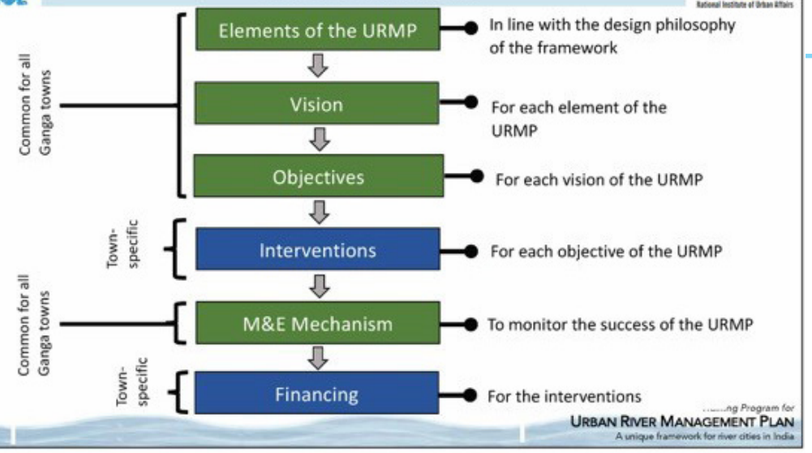

What is a URMP?
Coordination between agencies
Planning
Projects
An integrated approach to manage the river and its associated elements in a city sustainably
Water bodies
Wetlands
Nallahs
Environment
Social
Economic
Slide 4
Training Program for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India


Theory of Change
River - City Connect: Existing
Slide 5
Training Program for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India


Theory of Change
River - City Connect: Desired
Slide 6
Training Program for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India


URMP : Design Philosophy
Measurable
Simple
URMP
Synergistic
Generic and replicable
Sustainable
Slide 7
Training Program for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India

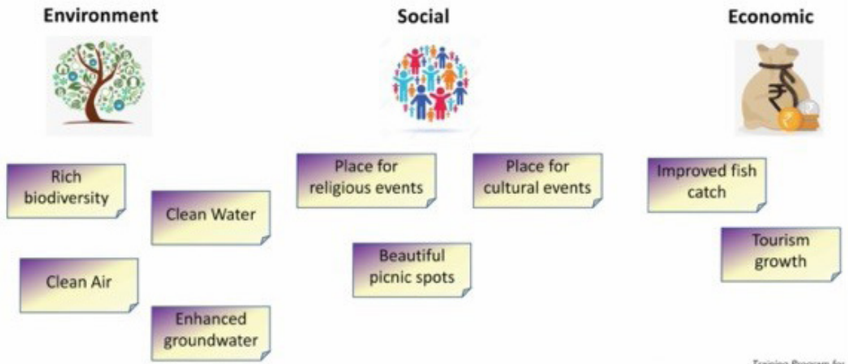
URMP : Framework



Slide 8

Training Program for URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India

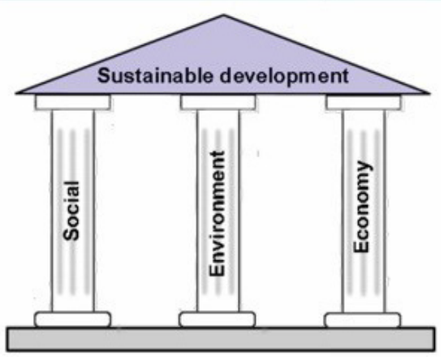
URMP : Benefits to City



Slide 9

Training Program for URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India

URMP : Key Elements



The URMP will provide:

- Environmental benefits
- Social benefits
- Economic benefits

Slide 10

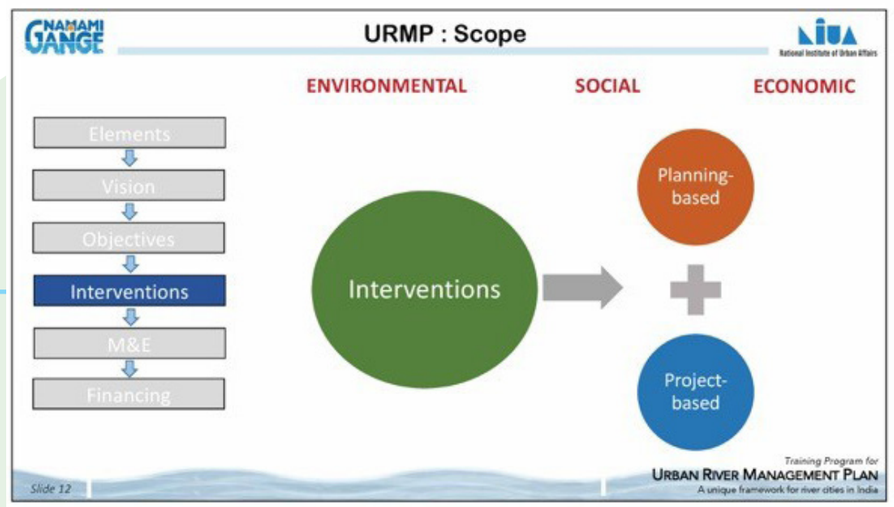
Training Program for URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India

URMP : Vision Statements

Slide 11

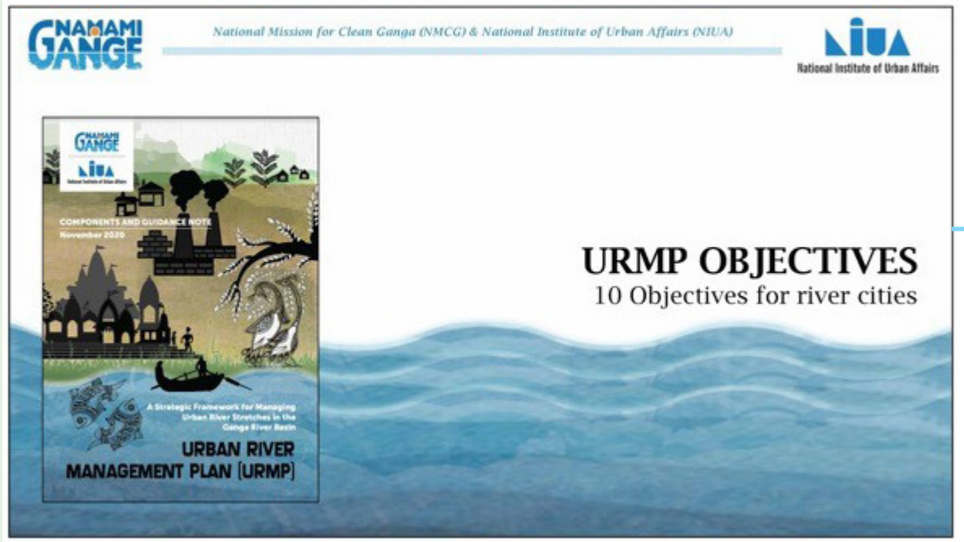
Training Program for URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India

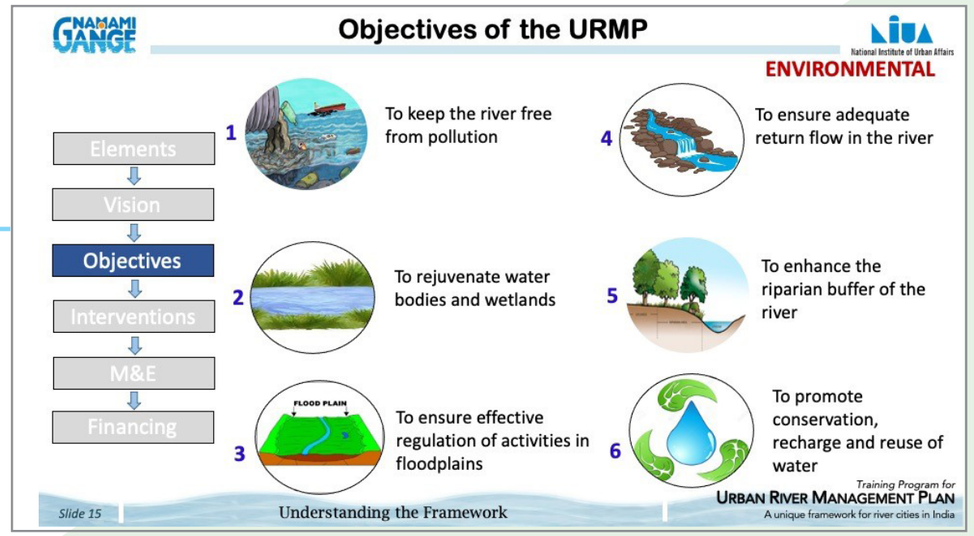
URMP : Scope

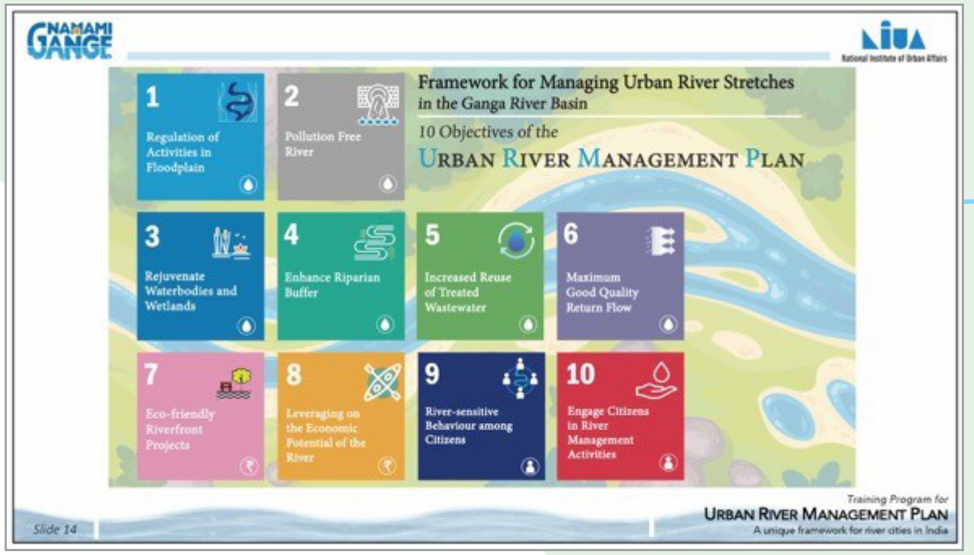


Slide 12

Training Program for URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India


National Mission for Clean Ganga (NMCG) & National Institute of Urban Affairs (NIUA)
National Institute of Urban Affairs
COMPONENTS AND GUIDANCE NOTE
November 2020
A Strategic Framework for Managing Urban River Stretches in the Ganga River Basin
URBAN RIVER MANAGEMENT PLAN (URMP)
URMP OBJECTIVES
10 Objectives for river cities


Objectives of the URMP
ENVIRONMENTAL
Elements
Vision
Objectives
Interventions
M&E
Financing
1 To keep the river free from pollution
2 To rejuvenate water bodies and wetlands
3 To ensure effective regulation of activities in floodplains
4 To ensure adequate return flow in the river
5 To enhance the riparian buffer of the river
6 To promote conservation, recharge and reuse of water
FLOOD PLAIN
Slide 15
Understanding the Framework
Training Program for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India


Framework for Managing Urban River Stretches in the Ganga River Basin
10 Objectives of the
URBAN RIVER MANAGEMENT PLAN
1 Regulation of Activities in Floodplain
2 Pollution Free River
3 Rejuvenate Waterbodies and Wetlands
4 Enhance Riparian Buffer
5 Increased Reuse of Treated Wastewater
6 Maximum Good Quality Return Flow
7 Eco-friendly Riverfront Projects
8 Leveraging on the Economic Potential of the River
9 River-sensitive Behaviour among Citizens
10 Engage Citizens in River Management Activities
Slide 14
Training Program for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India


Objectives of the URMP
SOCIAL
ECONOMIC
Elements
Vision
Objectives
Interventions
M&E
Financing
7 To inculcate river-sensitive behaviour among citizens
8 To engage citizens in river management activities
9 To develop eco-friendly riverfronts
10 To promote sustainable river tourism
Slide 16
URMP Objectives
Training Program for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India

SESSION 2

Indicative Exercises Example

Exercise - I: Syndergy of URMP objectives with the national/ state missions

Print the following table on chart paper preferably (A0) size. 5 groups (or as per no. of trainees) can be prepared. The objectives can be mixed and can be distributed among different groups.

URMP Objective List at least 5 for each group	Link with national mission	Relevant project/planning
To regulate activities in floodplain	Master Plan of city, DCR etc.	
To abate river pollution	Namami Gange (NMCG), AMRUT,	
To rejuvenate wetlands and waterbodies	Jal Jeevan, AMRTU, Jal Jeevan Mission, 15FCC	
Objective...		

Indicative Exercises Example

To extend the above exercise further, a column of financial choice can be added in the above table. Trainees should be asked to suggest appropriate financial options to implement the project.

Requirements to conduct the session

PPT slides of session, flipcharts, A0 size chart paper, color pen sets to write and do moderated discussions.

Session 2: Overview of URMP Framework ;Source: NMCG Team

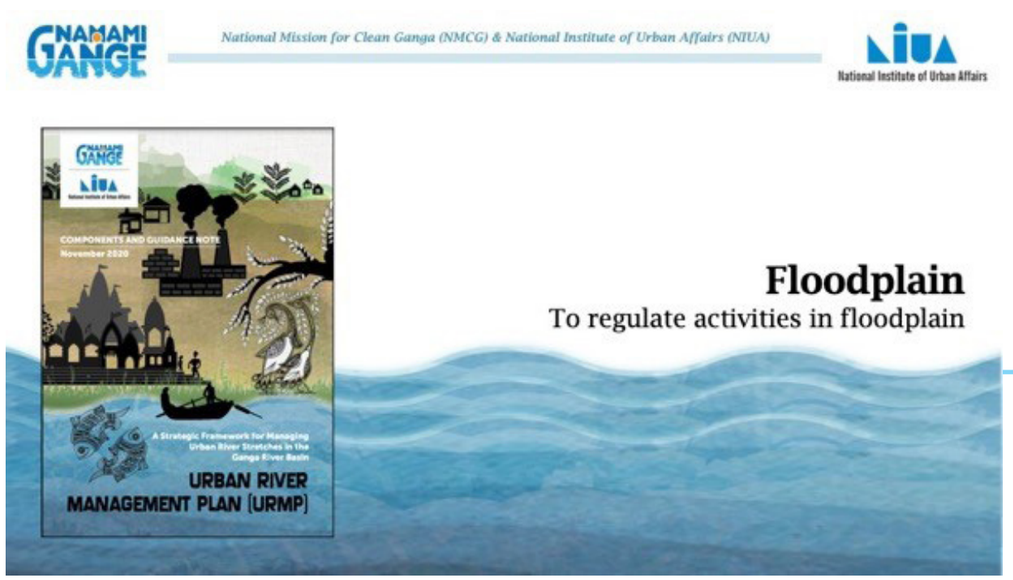
Ganga River in Rishiskesh;Source: Pixabay

3. Obejective 1: To ensure effective regulation of activities in the floodplain

Floodplain is the most important and integral part of rivers and is usually neglected in urban set up. Most of the time floodplains have agriculture activities due to high fertility, and industrial activities. In most of city's floodplains are encroached due to poor floodplain regulation provisions, enforcement of regulations etc. Slums and unauthorized development (small/big industries) usually occupies the sections of floodplains.

Duration – 50 minutes

Activity	Time	Materials / Methods
Lecture on regulations of activities in floodplain	10 min	PPT slides. Trainer will explain various approaches through which floodplain activities can be regulated. The strategies explained through slides include planning provisions, norms & standards, special projects etc.
Activity – I What is your city doing to protect floodplain?	30 min	Flipchart/print of A0 size table matrix. The strategies covered in presentation are listed in one column of table. As per no. of groups, 4-5 cities name from where trainees have come can be listed in another column. Trainer will explain and moderate the discussions and know from trainees about the existing strategies in their cities. Various provisions available in Master Plan/DCR / Bye-laws etc.)
Session summary	10 min.	Lead trainer of the session will do plenary discussion and make sure the learning objectives are achieved



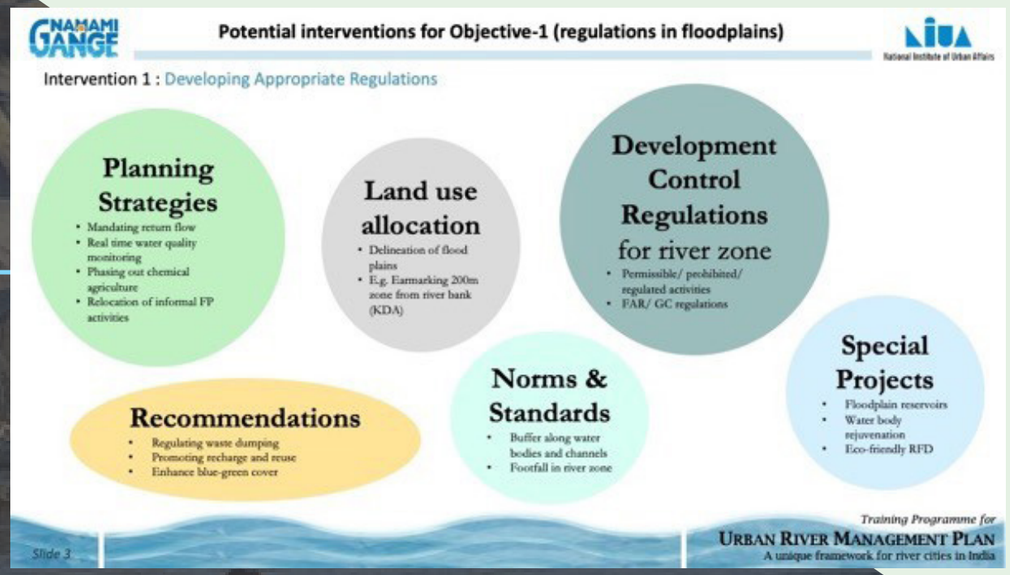
Learning objectives

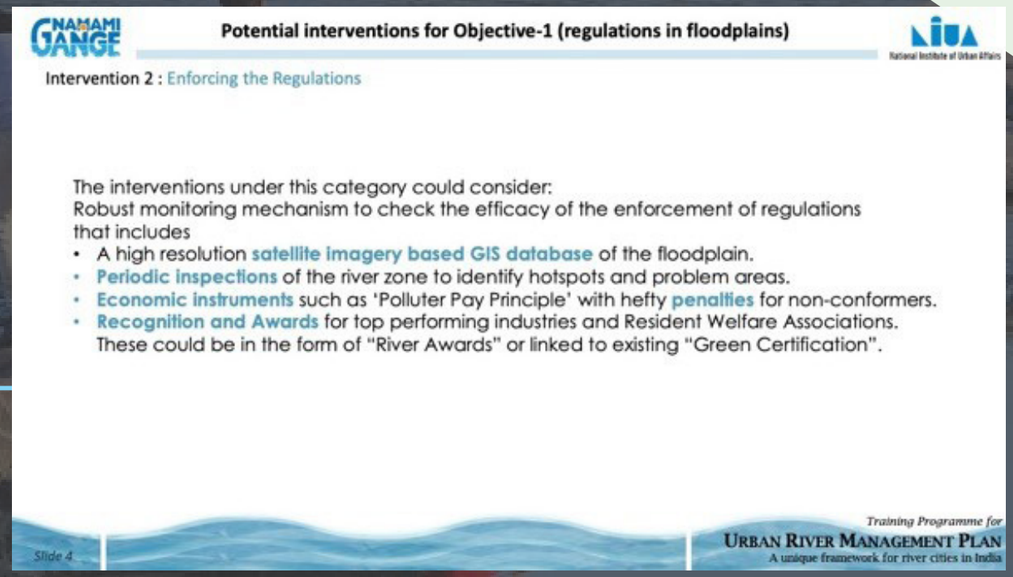
Trainees understand:

- **Importance of floodplains**
- **Mandates & various provisions to protect floodplains**
- **How urban activities modify floodplains**
- **What are important regulations to regulate activities in floodplains**

Short Presentation

The trainer should briefly explain floodplains and its importance. A slide covering various strategies shall be shown with examples, if possible. There are six categories explained in the slides. Trainer should elaborate and explain some of them and not all by giving more time on discussions with trainees about situation in their cities.





Indicative Exercises Example

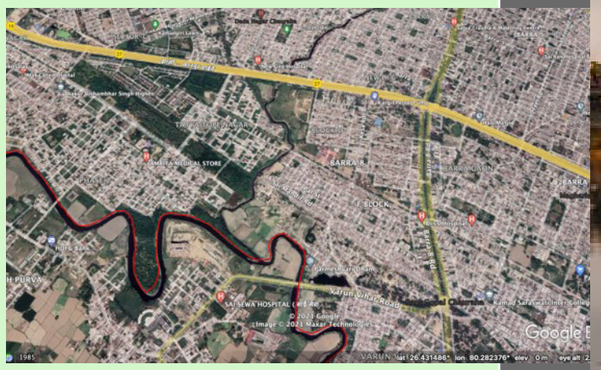
Exercise – I Floodplain regulations in your city
This activity helps trainees understand various strategies covered in the lecture. For this purpose, cities from where trainees are present can be taken as cases. If trainer is already aware of some examples, they can also be used for the activity (e.g. floodplain protection provisions in Delhi planning).

Following table should be prepared on A0 chart paper. As per the numbers of groups, 2 to 3 copies of the table can be printed. Facilitator will probe about various strategies/approaches covered in the presentation that are practiced in cities and write on the chart paper. Each facilitator present with the group will discuss the relevant approach used in the trainees city. **At the end of session, lead trainer will summarize the session by referring to activity done by trainees in plenary discussions.**

Floodplain regulation strategy	City A (Trainee's city)	City B
Planning provisions	a. ..... b. ..... c.	
Land use allocation	a. b. c.	
DCRs	a. b. C.	
Norms & standards/Bye-laws		
Special project		

Indicative Exercises Example

As alternative to above tabular exercise, a map-based activity can be planned. A Google map print with river passing nearby or through city is provided to trainees. Trainee groups will try to mark floodplain extent on the map/OR a butter paper with floodplain marked in advance to be overlaid on map. With group discussions trainees write various visible issues observed in the map (encroachment, nearby industry etc.). To deal with the issues identified, most relevant approach can be discussed in plenary by facilitator.



Requirements to conduct the session

PPT slides, flipchart, A0 size chart paper, color marker pens/highlighter pens to write on table or highlight features on map. Google maps print as per groups with tentative floodplain boundary marked on butter paper

Source: Pexel

SESSION 3: OBJECTIVE 1

4. Obejctive 2: To keep river/s free from pollution

Pollution is the biggest threat for the rivers passing through urban areas and a serious concern for the city administration. Commonly, centralized sewage management of sewerage infrastructure and STP is first choice of cities. However, it is costly, time taking and O&M heavy system. Therefore, cities should be able to appreciate De-centralized sewage management strategies and compliment it with conventional one. Onsite Sanitation System (OSS) and associated waste management is a common challenge in most of the small and medium cities. Therefore, this session is focused on pollution abatement through Decentralized sewage management option and Faecal Sludge Septage Management (FSSM).

Duration – 75 minutes

Activity	Time	Materials / Methods
Lecture on of river pollution sources and FSM as possible decentralized waste management strategy	10 min	This is well known and common issue, therefore the PPT slides are minimum. The trainer can do moderated discussion while presenting slides on FSM.
Activity – I Plan relevant FSSM intervention a. b. FSM: - Co-treatment OR separate FSTP? c. DEWAT for uncovered area (map-based exercise)	40 min.	Out of the three options, any one or more as per time can be covered in the 40 min. duration time. A0 size chart paper, flip chart, printed map of a section of city, FSSM value chain options table prepared in advance
Activity – II Understanding CPCB standards	15 min	CPCB has given designated usage of waterbodies as per its quality parameters. Trainees are not aware on these standards and therefore, to make them aware quick exercise is proposed. Flipchart/PPT slide showing the CPCB class of waterbodies are required to discuss this.
Session summary	10 min.	Lead trainer will summarize in plenary discussions and make sure the 10 core objectives are learnt by trainees.

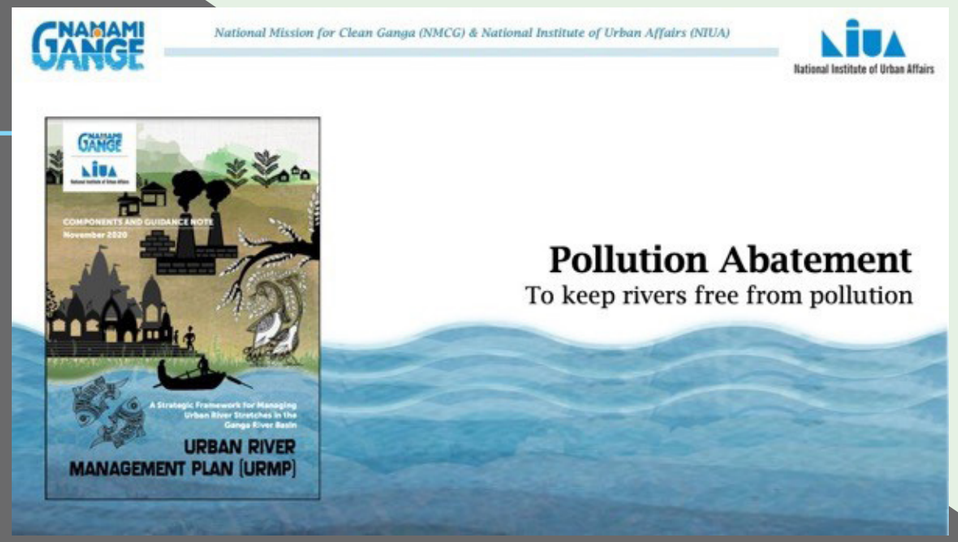
Learning objectives

Trainees understand:

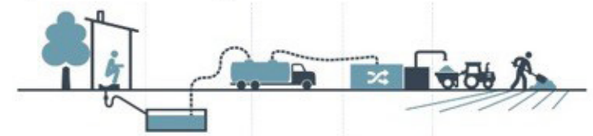
- **Point and non-point sources of river pollution**
- **Options of pollution abatement**
- **Understand FSSM value chain**
- **Co-treatment of septage as key strategy to deal with OSS**

Short Presentation

The trainer first covers point and non-point sources of river pollution and briefly explains conventional approaches of centralized waste management in cities. In subsequent PPT slides, trainer should first explain pollution issues of liquid waste generated from OSS particularly in absence of UGD system and explain all component of the FSSM value chain and common challenges associated with it. Two options of treating septage as co-treatment at STP (commonly practiced) and at dedicated faecal sludge treatment plant (FSTP) are explained. Co-treatment should be emphasized.



Liquid Waste Management from OSS



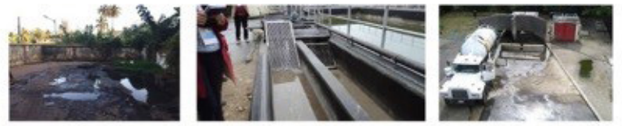
CONTAINMENT	EMPTYING	TRANSPORT	TREATMENT	RECYCLE/RE-USE
• Database of OS (households, public/community toilets) • Estimation of Septage/FS generation	• FS/septage desludging frequency • Desludging plan for city – demand/scheduled	• Database of desludging tanker operators • Formalisation of tanker operators	• Standalone FSTP • Technical feasibility of co-treatment at STPs	• Identification of re-use opportunities

Feasibility of Co-treatment at STP

How much FS can be discharged
- Max 1-2% of STP capacity

Distance
- Within 15-20 KMS of drive to STP

Discharge Location
- Pumping station
- An inlet of STP
- Manhole (trunk sewer)*



Septage/Fecal Sludge Treatment

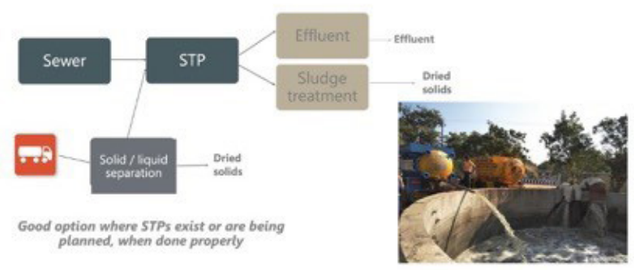
Treatment of septage/fecal sludge at dedicated FSTP

Co-treatment of sewage and septage/fecal sludge at STP

Planning for Co-treatment at STP

EVALUATE POTENTIAL	GATHER BASIC INFORMATION	PRELIMINARY PROCESS	PRETREATMENT	CO-TREATMENT
• large STP • substantial % connected population, others using on-site systems • significant unutilised STP capacity • location of STP suitable for sludge treatment	•STP Characteristics • capacity • current loading • process design parameters • regulated effluent standards and current STP performance •Characteristics and future prospect of catchment • Current and future sewage flows and characteristics •Characteristics and future prospect of sludge catchment • estimated sludge to be treated and projection • source of sludge • characteristics of sludge and changes expected in planning period	Preliminary steps: •screening •grit removal •blending/ mixing •equalisation	• stabilisation for fresh sludge • direct dewatering for sludge from pits, with high solids content • solids/ liquid separation with the solids part dewatered further, for septage or wetter sludges	• Liquid co-treated with sewage Check • Solids loading • organic loading • oxygen requirement • nutrient loading

Co-treatment at STP



Good option where STPs exist or are being planned, when done properly

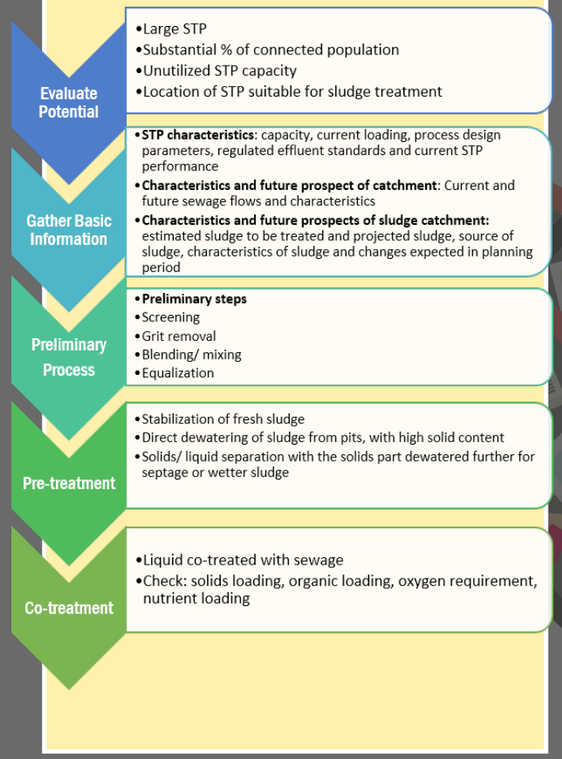
Co-treatment at Puri STP, Odisha

Indicative Exercises Example

Exercise – I Feasibility of co-treatment option to treat septage

Five groups can be formed based on the above process. Each group should be provided flipchart page with aspect written on it (as per above slide). Trainees are first asked to do brainstorming on topic covered and prepare the process diagram. Trainees will elaborate only one part of process written on flipchart, write its importance, discuss information given during the presentation and write them on flipchart. Facilitator in the groups should guide trainees to list the points mentioned in above process diagram so trainees understand that.

With this exercise, trainees will understand importance of co-treatment and will be sensitized on necessary requirements to opt for the co-treatment of septage.



Indicative Exercises Example

Exercise – II : Understand CPCB standards of waste disposal

The following table can be projected on the screen and trainer should first explain the CPCB standards. The same groups should be asked to discuss the standards explained and only write all classes (A to E) and associated designated usage in the flipchart paper provided.

Designated-best-Use/ Beneficial Use`	Classification of water	Criteria
Drinking water source without conventional treatment but after disinfection	A	1. Total Coliforms Organism MPN/100 ml shall be 50 or less 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 6 mg/l or more 4. Biochemical Oxygen Demand 5 days 20 °C 2 mg/l or less
Outdoor bathing (organised)	B	1. Total Coliforms Organism MPN/100 ml shall be 500 or less 2. pH between 6.5 and 8.5 3. Dissolved Oxygen 5 mg/l or more 4. Biochemical Oxygen Demand 5 days 20 °C 3 mg/l or less
Drinking water source after conventional treatment and disinfection	C	1. Total Coliforms Organism MPN/100 ml shall be 5000 or less 2. pH between 6 and 9 3. Dissolved Oxygen 4 mg/l or more 4. Biochemical Oxygen Demand 5 days 20 °C 3 mg/l or less
Propagation of wild life and fisheries	D	1. pH between 6.5 and 8.5 2. Dissolved Oxygen 4 mg/l or more 3. Free Ammonia (as N) 1.2 mg/l or less
Irrigation, industrial cooling, controlled waste disposal	E	1. pH between 6.0 and 8.5 2. Electrical Conductivity at 25 °C micro mhos/cm maximum 2250 3. Sodium absorption ratio maximum 26 4. Boron maximum 2 mg/l

Requirements to conduct the session

PPT slides of session, flipchart, A0 size chart paper, color pen sets to write and do moderated discussions.

Source: Pixabay

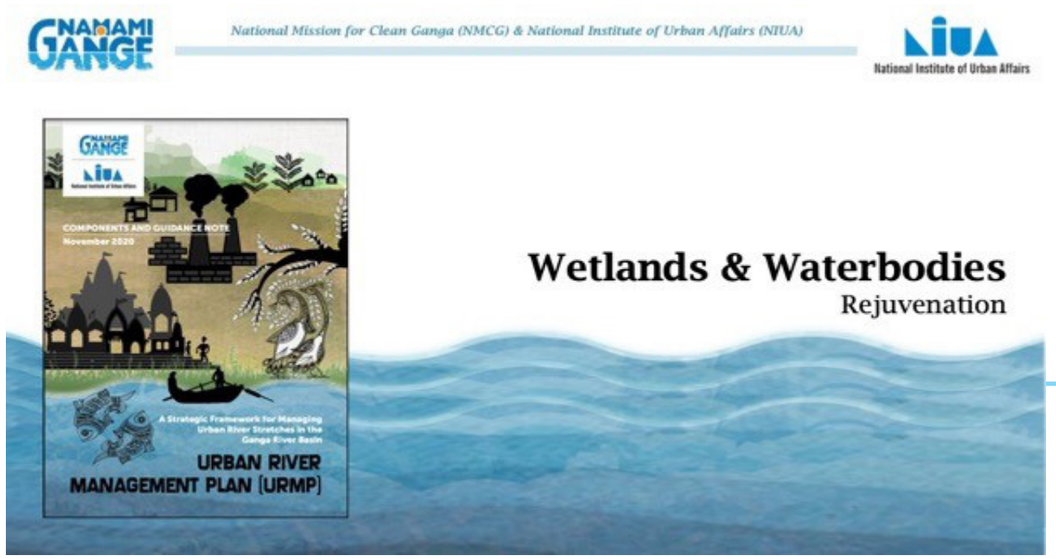
SESSION 4: OBEJECTIVE 2

5. Objective 3: To rejuvenate waterbodies and wetlands in city

Waterbodies and wetlands are intrinsically connected to rivers either through their outflow channels or base flow. Revival of polluted waterbodies, degraded wetlands can help rivers by reducing freshwater burden or prevent pollution entering into it. Healthy waterbodies can improve groundwater and help augment the water supply in a city. Similarly, rejuvenated wetlands are natural "wastewater treatment plants" to reduce river pollution. The recreational benefits that these two interventions offer are an added incentive to the city.

Duration – 75 minutes

Activity	Time	Materials / Methods
Lecture on urban waterbodies & wetlands	10 min	PPT slides
Activity - I Waterbody revival approach	30 min	PPT slides,
Activity – II Waterbody revival concept plan	30 min	
Session summary	5 min.	Trainers does a plenary discussion with participants based on the results from the Mentimeter based quiz OR their perceptions about rivers and its situation with guided questions



SESSION 5: OBJECTIVE 3

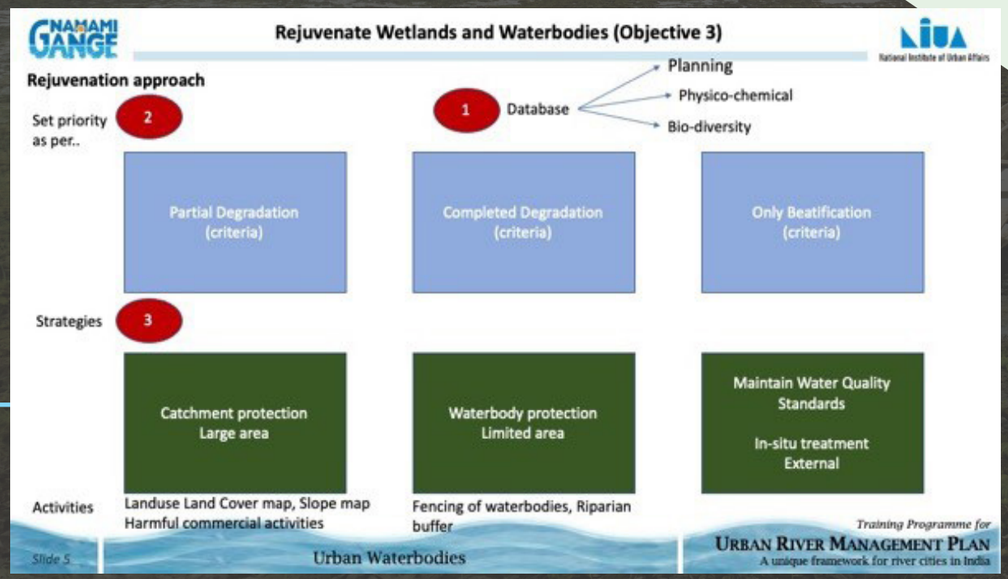
Learning objectives

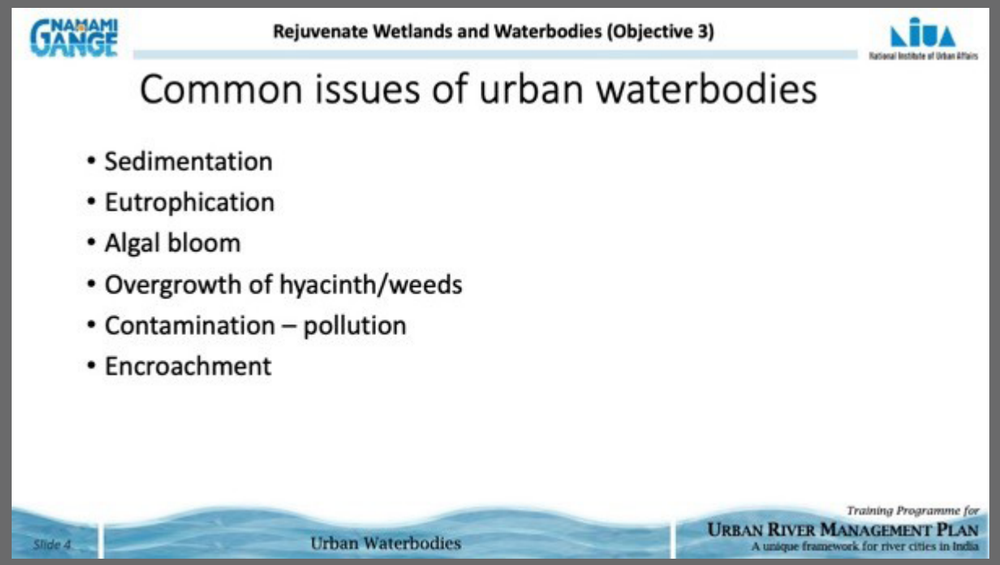
Trainees understand:

- **Importance of waterbodies and wetlands**
- **Common issues of urban waterbodies and wetlands**
- **Scope of waterbodies and wetlands rejuvenation**
- **Various database attributes of urban waterbodies**

Short Presentation

Trainer will introduce the urban water bodies and wetlands by showing some of the pictures of their exisiting conditions and starting the delibration on what are the challenges that cities face. From challenges the trainer would move the discussion to possible solutions followed up by some brainstorming exercise with the trainees.



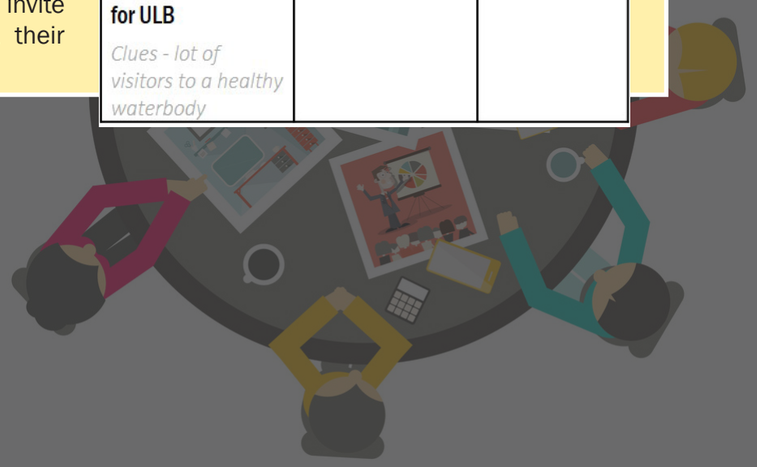


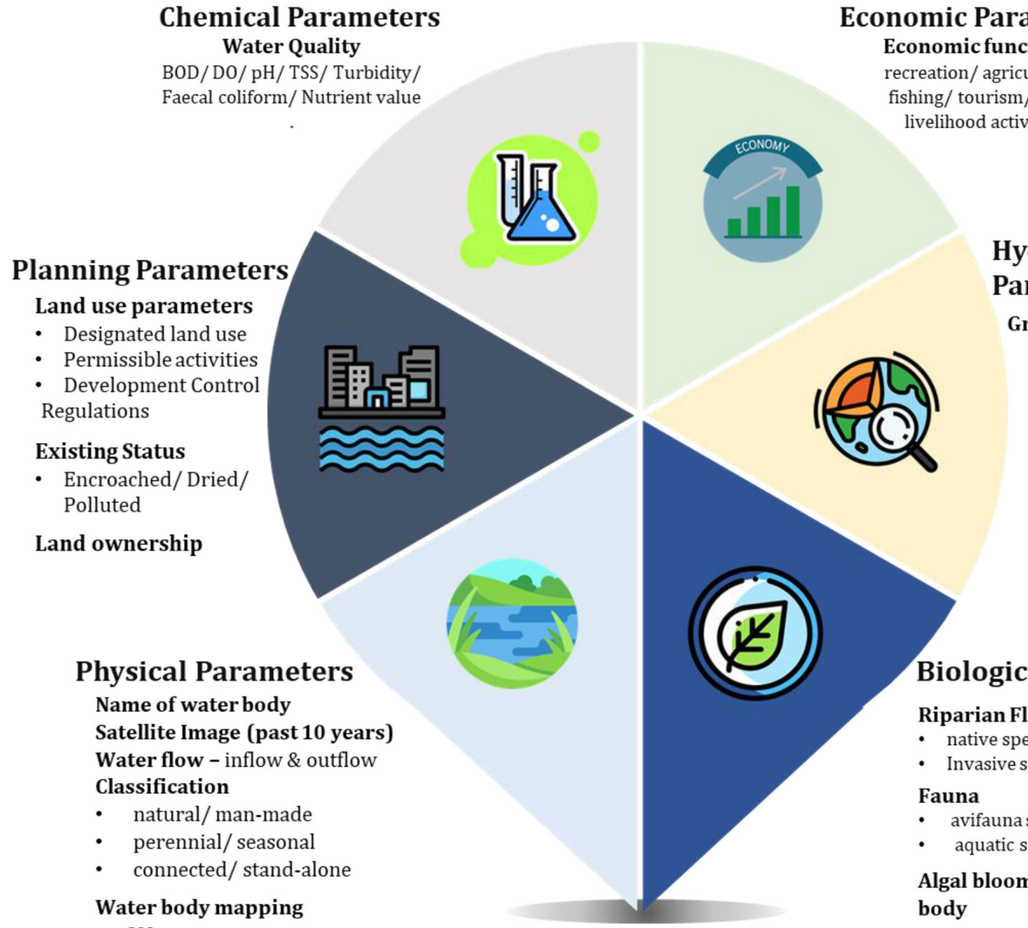
Indicative Exercises Example

Exercise – I: Waterbody management approach

The purpose of this exercise is to enable trainees to appreciate variety of approaches related to waterbodies revival. Four groups can be prepared and each group should be given the following table printed on chart paper. Groups will do brainstorming and list various options to deal with issues and also mention which city departments will be involved to resolve it. In a plenary discussion lead trainer can invite trainees to discuss about their proposals.

Waterbody issue	What strategy you will propose?	Who will you involve?
Lack primary information/database *Clues - ownership, fencing, area, water quality*	Survey, satellite imageries GIS etc.	
Highly polluted *Clues - sewage/ MSW / algal growth/ water hyacinth*		
Highly encroached *Clues - slums in periphery/catchment; inflow-outflow channels blocked*		
Generate revenue for ULB *Clues - lot of visitors to a healthy waterbody*		





Methods Of Strengthening waterbody database

Indicative Exercises Example

Exercise – II Recommend a rejuvenation plan for a waterbody.

Prepare Two to Three groups of trainees.

Provide a Google map print as example of waterbody to be revived. Different waterbodies can be given to the groups. A short description of typical urban waterbody issues should be given.

Trainees should be asked to recommend a concept plan for the waterbody's revival. Plan should include:

- What is required to be done?
- Who will do?
- How finance will be secured?
- What technology options will be used?

Prepare a concept plan for following elements/requirements. The concept plan should include planning, implementation and institutions which should be part of revival plan.

Indicative elements

- Riparian Buffer
- Promenade with stepped seating
- Waterfront watch Tower
- Floating Bridge
- Central Island
- Play Area
- Open Area Theatre

Requirements to conduct the session

PPT slides, flip-charts, stickers, chart papers, print out of google maps of waterbodies, flip charts, color pens

SESSION 5: OBJECTIVE 3

Source: Pexel

4. URMP training: DAY 2

Second day of the training should start with highlights of first day and briefly recapturing all sessions, discuss various exercises covered, trainer must recapture URMP objectives as they are very important. Training continues with remaining objectives of environment element, and two social and two economy elements. The M&E plan and a case study of Kanpur URMP is covered in the second half of the day.

In the beginning, a pre-training assessment of the trainees was done. After completing the training, a post-training assessment of the trainees will help to understand their knowledge enhancement. Total 30 minutes have been assigned for the post-assessment, feedback and certificate distribution at the end of training.

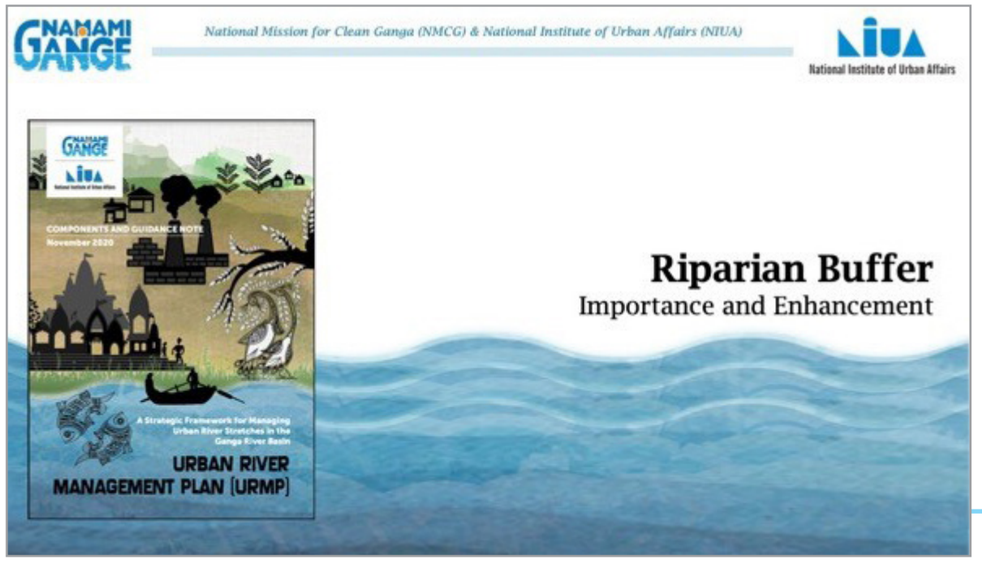
Sessions for second day begins with critical components related to urban river management. Wetlands and waterbodies rejuvenation and enhance the riparian zone objectives and kept together. Since this is an important element, it is proposed to be kept in the beginning.

Objective 4: To enhance riparian buffer along river

A riparian buffer is a longitudinal stretch of vegetation on either bank of a river. It acts as a shock absorber for the river and its aquatic ecosystem from detrimental developmental activities. This buffer also protects the urban area from the impact of floods. Ideally, the riparian buffer should be a continuous stretch with a width of 30 meters. The cities must take up whatever is possible today, and aspire for the ideal condition in its long-term planning, integrating it with the Master Plan of the city.

Duration – 40 minutes

Activity	Time	Materials / Methods
Lecture on riparian zone and its importance	10 min.	PPT slides. Trainers will define riparian zone and narrate its benefits for the rivers
Activity - I Implement riparian project	25 min	Flip chart, large print of 30 m profile of riparian zone
Activity – II Prepare riparian profile		
Session summary	5 min.	Lead trainer will do structured debate in plenary



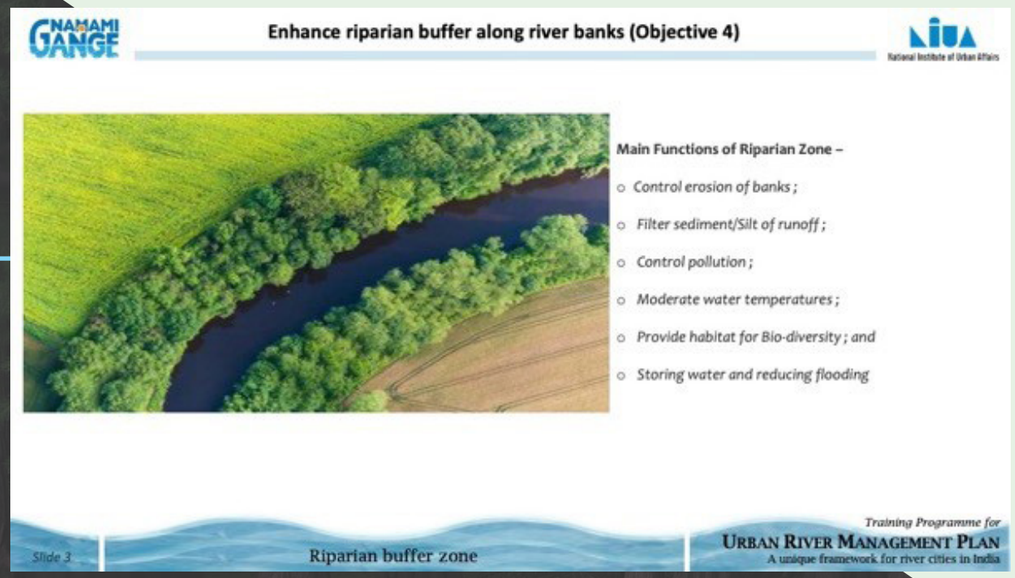
Learning objectives

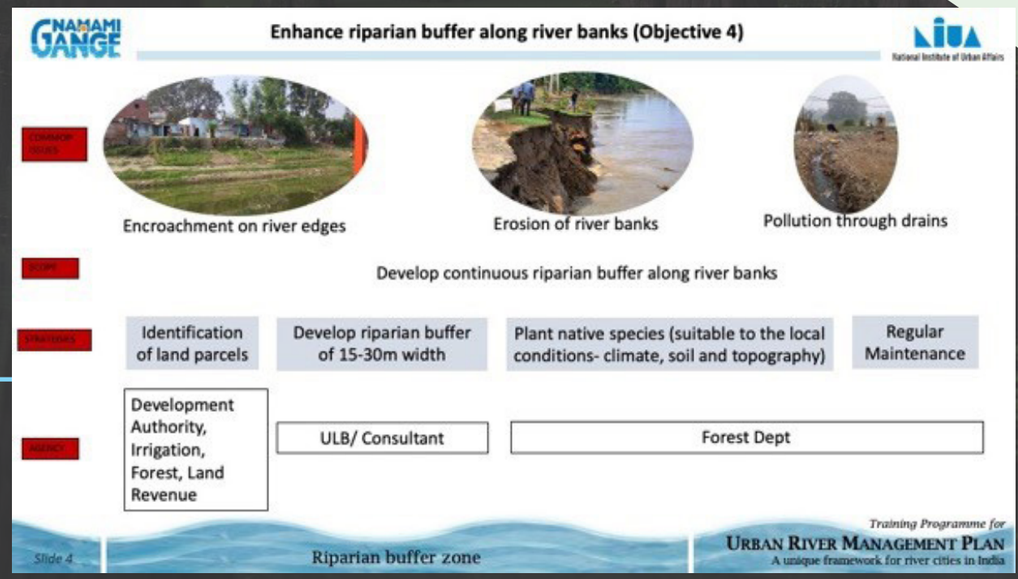
Trainees understand:

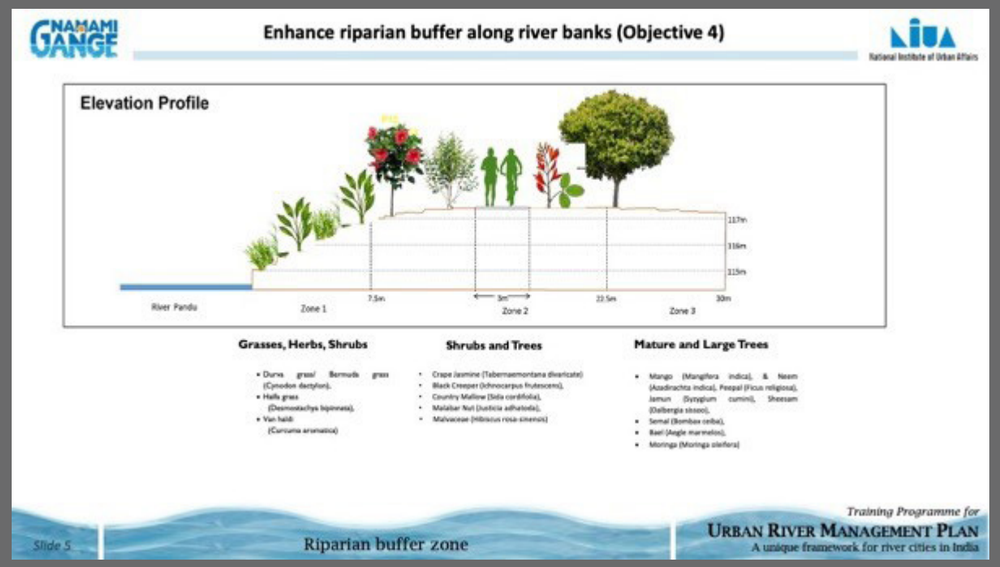
- **Riparian buffer definition and its importance**
- **Ideal profile of riparian buffer strip**
- **Various species that can be planted in riparian strip**

Short Presentation

Through the ppt., trainees will be introduced to the significance of riparian zone towards managing the health of the river. The trainer shall also discuss on the challenges and threats that riparian zones are confronting and what can be the potential strategies towards protecting or restoring the riparian buffer stretches along the river.







Indicative Exercises Example

Exercise I – Implement riparian project

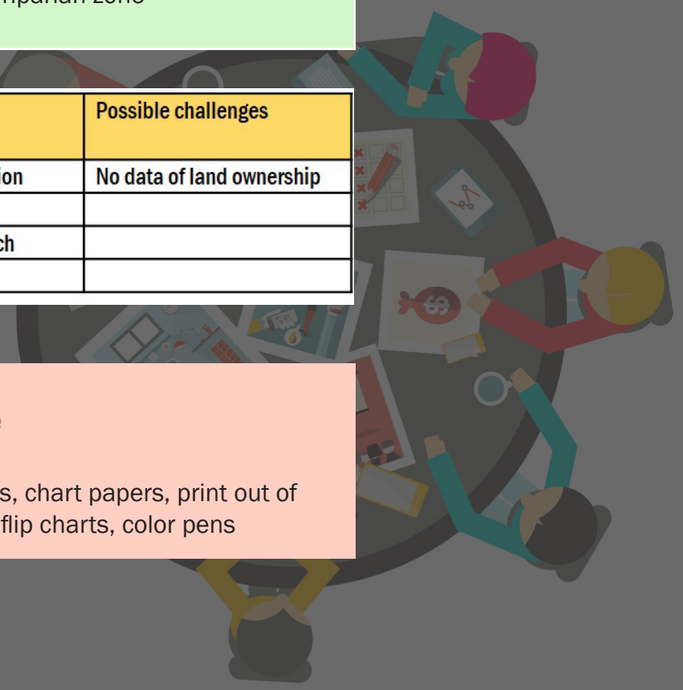
Trainees can be divided into groups. Each group can be given following matrix to discuss and fill. The facilitators can support trainees to list details.

Agencies/Departments to involve	Role of department	Possible challenges
Revenue	Land parcel information	No data of land ownership
Forest		
Irrigation & flood	Identify erosion stretch	
ULB		

Indicative Exercises Example

Exercise II – Prepare riparian profile

Provide a 30m wide river edge profile to trainees, ask them to paste various tree pictures in profile as covered in session, ask them to write benefit of riparian zone



Requirements to conduct the session

PPT slides, flip-charts, stickers, chart papers, print out of google maps of waterbodies, flip charts, color pens

SESSION 6: OBJECTIVE 4

Source: Pixabay

7. Objective 5 and 6: To adopt increased reuse of treated wastewater and maximize return flow

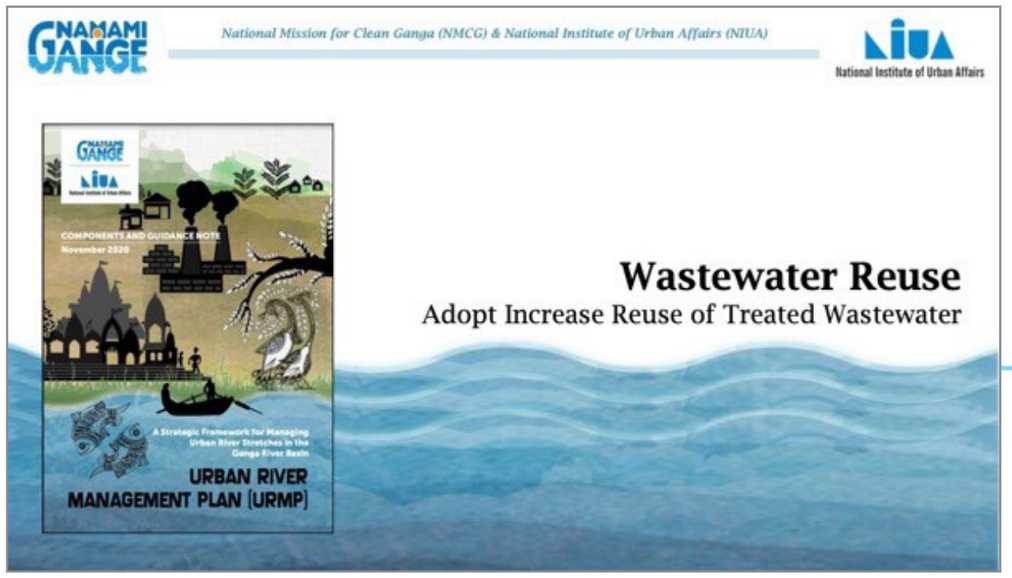
This module covers two URMP objectives viz. reuse treated wastewater and maximize return flow together instead of covering them separately. Reuse of treated wastewater is an excellent avenue to relieve the stress on rivers and would result in restricted water extraction from the rivers which can serve the purpose of maintaining the environmental flow.

The objective of maximizing the return flow is based on the premises that a city or town contributes to maintain the environmental flow of the river required to sustain its natural habitat, bio-diversity. Usually a town has very little control over the environmental flow in the river, given that this is regulated by national or state authorities.

However, this should not absolve the town of its responsibility to the river. There is no definitive guideline of how much a town should give back to the river as this depends on site-specific factors. Towns will have to take stock of the rivers within their stretches, and decide upon an optimal contribution after adjusting for in-house uses.

Duration – 60 minutes

Activity	Time	Materials / Methods
Lecture on avenues of treated wastewater reuse in urban areas and how to ensure city maximize return flow	20 min.	PPT slides. Trainers will explain policy framework and possible interventions to adopt these objectives in URMP
Activity - I Wastewater reuse assessment	35 min	Flip chart, A0 size chart paper, color pens to write
Wrap up and summarize	5 min.	Lead trainer will do structured debate in plenary to summarize the two objectives



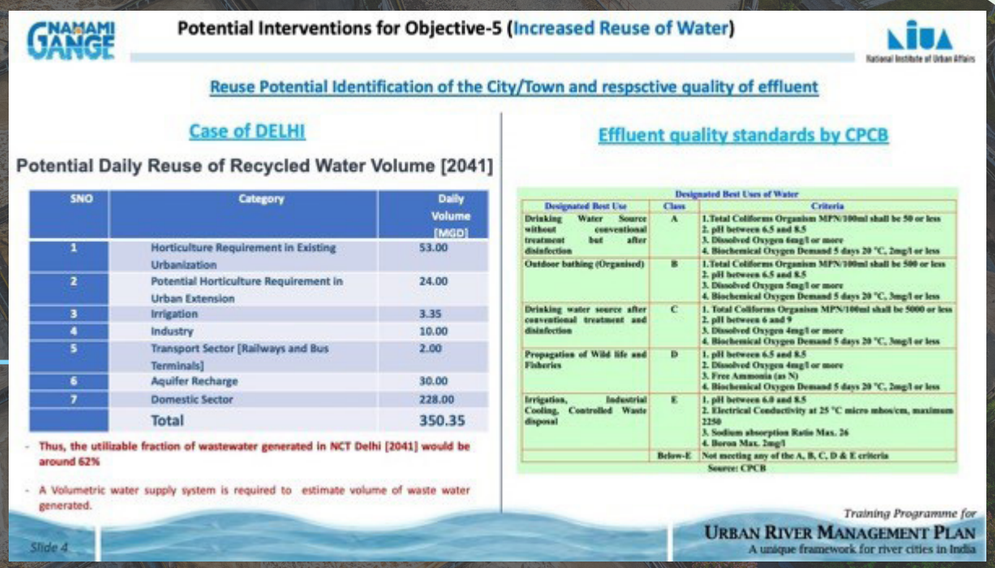
Learning objectives

Trainees understand:

- **Enabling policy framework**
- **Avenues of using treated wastewater in urban areas**
- **Benefits of reusing treated wastewater**
- **Issues related to return flow and scope in urban areas**
- **Potential technologies to maximize return flow**

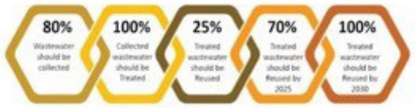
Short Presentation

Trainer will deep dive into the policy and planning ecosystem of the treated waste water reuse and how it is instrumental in reducing the pressures on urban rivers. The presentation must also focus on the various avenues of wastewater reuse and different strategies towards mainstreaming it into the urban functioning. This will be followed by a presentation on the idea of return flow towards maintaining the natural flow of the river.



Potential Interventions for Objective-5 (Increased Reuse of Water)

Almost many states have their WASTE WATER REUSE POLICY



Gujarat TWW reuse policy targets

- Large campuses of 2 ha plus area are mandated to recycle a minimum of 50% of their waste water including for indirect groundwater recahrge
- All new construction proposals would have to provide their water budget and water plan [showing treatment and disposal arrangements] along with their building applications

Potential Interventions for Objective-5 (Increased Reuse of Water)

Benefits and Challenges of wastewater reuse

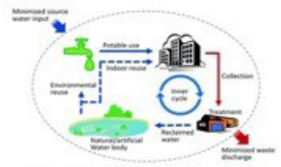
Benefits
- Environmental Protection (utilizing nutrients in treated effluent, maintaining environmental flows)
- Water Scarcity/Water Conservation
- Energy Efficiency and Sustainability

Challenges
- Technical
- Environmental
- Institutional
- Social
- Economical

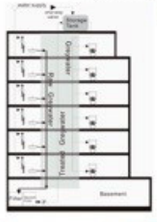
Potential Interventions for Objective-5 (Increased Reuse of Water)

Types of wastewater reuse

Types of wastewater reuse
- Reclaimed water from treated sanitary effluent (sewage)
- Grey water reuse at building level



Conventional sewage recycling and re-use



Potential Interventions for Objective-5 (Increased Reuse of Water)

Increased Reuse of Water
I. Domestic reuse (from d-WWT)
II. Local irrigation (Horticulture)
III. Industrial reuse
IV. City scale usage – Transit depots/Firefighting/Power plants
V. Reuse for Construction activities
VI. Controlled agriculture reuse
VII. Environmental/Recreation reuse (waterbody-wetland recharge)

Potential Interventions for Objective-5 (Increased Reuse of Water)

Potential wastewater reuse in Urban Areas

Urban Reuse
Irrigation Purpose (Golf Courses, Residential Fields and Landscaping School Yards , Large office parks, Cemeteries, Highway Medians, Athletic Fields, Parks etc.) Ornamental Fountains , Fire Protection, HVAC & Cooling systems, Toilet Flushing, Car Washes, Commercial Laundries, Street Sweeping , Construction and Dust Control

Industrial Reuse
Cooling Towers , Boiler Feed Water, Cleaning, Process Water, Electronics, Prepared Food Manufacturing/Processing, Pulp and Paper Facilities, Textile Facilities, Power Generation

Agricultural Reuse
Irrigation of Food Crops, Irrigation of Processed Food Crops, Irrigation of Non-Food Crops, Seed Crops, Industrial Crops , Fodder Crops, Sod Farms, Plant Nurseries, Pasture Land Irrigation, Livestock Watering

Environmental Reuse
Wetlands, Habitat Restoration, Supplement Stream and River Flows, Increase Lake Levels, Groundwater Recharge, Infiltration Basins, Injection Wells, Saltwater Intrusion Barrier

Recreational Reuse
Recreational Impoundments, Contact - beaches, swimming areas, Non-Contact - boating, fishing, Landscape, Impoundments,

Potential Interventions for Objective-5 (Increased Reuse of Water)

Wastewater Reuse Action plan

Urban Reuse (domestic)
Building by-laws by municipal authority
Plumbing initiatives (dual piping)

Industrial Reuse
Potential Assessment
Industrial water demand/supply guidelines
Infrastructure
Incentives

Agricultural Reuse
Potential Assessment
Infrastructure
Incentives

Environmental Reuse
Green-blue infrastructure linkages
Horticulture potential

Recreational Reuse
Water bodies and wet land management

Potential Interventions for Objective-5 (Increased Reuse of Water)

Intervention 1 : Increased Domestic Reuse (from d-WWT)

Planning	Identifying the Solution/ Technical details	Implementation of the Solution/ Operations
Processes Involved • Mandatory guidelines for d-WWT by local body (on premise) • Incentives/Penalties by local body	**Elements** • Guidelines for d-WWT systems (e.g. DeWATS) • Guidelines for water water reuse	• Mandatory building bye-laws (plumbing -dual piping) • Awareness for treated waste water reuse.

Intervention 2 : Local irrigation (Horticulture)

Planning	Identifying the Solution/ Technical details	Implementation of the Solution/ Operations
Processes Involved • Availability for Treated Water are Local STP • Guidelines to to prohibition of use fresh water for horticulture • Identification green areas/parks/golf course etc	**Elements** • Ecosystem to provide TWW for horticulture • Quality management mechanism	• Connections to green areas/parks/golf course etc • Incentives/Penalties

Potential Interventions for Objective-5 (Increased Reuse of Water)

Intervention 3 : Industrial reuse

Planning	Identifying the Solution/ Technical details	Implementation of the Solution/ Operations
Processes Involved • Identification of Industries frr TWW reuse	**Elements** • Guidelines for d-WWT systems (e.g. DeWATS) • Guidelines for water water reuse	• Mandatory building bye-laws (plumbing -dual piping) • Awareness for treated waste water reuse.

Intervention 4 : City scale usage – Transit depots/Firefighting/Power plants

Planning	Identifying the Solution/ Technical details	Implementation of the Solution/ Operations
Processes Involved • Availability for Treated Water are Local STP • Guidelines to to prohibition of use fresh water for horticulture • Identification green areas/parks/golf course etc	**Elements** • Ecosystem to provide TWW for horticulture • Quality management mechanism	• Connections to green areas/parks/golf course etc • Incentives/Penalties

Potential Interventions for Objective-5 (Increased Reuse of Water)

Intervention 5 : Reuse for Construction activities

Planning	Identifying the Solution/ Technical details	Implementation of the Solution/ Operations
Processes Involved • Identification of Industries frr TWW reuse	**Elements** • Guidelines for d-WWT systems (e.g. DeWATS) • Guidelines for water water reuse	• Mandatory building bye-laws (plumbing -dual piping) • Awareness for treated waste water reuse.

Intervention 6 :Controlled agriculture reuse)

Planning	Identifying the Solution/ Technical details	Implementation of the Solution/ Operations
Processes Involved • Availability for Treated Water are Local STP	**Elements** • Ecosystem to provide TWW for horticulture	• Connections to green areas/parks/golf course etc

Intervention 7 :Environmental/Recreation reuse (waterbody-wetland recharge)

Planning	Identifying the Solution/ Technical details	Implementation of the Solution/ Operations
Processes Involved • Availability for Treated Water are Local STP	**Elements** • Ecosystem to provide TWW for horticulture	• Connections to green areas/parks/golf course etc

Potential Interventions for Objective-5 (Increased Reuse of Water)

INTERVENTION 1 – *Increased reuse of TWW for On-site (* **Domestic/institutional** reuse from d-WWT)

ACTION PLAN

Development Authority/Municipality

1. Mandating d-WWT for of 10,000 L discharge entities (URDPFI)
2. Adoption of building by-laws for dual piping system in all new construction
3. Incentive for adopting green certification standards (TWW reuse)

Water Supply Board/ Jal Sansthan

1. Incentive in Water bill for d-WWT
2. Penalties for defaulters (10K L discharge entities)
3. Financial support to construct d-WWT system

Example: DELHI

1. Delhi Development Authority mandated dual plumbing system in all new constrictions and all government buildings
2. Delhi Jal board provided 50% rebate on water bill for the properties having d-WWTS on site.
3. 50% penalty (150% bill) for the defaulters

Potential Interventions for Objective-5 (Increased Reuse of Water)

INTERVENTION 2 - *Increased reuse of TWW for* **Macro irrigation (Horticulture)**

ACTION PLAN

1. Prohibition on the ground water withdrawal
2. Strict ecosystem of Treatment quality check at all the STPs
3. Availing treated effluent from STPs for Large scale parks and Gardens (through piped or tanker infra)

Example: DELHI

NGT directs **DJB** to stop extraction of groundwater for **gardening** purposes. The National Green Tribunal (NGT) has directed the **Delhi Jal Board** (**DJB**) to ensure **supply** of **treated water** to public parks and to stop extraction of groundwater for **gardening** purposes.

1. Treated effluent is availed by DJB STPS at 7Rs/KL
2. Tankers to be arranged by beneficiary or DJB can arrange with additional charges.
3. Beneficiary are also provided FREE of cost connection to untreated effluent for treatment and reuse on its own.


DELHI JAL BOARD: GOVT. OF N.C.T. OF DELHI
OFFICE OF THE CHIEF EXECUTIVE OFFICER
PUBLIC NOTICE

Potential Interventions for Objective-5 (Increased Reuse of Water)

INTERVENTION 3 - *Increased reuse of* TWW for **Industrial purpose/ City scale usage** – Transit depots/Firefighting/Power plants/ **Construction activities**)

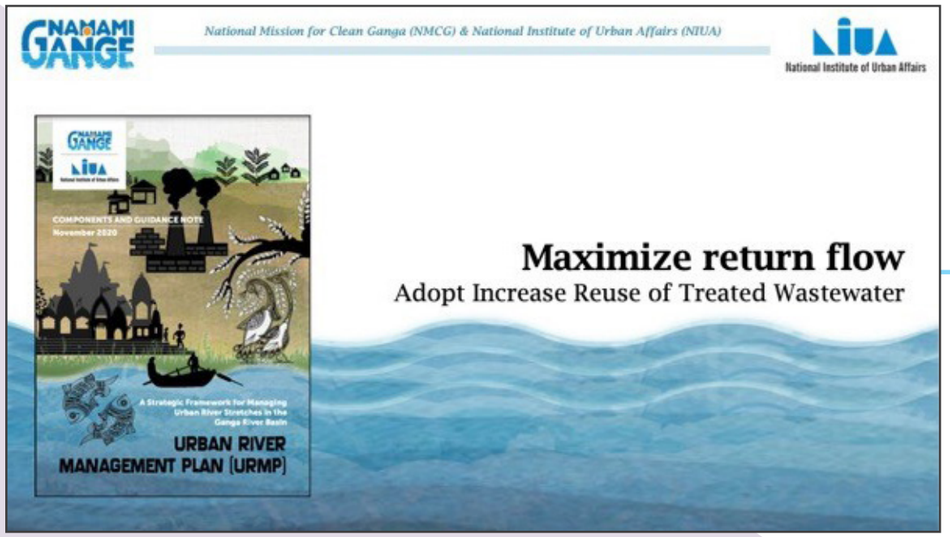
ACTION PLAN

1. Identification of Water intensive industries
2. Policy mandate for Industrial corporation
3. A
4. a
5. All new construction proposals would have to provide their water budget and water plan [showing treatment and disposal arrangements] along with their building applications

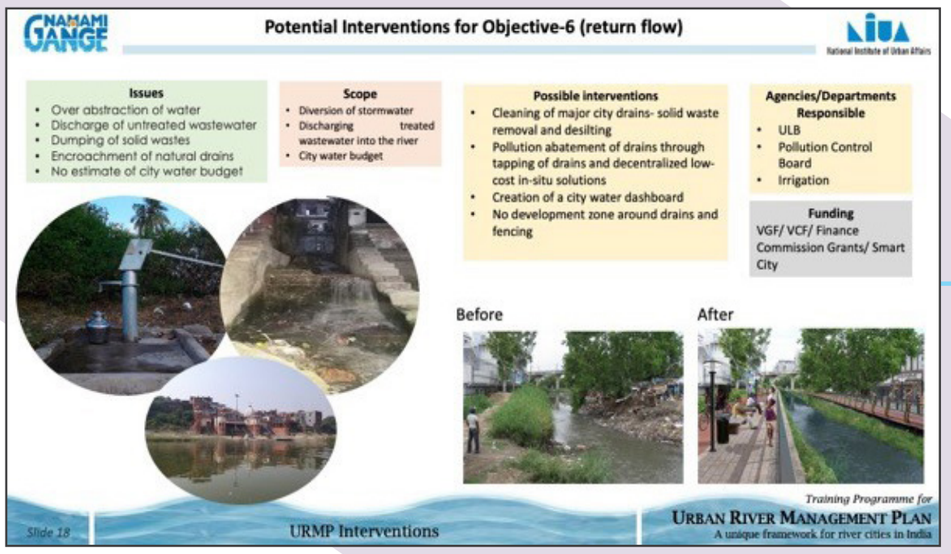
Example: Gujarat TWW reuse policy and Action plan

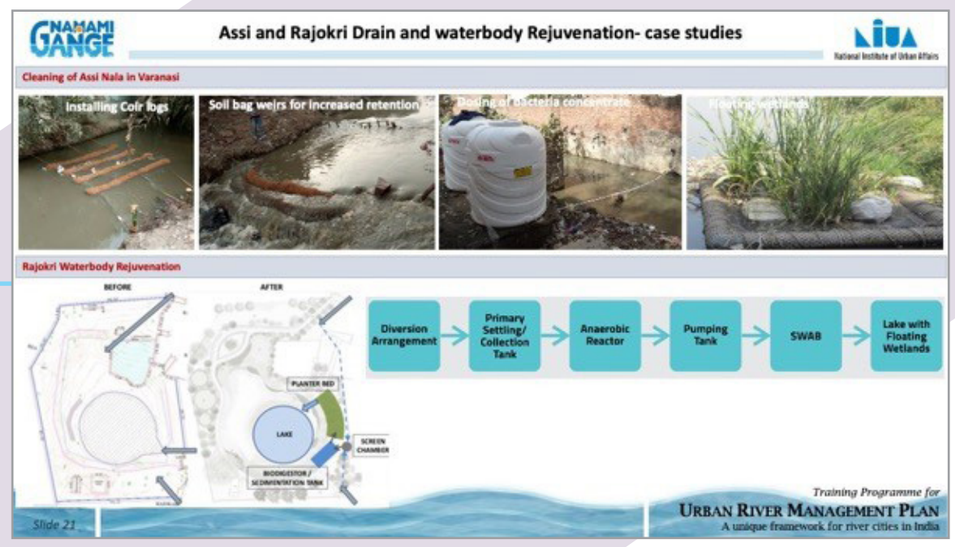
Uses of Treated Wastewater

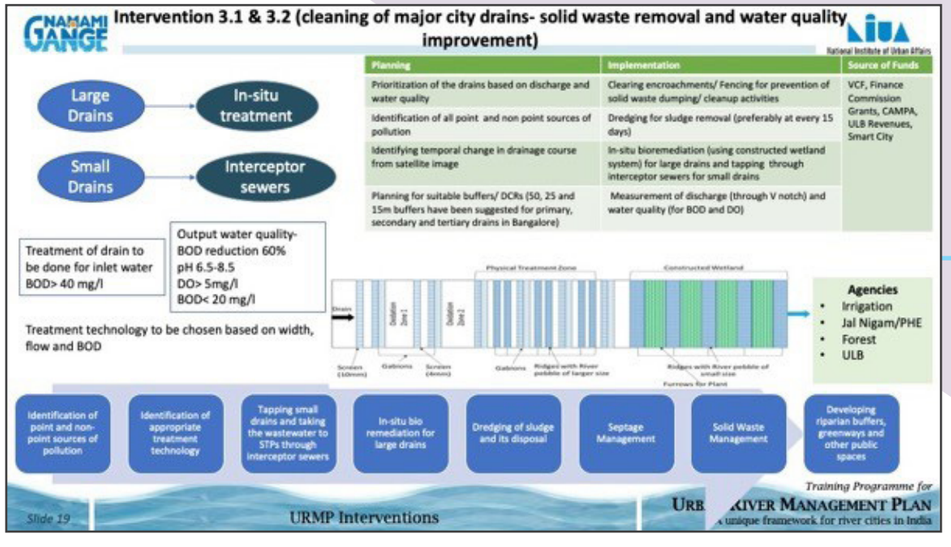
The policy mandates different types of reuse depending on the availability:
- Mandatory Reuse – The industries and Power plants which utilise more than 1 lakh litres of water daily, located within 50 km from the STP or city limits.
- Conditional Reuse – Municipal bodies, large Commercial and Institutional users and construction activities shall use water based on the arrangement with the authorities.
- Optional Reuse – If the treated water is available after the above-mentioned uses then it can be supplied for Irrigation.

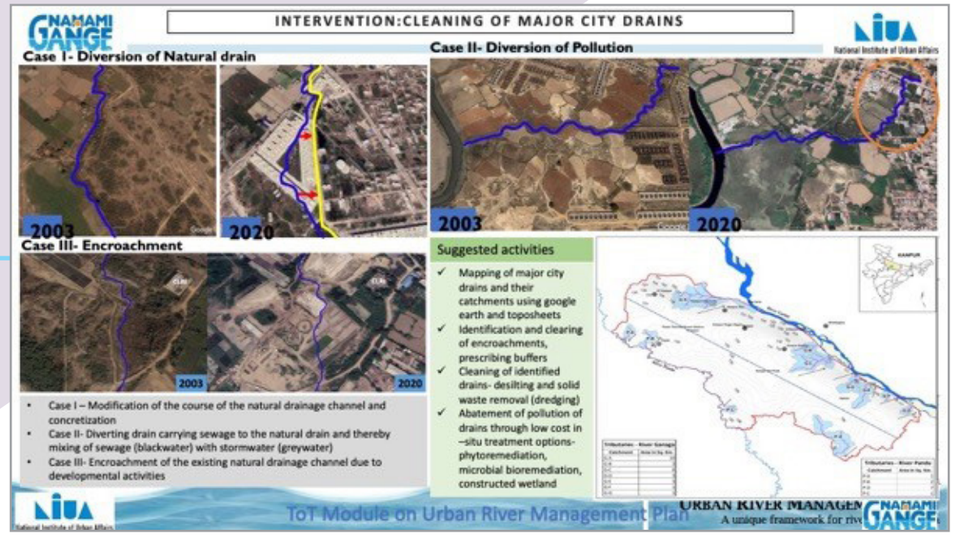

National Mission for Clean Ganga (NMCG) & National Institute of Urban Affairs (NIUA)
National Institute of Urban Affairs
COMPONENTS AND GUIDANCE NOTE
November 2020
A Strategic Framework for Managing Urban River Stretches in the Ganga River Basin
URBAN RIVER MANAGEMENT PLAN (URMP)
Maximize return flow
Adopt Increase Reuse of Treated Wastewater


Yamuna Turnaround Plan- Najafgarh Drain Cleaning Proposed Interventions
Constructed Wetland
Solid Waste Removal
Dredging of Sludge
Cycle Tracks & Park
Slide 20
Training Programme for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India


Potential Interventions for Objective-6 (return flow)
Issues
Over abstraction of water
Discharge of untreated wastewater
Dumping of solid wastes
Encroachment of natural drains
No estimate of city water budget
Scope
Diversion of stormwater
Discharging treated wastewater into the river
City water budget
Possible interventions
Cleaning of major city drains- solid waste removal and desilting
Pollution abatement of drains through tapping of drains and decentralized low-cost in-situ solutions
Creation of a city water dashboard
No development zone around drains and fencing
Agencies/Departments Responsible
ULB
Pollution Control Board
Irrigation
Funding
VGF/ VCF/ Finance Commission Grants/ Smart City
Before
After
Slide 18
URMP Interventions
Training Programme for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India


Assi and Rajokri Drain and waterbody Rejuvenation- case studies
Cleaning of Assi Nala in Varanasi
Installing Coir logs
Soil bag wejrs for increased retention
Rajokri Waterbody Rejuvenation
BEFORE
AFTER
Diversion Arrangement
Primary Settling/ Collection Tank
Anaerobic Reactor
Pumping Tank
SWAB
Lake with Floating Wetlands
Slide 21
Training Programme for
URBAN RIVER MANAGEMENT PLAN
A unique framework for river cities in India


Intervention 3.1 & 3.2 (cleaning of major city drains- solid waste removal and water quality improvement)
Large Drains
In-situ treatment
Small Drains
Interceptor sewers
Planning
Implementation
Source of Funds
Prioritization of the drains based on discharge and water quality
Clearing encroachments/ Fencing for prevention of solid waste dumping/ cleanup activities
VCF, Finance Commission Grants, CAMPA, ULB Revenues, Smart City
Identification of all point and non point sources of pollution
Dredging for sludge removal (preferably at every 15 days)
Identifying temporal change in drainage course from satellite image
In-situ bioremediation (using constructed wetland system) for large drains and tapping through interceptor sewers for small drains
Planning for suitable buffers/ DCRs (50, 25 and 15m buffers have been suggested for primary, secondary and tertiary drains in Bangalore)
Measurement of discharge (through V notch) and water quality (for BOD and DO)
Treatment of drain to be done for inlet water BOD> 40 mg/l
Output water quality- BOD reduction 60% pH 6.5-8.5 DO> 5mg/l BOD< 20 mg/l
Treatment technology to be chosen based on width, flow and BOD
Agencies
Irrigation
Jal Nigam/PHE
Forest
ULB
Identification of point and non-point sources of pollution
Identification of appropriate treatment technology
Tapping small drains and taking the wastewater to STPs through interceptor sewers
In-situ bio remediation for large drains
Dredging of sludge and its disposal
Septage Management
Solid Waste Management
Developing riparian buffers, greenways and other public spaces
Slide 19
URMP Interventions
Training Programme for


INTERVENTION:CLEANING OF MAJOR CITY DRAINS
Case I- Diversion of Natural drain
2003
2020
Case II- Diversion of Pollution
2003
2020
Case III- Encroachment
2003
2020
Case I – Modification of the course of the natural drainage channel and concretization
Case II- Diverting drain carrying sewage to the natural drain and thereby mixing of sewage (blackwater) with stormwater (greywater)
Case III- Encroachment of the existing natural drainage channel due to developmental activities
Suggested activities
Mapping of major city drains and their catchments using google earth and toposheets
Identification and clearing of encroachments, prescribing buffers
Cleaning of identified drains- desilting and solid waste removal (dredging)
Abatement of pollution of drains through low cost in –situ treatment options- phytoremediation, microbial bioremediation, constructed wetland
ToT Module on Urban River Management Plan

Indicative Exercises Example

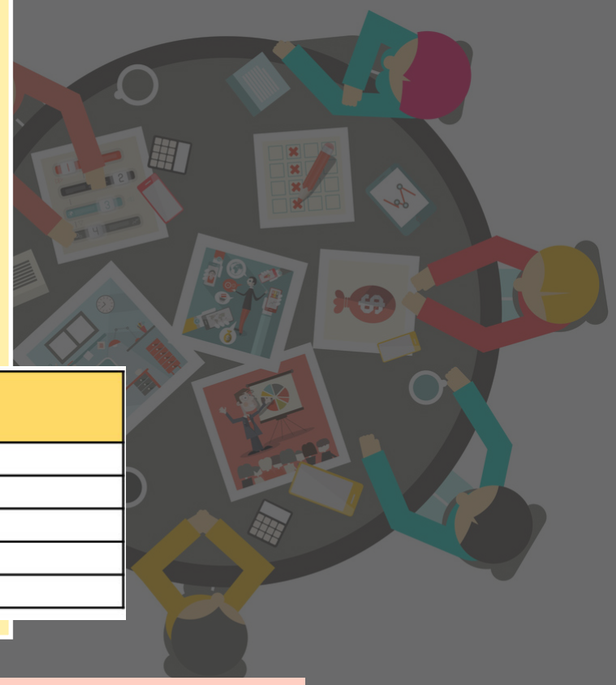
Exercise II- Maximize return flow
Based on the lecture, trainees are asked to list various issues related to this topic and list potential interventions to increase the return flow.

Issues related to return flow	Potential interventions
a. Solid waste in city drains	a. Removal of solid waste
b. Unlined drains	a.

Indicative Exercises Example

Exercise – I – Wastewater reuse assessment
Trainees have to be divided into various groups as per the number and their expertise. A matrix-based exercise is planned to make them understand about planning, identify technical details and roadmap to implement the identified solution. Following table needs to printed in A0 size.

Reuse area	Assessment needed
Parks & Gardens	
Construction	
Supply to industries	
Groundwater recharge	
Xyz...	



Requirements to conduct the session

PPT slides, flip-charts, stickers, chart papers, print out of google maps of waterbodies, flip charts, color pens

Source: Pexels

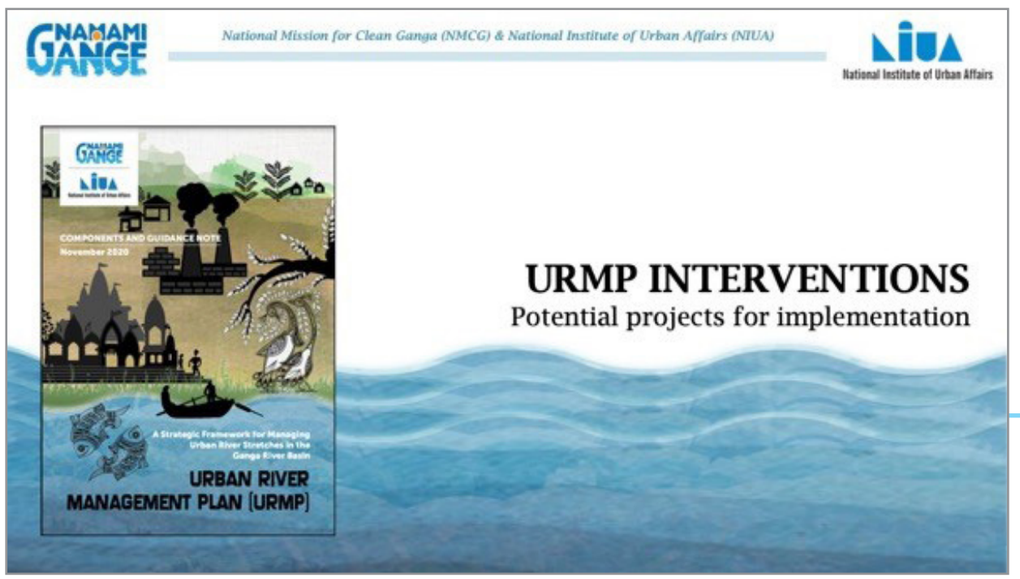
OBJECTIVE 6
OBJECTIVE 5

Objective 7: To develop eco-friendly riverfronts

Riverfronts add both aesthetic and economic value to the river. It serves as a medium to bring the river to the forefront. It is also a major avenue for recreation opportunities. In doing so, riverfronts become a wonderful instrument to connect citizens to the river as well as holds economic significance too.

Duration – 60 minutes

Activity	Time	Materials / Methods
Lecture on distinguishing between normal and eco-friendly riverfront, various strategies to develop eco-friendly RF	20 min.	PPT slides.
Activity - I Elements of Eco-friendly RF	20 min	Flip chart, A0 size chart paper, color pens to write
Wrap up and summarize	20 min.	Lead trainer will do structured debate in plenary to summarize the objectives



Learning objectives

Trainees understand:

- **Difference between conventional and eco-friendly river front**
- **Various elements of eco-friendly riverfronts**
- **Various options to develop eco-friendly riverfronts**

Short Presentation

The riverfront being a subject that trainees are also familiar with, the session can be made intercative by the trainer. The presentation will take the trainees through good practices of eco-friendly riverfronts and also look at some innovative strategies like developing recharge zones, biodiversity zones etc, that can increase the economic, social and ecological value of the river for the city.

SESSION 8: OBJECTIVE 7

SESSION 8: OBJECTIVE 7

Potential Interventions for Objective-7 (ecofriendly river projects)

Slide 5 — URMP Interventions — Training Programme for Urban River Management Plan — A unique framework for river cities in India

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 1 : Development of Theme Parks like Biodiversity Parks, Eco Parks, etc.

Intervention 2 : Construction of Recharge Zones within the river zone

Intervention 3 : Provision of access through Riverfront Promenades, Walkways, etc.

Intervention 4 : Development of eco-cultural & religious riverfronts like River Ghats, Temples, etc.

Slide 8 — URMP Interventions — Training Programme for Urban River Management Plan — A unique framework for river cities in India

Potential Interventions for Objective-7 (ecofriendly river projects)

Slide 6 — URMP Interventions — Training Programme for Urban River Management Plan — A unique framework for river cities in India

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 1 : Development of Biodiversity Parks

Slide 9 — URMP Interventions — Training Programme for Urban River Management Plan — A unique framework for river cities in India

Potential Interventions for Objective-7 (ecofriendly river projects)

Factors that need to be taken into account while planning and managing a riverfront :

1. **Land issues** – ownership, site preservation, orientation, scenic views, etc.
2. **Technical and Financial Assistance** - agencies and Grant Programs, community development blocks, growth management implementation, NGOs, etc.
3. **Water quality assessment and management** – sewage treatment plants, waste water disposal mechanisms, solid waste management & disposal, grey water management, green water harvesting, limiting non-point pollution sources, etc.
4. **Environmental considerations** – point and non-point pollution sources, natural water bodies, aquifers, ecosystems, vegetation, drainage, runoff control systems, etc.
5. **Cultural and Religious aspect** – ascribed holiness, national standing in terms of piety, potential World Heritage site, etc.
6. **Legal systems** and existing customary rules and rights, public access, land use and permissible activities, etc.
7. **Climate**, topography, etc.

Slide 7 — URMP Interventions — Training Programme for Urban River Management Plan — A unique framework for river cities in India

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 1 : Development of Biodiversity Parks

Biodiversity Parks are unique landscapes/ riverscapes of wilderness where ecological assemblages of native species are recreated over marginal/ degraded landscapes/ riverscapes.

Riverfronts are ideal sites for location biodiversity parks, especially to foster aquatic flora and fauna.

Biodiversity Parks in riverscapes include restored/ recreated river ecosystems along degraded stretches of rivers for their rejuvenation.

Nature Conservation Zone

- *Forest communities along embankment & adjacent upland*
- *Riparian forests and grasslands, marshes, wetlands and lakes in floodplains*
- *Representative riparian ecosystems along the channel banks and riverbeds.*
- *Natural treatment wetlands and constructed wetlands for wastewater treatment*
- *Aquatic garden for conservation of aquatic flora*

Visitor Zone

- *Greenways with walkways and cycleways along the river embankment/ bunds*
- *Greenways with Recreational Parks, where human settlements are in proximity*
- *Butterfly conservatory, herbal garden, recreational park and forest communities on elevated floodplains*
- *Nature interpretation Centre on elevated floodplains/ embankment/ upland*
- *Natural bathing sites for local communities.*

Slide 10 — URMP Interventions — Training Programme for Urban River Management Plan — A unique framework for river cities in India

Potential Interventions for Objective-7 (ecofriendly river projects)

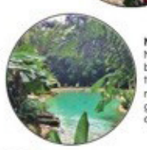
Intervention 1 : Development of Biodiversity Parks

Elements

- Miyawaki Tree Plantation
- Bird Park
- Nature Pools
- Nature Sanctuaries
- Conservatory
- Sustainable Construction Techniques & Materials
- Seating Areas
- Permeable paving & Landscaping
- Art Installations

Bird Park
For a riverfront where the avifauna thrives. This is an interactive engagement space with a variety of bird species, that promotes observation and bird watching. The habitat is harvested as per the needs of the avifauna species

Nature Sanctuary
A protected area of importance for flora, fauna, or features of geological or other special interest, which is reserved and managed for the purpose of conservation and to provide special research opportunities



Nature Pool
Natural pools or ponds are natural water bodies which are filtered organically rather than by chemicals. A regeneration zone is built near these, where the water enters either a gravel filter or a constructed wetland made out of plants that clean the water

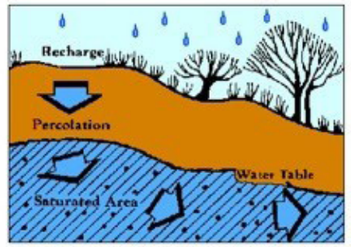
Conservatory
A conservatory is a building or a room having glass or tarpaulin roofs and walls, which is used as a greenhouse or a sunroof. It can conserve not just plants, but culture too

Miyawaki Technique
Invented by and named after Japanese botanist Akira Miyawaki, the 'Miyawaki Method' is a unique technique to grow forests. Under the approach, dozens of native species are planted in the same area, close to each other, which ensures that the plants receive sunlight only from the top, and grow upwards than sideways

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 2 : Construction of Recharge Zones

Recharge zone is an area in which water enters an aquifer, i.e., where surface water or precipitation percolate through relatively porous, unconsolidated, or fractured materials, such as sand, moraine deposits, or cracked basalt, that lie over a water bearing, or aquifer, formation. (Encyclopedia.com)



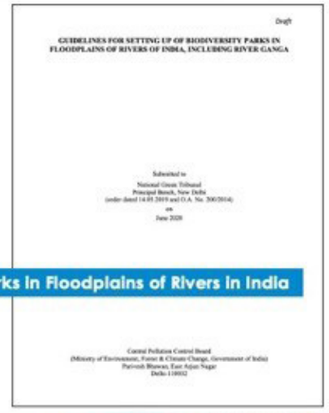
Recharge zone

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 1 : Development of Biodiversity Parks

Siting Considerations for Riverfront Theme Parks

- Recurring flooding problem
- Potential to most effectively store floodwaters
- Drainage allowing floodwaters to easily enter and recede in a controlled way, to effectively help in flood reduction
- Permitting submergence of park infrastructure by floodwaters, for extended stretches of time



Draft

GUIDELINES FOR SETTING UP OF BIODIVERSITY PARKS IN FLOODPLAINS OF RIVERS OF INDIA, INCLUDING RIVER GANGA

Submitted to
National Green Tribunal
Principal Bench, New Delhi
(order dated 14.09.2019 and O.A. No. 300/2014)
on
June 2020

Central Pollution Control Board
(Ministry of Environment, Forest & Climate Change, Government of India)
Parivesh Bhawan, East Arjun Nagar
Delhi-110032

Guidelines for Setting of Biodiversity Parks in Floodplains of Rivers in India

Potential Interventions for Objective-7 (ecofriendly river projects)

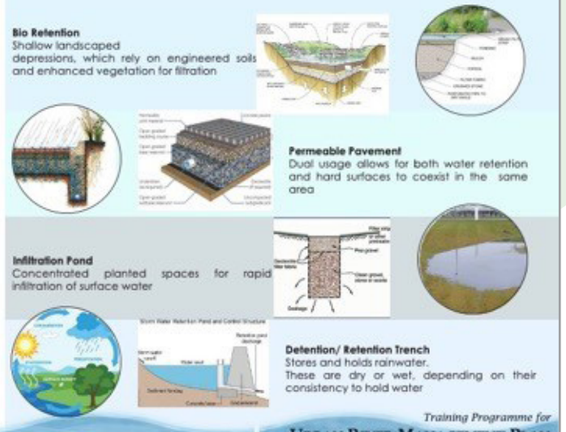
Intervention 2 : Construction of Recharge Zones

Criteria for identification of recharge sites –

- Declining ground water levels
- De-saturated aquifer, i.e. where regeneration of water in wells and hand pumps is slow after drawing some water
- Inadequate availability of water from wells and hand pumps during the lean months
- Permeable soil type
- Gradual slope for retaining water

Elements

- Bio-retention
- Permeable paving
- Infiltration zone and trenches
- Detention pond
- Sand filters
- Plantation management



Bio Retention
Shallow landscaped depressions, which rely on engineered soils and enhanced vegetation for filtration

Permeable Pavement
Dual usage allows for both water retention and hard surfaces to coexist in the same area

Infiltration Pond
Concentrated planted spaces for rapid infiltration of surface water

Detention/ Retention Trench
Stores and holds rainwater. These are dry or wet, depending on their consistency to hold water

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 1 : Development of Biodiversity Parks

Yamuna Biodiversity Park, Delhi

- Spread over an area of approximately 457 acres near Wazirabad village on the western bank of the river Yamuna
- The park features two major zones - the visitor zone and the nature reserve zone
- Key elements include ***Bambusetum, Nature interpretation Centre, Conservatory of fruit yielding species, Wetlands, Nature Reserve area, Herbal garden, Sacred grove, Butterfly conservatory and Amphitheatre***
- Home to diversity of flora and fauna

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 2 : Construction of Recharge Zones

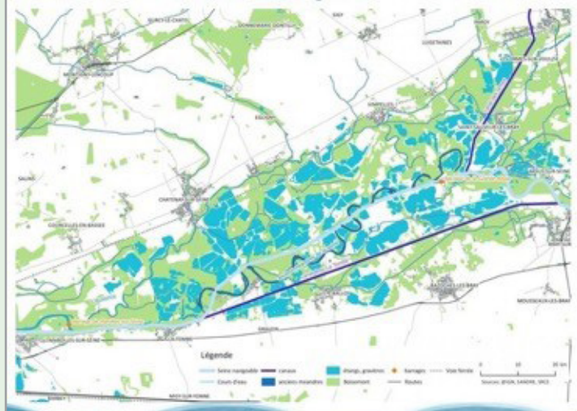
Renaturation of the Spree floodplains, Brandenburg, Berlin, Germany

- Eight new ponds with a 21 hectare stretch of water, and an area of 400 hectares were built
- Cut-off meanders were reconnected again, former water courses were reactivated and new floodplains were developed with typical vegetation.
- By constructing groyns, inlets and islands the river was given more structural diversity and a differing water flow rates.
- Several hectares of reeds provide a suitable place of refuge.

SESSION 8: OBJECTIVE 7

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 2 : Construction of Recharge Zones



The Bassée valley

- To protect the Paris region against floods from the Seine and the Yonne
- covers 30,000 hectares
- located upstream of the Seine / Yonne confluence.
- Benefits: flood management, long-term groundwater reserve, deposit of alluvial material, archaeological site, natural area of great ecological interest, etc.

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 3 : Provision of access through Riverfront Promenades or Walkways

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 3 : Provision of access through Riverfront Promenades or Walkways

Elements

- Biking Trails
- Promenades
- Riverfront streets
- Walking trails
- Scenic Drives

Scenic Drives
Driveways along or crossing the river provide a great combination of the required city infrastructure with aesthetics. The concept of bringing river as a part of the daily route, by proposing interventions such as promenades, boulevards and bridges, is being widely adopted by river cities.

Promenade
These are paved public walks, typically the ones along a rivertront, designed in a way to provide with an experience of a leisure walk from one place to another. These are usually accompanies by viewing and accessing decks to the river.

Riverfront Streets
These streets along the rivers are viewed as a part of the river, framing scenic views and making the river a part of the daily activities in these areas.

Biking Trails
These are paths with their own right of way dedicated to cycling, though in many cases shared with pedestrians and other non-motorized traffic. Dedicated bike trails along the river banks can serve as an engaging community activity space

Walking Trails
A green way is a long, narrow stretch of land, often used for recreation or pedestrian and bicycle users, and sometimes for streetcars, light rail or retail uses. Such shared use paths supports multiple modes, such as walking, bicycling, in-line skating and people in wheelchairs, for connecting rivers with the citizens.

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 3 : Provision of access through Riverfront Promenades or Walkways

Punggol Promenade Nature Walk, Singapore

- 2.4 km Nature Walk, between Punggol Point Walk and Riverside Walk
- Features a number of fishing platforms and rest shelters along its meandering track, spots that are perfect for a quiet respite and for scenic views

Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 3 : Provision of access through Riverfront Promenades or Walkways

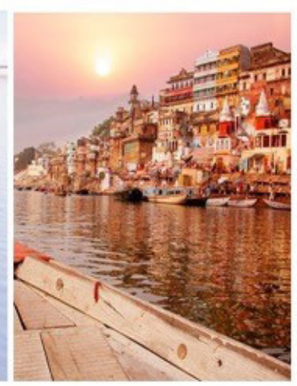
Riverfront Trails
These are riverfront connections that place emphasis on moving along the river. Ideally designed for pedestrians, runner, cyclist or rollerblades, these provide riverfront connections for recreational uses.

Riverfront Promenades
Promenades are generally more pedestrian in character, rather than recreational. They provide opportunities to experience the river from a different vantage point. Promenades are places to see and to be seen. They can open up the views of the river and integrate the character of the community with the pastoral nature of a park. Ideally placed where landings intersect connections along the riverfront park and where urban districts are adjacent to the riverfront.

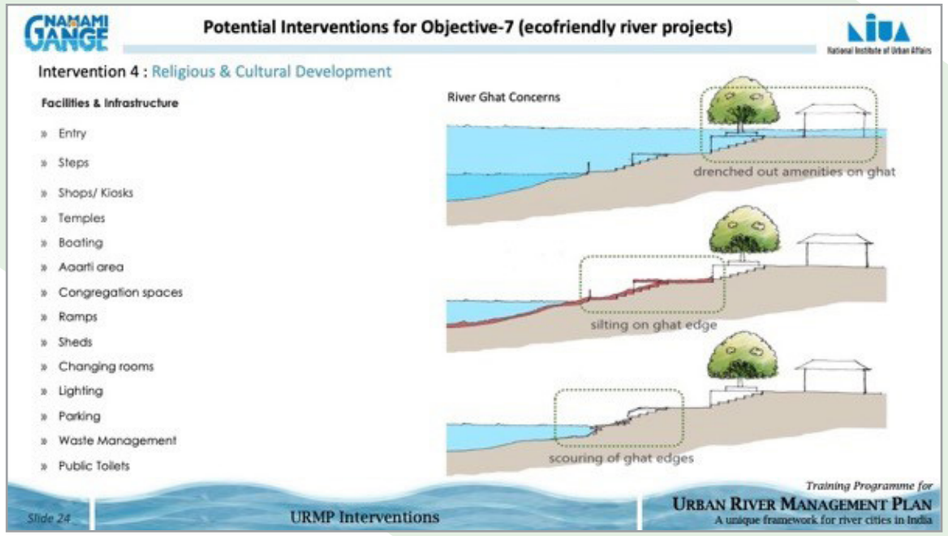
Riverfront Streets
Streets along a riverfront have the potential to be an exciting and different way to experience riverfront parks, and to create new opportunities for development adjacent to them. They can make the riverfront more accessible and open up all areas of the park. Designing and locating of riverfront streets should ensure that access to the riverfront is not restricted by the presence of vehicular streets, and with pedestrians as a primary consideration.

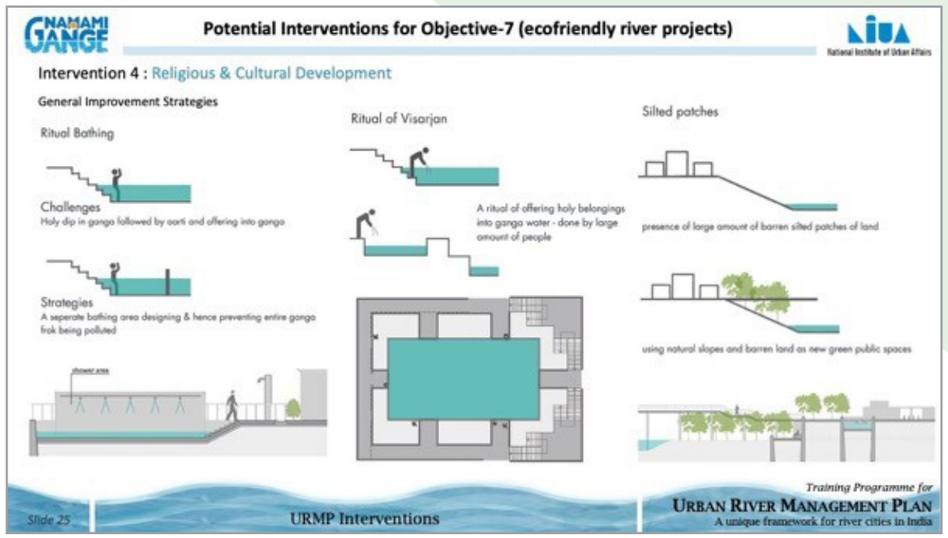
Potential Interventions for Objective-7 (ecofriendly river projects)

Intervention 4 : Religious & Cultural Development



SESSION 8: OBJECTIVE 7






Source: Pexel

SESSION 8: OBJECTIVE 7

Objective 8: To leverage river related economy

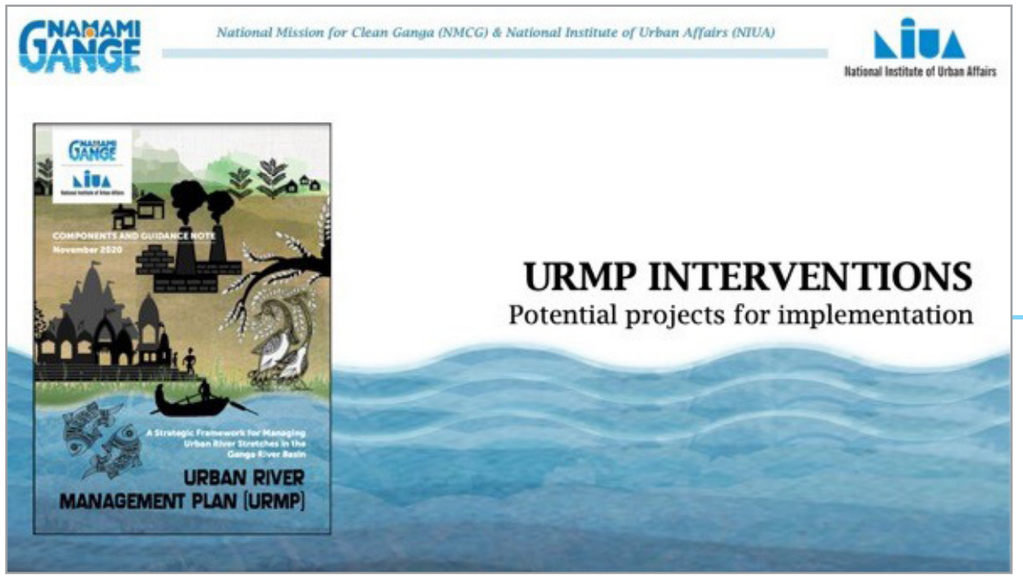
8

Leveraging on the Economic Potential of the River

Cities and towns must begin to realize that a river has tremendous economic value through the ecosystem services it provides, and livelihoods it can support. Already cities across the globe have boosted their economies through river-centric activities such as cultural tourism, water sports, river markets, fisheries, navigation, and several others. Rivers can help towns progress up the economic ladder, which every town aspires. Needless to say, the scale and extent of such activities must account for carrying capacity of the river.

Duration – 40 minutes

Activity	Time	Materials / Methods
Lecture on potential of clean and healthy river and benefits on river economy and livelihoods	20 min.	PPT slides. Trainer will explain the concept by using case examples of river economy
Activity - I Prepare concept plan for floating restaurant and river market	20 min	Flip chart, A0 size chart paper, color pens to write,
Plenary discussions and summarize	20 min.	Lead trainer will do structured debate in plenary to summarize the objectives



SESSION 9: OBJECTIVE 8

Learning objectives

Trainees understand

- **Benefits of river health improvement**
- **Livelihood aspects related to river**

Short Presentation

With city stakeholders looking at avenues to increase the revenue of the city and also attract more livelihood opportunities, this session shall be instrumental in encouraging a two way dialogue with the trainees, abouth their cities and what can be the potential interventions to leverage a healthy river flowing through the city. The trainer shall encourage exchange of ideas in this session.

Floating River Markets

International Examples


Solomon Islands


Myanmar


Mekong River, Vietnam


Ratchaburi, Thailand

Establishment of River Markets – Planning Considerations

- Application Process (permits, licenses, taxes, insurance etc.)
- Product profiling (eligible/ineligible products)
- Packaging/disposal requirements

Site Feasibility and finalization of location

- Daily operations guidelines and enforcement policy
- Booth assignments (rotational, permanent)
- Safety/emergency preparedness

- Operations budget
- Vendor fees
- Market Sponsors

- Website, Social Media
- Annual fairs, cultural events for river-city connect
- Branding of products
- Engaging with local businesses and organizations

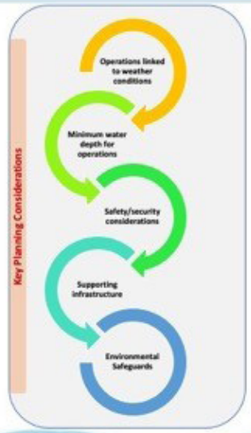
Impact assessment studies and statutory requirements

Patuli Floating Market, Kolkata

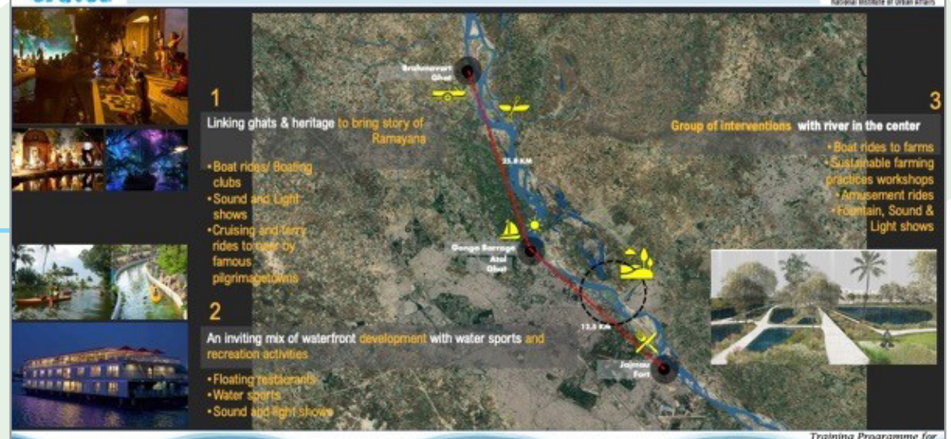
Key Features
India's first floating market after Dal Lake
Set up in January 2018 by Kolkata Metropolitan Development Authority
24,000 sq.mt abandoned waterbody rejuvenated for setting up market
Set up cost – INR 10 Crores
Market has approx. 110 boats, Each boat has 2 hawkers (shops), Approx. 250 shops in total
Market has four zones for selling products – (1) fish, (2) chicken, (3) eggs and mutton, (4) vegetables/fruits and groceries, fast food stalls
Major tourist attraction, no visitor fee
Shops pay INR 600 as monthly maintenance
Operating hours: 6am to 10pm

Eco-friendly Floating Restaurant

Key Planning Considerations



River Tourism in Kanpur - Concept



SESSION 9: OBJECTIVE 8

Indicative Exercises Example

Exercise – I – Develop concept plan of river market and floating restaurants

Divided the participant in the groups as per numbers. Distribute the following two matrix among the trainees. Facilitate them to brainstorm on developing concept plans for river market and floating restaurant in the river. For making this activity more engaging, a Google map print of a river stretch of any region can be given with some basic data and information to participants to mark the potential sites.

Planning requirements	Implementing requirements	Stakeholders
Identifying suitable site along river bank	Survey of the river stretch	Irrigation and flood control department

Requirements to conduct the session

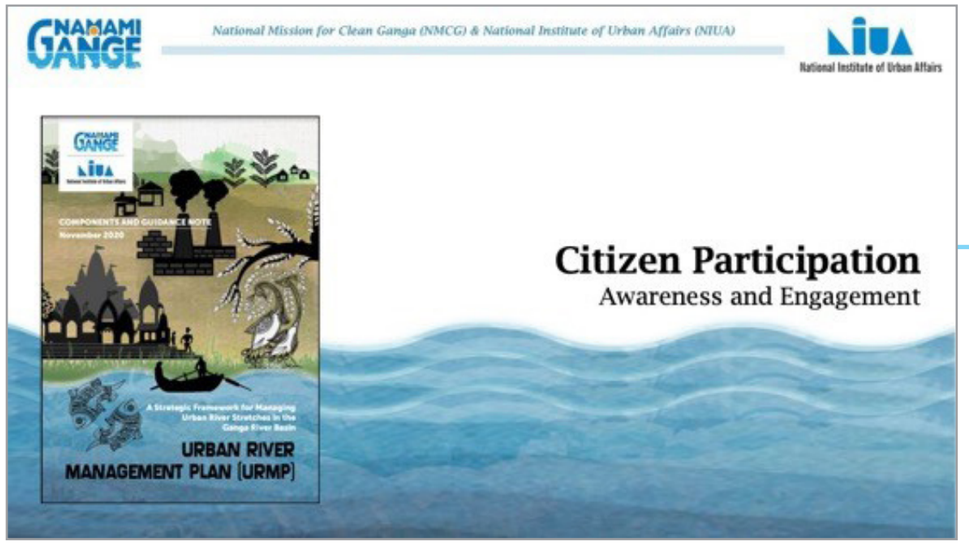
PPT slides, A0 size matrix/key, color pen sets, Google map print of river stretch with basic data and information related to two projects.

Source: Pixabay

SESSION 9: OBJECTIVE 8

Objective 9 and 10: To increase awareness and citizen engagement in river management

Citizen support is an important aspect for the long-term sustainability of urban river management planning and the success of any initiative taken up by the ULB. This support becomes far easier to solicit when citizens are aware of the issues at hand, and how they can help address those. Cities must develop a dedicated strategy to spread awareness about the benefits of healthy rivers through innovative dissemination mechanisms. This will be stepping stone for the desired behavioral change and also to make that shift from 'citizens as spectators' to 'citizens as actors. Citizen engagement also sends out the message that urban river management cannot be the government's job alone. Citizens will need to step in and share the onus of healthy rivers. Most progressive societies have some or the other form of this governance model. In the long run, it will help create a shift in the mind-set of people towards ecological assets of the city.



Learning objectives

Trainees understand

- **Difference between awareness and management engagement**
- **Various innovative approaches to do this**

Short Presentation

The presentation looks at the various strategies for involving citizens towards keeping the rivers healthy and natural. The trainer can elaborate on the awareness building strategies and also highlight innovative ways in which the local people can be roped in. Examples of some successful stories such as local campaigns, IEC material in local languages can also be shared with the trainees.

Indicative Exercises Example

Exercise I – Know your river's health

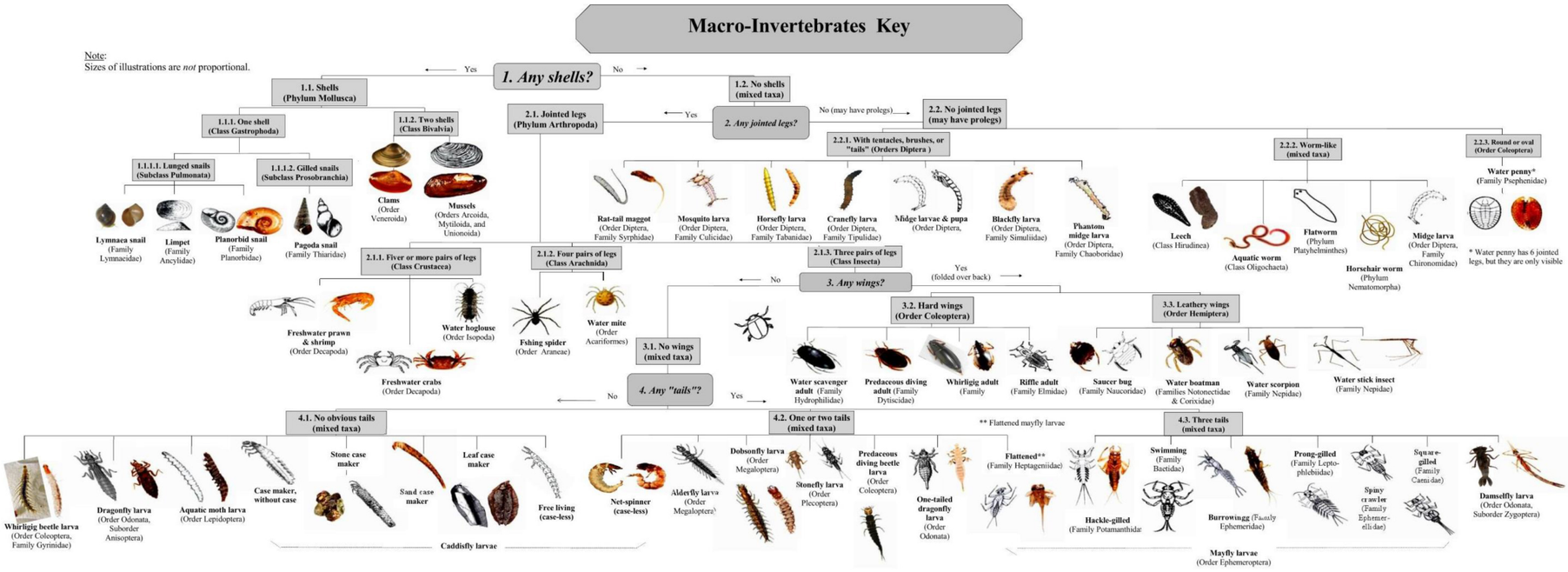
Trainees are divided into various groups. They are provided two charts that provide pictures of various macro-invertebrates found in the river and indicate the health and quality of river.

Second chart will provide a ranking matrix of macro-invertebrates to calculate of species richness and pollution score based on the species found. This interesting activity enable trainees to understand health of the urban river in an engaging way.

Requirements to conduct the session

A0 size charts of macro-invertebrate species key and record sheets, cut-outs of various macro-invertebrate species, pin boards.

River Health Assessment with Macroinvertebrates



River Health Assessment with Macroinvertebrates

Aquatic Macroinvertebrate Record Sheet

(Page 1 of 1) *(For use with Aquatic Macroinvertebrate*

	Common name	Scientific Order (unless otherwise indicated)	Pollution Sensitivity	Total no. found	Tick if present ✓	Put the sensitivity no. here
SENSITIVE	Mayfly nymph	*Ephemeroptera*	10			
	Caddis fly larva	*Trichoptera*	10			
	Stonefly nymph	*Plecoptera*	9	4	✓	9
	Riffle beetle adult	*Coleoptera*	8			
	Riffle beetle larva	*Coleoptera*	8			
	Crane fly larva	*Diptera*	6	12	✓	6
	Water mite	*Acariformes*	6			
	Water flea	*Cladocera* (suborder)	5			
	Whirligig beetle adult	*Coleoptera*	5			
	Whirligig beetle larva	*Coleoptera*	5			
	Black fly larva	*Diptera*	5			
					TOTAL	**TOTAL**

Water Quality Score	
0	No life
1.0 – 2.9	Poor
3.0 – 6.9	Fair
7.0 - 10	Good

Water Quality Score = $\frac{\text{Pollution Score}}{\text{Species Richness}}$

Species richness *Pollution Score*

Source: Pexels

4.2 Financial avenues & M&E framework for URMP

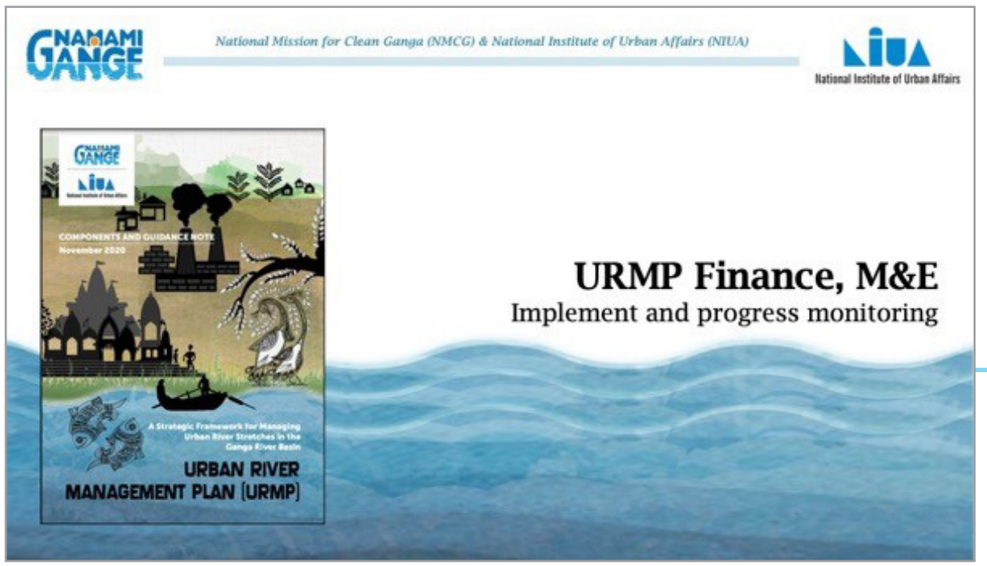
Finances are usually the deciding factor that dictate the realization of a plan. It is, therefore, important that the URMP clearly indicates the source and modality of procuring the finances for implementing the interventions. The URMP interventions could range from small-scale projects to large scale interveventions, each of these interventions will require financing for both capital and O&M expenditures.

As mentioned earlier, it would be ideal if the URMP could leverage on the funding from national missions. Moreover, there are a range of alternate financing options that a ULB can explore. Many of these options are quite common and have already been used by ULBs in the past.

The implementation of the URMP would be monitored through 10 indicators matching with URMP objectives and collectively culminate into an index called URMindex. The URMindex is measured on a scale from one to five, and is useful to paint a snap shot of the situation, which can be used to monitor the implementation of the URMP, and develop overall strategies and policies for enhancement.

Duration – 45 minutes

Activity	Time	Materials / Methods
Lecture on importance of M&E framework and various financial options to implement URMP projects	10 min	PPT slides
Activity - I Match the finance options with URMP projects Activity -II Monitor progress of URMP	30 min	Flip chart, A0 size chart paper, color pens to write
Plenary Discussions, Wrap up and Summarize	20 min	Lead trainer will do structured debate in plenary to summarize the objectives



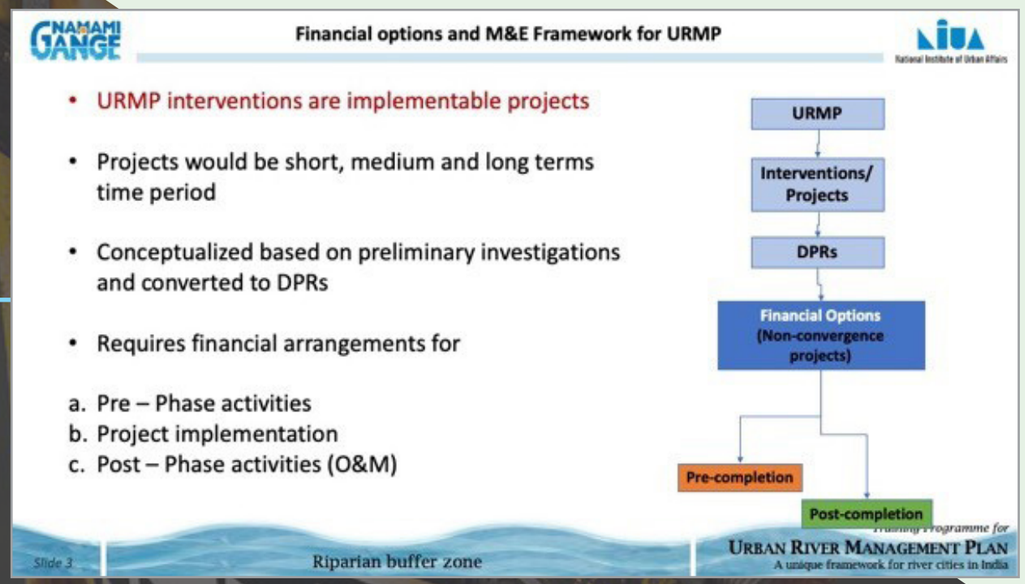
Learning objectives

Trainees understand

- **Different source of funds to implement URMP projects**
- **Concept of M&E of URMP**
- **Various indicators for monitoring the progress of URMP**

Short Presentation

This is one of the interesting presentation covering the most pertinent subjects of financing and monitoring and evaluation. Various financing alternatives and monitoring indicators shall be discussed and explained to the trainees in a simplified way. This would require a thorough preparation and understanding from the trainer's end too.



Financial options and M&E Framework for URMP

Fin. Option	Eligibility Criteria	Provision	Linkage with URMP	Access to Grant	Alignment – URMP objective
VGF	PPP Model; 20% of total project cost; 51% or more private investment	Slots <100 cr. 100-200 cr. >200 cr. Approval through committee	• Water Supply, • SWM, • Tourism, Convention Centre • Public Sanitation Facilities	https://www.pppinindia.gov.in/schemes-for-financial-support	River Health
VCF Tools- *Land Value Tax, Conversion of land, Betterment Levy, Impact fee, Land pooling etc.*	Private land and buildings that benefit from public investments in infrastructure and policy decisions of the government, should pay for it (e.g. change of land use or Floor Space Index (FSI)	Variable and project dependent	• Rehabilitation of slum dwellers • Dhobi Ghats • Event Area • Urban forestry • Sewerage system • Public/Flower Garden • Water recreation	http://smartcities.gov.in/upload/5901982d9e461VCFPolicyFrameworkFINAL.pdf	Economic Viability
CAMPA	Compensatory afforestation, soil moisture conservation, wildlife management and catchment area treatment, training and awareness generation,	Variable; every year, disbursed to states 2019-20 Announcement **Rs. 47, 436 cr.**	• Urban Forestry, Afforestation programs, • River bank erosion protection	http://moef.gov.in/wp-content/uploads/2017/06/CAMPA-guidelines.pdf	River Health, Economic Viability, Social Cohesion

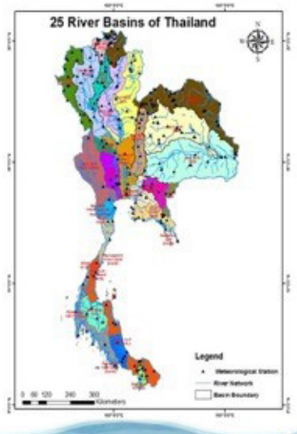
Riparian buffer zone

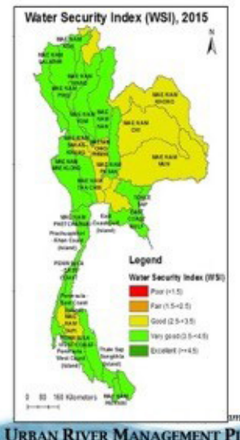
Financial options and M&E Framework for URMP

Fin. Option	Eligibility Criteria	Provision	Linkage with URMP	Access to Grant	Alignment – URMP objective
Centre/State Fin. Commission	Two main type of grants i.e. Basic and Performance,; Ration of Basic to Performance grant is 80:20 for urban local bodies Population a key criteria	Five year allocation 2015-20 ULBs **Rs. 87,143 cr.** *Released in June & October*	Finance commission grants are provided only for the basic services to the ULBs	https://planningonline.gov.in/douc uments/Guidelines.pdf	River Health, Economic Viability
CSR/Private Sector	Net worth of INR 500 cr. or more; or Turnover of INR 1,000 cr. or more; or Net Profit of INR 5 cr. or more during any financial year Company spends at least 2% of the average Net Profit	cumulative spending over the four years stands at ~Rs 34,100 crore for listed companies and ~Rs 18,900 crore for unlisted ones, totalling **~Rs 53,000 crore.**	Sectors eligible Environment Water supply including drinking water Sports & Culture	http://www.mca.gov.in/MinistryV2/csrdatasummary.html	River Health, Social Cohesion
Entry Fees	Projects on with BOT or PPP mode, ULBs can make conditions and provisions to collect entry fee as their share	Variable, Project dependent	Parks & Gardens, Parking areas, Entertainment zones,	-	Economic Viability

Financial options and M&E Framework for URMP

- The implementation of the URMP would be monitored through 10 indicators, which will collectively culminate into an index called URM_{index}.
- The URM_{index} is measured on a scale from 1 to 5.
- Useful to paint a snap shot of the situation and develop overall strategies and policies for enhancement.





Financial options and M&E Framework for URMP

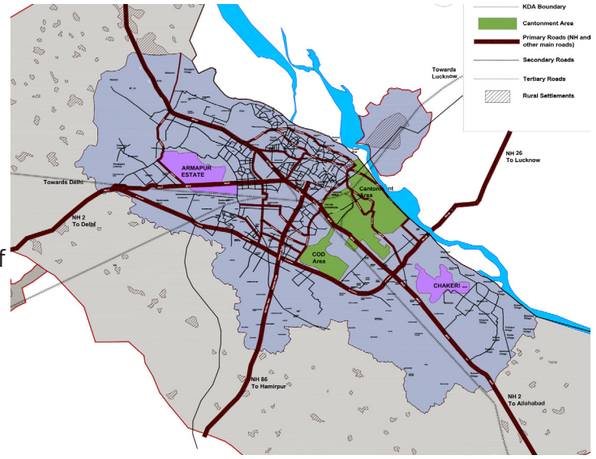
URM_{index}	Interpretation	What it means?
<1.5	Poor level of urban river management	The city is incapable of meeting the basic requirements for effective urban river management. The river is neglected and used indiscriminately without proper planning and management. There are serious concerns for all dimensions of urban river management.
1.6-2.5	Elementary level urban river management	Basic actions required to ensure urban river management are evident. However, there are still major gaps and serious concerns with regards to almost all dimensions of urban river management.
2.6-3.5	Average level of urban river management	The city has a satisfactory urban river management system. However, some dimensions of urban river management are still a cause of concern.
3.6-4.5	High level of urban river management	The city is well-placed with most of the dimensions of urban river management. The dimensions may not be at par with each other, but the overall situation is still nonetheless satisfactory.
4.6-5.0	Ideal level of urban river management	The city is an ideal example of urban river management. There are evidences of exemplary actions against every dimension of urban river management, suggesting that the plans and policies in regards to urban river management are working well.

Financial options and M&E Framework for URMP

S. No	Name of indicator	Estimation measure (Details of calculations to be followed are in Guidance note for the URMP framework)	Monitoring frequency
1	Floodplain management score	Based on consideration of desirable features of a well-managed and regulated flood plain.	Annual
2	Net Dissolved Oxygen (DO) Score	Based on the evaluating difference in DO at the downstream and upstream locations for each river.	Monthly
3	Waterbody revival score	Based on a qualitative assessment of the water bodies in the city that are in an acceptable condition.	Annual
4	Riparian buffer score	Based on a quantitative assessment of the length of the riparian zone on the river banks within the city's jurisdiction	Annual
5	Wastewater reuse score	Based on the amount of treated wastewater that the city is able to use for various uses	Monthly
6	Return flow score	Based on a measures of a city's return flow to the river against its intended commitment for it.	Monthly
7	Eco-friendly riverfront score	Based on a qualitative assessment of the economic and social benefits of the riverfront projects of a city.	Annual
8	River economy score	Based on the number of river-related economic activities carried out in the city, in a eco-friendly manner	Annual
9	Citizen sensitization score	Based on the modalities used for citizen sensitization	Annual
10	Citizen engagement score	Based on the modalities used for engaging citizens in river management activities	Annual

URMP in Action

The city of Kanpur is the first city in India to prepare a dedicated plan to manage urban rivers. The purpose is to develop a dedicated strategy for managing the extent of the Rivers Ganga and Pandu—that flow through the city of Kanpur—in an efficient and sustainable manner. The Kanpur URMP proposes nineteen tangible and practical actions for managing the two rivers This version of the URMP (Version 1.0) for Kanpur City is meant to be short-term in nature, targeting actions over a 2–3-year period. However, the URMP document is a living document, which will address issues related river management on continuous basis in subsequent versions.

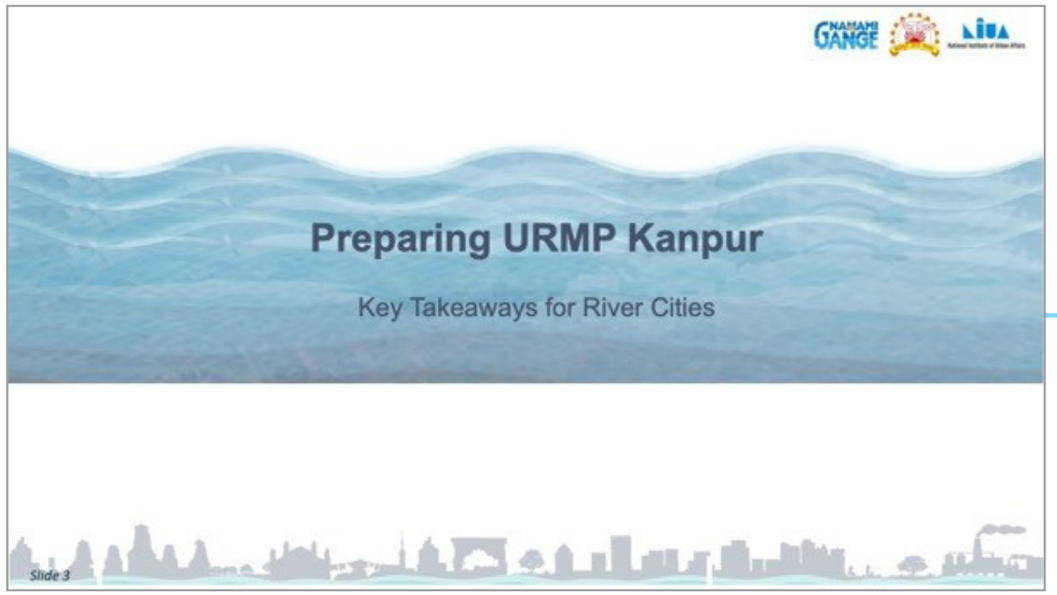


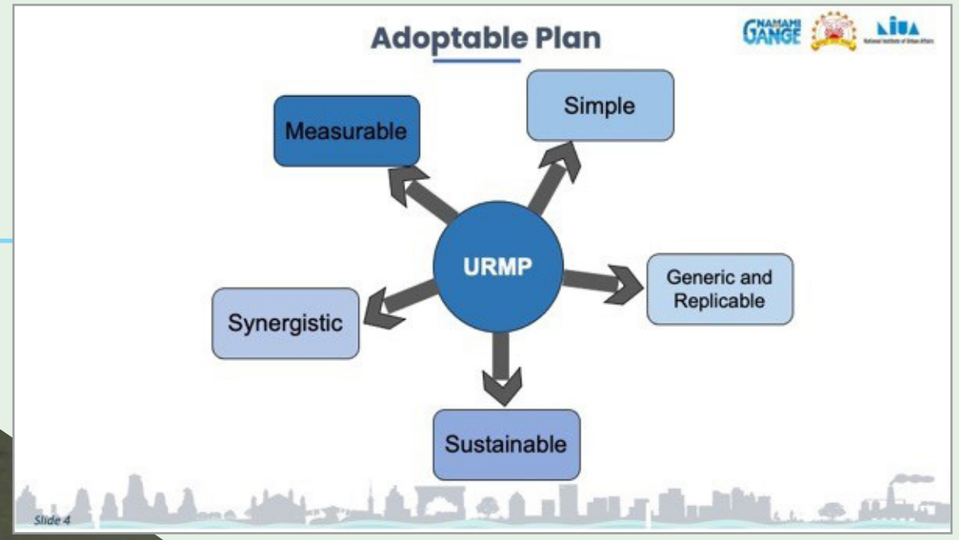
The Kanpur URMP is case example for any city on implementing the URMP. The presentation highlights following

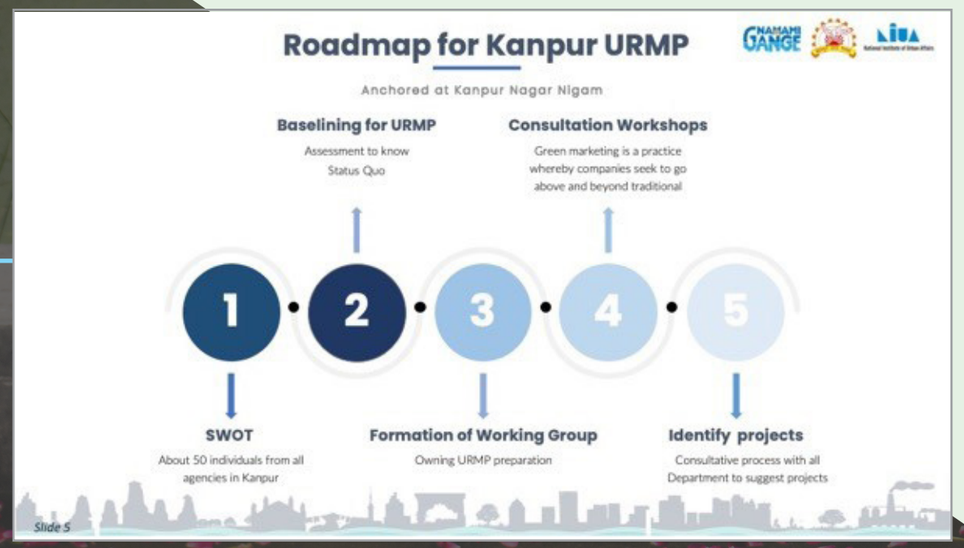
1. How Kanpur URMP started – Inception of URMP Kanpur V.1?
2. How the plan is prepared – SWOT of city, Baselining, Working group?
3. Which are the key stakeholders engaged – Different departments engaged

4. Key projects identified – Uniqueness in the projects

The presentation only covers the key elements and represents few projects. The URMP Kanpur report is available on NIUA website. The trainees can go through the report to understand entire process of making Kanpur URMP.







SESSION 11

SWOT

- One of the major polluting drains—The **Sisamau Nala—has already been tapped** into and diverted to an STP.
- There are a **large number of water bodies** in Kanpur. These could serve as strategic assets in the preparation of the URMP.

STRENGTH

- Increasing population/**additional stress on riverine resources**
- **Upstream side pollution** (Kannauj, Farukhabad)

THREAT

WEAKNESS

- There is a **big gap** between the capacity of the wastewater treatment plants and the actual wastewater that is treated
- There is a general **lack of river sensitivity** among the citizens

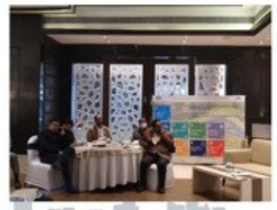
OPPORTUNITY

- **URMP projects can be dovetailed** with ongoing programs like AMRUT, Smart City Mission

Slide 7

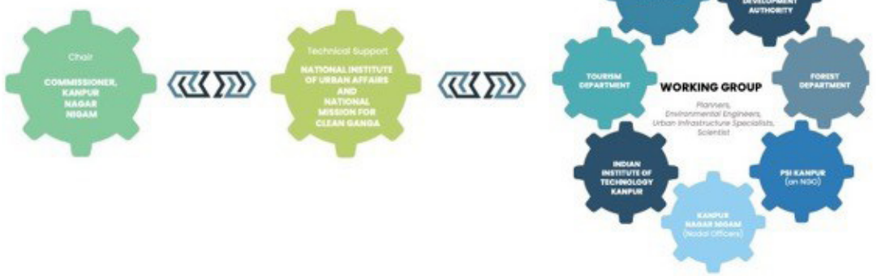
Consultative process for interventions





Slide 10

URMP Working Group



Slide 8

Unique Interventions proposed Kanpur URMP

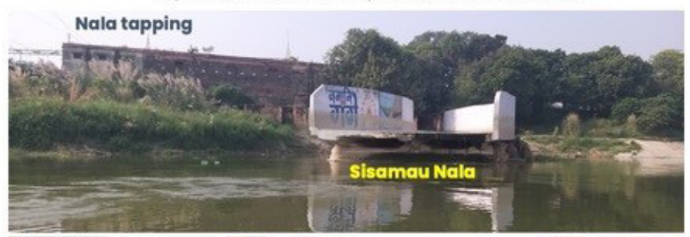
Slide 11

Baselining & Priority of URMP Objective

Slide 9

Key Achievement - pollution abatement

City administration has already initiated work in this direction




Faecal Sludge Management

Slide 12

19 Interventions – URMP

Master Plan	Smart Cities Mission	Sewage management	Swachh Bharat Mission	17. Develop dedicated river-based sensitization programme
Solid waste management	Smart Cities Mission	Jal Jeevan Urban Mission	Jal Jeevan Urban Mission	18. Engage citizens for water quality monitoring
9. Develop riparian zone along Pandu River in selected locations	Service Level Benchmarks	Service Level Benchmarks	Jal Jeevan Urban Mission	Swachh Bharat Mission
Solid waste management	14. Develop a Ganga Park at Atal Ghat	15. Develop a floating restaurant	16. Develop cultural theme boat ride between Ganga Barrage and Bithoor	

Slide 13

Interventions Discussed

1 REGULATING FLOODPLAIN ACTIVITIES
3 REJUVENATE WATERBODIES AND WETLANDS
5 INCREASED REUSE OF TREATED WASTEWATER
2 [illegible]
4 ENHANCE RIPARIAN BUFFER
6 [illegible]
7 [illegible]
8 LEVERAGING ECONOMIC POTENTIAL OF THE RIVER
9 CITIZEN AWARENESS ON RIVER SENSITIVE BEHAVIOUR
10 ENGAGE CITIZENS IN RIVER MANAGEMENT ACTIVITIES

ENVIRONMENT | ECONOMICS | SOCIAL

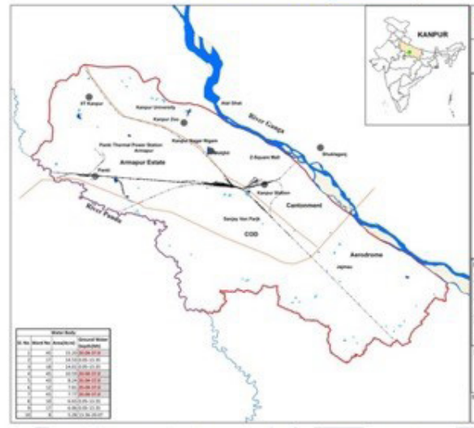
Slide 14

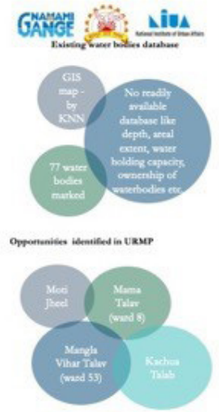
INTERVENTIONS: Revival of waterbodies

3 REJUVENATE WATERBODIES AND WETLANDS

Slide 15

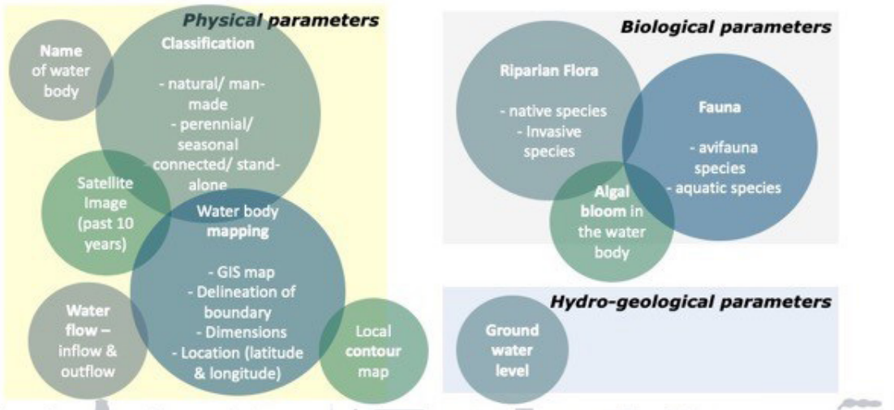
INTERVENTIONS: Waterbodies Database





Slide 16

INTERVENTIONS: Waterbodies Database



Slide 17

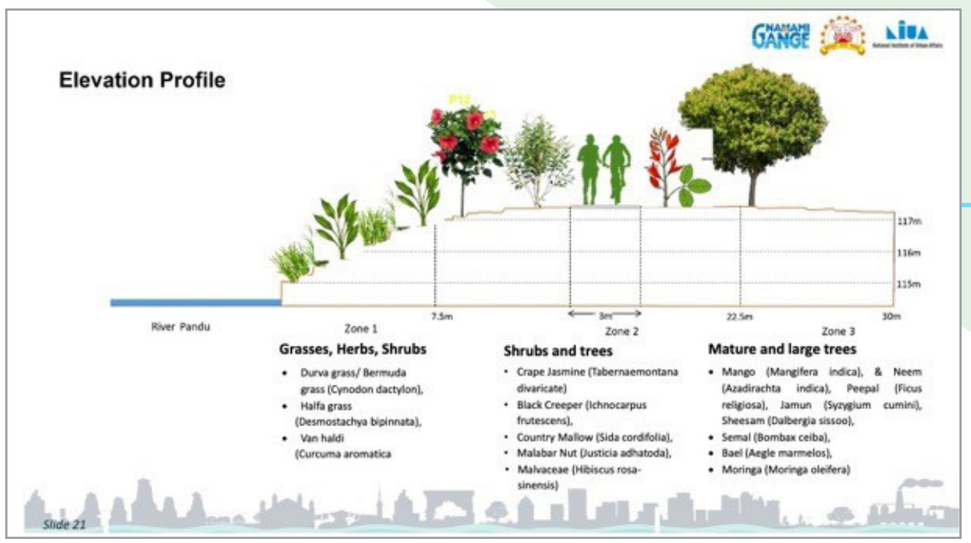
INTERVENTION: Revival of Mama Talav Waterbody

Slide 18

SESSION 11


4
ENHANCE RIPARIAN BUFFER
INTERVENTION: DEVELOP RIPARIAN ZONE ALONG PANDU RIVER
Slide 19


INTERVENTION: RIPARIAN ZONE ALONG PANDU RIVER
30 m riparian buffer wherever possible
Riparian Zone | Area in Acre
Pocket 1 | 10
Pocket 2 | 30
Pocket 3 | 11
Pocket 4 | 8
Pocket 5 | 18
Pocket 6 | 30
Pocket 7 | 4
Pocket 8 | 5
Pocket 9 | 17
Pocket 10 | 25
Pocket 11 | 5
Pocket 12 | 3
Pocket 13 | 9
Slide 20

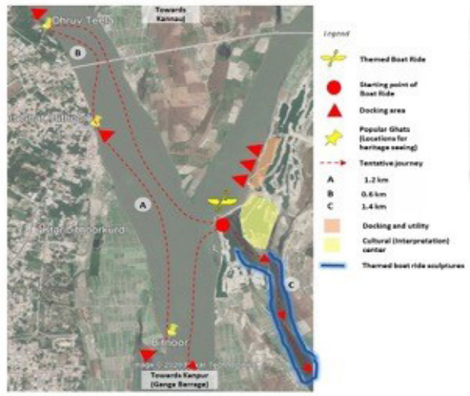

Elevation Profile
River Pandu
Zone 1
Zone 2
Zone 3
7.5m
8m
22.5m
30m
117m
116m
115m
Grasses, Herbs, Shrubs
Durva grass/ Bermuda grass (Cynodon dactylon),
Halfa grass (Desmostachya bipinnata),
Van haldi (Curcuma aromatica
Shrubs and trees
Crape Jasmine (Tabernaemontana divaricate)
Black Creeper (Ichnocarpus frutescens),
Country Mallow (Sida cordifolia),
Malabar Nut (Justicia adhatoda),
Malvaceae (Hibiscus rosa-sinensis)
Mature and large trees
Mango (Mangifera indica), & Neem (Azadirachta indica), Peepal (Ficus religiosa), Jamun (Syzygium cumini), Sheesam (Dalbergia sissoo),
Semal (Bombax ceiba),
Bael (Aegle marmelos),
Moringa (Moringa oleifera)
Slide 21

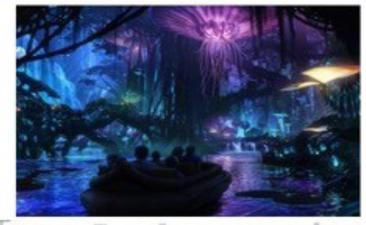

7
8
INTERVENTION: GANGA PARK AT ATAL GHAT & RIVER TOURISM
Slide 22


Kanpur
Legend
Ghat
Drain
Building
Green/Tree Cover
Open Area
Atal Ghat
Ganga River
Scale – 1:2,500
Source : Google Earth Image
Dated – 10.06.2020
Slide 23


GANGA PARK
ENTRY & EXIT
Open Air Community Space
Museum
Nature Interpretation Center
Flower Garden
Total Site Area- 72,527_ Sqm
Built-up Area- 7% (approx.)
Public & semi public- Toilet, Ghat, sitting spaces
Commercial spaces- Café, Museum & Art gallery, Boat landing
Recreational spaces- Garden (Flower Garden, Herbal Garden, Butterfly Park, NIC, Waterbody)
Slide 24

CULTURAL THEME BOAT CIRCUIT





Slide 25

Key Takeaways

1. URMP is a living document for a city
2. Preparing URMP is a lot easier than it appears
3. Creating a value for the river is a prerequisite to managing it
4. Managing urban river stretch is economically beneficial in long run

Slide 27

Newspaper coverage of the URMP in Kanpur (ToI, 14 Jan 2021)

City | Kanpur | Mumbai | Delhi | Bengaluru | Hyderabad | Kolkata | Chennai | Agartala | Agra | Ajmer | Amaravati

Photos | Weather | Pollution News | UP Elections

NEWS / CITY NEWS / KANPUR NEWS / KANPUR WILL BE FIRST CITY TO FORMULATE RIVER MGMT PLAN

Kanpur will be first city to formulate river mgmt plan

TNN | Jan 14, 2021, 04:06 IST A- A+

Slide 28

Source: Pexel

SESSION 11

4.2 Training Feedback and Conclusion

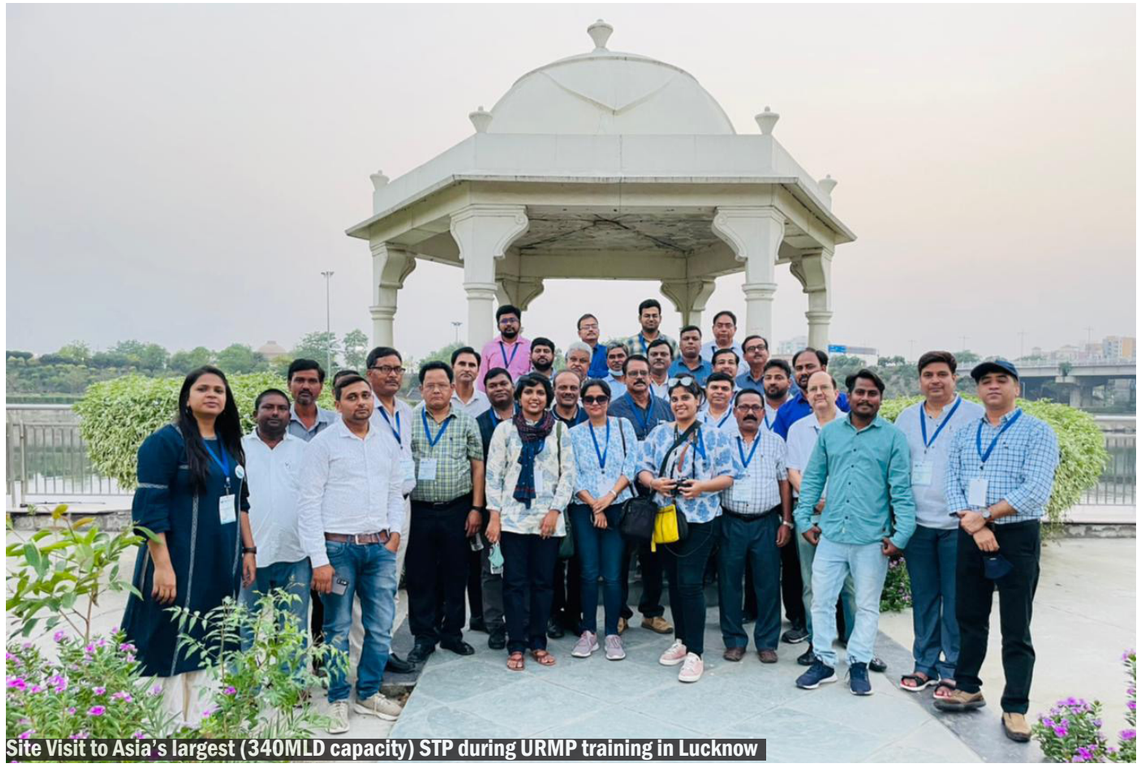
The 2 day training shall be concluded with some remarks from the senior delegation, authorities attending the training workshop. Trainees shall be felicitated with participation certificates and a post training feedback must be undertaken. This feedback can include the session wise levels of learning of the participants as well as record their views on any scope for improvement or additions in the respective sessions.

Alternatively, a post-training quiz can be another way to engage with the trainees. (as indicated in section 2.2.3)

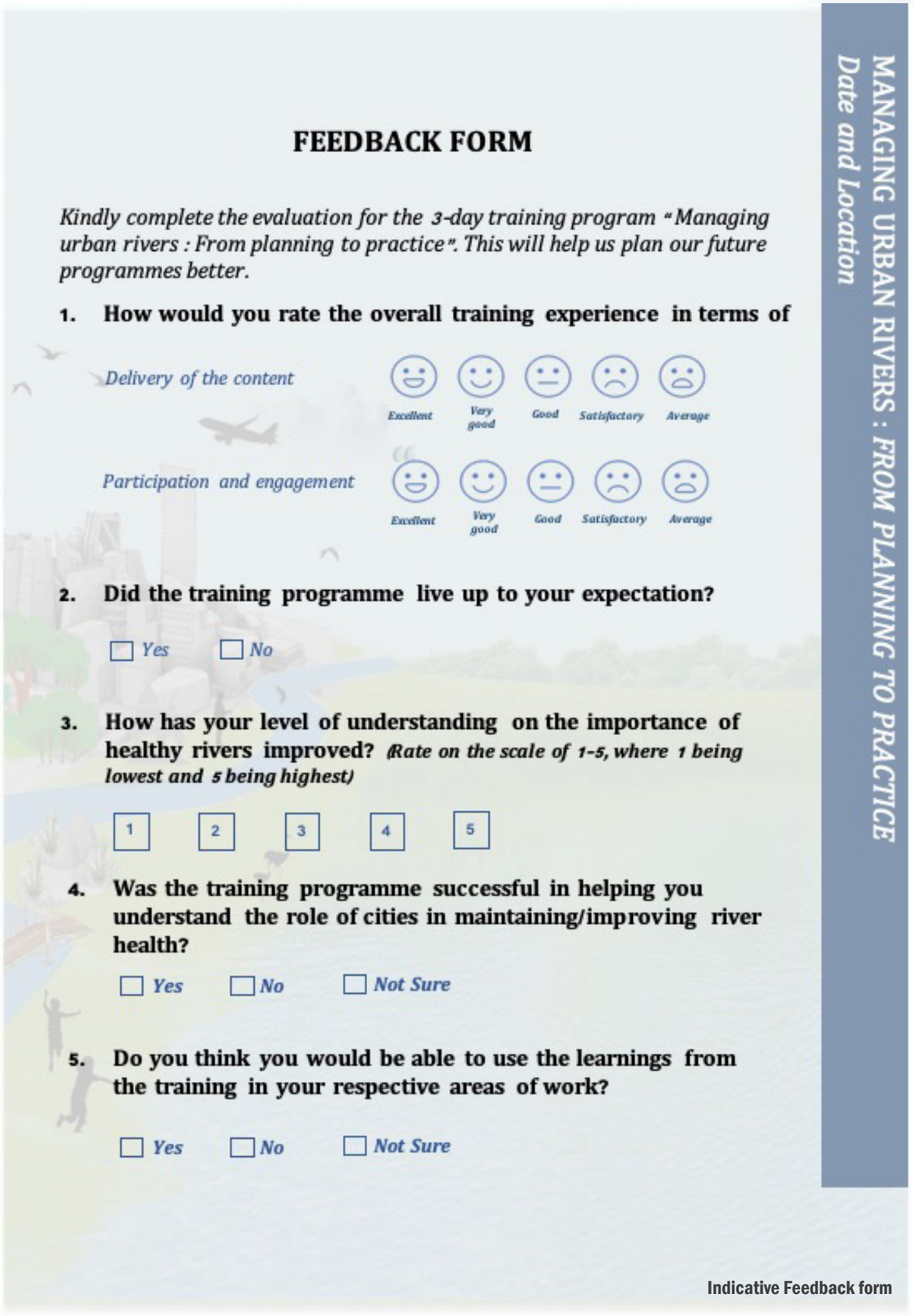
This can be followed by a discussion on the way forward that the trainees can take up in their respective areas,departments or cities. This can also include further guidance on some of the interventions that can be contextualized and applied by the cities or local areas. The Way Forward session can also help in shedding some light on any technical or other assistance that the city officials, professionals would need in furthering the agenda of formulating URMPs or taking up interventions in this direction.

The training can be either concluded here or a site visit relevant to any of the sessions can be planned. Site visits are usually appreciated by the trainees and give them more perspective on the onground challenges and practical implementation of projects.

Post training, a training report (Annex 2) can be developed by the ATI/ Training institute and shared with all the participants with the training presentations as well as any study material to have all the knowledge easily accesible for the participant cities as well as officials/ departments back home that can be sensitized towards river sensitive urban development and planning.



Site Visit to Asia's largest (340MLD capacity) STP during URMP training in Lucknow



MANAGING URBAN RIVERS : FROM PLANNING TO PRACTICE
Date and Location

FEEDBACK FORM

Kindly complete the evaluation for the 3-day training program "Managing urban rivers : From planning to practice". This will help us plan our future programmes better.

1. **How would you rate the overall training experience in terms of**

Delivery of the content — Excellent | Very good | Good | Satisfactory | Average

Participation and engagement — Excellent | Very good | Good | Satisfactory | Average

2. **Did the training programme live up to your expectation?**

☐ *Yes* ☐ *No*

3. **How has your level of understanding on the importance of healthy rivers improved?** ***(Rate on the scale of 1-5, where 1 being lowest and 5 being highest)***

1 | 2 | 3 | 4 | 5

4. **Was the training programme successful in helping you understand the role of cities in maintaining/improving river health?**

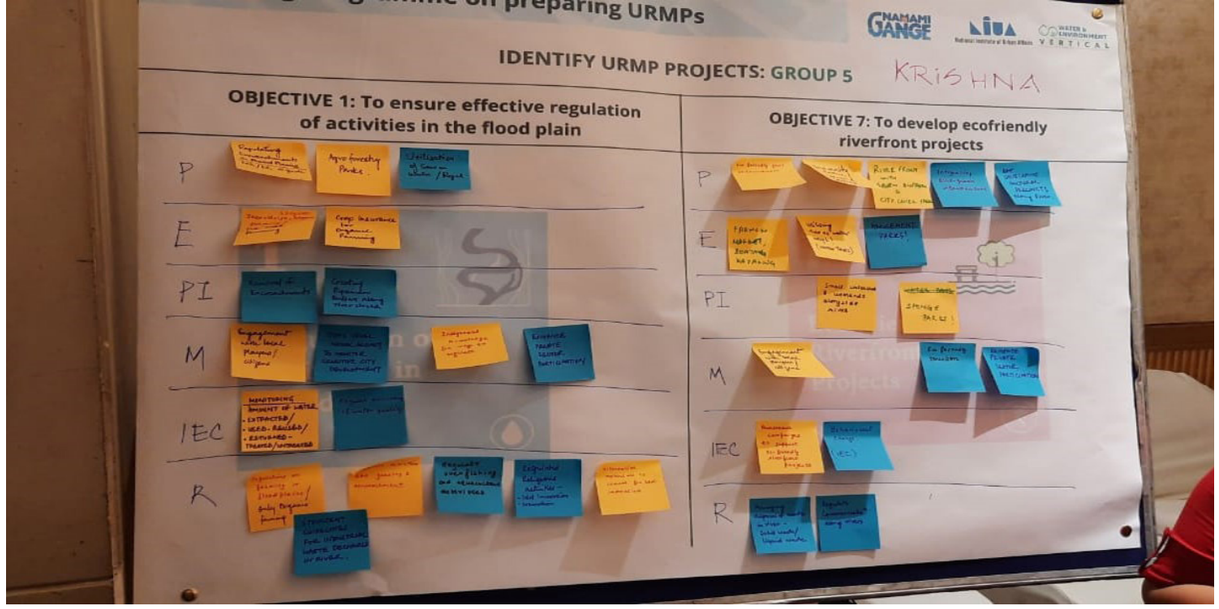
☐ *Yes* ☐ *No* ☐ *Not Sure*

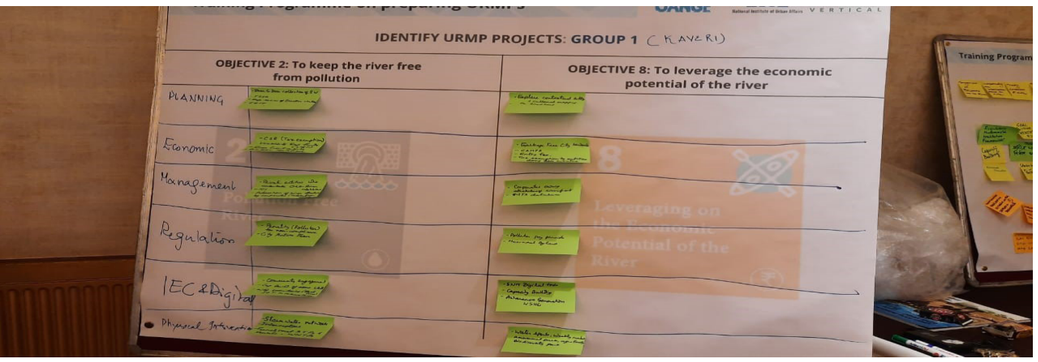
5. **Do you think you would be able to use the learnings from the training in your respective areas of work?**

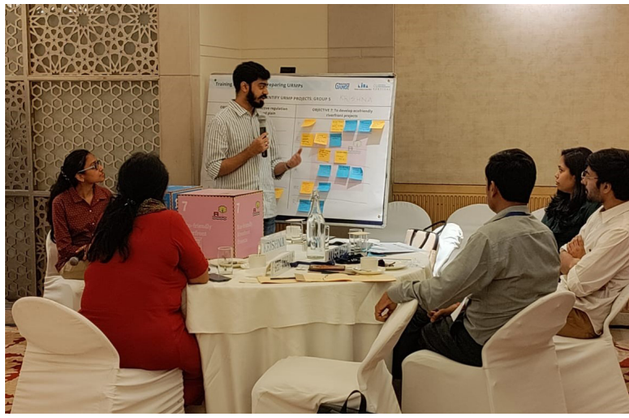
☐ *Yes* ☐ *No* ☐ *Not Sure*

Indicative Feedback form

Some glimpses from the URMP training conducted by NIUA Team







Source: Pixabay

Annexure 1: Key for URMP training

Session	Key for URMP Training Key Goal	Session content	Potential Exercise	Kanpur URMP
Understanding URMP framework				
To ensure effective regulation of floodplain			Map/Pictures: Can you identify issues in floodplain (map based) Tabular: Do you know planning provisions in your city (MP, DCR, guidelines)	NGT order, Master Plan document Byelaws, DCRs Encroachment status in your city
To keep rivers free from pollution	Trainees can evaluate pollution sources, prioritize actions and know possible interventions	Upstream - downstream linkages of pollution Sources of river pollutions (pan city/along rivers)? Point and non-point CPCB classification of healthy river Benefits of healthy rivers	Read river quality data and meaning, CPCB classes, Sanitation management facility mapping in city Importance of FSSM system, *link to SCBP material* Identify DEWATS project site	SLBs in your city
To rejuvenate waterbodies and wetlands	Trainees appreciate relation between rivers and waterbodies, prioritize actions and know possible interventions	Natural vs. urban waterbodies vs. wetlands Linkage of river-waterbodies	How to prepare database of waterbodies Use of GIS in waterbodies mapping Choice of waterbody pollution abatement projects (DEWATS, Bio-remediation, soil scape filter, constructed wetlands etc.) Case study to rejuvenate city waterbody. Give polluted waterbody map and ask what can be done to improve it	No. of waterbodies in city, ownerships, ongoing projects, primary waterbodies,

To enhance riparian buffer along river banks	Trainees understand riparian buffer and plan or protect within their preview	Importance of riparian zone for river Benefits of riparian zone Cross sections of riparian zones Land ownership along river stretch Yamuna river case?	Concept plan for 30m profile of riparian buffer along river	Map existing vegetation strip along rivers/drains Forest department activities along river Encroachment status along river
To adopt increased reuse of treated wastewater	These objectives can be covered together... Trainees know possible avenues of treated wastewater reuse, importance of return flow for bio-diversity conservation	Understand water as a resource for city Low demand usage and waterbodies rejuvenation	Identify avenues of wastewater use	Quantum of wastewater generated in from different wards of city
To ensure good quality return flow from city into rivers		Return flow for riverine bio-diversity Benefits of return flow in arid-semi arid regions / non-perineal rivers	Water balance of city	Drains carry sewage into rivers Industrial pollution is diverted into rivers
Rivers provide opportunities of economic development				
To develop eco-friendly riverfront project	Trainees understand terms like Ghat, riverfront, and distinguish between normal and eco-friendly river front	Concept of Ghats in India Constructed vs. eco-friendly river front Elements of eco-friendly riverfront Designs of eco-friendly river front	Match eco-friendly elements with profile of river front	No. of ghats in city, how people connect with river front in city, are there potential sites along river bank, can two ghats be connected
To leverage economic potential of river	Trainees understand innovative way to leverage river related economy in their cities	Connect of river economy & GDP Various economic activities along river River tourism, river sports, heritage tours		What are ongoing economic activities (boating, tourist /pilgrims/ Who is operating services and collecting revenue? What is fee/ticket charge

River will be celebrated among citizens				
To include river sensitive behavior among citizens	These objectives can be covered together... Trainees understand difference between two, how to inbuilt river awareness in ongoing missions	To promote citizens to engage in the river conservation activities,		Print and digital mode deployed in city for awareness How other missions of city are doing to sensitize citizens
To engage citizens in river management activities		To engage youth, and citizens in the river water quality monitoring, ghat cleaning,		Are there NGOs, Schools, Universities working on river aspects
M & E of URMP progress	Trainees can understand URMP index and its value	URMP M&E indicators, scoring, customization of indicators	Ranking of indicators for given conditions	NA
How to prepare baseline report for URMP	Trainees can do rapid assessment and collate information related to URMP baselining	Purpose, Ideal timeline for URMP baseline, data sources related to objectives Create working group URMP Kanpur outline Data/info. validation workshop with agencies	Tabular: Give objectives tables, list agencies from where data can be collected Selection of relevant data: pollution, planning, services & SLB etc. Use of GIS mapping: Thematic maps of Kanpur	Secondary data available with ULBs, parastatal agencies, GIS maps,

Annexure 2: Indicative Template for Post training report

Space for Logo

A Training group picture can be provided here

URMP: FROM VISION TO ACTION

TRAINING REPORT

DATE

LOCATION

Table of Contents

1. Introduction

The background of the training programme should be provided here, along with the training program's objective. The section may also discuss the training approach in terms of how training is delivered, such as through presentations, moderated discussions, or group activities. A brief description of the participants should be included, and a detailed list can be provided in the Annexure section.

1.1. objective

1.2. Approach

1.3. Trainers profile

1.4. Overall assessment (pre- post training)

2. Sessions detail

Details for each session may be provided here, as well as a list of the key points that emerged from the session.

It is also recommended to include pictures of the sessions that show people's participation and the outcome of the sessions (in the case of flip charts, post-it notes or a whiteboard used to list the participant's observations).

2.1. Session 1 (with Session Heading)

- Brief on Session discussion
- Key points emerged from the session

2.2. Session 2 (with Session Heading)

- Brief on Session discussion
- Key points emerged from the session

Training session pictures may be provided here

Training session pictures may be provided here

3. Way Forward

A short summary of all the key points that emerged from the session, as well as the key points that can be converted into an action plan post-training, should be provided here. This will include a list of interventions/actions proposed by participants that they will pursue following the training programme.

Handholding support

The report may also include a list of the handholding assistance that will be required for participants to implement the training's learning.

4. Feedback

A snapshot of participant feedback may be provided here in the form of charts or infographics to give readers a sense of the training workshop's experience.

5. Testimonials

Some participants' testimonials may be included in this section. A picture of the participant and key experiences shared by them may be included.

6. Annexure

In this part of the report, the following may be provided as the annexes

- A list of participants in detail (Name, Contact Number, Email Id, Organisation Name and Designation)
- Signed registration sheet
- Agenda of the training program
- Copy of presentation used for the training program
- Participant's Feedback sheet

Contact Details

Name of the organization
Address
Contact Number

Website Name
Mail Id
Social Media handle (if any)


NAMAMI
GANGE
National Institute of Urban Affairs
WATER &
ENVIRONMENT
VERTICAL