

DREES &
SOMMER

➤ BABLE

SUDSC II

WEBINAR

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SPEAKERS

NIUA & Dr. Haris Piplas

Dr. Haris Piplas
Minu Tegethoff
Phillipp Gross
Thierry Nolmans

GIZ Moderation

All

ABOUT YOUR EXPERTS



Dr. Haris Piplas – Team Lead
Senior Expert – Lead Smart,
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Minu Tegethoff
Senior Expert - Lead Smart Building
International



Philipp Gross
Senior Expert – Lead Urban
Environments, Energy and Water



Thierry Nolmans
Expert – Urban Design, Sustainable Urban
Planning and Geography

URBAN LABS OVERVIEW

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) commissions Drees & Sommer SE and BABLE Smart Cities experts as part of the „Sustainable Urban Development – Smart Cities II“ Program.

The experts will support GIZ in the development and evaluation of „Digital business models for public services and spaces with gender lens“ in 7 Urban Labs situated in 6 Indian cities.

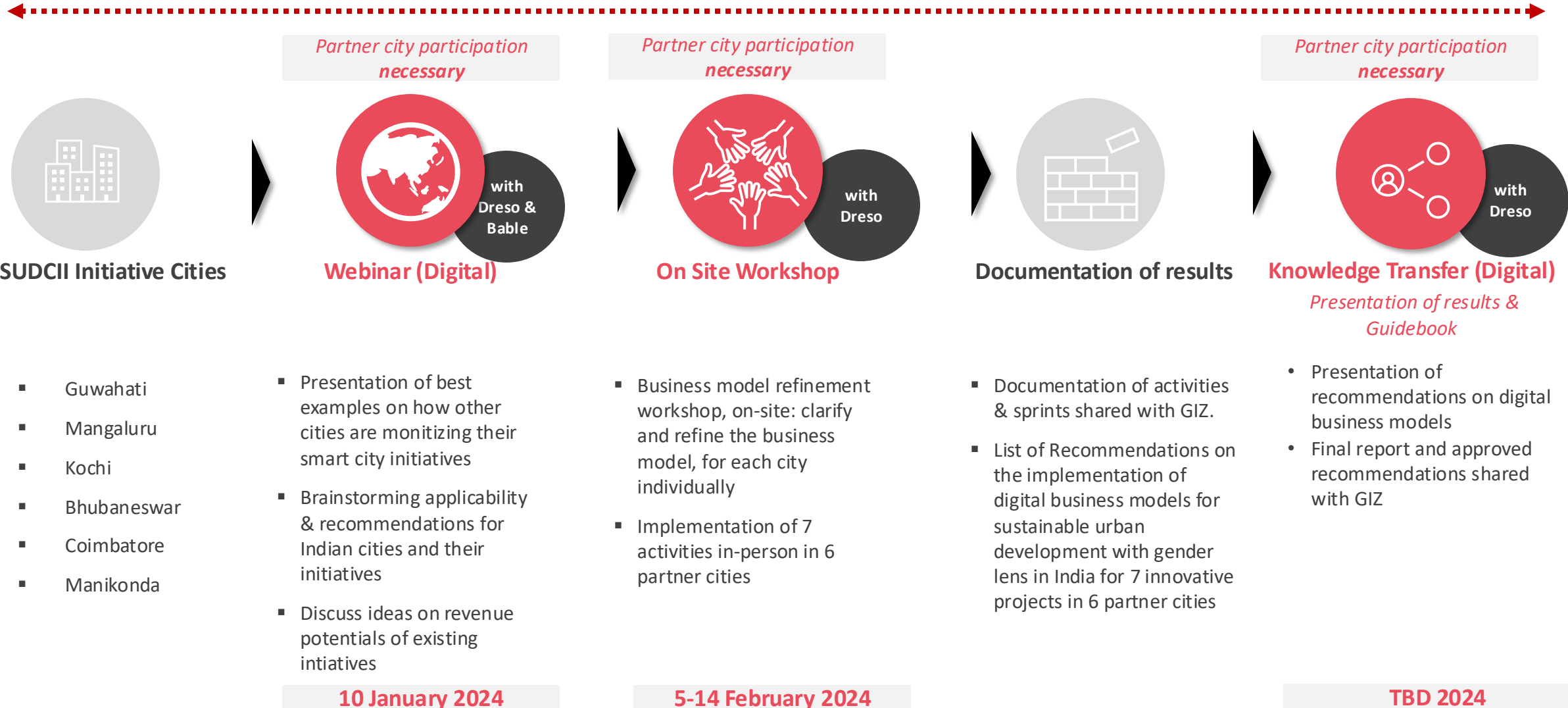
Participatory, inclusive and gender-sensitive innovative projects in selected urban and peri-urban areas (i.e., disaster risk management, public spaces, urban green) will be implemented in partner cities. The data-based approaches of these innovative projects shall then contribute to informed decision-making processes. The integration of data-based, digital solutions into command-and-control centres and other urban data platforms will follow the open data approach of MoHUA. In this context the project reaffirms the importance of collecting, analysing and disseminating disaggregated data to develop and strengthen evidence-based public policies and programmes in order to leave no one behind.



Urban Lab	Innovative, Data-Based Project
Guwahati	<ul style="list-style-type: none"> Climate-proofing urban planning and infrastructure for Guwahati City expansion Inclusive GIS-based drainage master plan.
Mangaluru	<ul style="list-style-type: none"> Solid waste management with gender lens and urban water management.
Kochi	<ul style="list-style-type: none"> Urban observatory and green public spaces.
Bhubaneswar	<ul style="list-style-type: none"> Climate-proofing urban planning and infrastructure for New Bhubaneswar City.
Coimbatore	<ul style="list-style-type: none"> Circular economy: Solid waste management and wastewater management.
Manikonda in the peri-urban area of Hyderabad	<ul style="list-style-type: none"> Solid waste management and green public spaces.

PROCESS SUDSC II INITIATIVE

GIZ



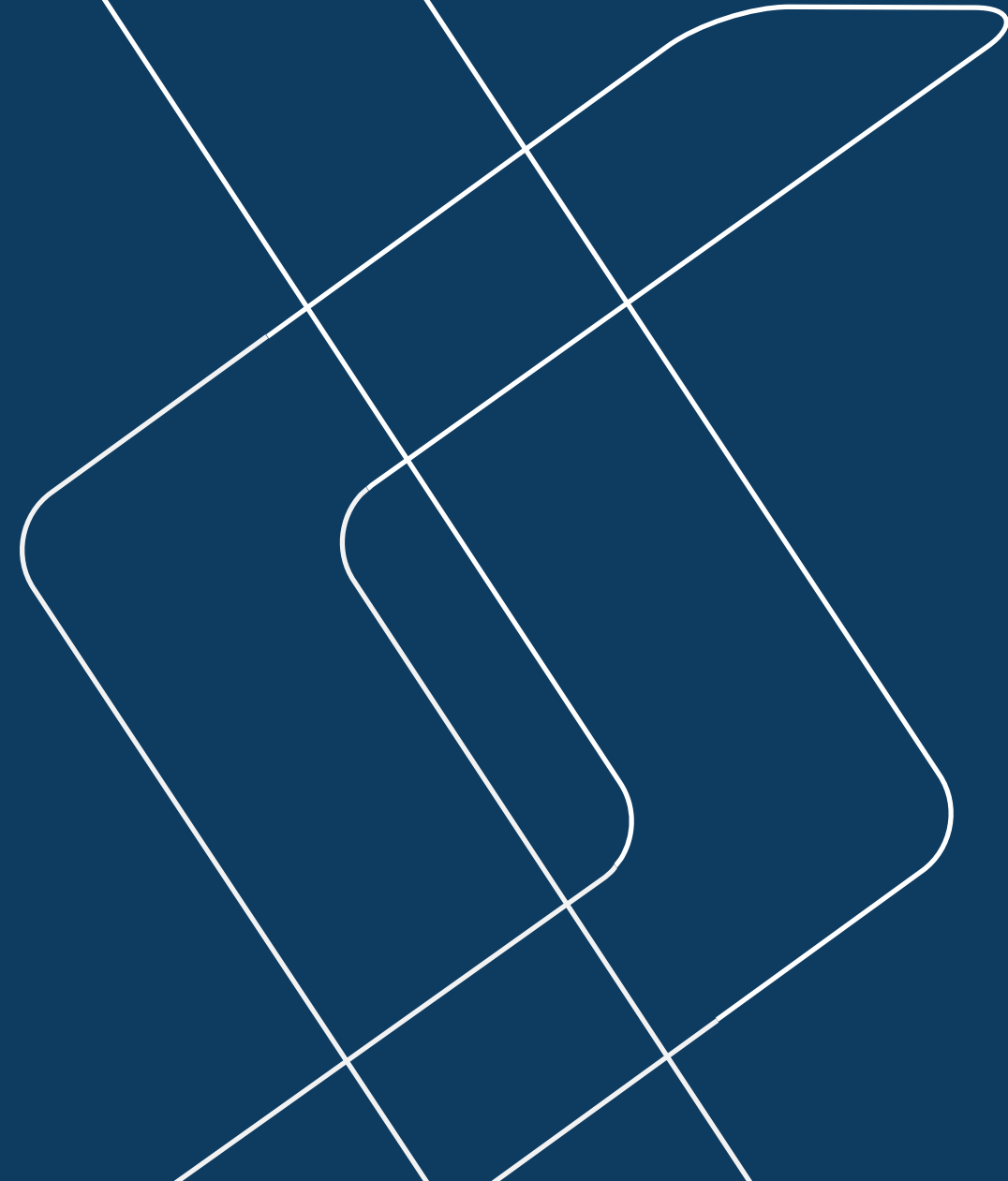
CONCEPT NOTE

In our **webinar** showcases the international best examples of how other cities are successfully implementing sustainable and smart initiatives that provide several benefits for their respective cities

- **Learning from innovative and successful smart city initiatives**
- **Best strategies and identify new revenue streams**
- **Formulating new business models**
- **Establishing innovative urban governance structures**
- **Avoiding pitfalls leading to time and budget savings.**

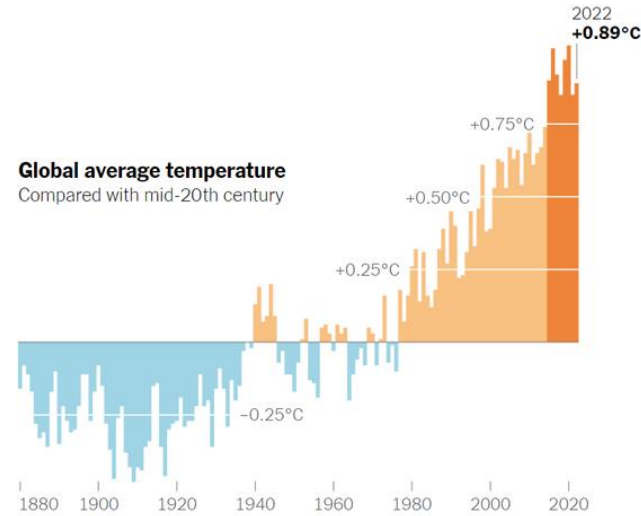
This SUDSC II can offer your city a wealth of knowledge, inspiration, and networking opportunities, ultimately contributing to more effective and informed decision-making in the implementation of your own smart city projects.

**Best-practice
Climate-Proofing
Urban Planning**



CLIMATE-PROOFING URBAN PLANNING

General Problems, Solutions and Technologies



Problems related to Climate-Proofing Urban Planning

- Lack of data and information
- Fragmented governance = high costs
- Community engagement

Types of Climate-Proofing Urban Planning Solutions

- Comprehensive risk assessment
- Sustainable and resilient infrastructure
- Collaborative and inclusive approach

Innovative Climate-Proofing Urban Planning Technologies

- Bioretention systems
- Sponge city
- Digital twins



URBAN & ECOSYSTEM PLANNING | BASEL, SWITZERLAND

Problem & Challenges



Problem Statement

Due to climate change the city of Basel was facing the following events in a higher frequency:

- Rising temperatures and heat waves
- Heavy precipitation events
- Intensive flooding of Rhine river

What initiated action

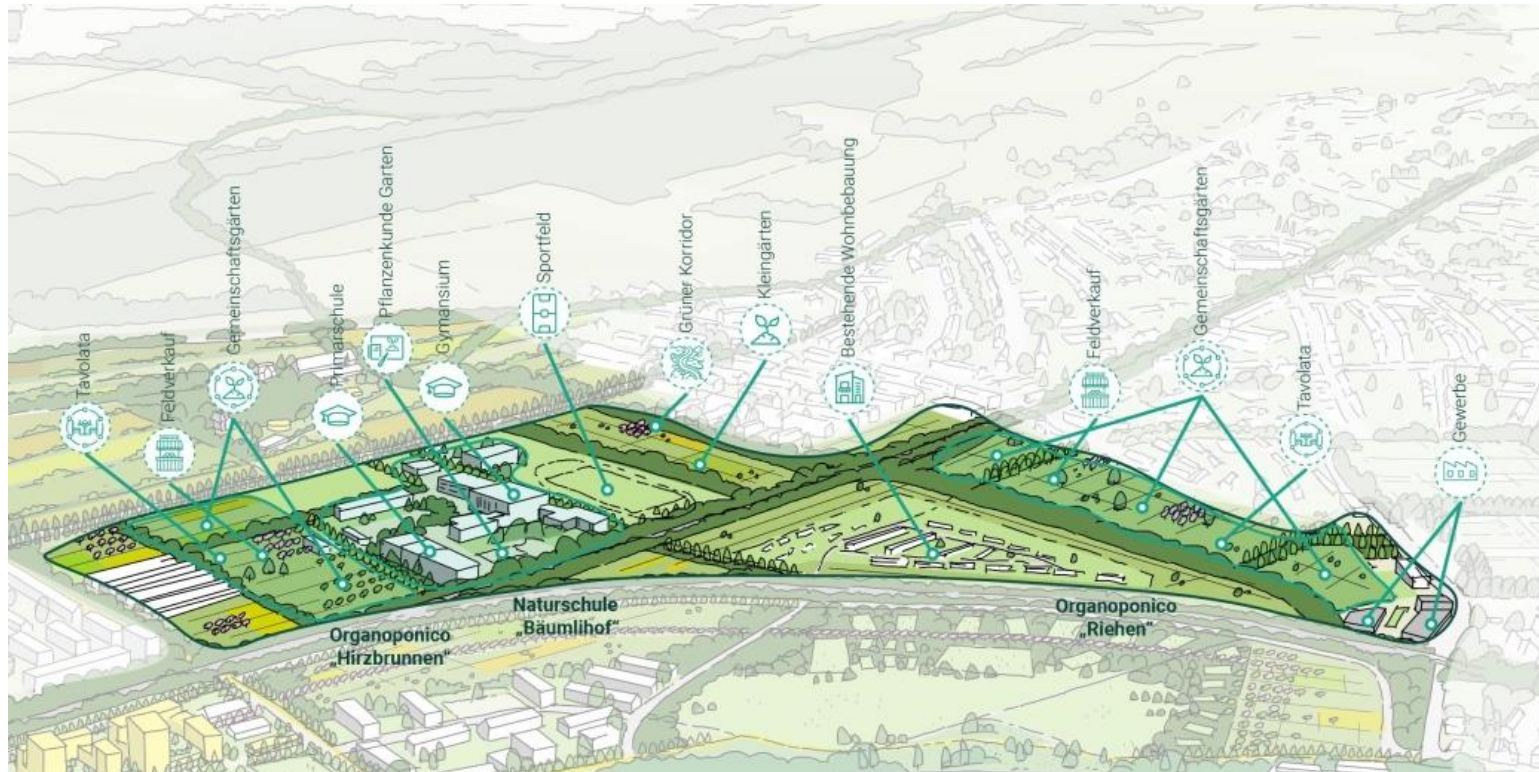
The city acknowledged the necessity of mitigation measures and included aspects of urban greening, resilient (waterfront) infrastructure and smart city solutions in their urban development plan.

Stakeholders' involvement

- Municipal government
- Local businesses
- Residents

URBAN & ECOSYSTEM PLANNING | BASEL, SWITZERLAND

Solution



What solutions was implemented?

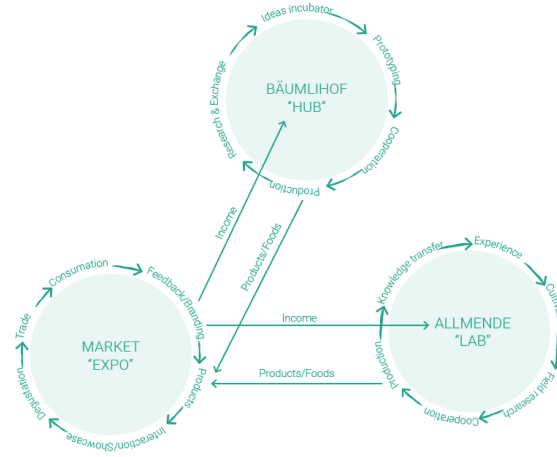
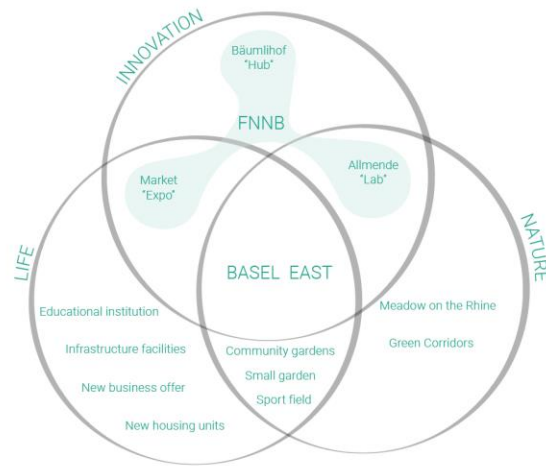
- Creation of new Green Corridors
- Regenerative agriculture
- From exclusive leisure gardens to collective & community gardens
- Multifunctional open spaces on Rhein riverside
- Flexible space for the local market
- Innovation centre for research, school and evening education

Stakeholders' roles

- Government = Funder
- Researcher = education, innovation
- Farmers = knowledge transfer
- Locals = business, leisure
- Kids = education, leisure

URBAN & ECOSYSTEM PLANNING | BASEL, SWITZERLAND

Revenue Stream



What was the business model behind the solution?

By placing ecosystems services in the center of the development framework and connecting them to business opportunities, urban green spaces in the eastern part of Basel can be used for:

- cultivation & production
- innovation & education

The main structure would be a future nutrition network combining a new Agrotech Hub, market areas, educational spaces for sustainability and performative urban agriculture that aims to catalyze local business endeavors.

Details of funding

After initial funding, the Future Nutrition Network evolves into a self-sustaining system

URBAN & ECOSYSTEM PLANNING | BASEL, SWITZERLAND

Relevance in India: Guwahati & Bhubaneswar

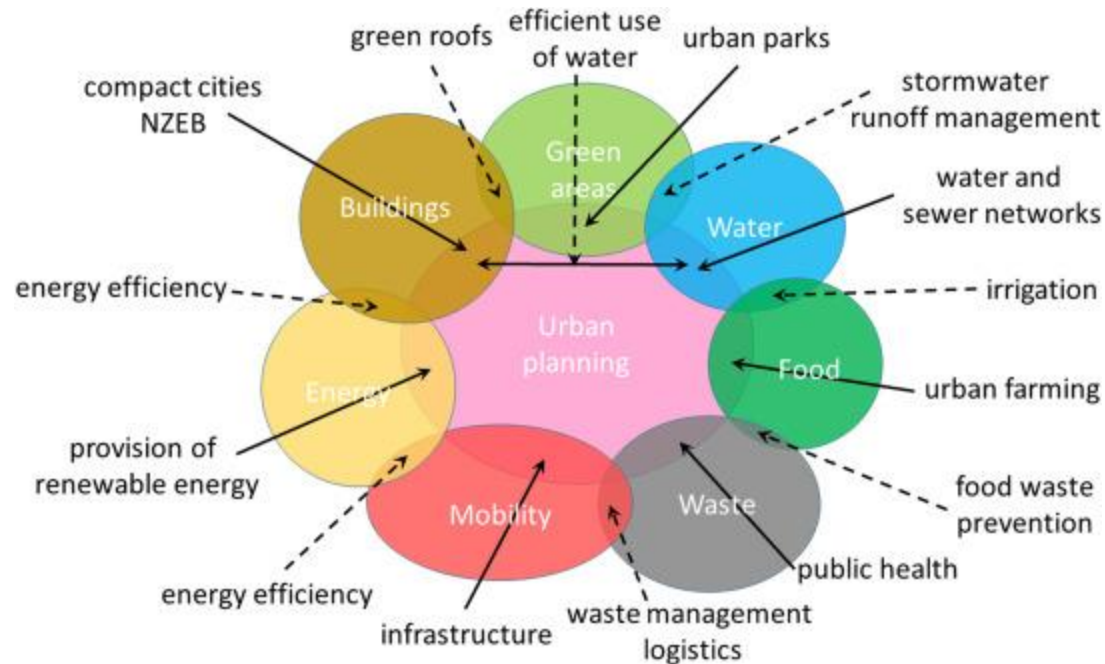


What are the main take aways for the urban labs?

- Local sales networks can bundle expertise and create business opportunities.
- Innovative cultivation techniques allow new distribution channels and new areas can be gained for cultivation.
- Through a systemic business approach, both the local population and the local environment benefit from cultivation.
- Start-ups that enable new and innovative cultivation methods through agricultural technology should be promoted and integrated into local networks.

CLIMATE-PROOFING URBAN PLANNING

Indian context recommendation & gender lens



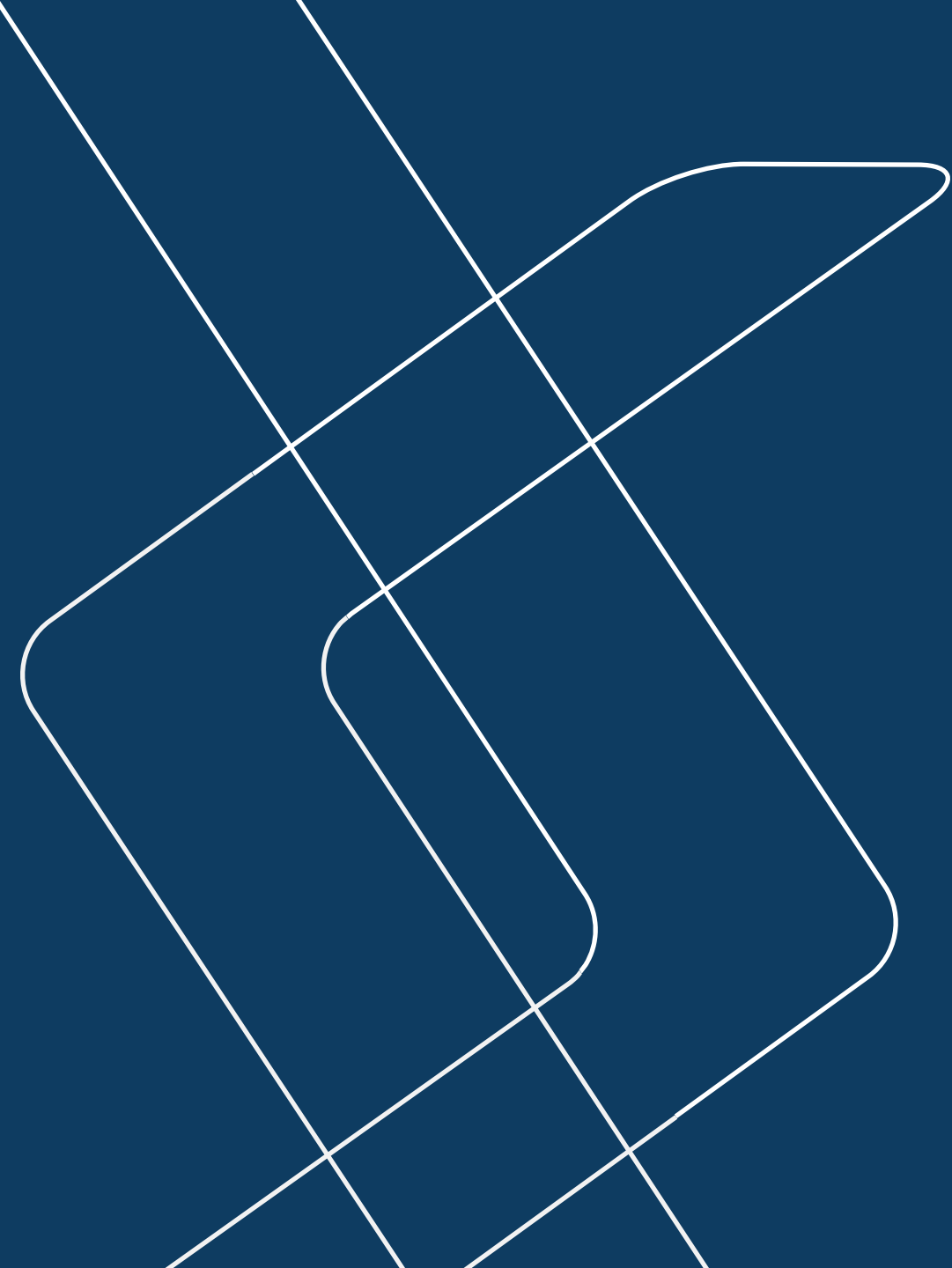
Indian context recommendation:

- Conducting a comprehensive climate risk assessment
- Enhancing the capacity and coordination of urban local bodies to plan, finance and deliver climate-resilient urban services
- Promote and implement nature-based solutions, such as urban green spaces and rainwater harvesting to reduce the urban heat island effect and improve water security and biodiversity.

Gender lens:

- Enhancing female representation and participation in urban governance and management, by increasing the number of women in urban local bodies, public transport authorities and community-based organizations
- Promoting female empowerment and livelihood, by supporting education and skill development, creating employment and income-generating opportunities for women in urban sectors and enhancing their access to resources.

**Best-practice
Green public
spaces**



GREEN PUBLIC SPACES

General Problems, Solutions and Technologies



Problems related to Green Public Spaces

- Unequal access and distribution
- Funding and maintenance challenges
- Conflicting uses and overcrowding
- Lack of security and safety

Types of Green Public Spaces Solutions

- Improving management practices and community engagement
- Promoting responsible use and conflict resolution among users
- Art, music, sport and community events

Innovative Green Public Spaces Technologies

- Sustainable stormwater management
- Interactive wayfinding systems
- Data-driven Decision-making

MAUERPARK | BERLIN, GERMANY

Problem & Challenges



Problem Statement

- overcrowded especially on Sundays (10'000 ppl.)
- Littering by visitors
- Spot for illegal activities

What initiated action

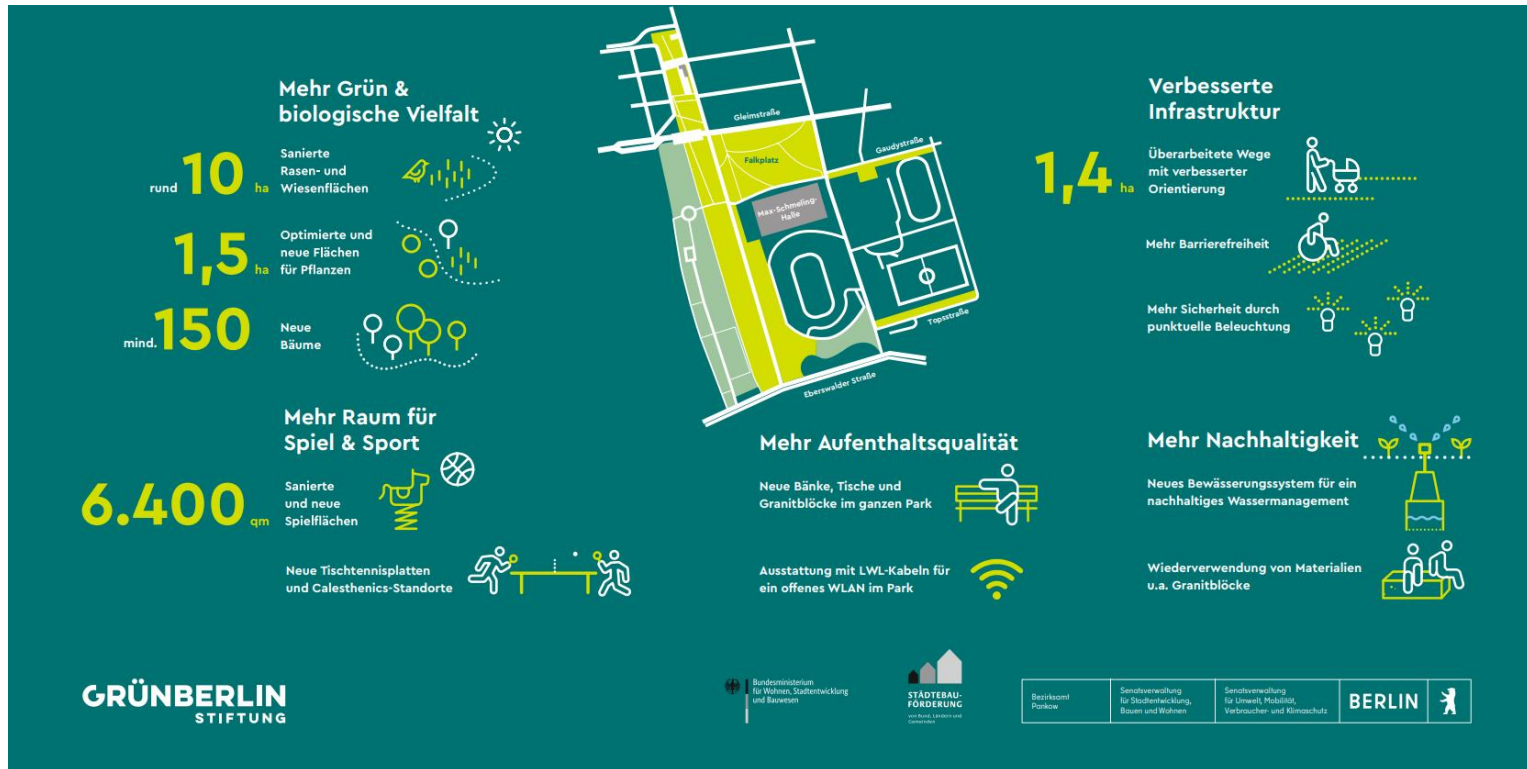
- The park has been outsourced to a public-owned business company Grün Berlin due to a lack of maintenance
- They developed an action plan, that expands the park, increases security and makes it appropriable for local businesses, artists and culture

Stakeholders' involvement

- Senat Berlin and Grün Berlin
- Flea market as popular tourist destination
- Sport facility for clubs
- Bars, restaurants and small local business

MAUERPARK | BERLIN, GERMANY

Revenue Stream



What was the business model behind the solution?

From concept development to project and construction management, to administration and infrastructure management, to the active involvement of the Berlin population, or to educational work and the communication of our measures during operation with the large, interdisciplinary network of experts.

Details of funding

The funding is derived from the public budget for part of the maintenances, whereas event management and special construction projects (partly funded by private actors) are run by subsidiary organizations and foundations.

MAUERPARK | BERLIN, GERMANY

Relevance in India: Guwahati & Bhubaneswar



What are the main takeaways for the urban labs?

- Core revenue: Primary business needs to be complemented with additional revenue streams
- Budget boost from complementary engagements
- Startup support: Alternative offerings and sale channels for small-scale businesses
- Tourism ventures: Cultural showcase, International attraction
- Green space management through new governance models incl. events and festivals
- Neighborhood enhancement: Unused open space transformation for placemaking purposes

GREEN PUBLIC SPACES

Indian context recommendation & gender lens



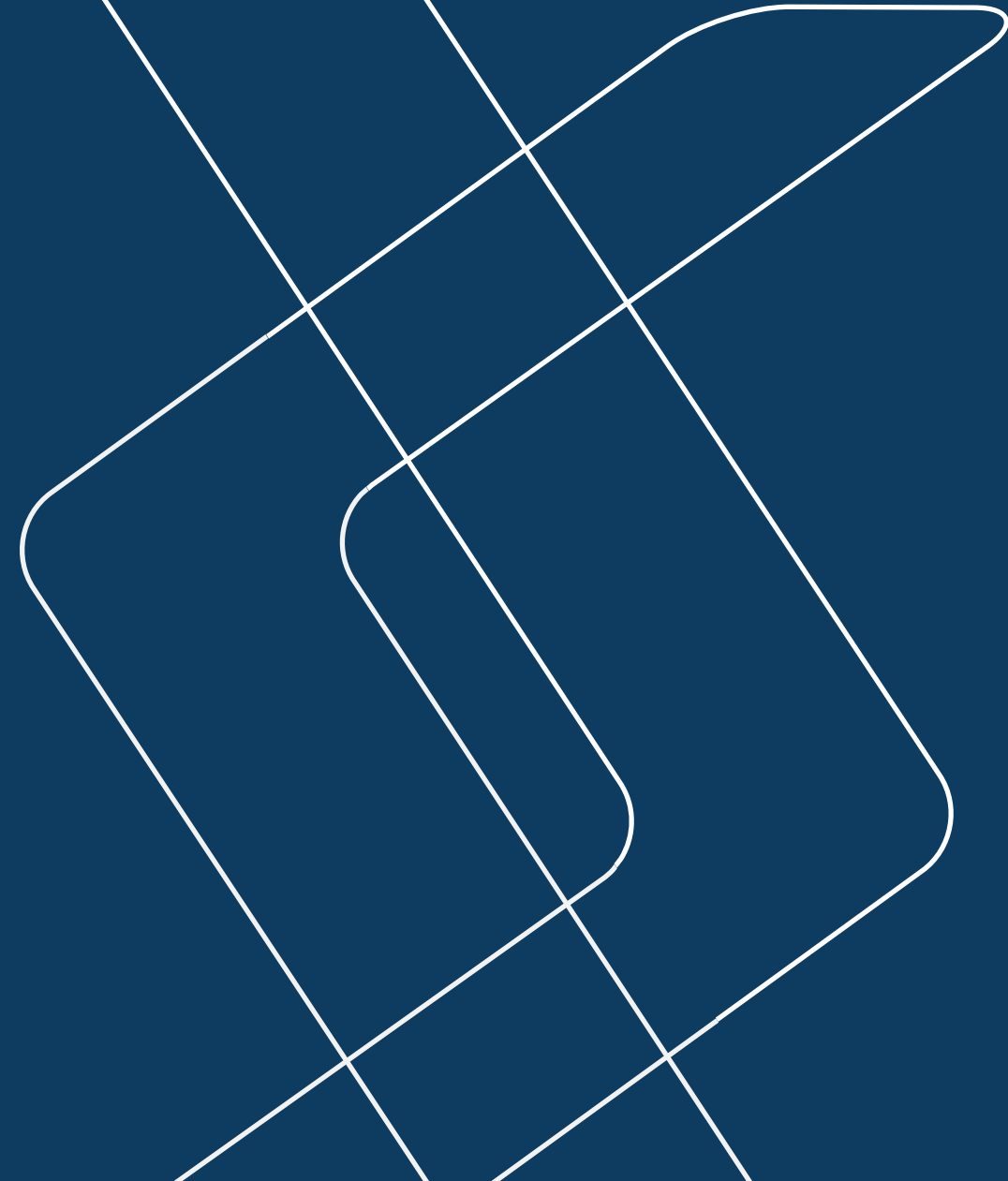
Indian context recommendation

- Promote innovative and low-cost solutions such as tactical urbanism or pocket parks to develop vacant lots into public green spaces
- Integrate green public spaces with other urban services and infrastructure, such as water, transport, waste or energy to enhance their multifunctionality.

Gender lens

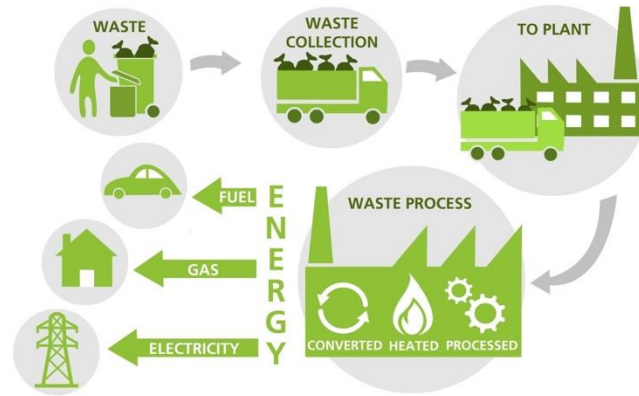
- Improving women's safety and accessibility in green public spaces through adequate lighting, signage, surveillance and gender-responsive transport options.
- Promoting female empowerment through initiatives that support female groups to appropriate, manage and use green public spaces in an entrepreneurial manner.

**Best-practice
Solid waste
management**



SOLID-WASTE MANAGEMENT

General Problems, Solutions and Technologies



Problems related to Solid Waste Management

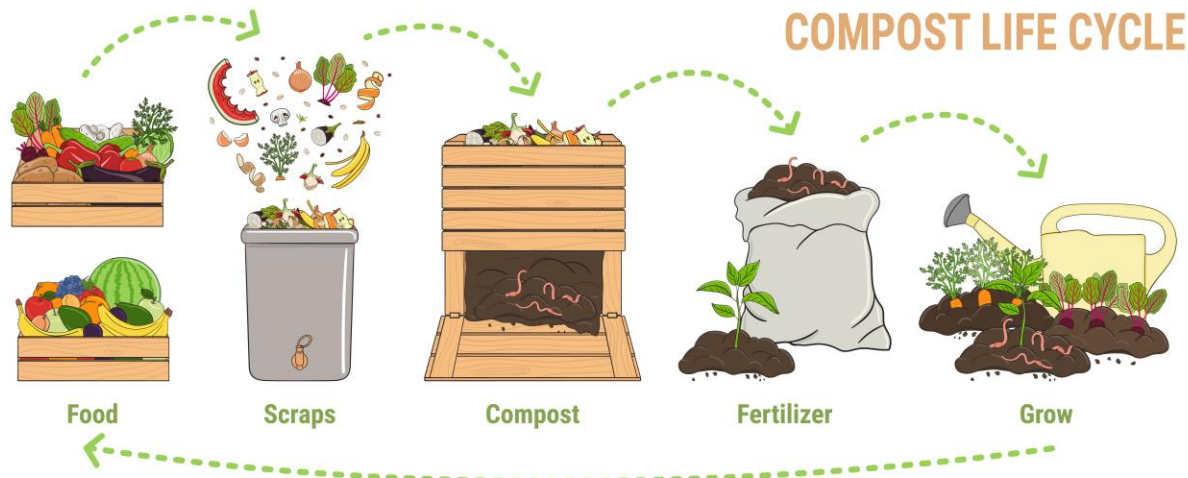
- Shortages in collection and disposal infrastructure
- Ineffective recycling or composting
- Illegal waste deposition
- Lack of technological advances

Types of Solid Waste Management Solutions

- Correct waste separation and collection
- Opportunity to recycling and composting
- Infrastructure for Waste-to-Energy (WTE)
- Appropriate Landfill Management

Innovative Waste Management Technologies

- Smart Waste Management Systems
- Advanced Waste Sorting Technologies
- Waste-to-Product Technologies



SMART WASTE BOT | ONTARIO, CANADA

Problem & Challenges



Problem Statement

- Dense areas struggle with careless waste.
- Waste sorting lacks precision, causing pollution.
- Limited awareness hampers sustainable waste management.

What initiated the action

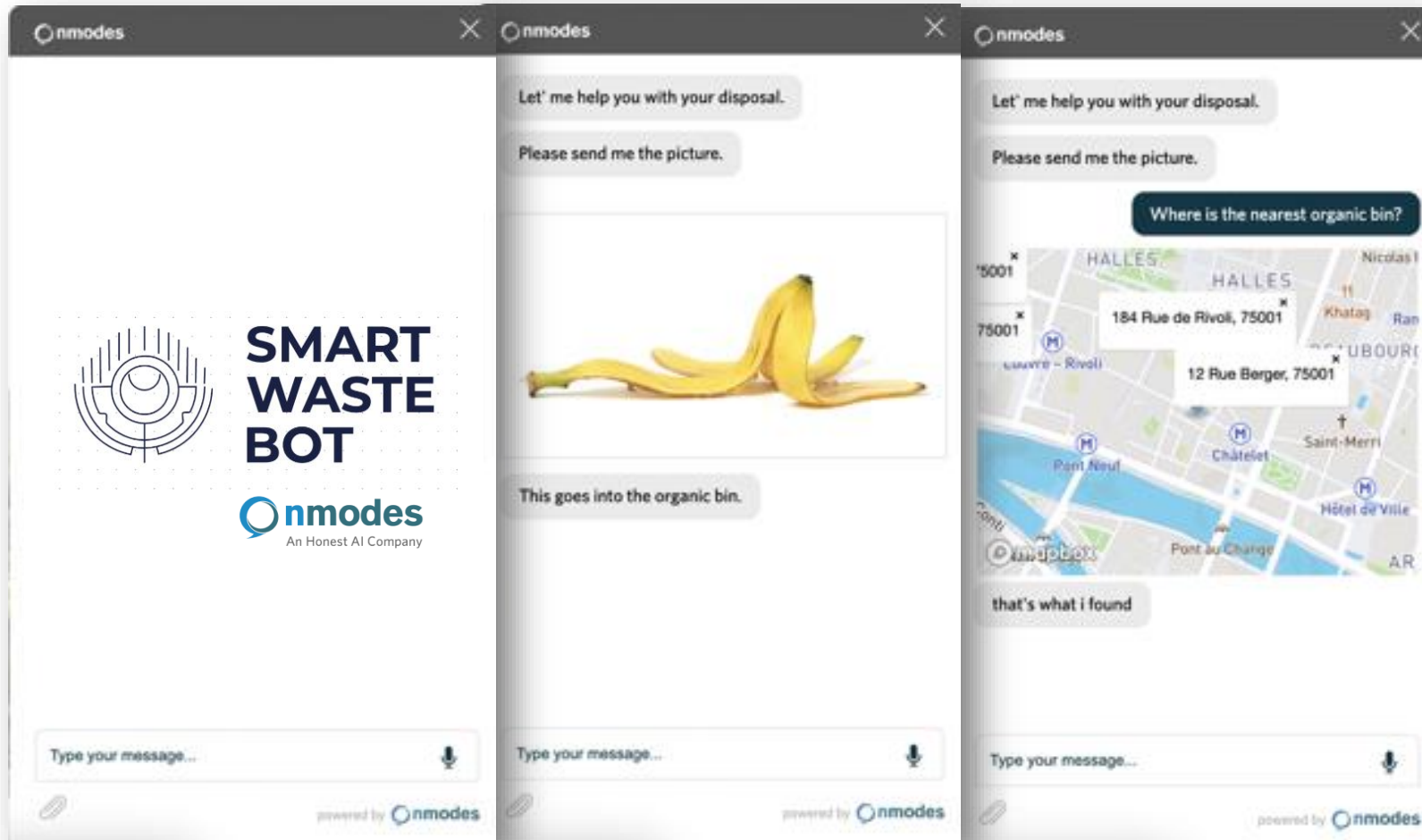
- Municipality surveyed citizens due to littering complaints.
- Survey revealed demand for disposal information service

Stakeholders involved

- Municipality Authorities
- Citizens
- nmodes (Developer of Smart Waste Bot)
- Local Businesses
- Community Organizations

SMART WASTE BOT | ONTARIO, CANADA

Solution



What solutions was implemented?

The Smart Waste Bot is a citizen app that uses computer vision to analyse and separate waste into recyclables, organics, and disposables. It uses conversational AI to communicate with end-users in natural language, directing the users with where to put their garbage.

Smart Waste Bot is available as

a SaaS app available on mobile devices, websites, social media, messengers, and more

As a physical device installed either on garbage bins, and/or in designated areas in cities, arenas, or any high-population density areas.

Stakeholders' Roles:

Municipality Authorities = Initiators *Organize, implement Smart Waste Bot.*

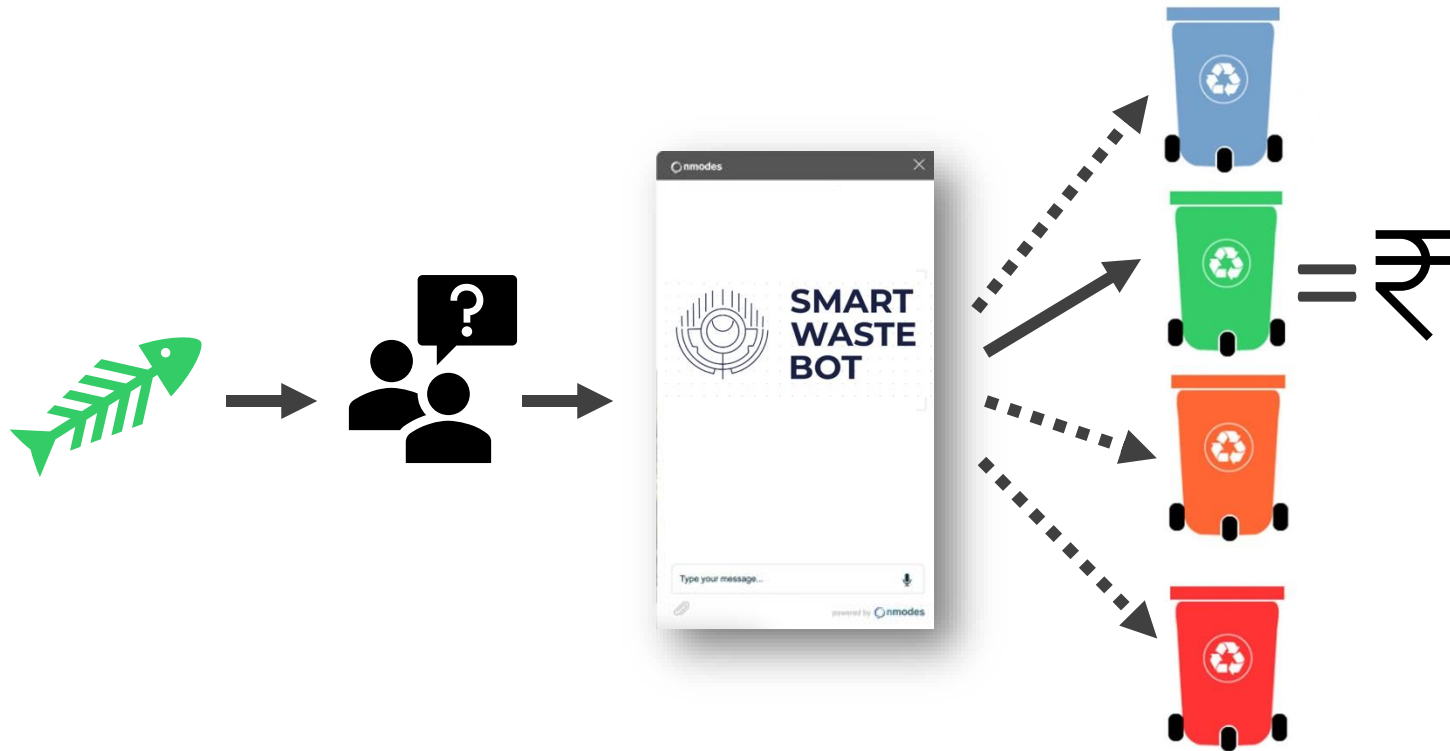
Citizens = End-users. *Engage, provide feedback, contribute to AI. Collaborate, support sustainable initiatives.*

nmodes (Developer) = Solution provider. *Design, maintain Smart Waste Bot.*

Local Businesses = Impacted entities. *Support initiative, sponsorship.*

SMART WASTE BOT | ONTARIO, CANADA

Revenue Stream



What was the business model behind the solution?

The design and development **costs of 50.000 Euros** were carried by private investors, that saw the chance to benefit from **lower taxes and lower commission** through a more sustainable and local waste disposal.

Since this app provides an additional service to citizens it also has a public benefit, through **increased level of recycling and cleaner public spaces**, which makes it attractive for the municipality to support such a project. Chatbots **can gather data on the types and amounts of waste generated**, offering municipalities valuable insights for future waste management strategies and resource allocation.

Details of funding

Business stakeholders funded the development of the project

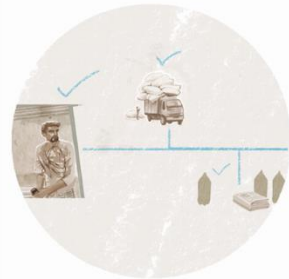
KABDIWALLA CONNECT INFORMATION | CHENNAI, INDIA

Relevance to India



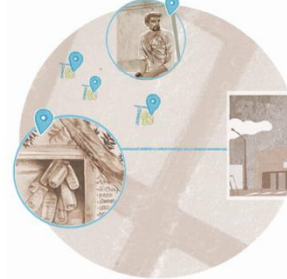
Mapping

Spatially-enabled, industry compliant data-collection on informal and formal waste infrastructure in cities in the developing world



Digitalisation

KYC and transaction based material tracking and traceability across stakeholders in the formal/informal supply-chain



Sourcing

Secondary raw material guarantees for processors/PROs in cities in the developing world through informal sector procurement



Municipal Collection

Reverse logistics solutions for post-consumer waste collection – powered by local informal scrap-shops and their waste-pickers

Kabadiwala Connect operates by integrating waste pickers, IoT bins, and tricycles for source collection, aggregating at scrap shops, and transporting to recycling plants. This multi-level approach ensures a circular economy, enhances supply chain efficiency, and addresses the recyclability potential of 15-20% of waste in India. The benefits include convenient access to recycling services, environmentally-friendly waste management, and support for local communities and businesses.

Case Study in Chennai

- Level 0 Aggregator: Integration of waste pickers, IoT Bins in residences (5 sq km coverage), and tricycles for last-mile collection.
- Level 1 Aggregator: Scrap Shops responsible for the segregation of waste materials. Digitalizing the entire process.
- Level 2 Aggregators: Entities outside the city overseeing the transportation of segregated waste to recycling plants.

SMART WASTE MANAGEMENT

Relevance in India: Mangaluru, Coimbatore and Manikonda



What are the main take aways for solid waste management

- Efficient Waste Practices: Streamlined waste collection and segregation enhance recycling practices.
- Circular Economy Initiatives: Integration of informal waste ecosystems contributes to sustainable waste practices.
- Community Engagement: Support for local businesses and waste pickers fosters community involvement.
- Data-Driven Transparency: Data-driven insights ensure transparency and trust in waste management.
- Convenient and Eco-Friendly Solutions: Convenient waste disposal reduces individual trips, emphasizing environmentally-friendly practices.

SMART WASTE MANAGEMENT

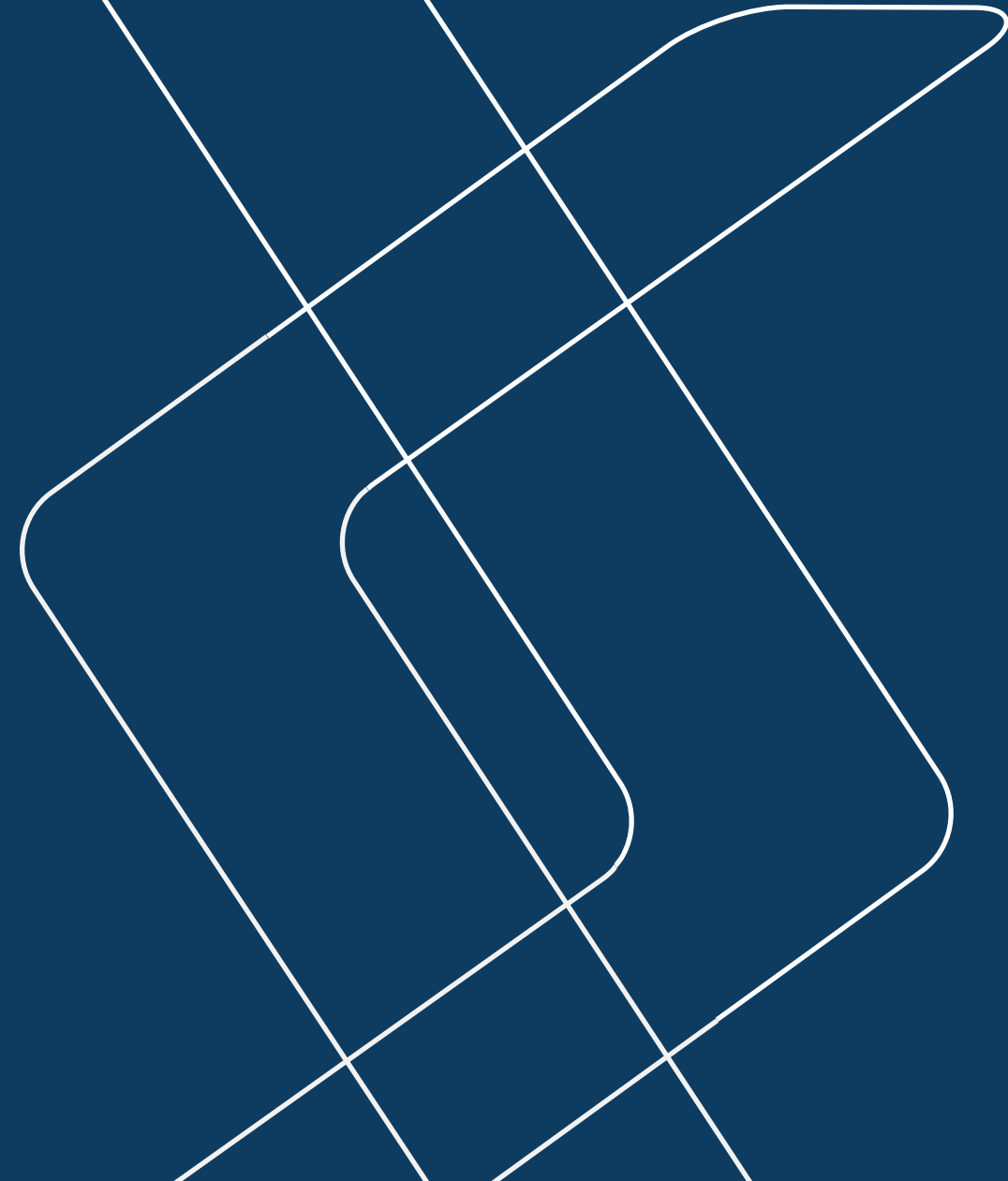
Gender Lens



Gender Lens

- Acknowledge and highlight women recyclers' contributions through targeted campaigns.
- Facilitate easy collaboration with women kabadiwallas by mapping locations and encouraging community engagement.
- Launch accessible information services tailored to women in solid waste management.
- Organize events promoting active women participation in waste management.
- Conduct focused surveys on women kabadiwallas to address gender-specific challenges.
- Support women in waste management for financial independence through training opportunities.

Best-practice of Urban Observatory



URBAN OBSERVATORY : DATA REPOSITORY AND DATA-BASED GOVERNANCE

General Problems, Solutions and Technologies



Problems related to climate change and lack of resilient infrastructure:

Climate change is intensifying, leading to a rise in both the scale and frequency of natural disasters. To mitigate these challenges, there is a pressing need for countries to collaborate, sharing experiences and technology to prevent disasters. The establishment of an international cooperative system is crucial for effective response and collaboration during large-scale disasters

Goals for Urban Observatory Vision:

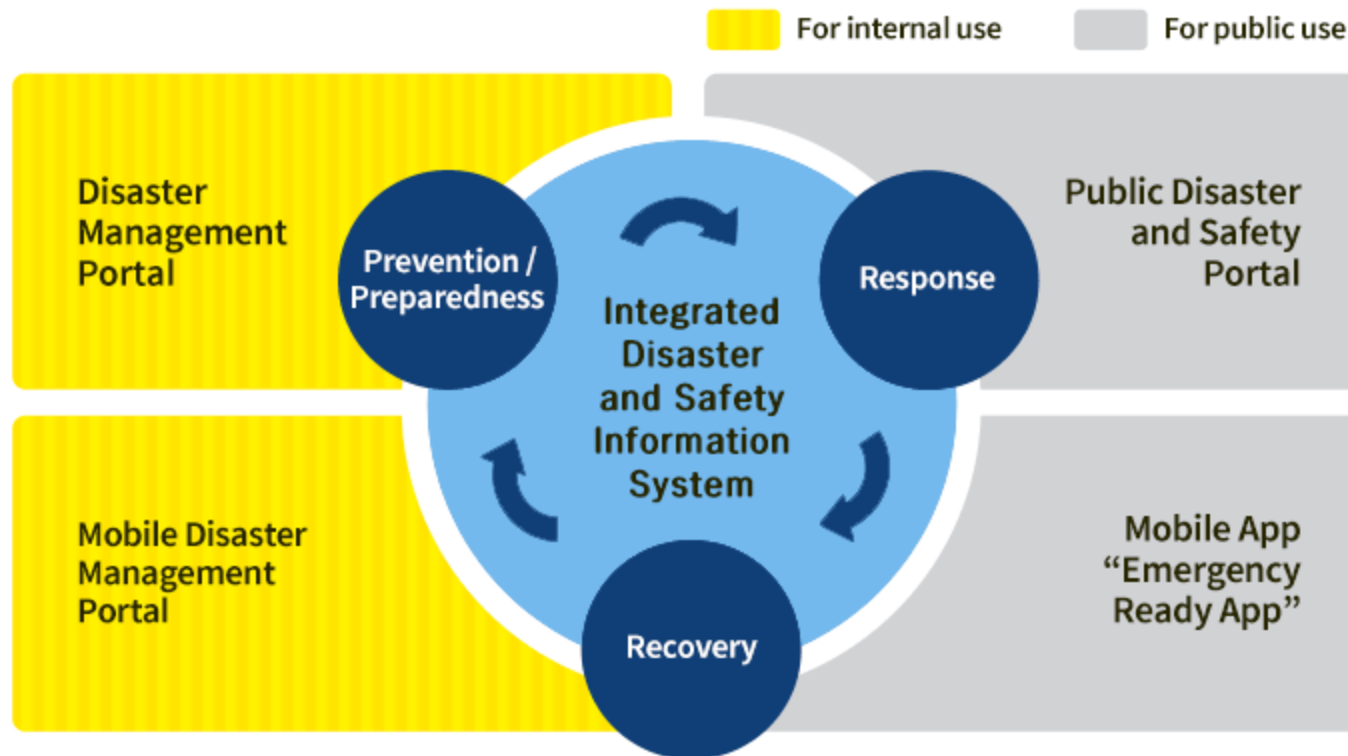
- A data repository supports early warning systems, enhancing disaster preparedness.
- Data-based governance enables tailored relief efforts, efficiently addressing community-specific needs.
- Predictive analytics contribute to climate resilience, allowing proactive adaptation in urban planning.

Technologies:

Earthquake Early Warning System, Flood Barriers, Drones for Infrastructure Inspection

DISASTER AND SAFETY MANAGEMENT I KOREA

Problem & Challenges



Problems statement:

As a result of recent climate change, natural disasters are becoming not only larger in scale, but more frequent. It is critical for countries to share their experience and technology to prevent such disasters, and for the international community to establish a system for cooperation and collaboration in times of large-scale disasters.

Four Main Strategies

Developing a field-oriented disaster response mechanism

Establishing a victim-oriented relief system

Raising public awareness of safety

Reinforcing governmental protection of people's lives

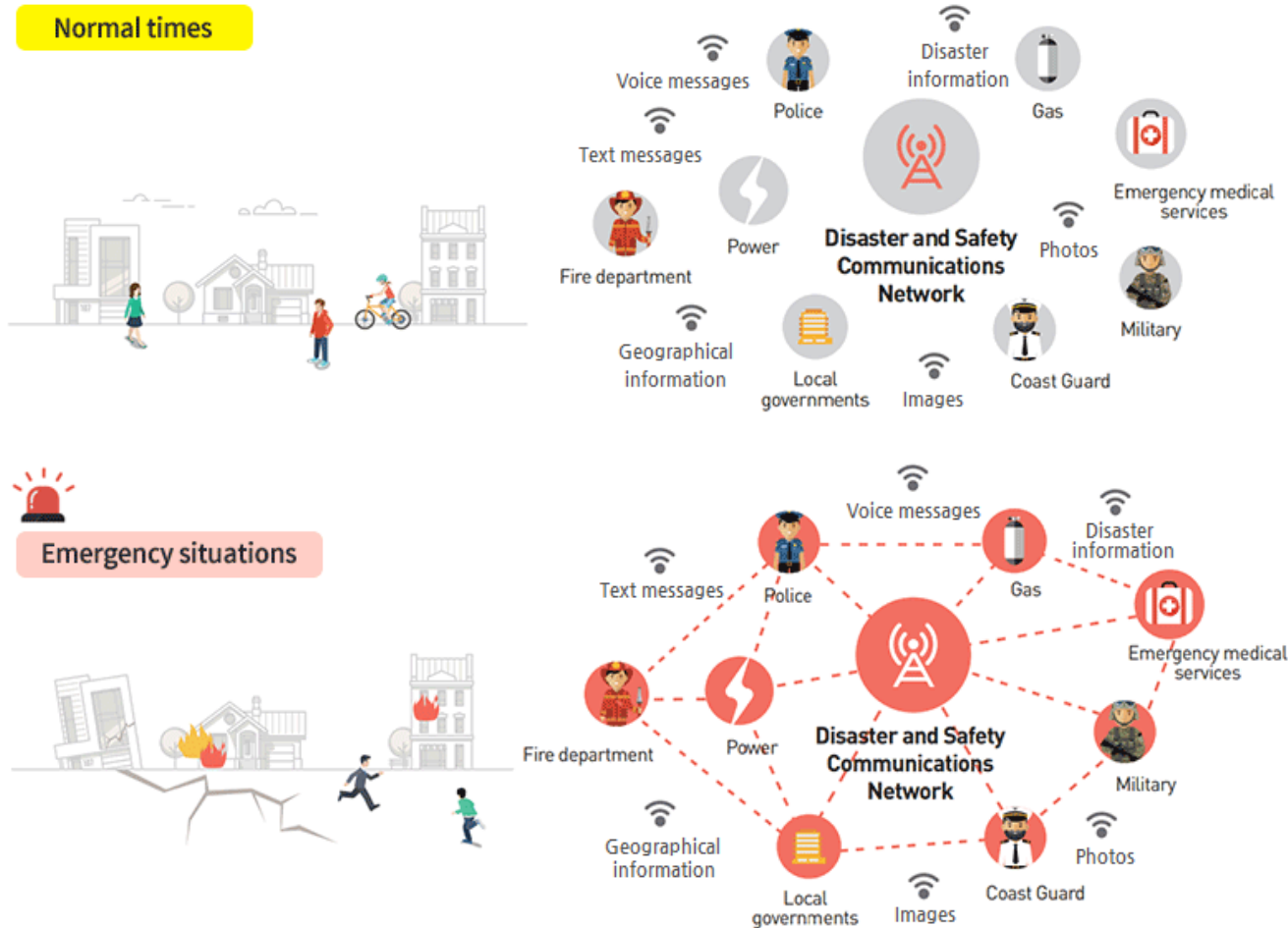
Technologies

Stakeholders Involved

National & Local Administration, International Cooperation, Emergency Services, GIS and Technology Providers, Private Sector, Public, Citizens, Construction and Infrastructure Sector, Communication and Media Outlets, Online and Mobile Platforms

DISASTER AND SAFETY MANAGEMENT I KOREA

Solution 1: Disaster and Safety Communications Network (Korea Safe-net)



Solution:

- Essential communication system designed for policemen, firefighters, and public officials, ensuring effective communication in both normal times and emergencies.
- Utilizes dedicated terminals to establish a robust communication network on a national scale with a singular channel for command and control.
- Facilitates an integrated response at disaster sites, streamlining coordination and collaboration among emergency responders.
- Adopts cutting-edge fourth-generation wireless technologies specifically for Disaster and Safety management, enhancing system efficiency.
- Provides real-time feeds of accident and risk sites, allowing for prompt and efficient response to emerging situations.
- The system's function and performance are rigorously validated through a comprehensive pilot program, ensuring reliability and effectiveness.

DISASTER AND SAFETY MANAGEMENT I KOREA

Solution 2: Flood Outbreak Forecast & Warning System



Countries that have adopted our flood outbreak forecast & warning system



Mindanao Island, Philippines
Work completed (2013-2015)



Laos
Vang Vieng
(work completed in 2016)
Udomxai (2017-2018)



Vietnam
Lao Cai
(2016-2018)

Solution:

- Flood Outbreak Forecast & Warning System effectively tackles global flash-flood challenges associated with heavy rains.
- Utilizes real-time data analysis from vulnerable areas to predict and anticipate flood outbreaks.
- Automatic Precipitation Warning Facility plays a crucial role by triggering sirens based on precipitation levels, providing early warnings.
- Incorporates a radar system to predict unforeseen risk factors and alert the public about areas prone to high-risk flooding.
- Automatic Precipitation Warning Facility comprises observatories and warning stations, ensuring real-time monitoring of precipitation data.
- Acts as a comprehensive warning system, actively observing, analyzing, and promptly disseminating crucial precipitation data.

DISASTER AND SAFETY MANAGEMENT I KOREA

Solution 3: Public Safety Map Service



Solution:

Public Safety Map Service designed for information presentation on maps (2D or 3D)

Accessible via the Internet and mobile app

Information provided in eight categories: crime, traffic, natural disasters, safety for the vulnerable, facilities, industries, public health, and man-made disasters

Real-time alarm service, especially for traffic and other risks near the user's location, using GPS from mobile devices

Safety facility Points of Interest (POI) service offering information on public facilities like police stations, fire stations, shelters, and hospitals in 45 areas

Development of the Public Safety Map into customized, open services in collaboration with other government organizations

Positive impacts on local governments, academia, research institutes, and businesses

DISASTER AND SAFETY MANAGEMENT | KOREA

Revenue Stream



What was the business model behind the solution?

- Korea globally contributes through MOUs, consultations, pilot programs, and seminars.
- Emphasizes ongoing efforts for international disaster management cooperation.
- Focuses on collaborative initiatives to enhance global disaster preparedness.
- Education program on disaster management via NDTI's international risk reduction initiative.
- Customized workshops and training programs for foreign public officials.
- Disaster management consulting for countries like the Philippines, Laos, Vietnam, and Indonesia.
- Assistance in implementing systems like the Flood Outbreak Forecast & Warning System.
- Actively participates in global campaigns like UNDRR's Making Cities Resilient (MCR).
- Positions Seoul as an environmental solutions provider through commitment to the Paris Agreement.

URBAN OBSERVATORY : DATA REPOSITORY AND DATA-BASED GOVERNANCE

Relevance in India



What are the main take aways for Urban observatory ?

- Urban observatories are vital for disaster risk management, identifying climate-resilient projects and mapping vulnerable locations.
- Recognition of addressing climate challenges, participating in global initiatives, and implementing sustainable measures for disaster risk reduction.
- Successful disaster risk management requires collaboration among government bodies, private organizations, citizens, and other entities.
- Challenges related to data quality, exchange of information, and governance necessitate clear structures and robust cybersecurity measures.
- Emphasis on citizen engagement through safety initiatives, mobile applications, and participatory sensing techniques.
- Incorporating data-based governance is a key takeaway, emphasizing the importance of informed decision-making and data-driven approaches in urban development

URBAN OBSERVATORY : DATA REPOSITORY AND DATA-BASED GOVERNANCE

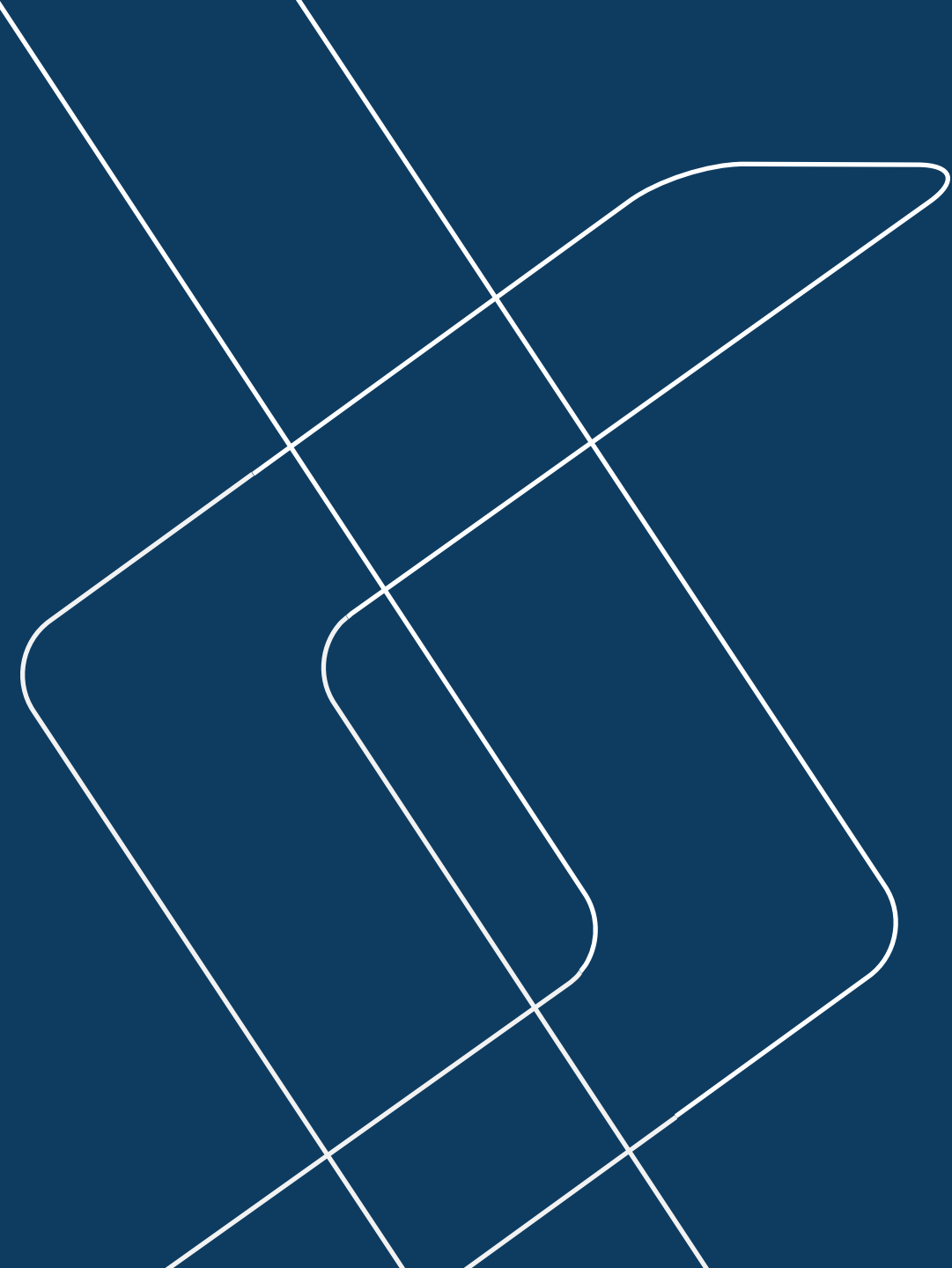
Gender Lens



What are the main take aways for Urban observatory ?

- Implement 'data cooperatives' to foster collaboration, allowing individuals to contribute and retain ownership over their data for inclusive disaster risk management.
- Adopt a co-construction approach in data collection, analysis, and investigative structures, ensuring a shared understanding that accurately represents diverse realities aligning with project priorities.
- Emphasize accessibility and emotional communication in data, making it comprehensible to a wider audience, including diverse genders, for increased engagement.
- Embrace Data Feminism principles, utilizing data to address unequal power structures related to gender, class, race, religion, ability, socioeconomic status, and more.
- Apply an intersectional lens to data science, considering overlapping aspects of identity like gender, race, and socioeconomic status for a nuanced understanding of diverse experiences in disaster-affected communities

**Best-practice
Waste-Water
management**



WASTE-WATER MANAGEMENT

General Problems, Solutions and Technologies



Problems related to Waste-Water Management

- Water pollution harming water reserves
- Emerging contaminants with health impact
- Destruction of aquatic ecosystems
- Water scarcity due to climate change

Types of Waste-Water Management Solutions

- Wastewater treatment and re-use
- Constructed wetlands
- Advanced oxidation processes (AOPs)

Innovative Waste-Water Management Technologies

- Advanced metering infrastructure (AMI) using the Internet of Things (IoT)
- Thermal hydrolysis for energy production
- Membrane bioreactor (MBR) as filtration system

WATERSHED CLEANUP PROGRAMM PRODES | BRASIL

Problem & Challenges



Problem Statement

Underinvestment in infrastructure and utility inefficiency due to weak management in the sanitation sector led to an over pollution of the water in key river basins.

What initiated action

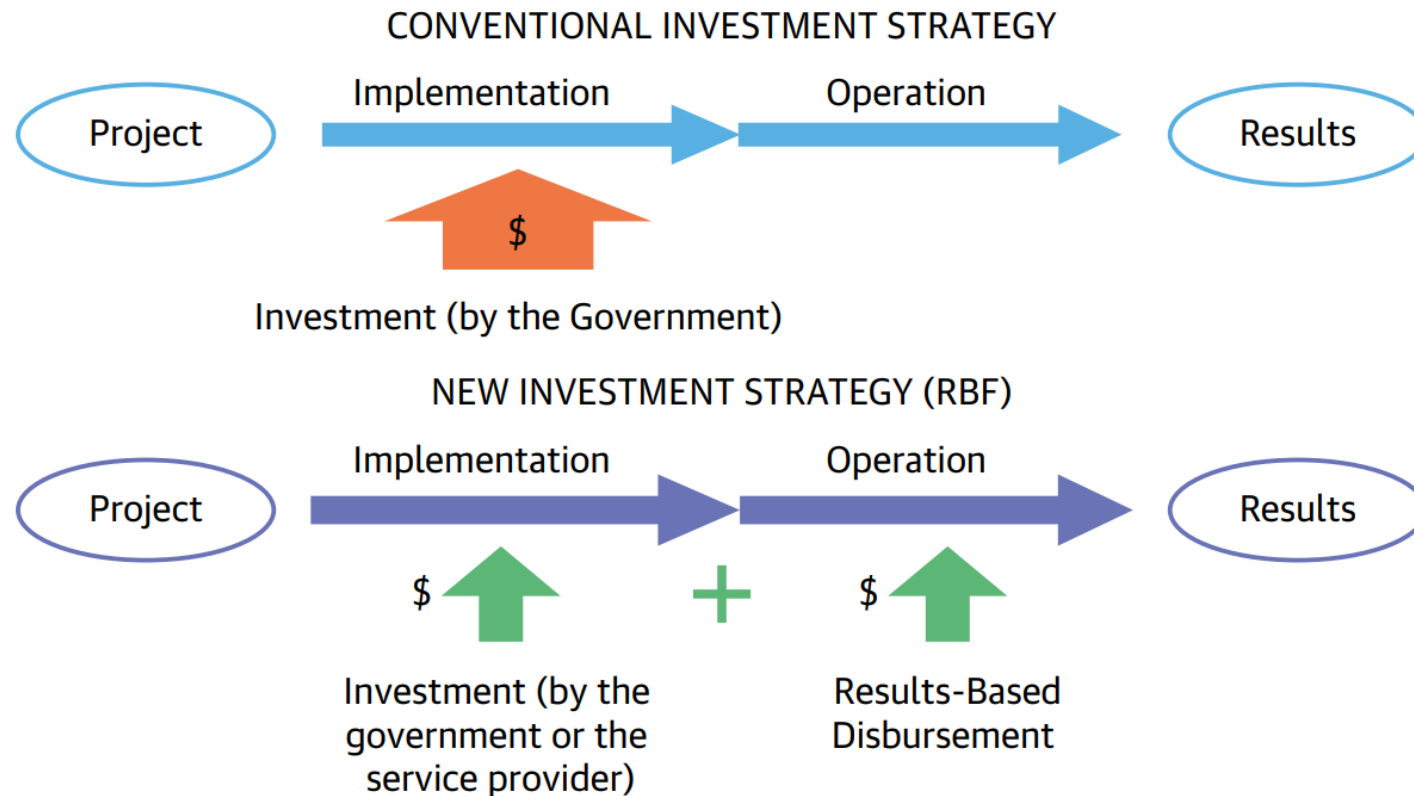
The Brazilian government aimed to increase water quality in key river basins by providing output grants instead of input subsidies.

Stakeholder Involvement

- Brazilian Federal Government
- Regional Municipalities
- Public Operators of Wastewater Treatment Plants
- Private Operators of Wastewater Treatment Plants
- Regional River Basin Management Committees

WATERSHED CLEANUP PROGRAMM PRODES | BRASIL

Solution



What solutions was implemented?

The Brazilian government created the Watershed Cleanup Program PRODES, that is based on the idea of results-based financing (RBF), which focuses on providing funding and incentives for achieved development outcomes and outputs.

Thus, the federal governments pays service providers for treating wastewater based on certified outputs tied to strict environmental and managerial performance standards instead of financing inputs.

Stakeholder Roles

- Wastewater treatments plants can apply for output-based funding granted by the Brazilian federal organisation for Water (ANA).
- Regional management committees define the local thresholds and goals which are connected to the funding provided by ANA.
- 82 projects have been funded since 2001.

WATERSHED CLEANUP PROGRAMM PRODES | BRASIL

Revenue Stream

TABLE 1. PRODES Selection Criteria, 2015

Criterion	Maximum score
Population served and treatment efficiency	50
Existence of Basin Committee in operation	5
Location of the development in priority basin	15
Municipalities prioritized in the Atlas Brazil	5
Allocation of resources to PRODES by committees	10
Planned development in water resource plans, investment programs, etc.	5
Project situated in municipalities with criticality criterion 1 and 2 of Portaria 062 / ANA, and listed in Annex IV of Res. 601, dated May 28, 2015	10
Total maximum points	100

What was the business model behind the solution?

Under PRODES the ANA agrees to a contract with a public or private Wastewater Treatment Plant owner. The conditional payment linked to the achievement of performance standards provides a strong incentive for service providers to increase efficiency and improve environmental outcomes.

Details of funding

Up to 50 percent of the investment costs for the wastewater treatment plant will be reimbursed by the government if the quality of the discharged wastewater meets the regional norms.

The service providers receive a quarterly payment through PRODES as long as their treated water meets the certified regional standards.

WATERSHED CLEANUP PROGRAMM PRODES | BRASIL

Take Aways for the Urban Labs: Mangaluru & Coimbatore

WATER POLICY

Set of guidelines and directives to the State for harnessing water resources - to cater the sectoral (agriculture, industrial and domestic) - need in equitable way that leads to sustainable development.

COMPONENTS OF WATER POLICY

LEGISLATIVE FRAMEWORK

Legal framework that defines the rights to exploit/use of water resources and provisions of award of incentives and penalties.

INSTITUTIONAL FRAMEWORK

Administrative system responsible for assessment and management of water resources.

MAJOR WATERSHED DEVELOPMENT PROGRAMS IN INDIA

1973-74	1989-90	1990-91	2006	2008	2009
DROUGHT PRONE AREA PROGRAMME (DPAP)	INTEGRATED WASTELAND DEVELOPMENT PROGRAMME (IWDP)	NATIONAL WATERSHED DEVELOPMENT PROJECT FOR RAINFED AREAS (NWDPA)	NATIONAL RAINFED AREA AUTHORITY (NRAA)	COMMON GUIDELINES FOR WATERSHED DEVELOPMENT - NEERANCHAL	INTEGRATED WATERSHED MANAGEMENT PROGRAMME (IWMP)
Ministry of Rural Development (MoRD)	Ministry of Rural Development (MoRD)	Ministry of Agriculture (MoA)	Planning Commission	National Rainfed Area Authority (NRAA) and Planning Commission	Ministry of Rural Development (MoRD)

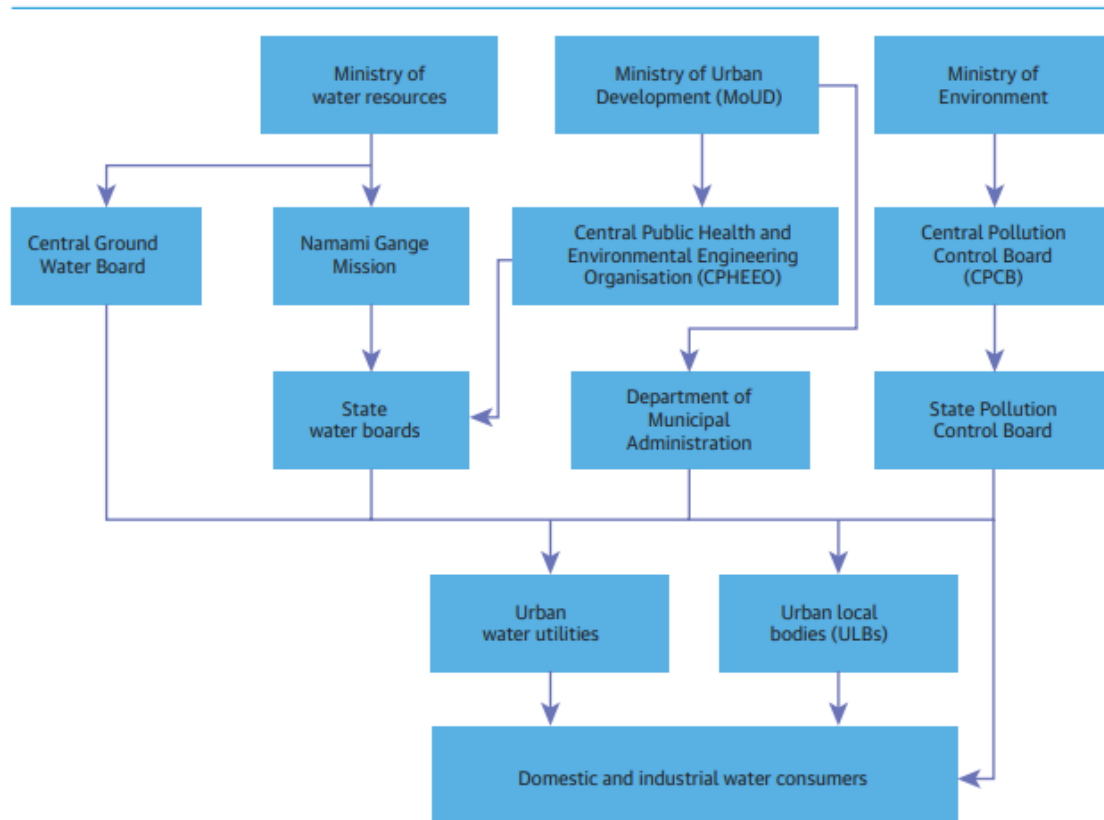
Source: Watershed development in India: Economic valuation and adaptation considerations - world resources institute study

What are the main take aways for the urban labs?

- By providing output-based subsidies the federal government can create leverage for the service providers to work as efficient as possible, transitioning for poorly managed capital-intensive projects into smart and efficient solutions
- Private Investments in infrastructure are encouraged by this model.
- By letting a regional committee establish the funding standards local disparities are considered and tailored funding criteria can be developed.
- Furthermore, the requirement of a local steering institutions allows the central government to guide the transition towards a regional water resource management.

GENDER SENSITIVE WASTE-WATER MANAGEMENT IN INDIA

FIGURE 2. Institutional framework for municipal wastewater reuse in India



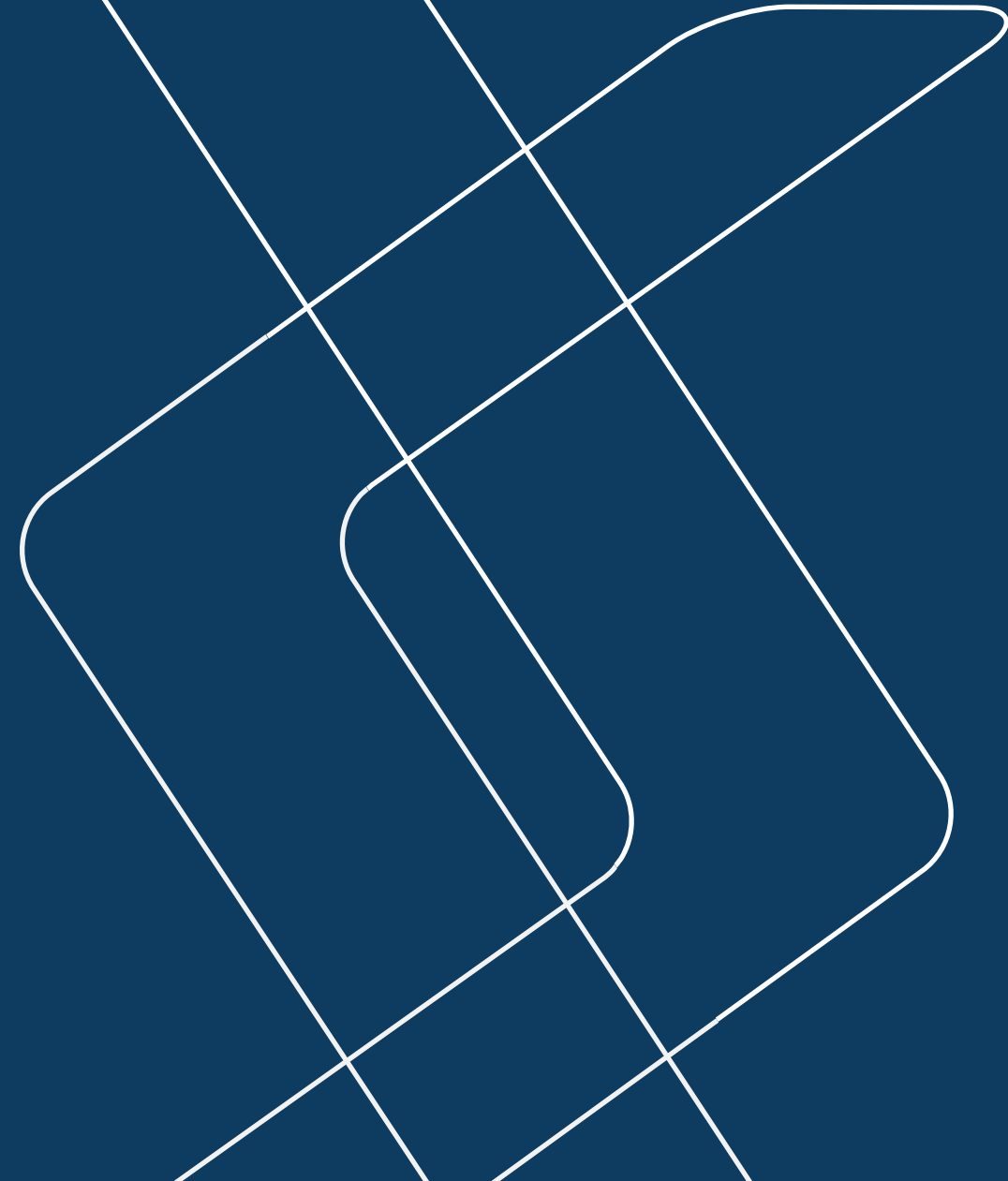
Challenges and recommendations for the Indian context:

- India has a huge potential for wastewater reuse in agriculture, as it generates about 62 billion cubic meters of wastewater per year, of which only 37% is treated.
- There are several barriers and challenges for wastewater reuse in India, such as lack of awareness, institutional and policy gaps, weak enforcement, social stigma, and economic constraints.
- Possible actions involve developing a national framework and guidelines, strengthening institutional capacity and coordination, improving data collection and monitoring, raising awareness and engagement, and providing financial and technical support.

The gender aspects involved in wastewater management for India are:

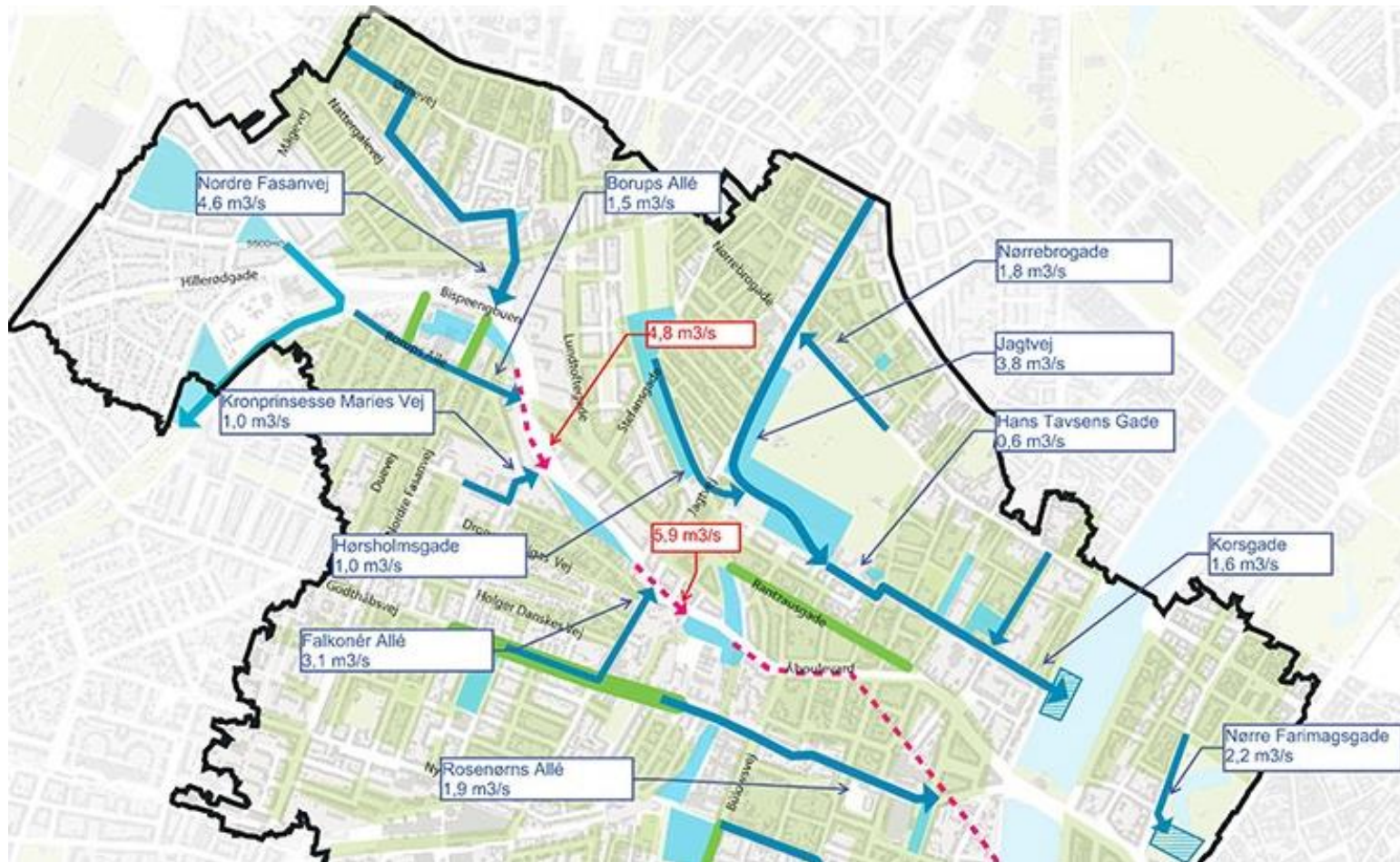
- Women are often more exposed to wastewater and its health risks, as they are typically responsible for domestic water use and management, and they also participate in agricultural activities .
- Women have limited voice and representation in the decision-making and governance of wastewater management, as they face barriers such as lack of education, information, and empowerment.
- Women can play a key role in improving wastewater management and reuse, as they have valuable knowledge, skills, and perspectives that can contribute to innovation, adaptation, and sustainability

**Best-practice of
inclusive GIS-
based drainage
masterplan**



GIS-BASED DRAINAGE MASTERPLAN

General Problems, Solutions and Technologies



Problems related to Drainage Management

- Climate change and increasing extreme weather events
- Impervious surfaces and the lack of open (green) space
- Damages to vital infrastructures and livelihoods due to flooding events

Types of Drainage Management Solutions

- Sustainable urban drainage systems (SUDS)
- Watershed management
- Urban design interventions

Innovative GIS-Based Drainage Management Technologies

- Remote sensing and GIS-based watershed prORIZATION
- Interconnected Channel and Pond Routing (ICPR) via GIS

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Problem & Challenges



Problem Statement

A massive cloudburst hit Copenhagen in 2011. The greatest rainfall recorded in 55 years caused massive damage. Since climate change predictions indicated a higher probability for such heavy rainfall events, action was needed.

What initiated action

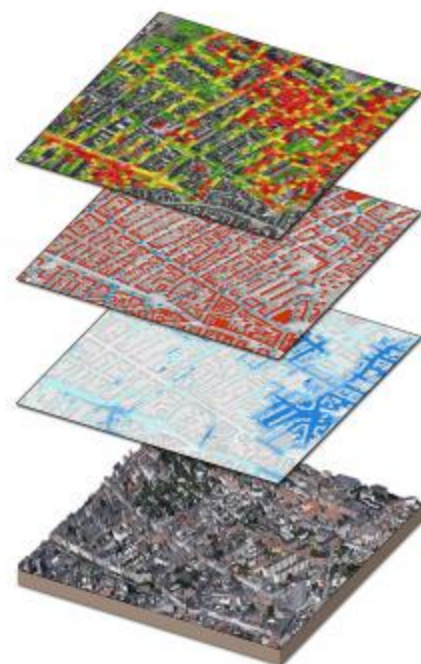
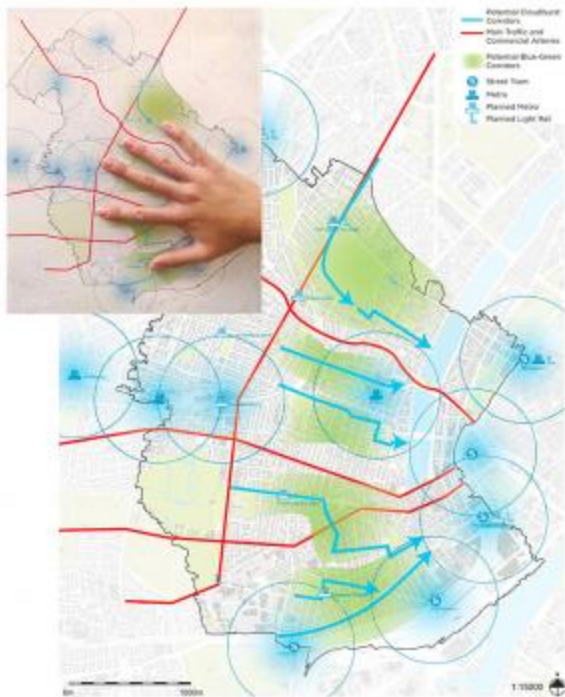
Copenhagen decided to act and develop an overarching masterplan to prevent or mitigate future flooding events.

Stakeholder Involvement

- Municipal bodies
- Public utilities
- Road maintenance
- Local residents
- Private infrastructure owners

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Solution



Detailed site analysis reveals the complex existing situations; identifying areas most at risk to flooding shows the potential sites as catalyst pilot projects (Frederiksberg District shown in isometric visualization above)



What solutions was implemented?

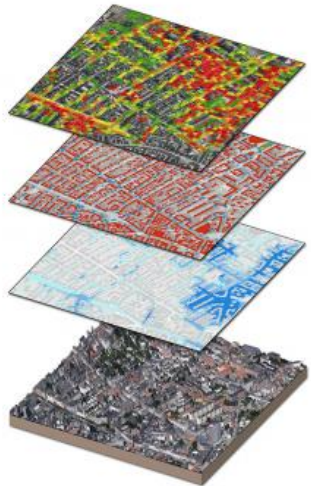
- An overarching analysis was executed for rainfall and flooding. Using Geoinformation Services (GIS), the city was divided into eight catchment areas.
- Each catchment was assessed for risk, implementation and coherence with ongoing urban development projects.
- 300 infrastructure measures were identified from the analysis to be carried out within the next 20 years.

Stakeholder Roles

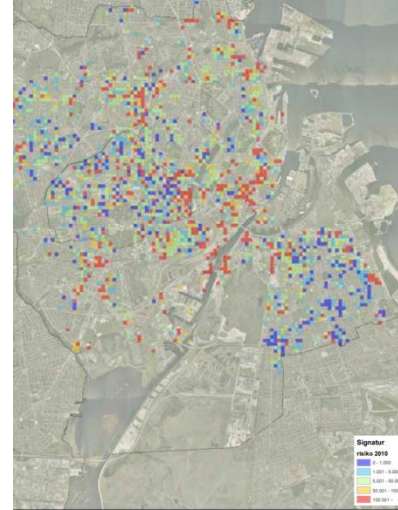
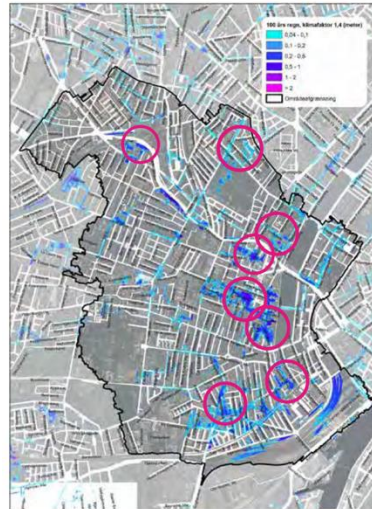
Involvement of local infrastructure coordinators and execution of public participation workshops. Stakeholder steering through the municipal government.

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Solution



Detailed site analysis reveals the complex existing situation, identifying areas most at risk to flooding above the potential sites of potential pilot projects (Frederiksberg District shown in isometric visualization above)



Data & Investigation

Collecting planned projects & terrain modelling

Modelling & Mapping

GIS surface hydrology & hydraulic modelling

“Cost of doing nothing”

Rate previous damage and collection of insurance claims.

Design & Qualify

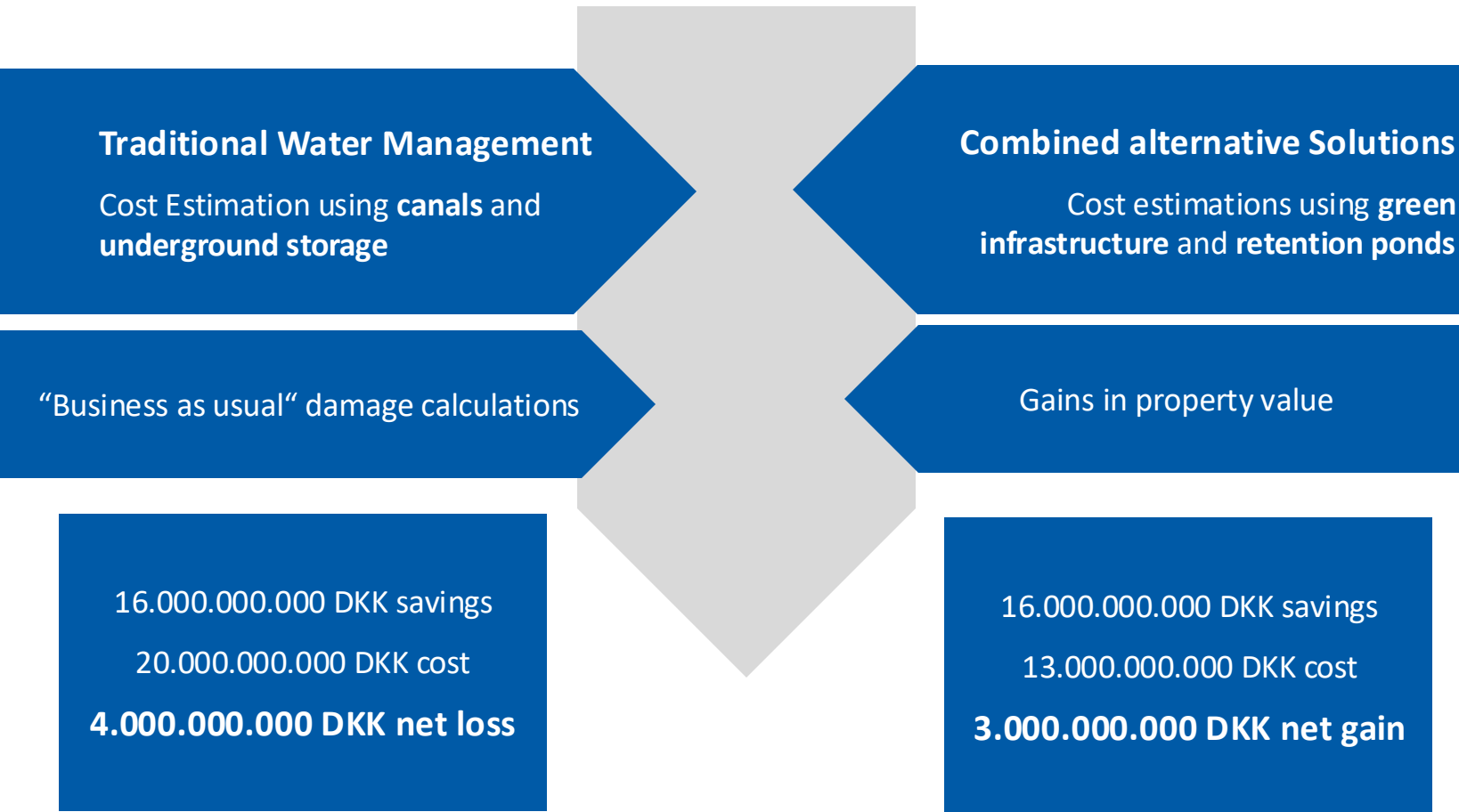
Suggest architectural and landscape measures.

Involvement & Iteration

Stakeholder workshops, public and client involvement.

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Revenue Stream



What was the business model behind the solution?

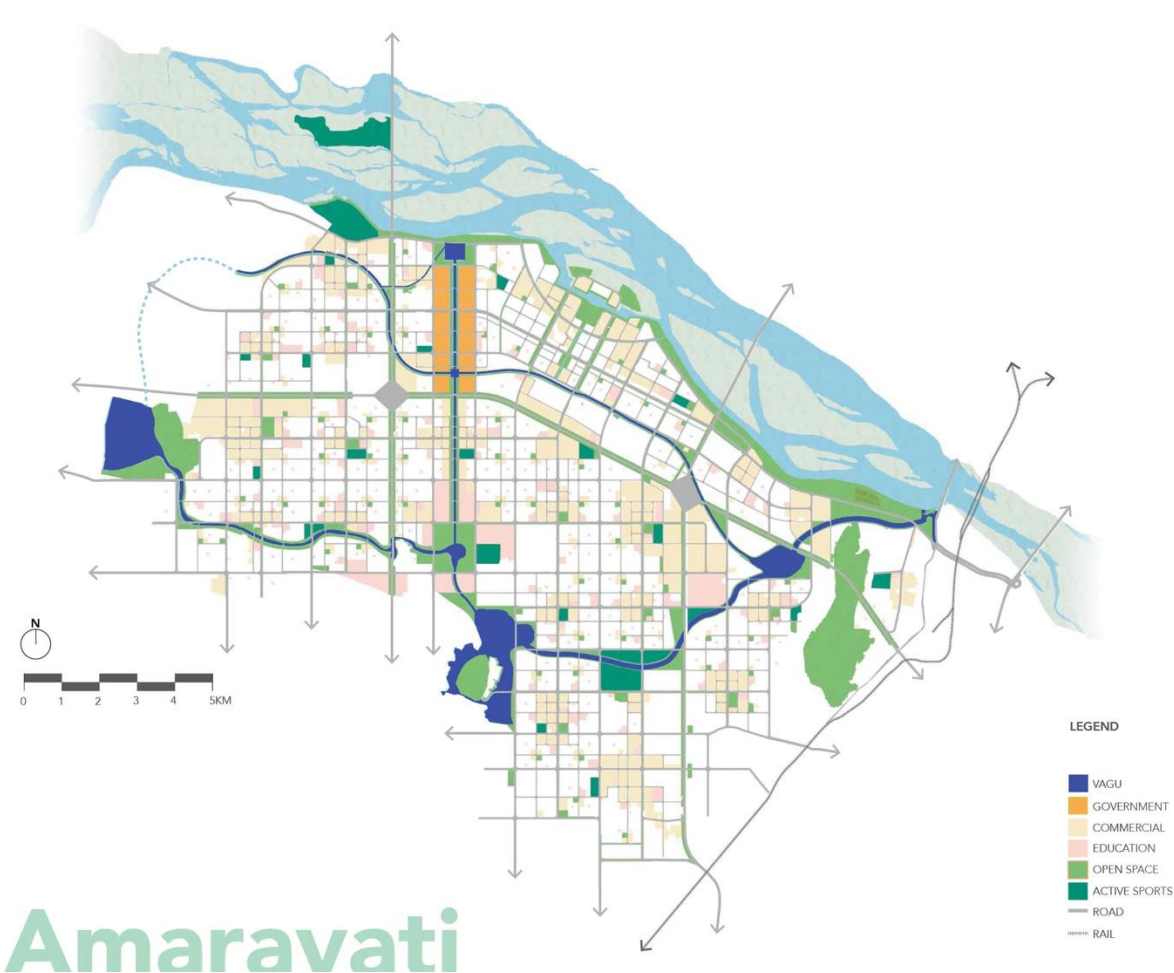
The masterplan compared traditional with green-infrastructure-based solutions. The analysis and implementation of this sustainable alternative solutions provided a remarkable net gain for the city of Copenhagen.

Details of funding

- Employment through constructed created 1.6 million DKK extra tax revenues.
- Funding is taken from public water fees, private street ownership participation, and property owners.

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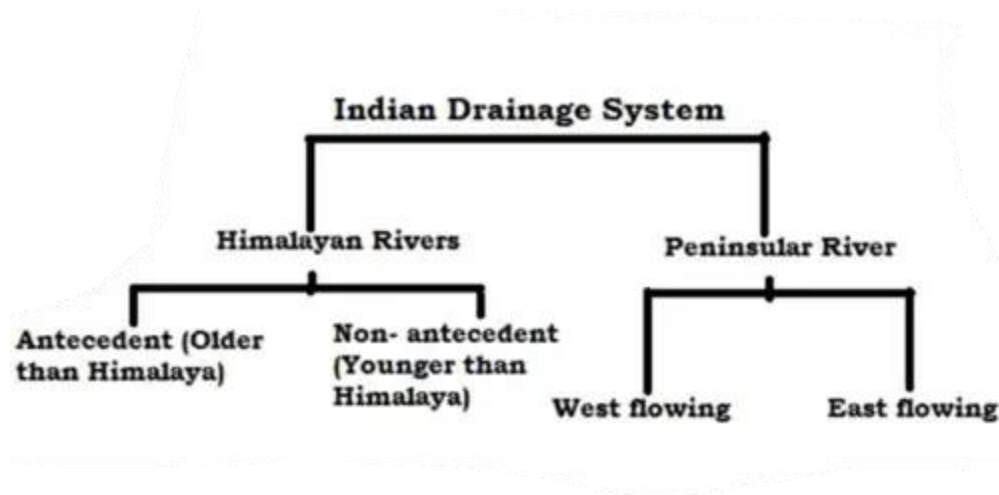
Take Aways for the Urban Labs: Guwahati



What are the main take aways for the urban labs?

- Use GIS technologies to collect, analyse and visualize spatial and temporal data on drainage networks, flood hazards, and socio-economic indicators enabling a better systemic understanding and facilitating the development of evidence-based solutions.
- Create awareness and feedback through participatory workshops with citizens and associated public and private actors
- Via data-collection the most urgent and effective points of action become evident and can be included in an overarching strategy for drainage.

GENDER SENSITIVE DRAINAGE MANAGEMENT IN INDIA



Challenges for Indian cities in drainage management and master planning:

- Inadequate and outdated infrastructure paired with rapid urbanization and population growth
- Climate change and increasing extreme weather events
- Institutional and governance issues

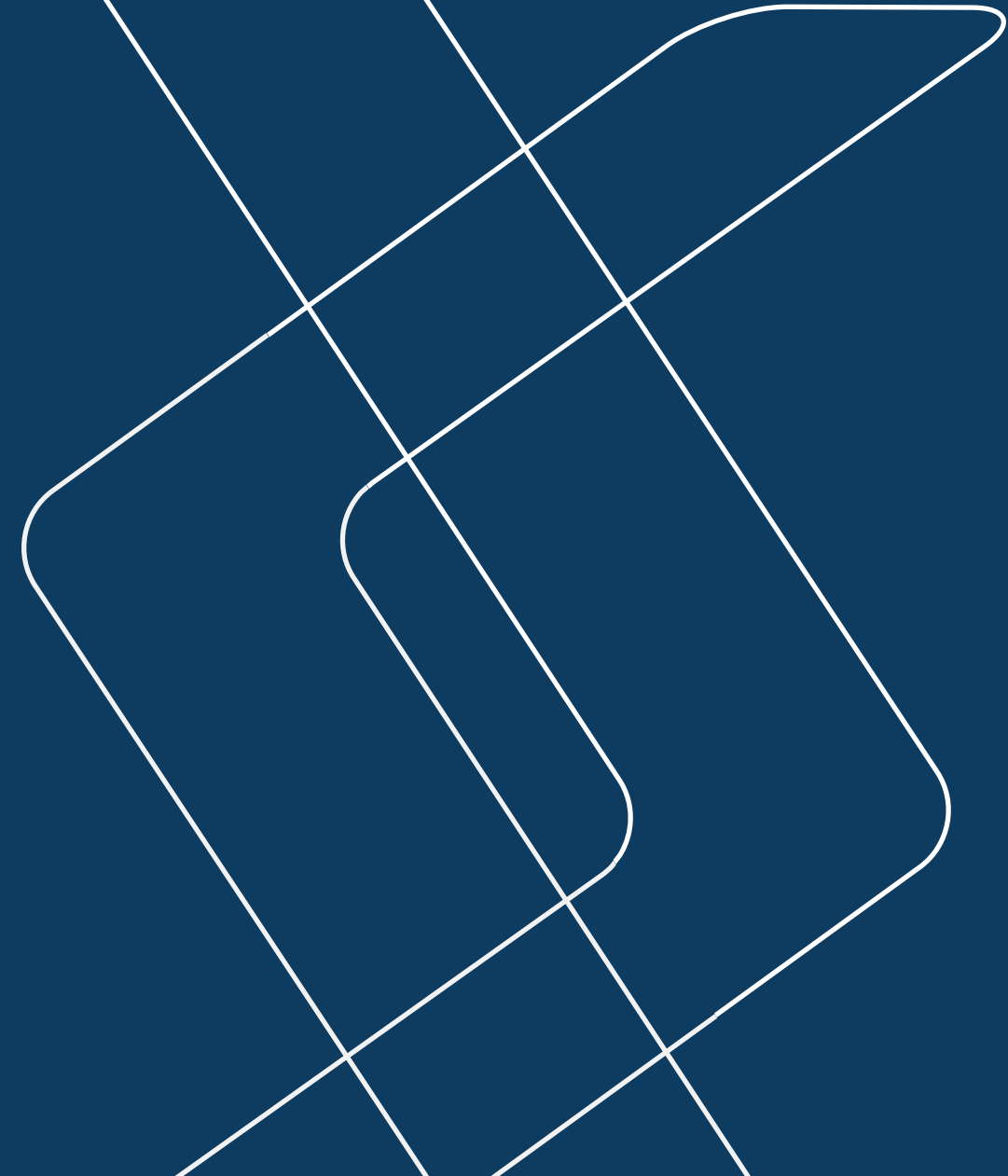
Recommendations for Indian cities to improve drainage management and master planning:

- Adopting a holistic and integrated approach to urban water management, using GIS to assess the water demand and supply, and the impacts of climate change and urbanization.
- Enhancing the resilience and adaptability of the urban water systems, using GIS to monitor and evaluate the water quality and quantity.
- Strengthening the institutional and governance frameworks, using GIS to communicate and disseminate the information and knowledge.

Gender aspects to consider in drainage management are:

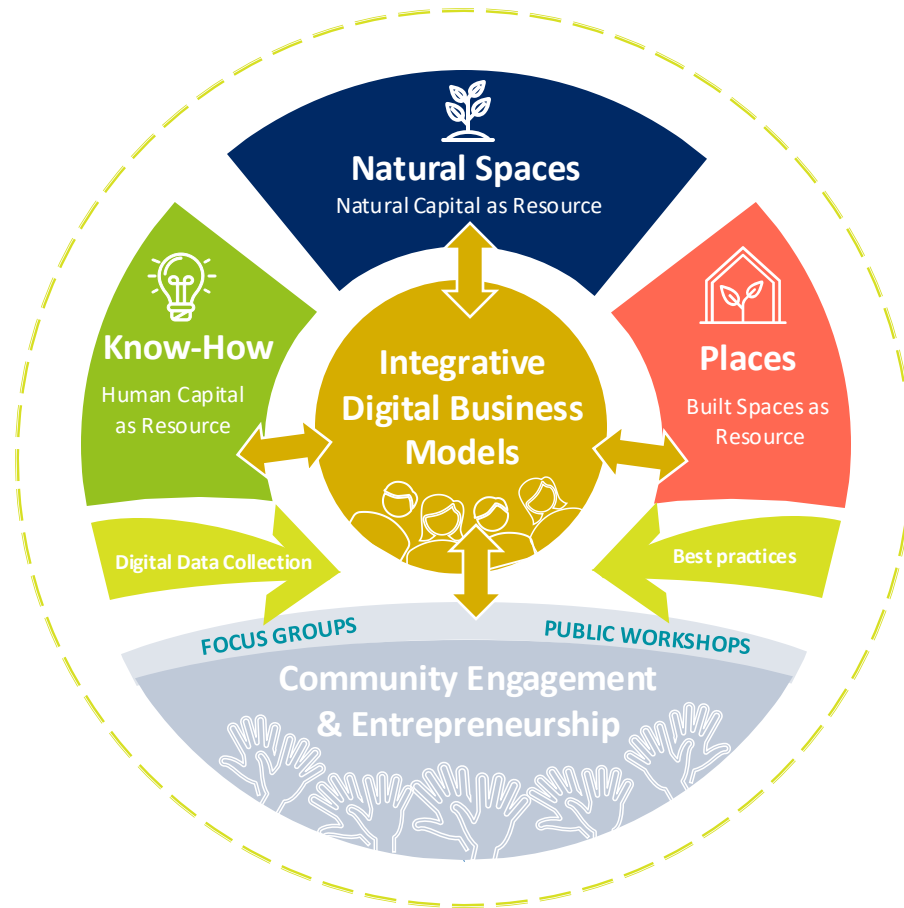
- Gender differences in water use and management in rural and peri-urban areas
- Lack of inclusion and participation of women and gender minorities in drainage planning and decision making
- Safety and security risks of poor drainage management for women and gender minorities

**On-Site
Workshops
Information**



ON-SITE WORKSHOPS | IMPLEMENTATION-SUPPORT AND STAKEHOLDER ENGAGEMENT

Dr. Haris Piplas, Minu Tegethoff and Philipp Gross



Once the concept is established, operations towards implementing the business model knowledge commence at the seven Urban Labs. During the on-site workshops, the experts of Drees & Sommer will oversee in-situ implementation, employing agile methodologies to engage various local stakeholders. The following tasks will be undertaken in this phase:

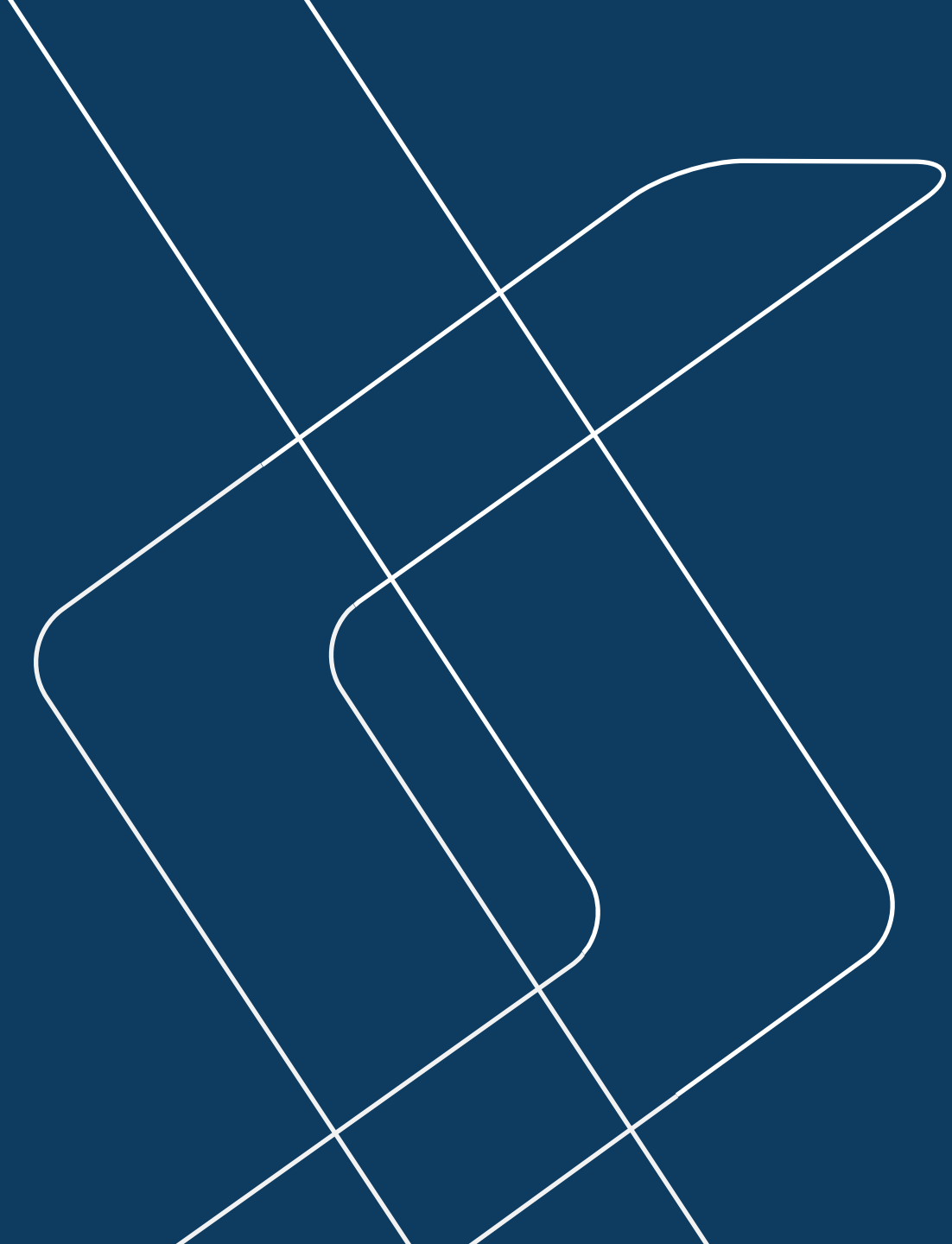
- Collaborative planning of forthcoming on-site endeavors in conjunction with Urban Labs, participating municipalities, and other local stakeholders including entrepreneurs, private sector entities, and civil institutions.
- Execution of seven in-situ activities encompassing sprints, smart city labs, multi-stakeholder workshops, innovation navigation, etc., tailored to fortify digital business models with a gender-inclusive approach, serving as a catalyst for sustainable and resilient urban development.
- Dynamic interaction with local stakeholders regarding project-related endeavors.
- Continuous documentation of on-site activities
- Preparation of textual and visual reports for the GIZ, involving editing and synthesis of the documentation.

ON-SITE WORKSHOPS | IMPLEMENTATION-SUPPORT AND STAKEHOLDER ENGAGEMENT

Dr. Haris Piplas, Minu Tegethoff and Philipp Gross

Date	City	Themes
5/6 February	Mangalore, Manikonda, Coimbatore in Hyderabad	<ul style="list-style-type: none">- Solid waste management with gender lens and urban water management- Solid waste management and green public spaces- Circular economy: Solid waste management and wastewater management
9 February	Kochi	<ul style="list-style-type: none">- Urban observatory and green public spaces
12 February	Bhubaneswar	<ul style="list-style-type: none">- Climate-proofing urban planning and infrastructure for New Bhubaneswar City
14 February	Guwahati	<ul style="list-style-type: none">- Climate-proofing urban planning and infrastructure for Guwahati City expansion- Inclusive GIS-based drainage master plan

General Discussion





**UNITING
OPPOSITES
TO CREATE
A WORLD
WE WANT
TO LIVE IN**

**DREES &
SOMMER**