

PolyUrbanWaters Concept for Sleman

May 2020

Polycentric approaches to the management of urban water resources in South-East Asia



**POLYURBAN
WATERS**

PolyUrbanWaters

Overall Goal

Polycentric approaches of urban development and integrated urban water management enhance the resilience, sanitation, inclusion and attractiveness of urban areas, thus contributing to the fulfillment of national/ global sustainability agendas and the localization of SDGs.

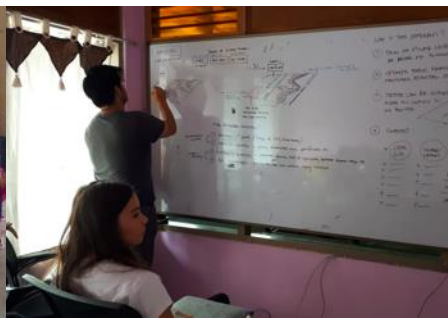
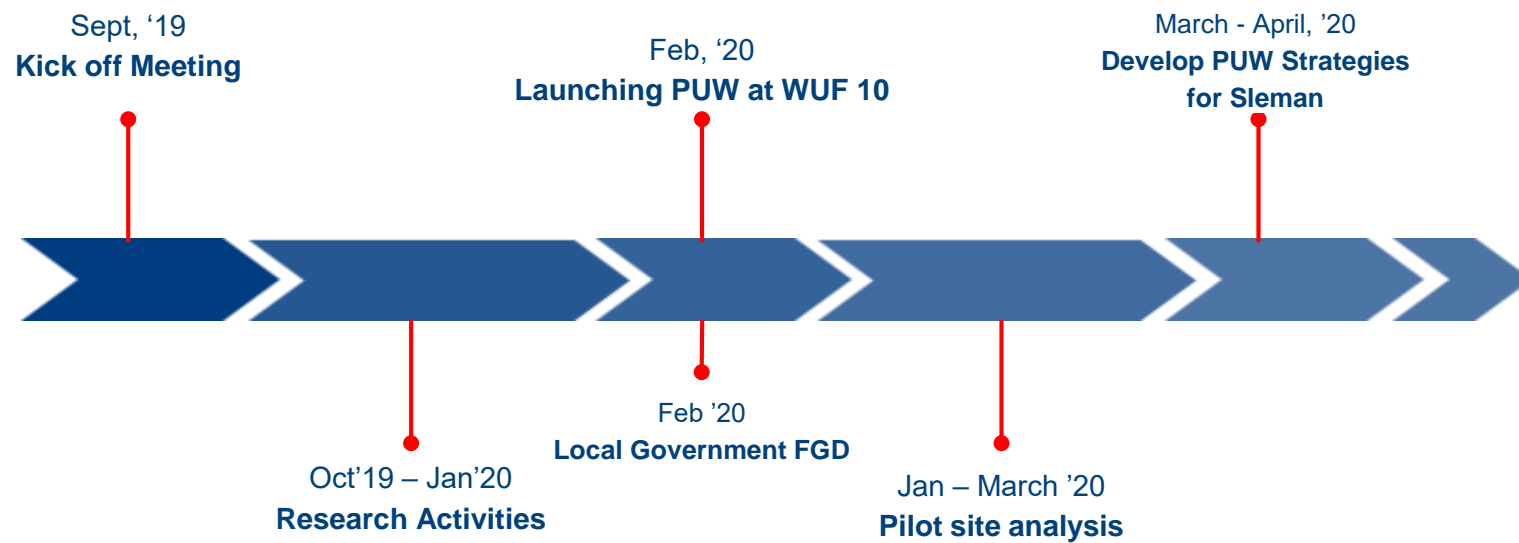
Project Goal

Comprehensive and effective management of urban waters and cross-sectional management structures



Localization of SDGs

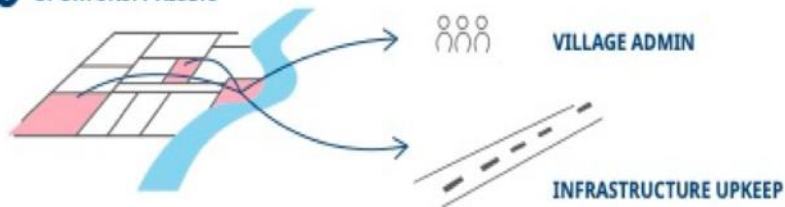




Problem Definition

1. **Clean surface water is a critical resource for the future.** In Sleman, where there is limited management of wastewater, solid waste and water extractions, the continued high pollution of the surface rivers and the contamination and depletion of groundwater pose serious risks to public health and liveability.
2. **River setbacks are not addressing the fundamental issues of waste and water**
3. **100-0-100 policy require a comprehensive yet fine-grained approach**
4. **Undang-undang Desa (i.e. Village Regulations) is an opportunity for decentralized planning at the village level**

1 OPORTUNITY ASSETS



GOALS:
100-0-100
SDGS
BETTER GOVERNANCE

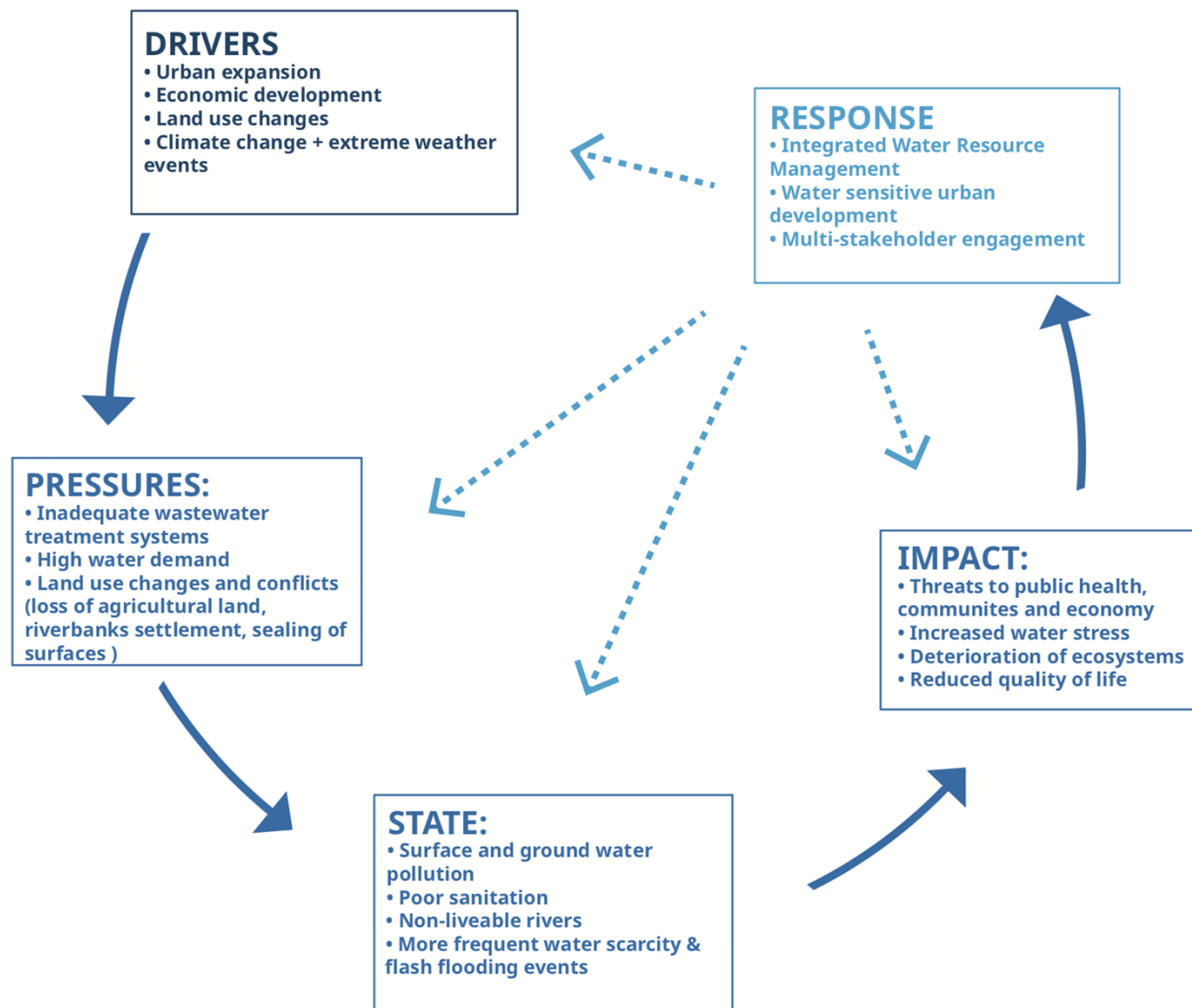
PolyUrbanWaters Concept for Sleman

1. Urban development in Sleman and challenges for the comprehensive management of urban water resources

2. Benefits of Polycentric water-sensitive urban development for Sleman

3. Goals and outputs of project “PolyUrbanWaters” in Sleman

Development dynamics in Sleman and its impact on water resources



Areas of Development in Sleman Regency

- Key investments for economic development (new toll road, new international airport, outer ring road, etc.)
- Tourism development (cultural heritages, eco-tourism, etc.)
- Center for higher education (public and private universities)
- Integration of clean water and wastewater management (Main goals of Water Utilities by 2021)
- Effective sanitation and solid waste management
- Sustainable management of agricultural land
- Sustainable housing (mainly along the riverbanks)



Problems faced by Sleman in managing massive urban transformation

- The current urban planning and design approach gives little attention to water-related issues;
- Lack of knowledge and strategies in applying 'water-sensitive urban development'
- Weak coordination among government agencies dealing with urban development and water related issues
- Lack of tools and methods to strategically respond current and future urban challenges in a modern, water-sensitive and strategic manner
- Inadequate capacity of village governance in strategically manage local resources and assets, including water
- Lack of exemplary models of water sensitive development at the village level

Water relevant challenges in Sleman

- Managing massive urban transformation and its impact on regional and local water resources:
 - Ensuring access to safe water
 - Wastewater management
 - Effective sanitation and solid waste management
 - Decreasing water stress
 - Closing the gap between water supply and demand
 - Clean/livable rivers
 - Improve resilience to effects of climate change (droughts, flash flooding, etc.)



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Benefits of “Polycentric Approaches” for the management of urban water-sensitive development in Sleman

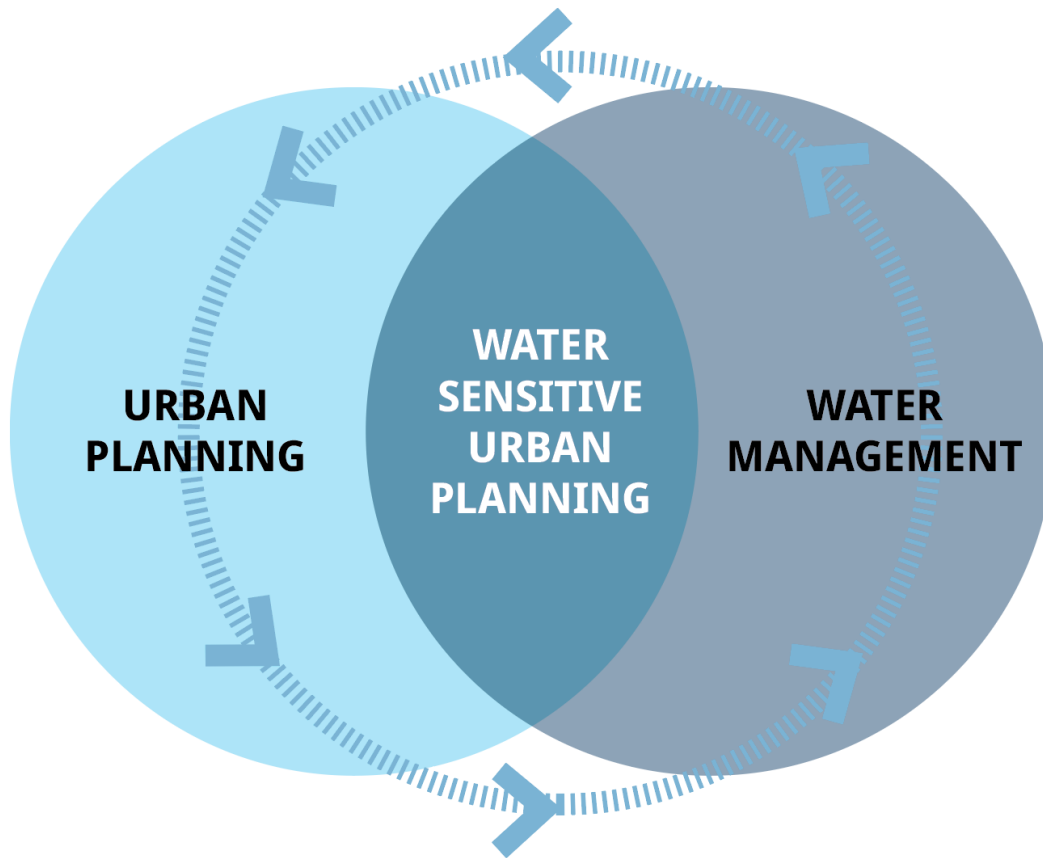
- Integrating water issues into urban planning and design strategies;
- Providing more effective and efficient collaborations among multiple sectors and other stakeholders, both horizontally and vertically;
- Integration of technical, socio, economic, and cultural parameters in the approach;
- Offers innovative and appropriate tools and methods to anticipate and plan for current and future urban challenges in a modern, water-sensitive and strategic manner;
- Strategically linking research, knowledge, and policy making;
- Provide real exemplary model of water-sensitive development at the village level that could be replicate in other villages.

Polycentric approaches for the management of urban waters

- ➔ **Developing capacities, tools & methods to anticipate and plan for current and future urban challenges in a modern, water-sensitive and strategic manner**



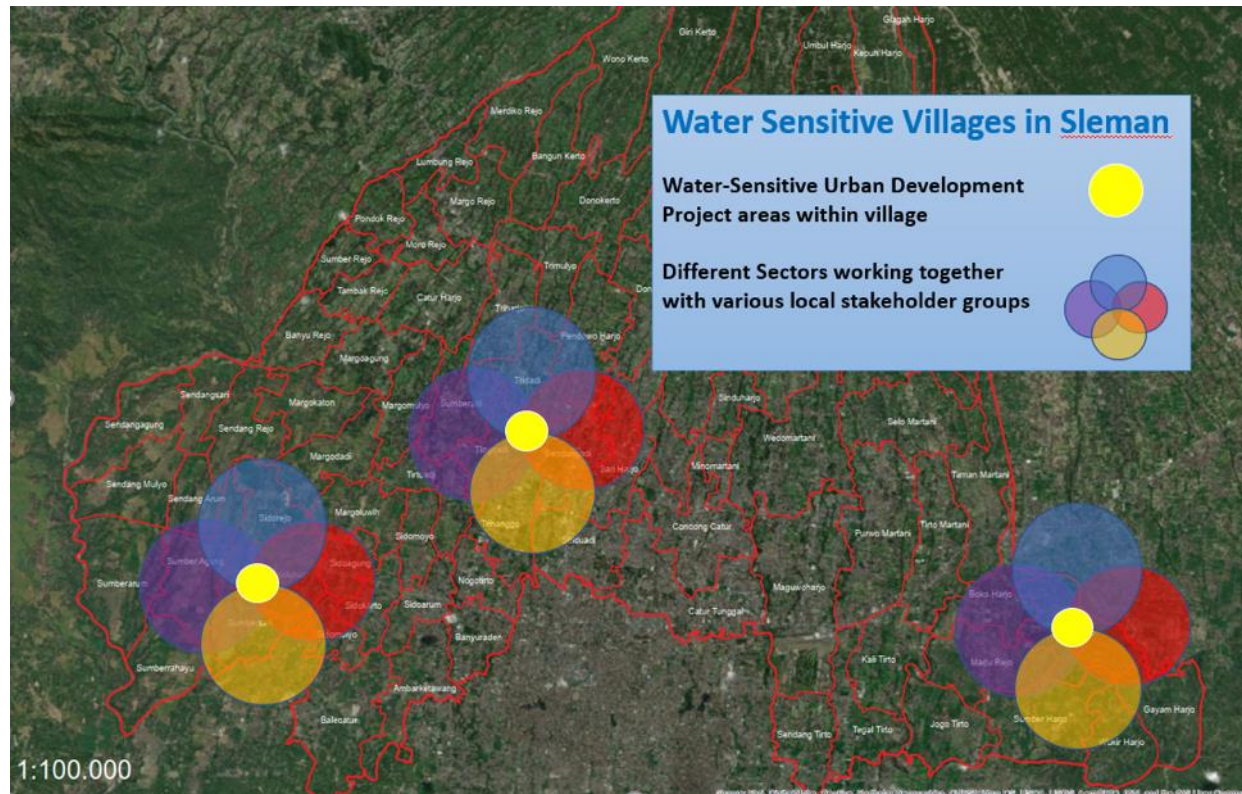
Polycentric approaches for the management of urban waters – combining urban design and integrated water management



- Development steps are in line with **local capabilities** and **resources**
- Development steps can be aligned **with existing planning processes**

What is the Polycentric Approach?

A set of **tools & methods** to **co-develop cross-sectoral** and **multi-scale water-sensitive** urban development pathways that are **context customized**.



Allows **multiple stakeholders** (sectors, government, community groups, science & education, business) to **co-develop customized solutions** (strategic and multi-scale) for **current and future challenges**.

Elements of the Polycentric Approach

- Multiple sectors, local government and different community groups **work together** in planning and decision-making for development of **multiple sub-centres (e.g. villages)** in a city/district
- Integration of **centralized** and **decentralized approaches to water management**
- Integration with and **building on existing capacities and processes that already function and are valued** by local government, water operators and communities
- Integration of **planning, technical, institutional, financial and cultural parameters** in the approach
- Integration of **urban planning** with **water management**
- Improvements are made **progressively, step by step**, over a long time and in line with **local capabilities** and **resources**

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The project “PolyUrbanWaters”: strengthening capacities to respond adequately to water challenges in Sleman

- ➔ 1. Strengthening capacities of local government to strategically plan for water-sensitive urban development
- ➔ 1. Elaboration with local stakeholders of exemplary models of water sensitive urban development at the village level and support for its implementation
- ➔ 1. Support for the establishment of effective technical, methodological, institutional, and financial schemes that are transferable and scalable for villages in Sleman and at the national level

Support strengthening capacities for achieving targets related to the national programs for localizing SDGs

PolyUrbanWaters - Main Goals in Sleman

Overall Goal

Polycentric approaches of **water sensitive urban development** contribute to:

1. Improving **water security**
2. Achieving comprehensive, good quality provision of **water related municipal services**
3. Protecting the **health of water bodies**
4. Strengthening resilience to **climate change impacts**
5. Establishing **livable neighborhoods** in Sleman
6. Localization of **SDGs** (realisation of local and national development agendas and programs, including the 100-0-100 targets)

Project Goal

Development of **urban design approach** and **capacity building** for **“Water-Sensitive Villages in Sleman”** considering the social, technical, ecological, governance and economic dimensions.

4 Key Project Outcomes of PolyUrbanWaters

A: “PolyUrbanWaters Toolbox 1 “Developing Water Sensitive Villages”

Tools & methods for “Polycentric approaches for water sensitive villages of Sleman” are co-developed, elaborated and tested in selected villages.

B: Growing Capacities: Water-Sensitive Planning and Development

Capacities for water sensitive village development in Sleman for

- strategic planning and informed decision making by the local government
- strengthened co-production schemes in selected villages with communities, local government, civil society, water operators and private sector

C: Dissemination and Integration of Discourse

Tools & methods for “Polycentric approaches for water sensitive villages of Sleman”

- are reflected in strategic papers of public entities of Sleman and Indonesia
- contribute to an economic/political/academic discourse in Indonesia and SEA

D: Growing Capacities: Practice Oriented Research

Technical and methodological capacities are developed for practice-oriented research on polycentric approaches for water sensitive villages in Indonesia

Outcomes and outputs of PolyUrbanWaters in Sleman

– Outcome A

Outcome A

Tools & methods for “Polycentric approaches for water sensitive villages of Sleman” are **co-developed, elaborated and tested in selected villages.**



Output 1

Baseline study “**water in selected villages of Sleman 2021**”



Output 2

Scenario development “**water in selected villages of Sleman 2030/2045**”



Output 3

Technical, methodological and financial **tools for the design and implementation** of water sensitive villages in Sleman

1. Water in Villages of Sleman 2021: Understand the current situation, emerging risks & existing programs

Baseline assessment of **existing**:

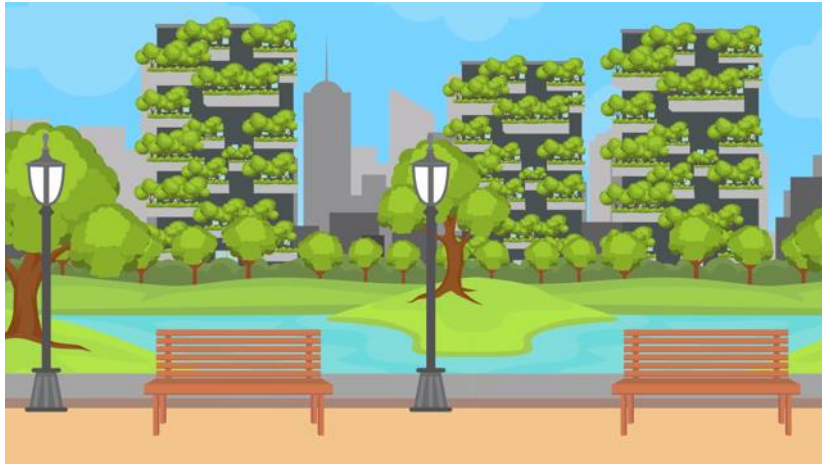
- Water resources (availability, demand, quality)
- Ecosystem services
- Urban planning approaches
- Planning instruments and methods
- Challenges & vulnerabilities
- Opportunities for the city

➔ **Strengthening local capacities to assess, quantify & evaluate resources availability and planning options**



2. The vision of water-sensitive villages, 2030/2045

- Management of urban transformation dynamics in line with natural resources preservation, sustainable agriculture and economic development
- Strong integration of water resources management into urban development

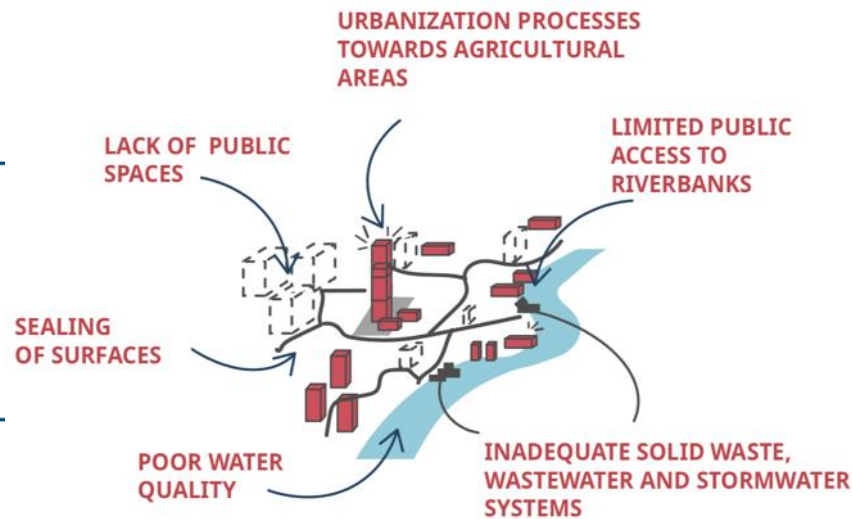


What does this mean for sustainable water management for villages in Sleman?

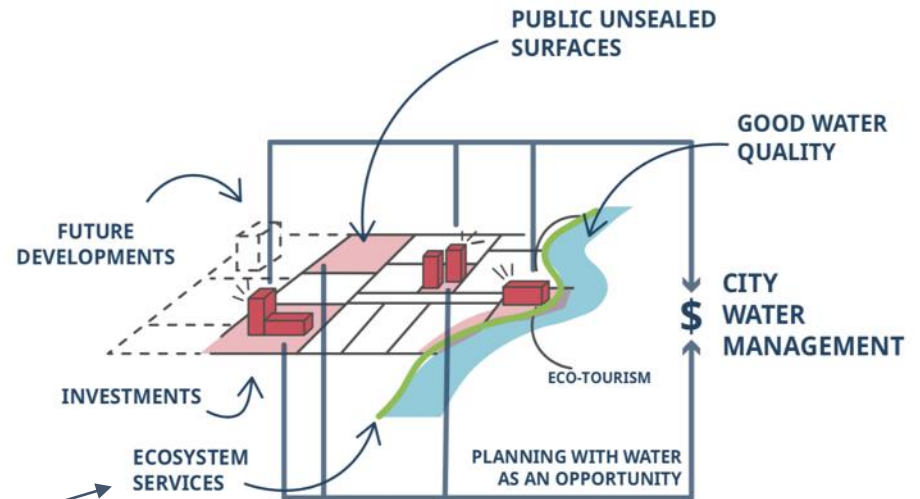
➔ **Water-sensitive urban planning**

2. Water sensitive villages in Sleman 2030/2045

Development: “Business as usual”



Water-sensitive development approach



Integrated management of solid waste, wastewater and stormwater systems

Improving village-level development planning, prioritizing the importance of ecosystem services

Water sensitive developments that **reduce demands**, **improve water storage**, etc.

3. Technical tools for water-sensitive villages



Harvesting stormwater for non-potable use



Using sponge city approaches



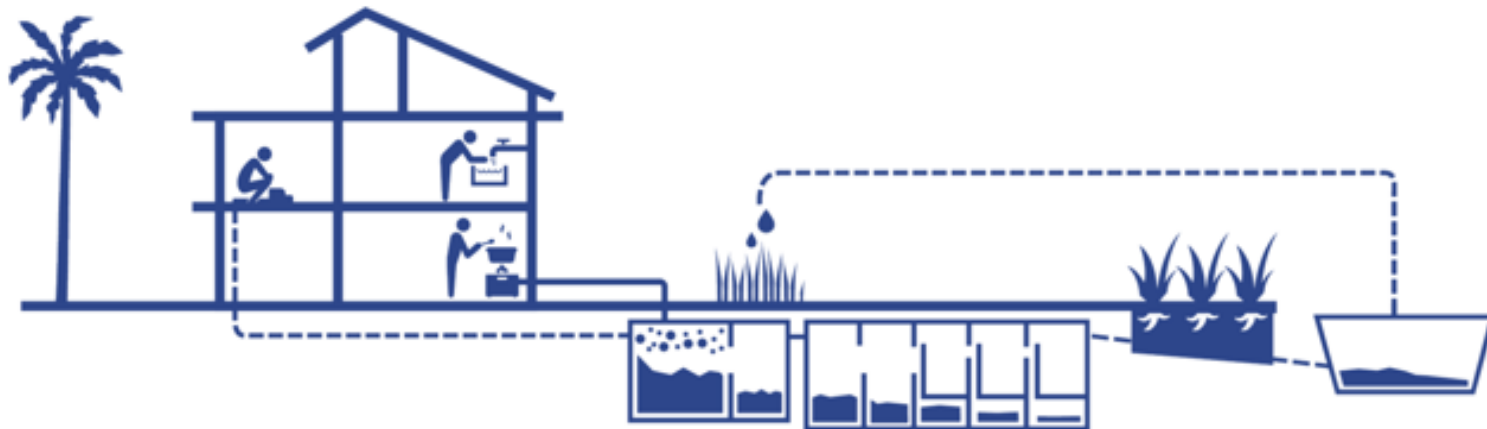
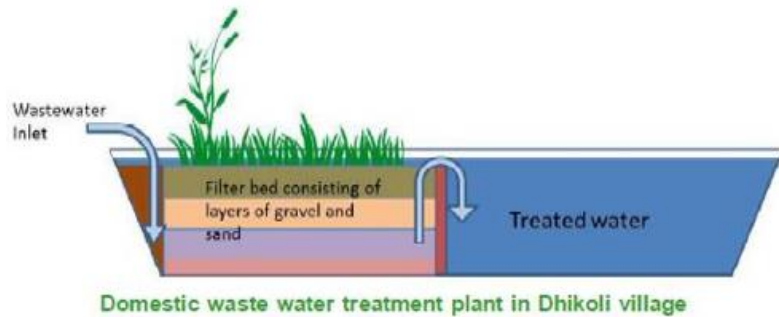
Using modern technology for monitoring & mapping



Integrating spatial planning & analysis

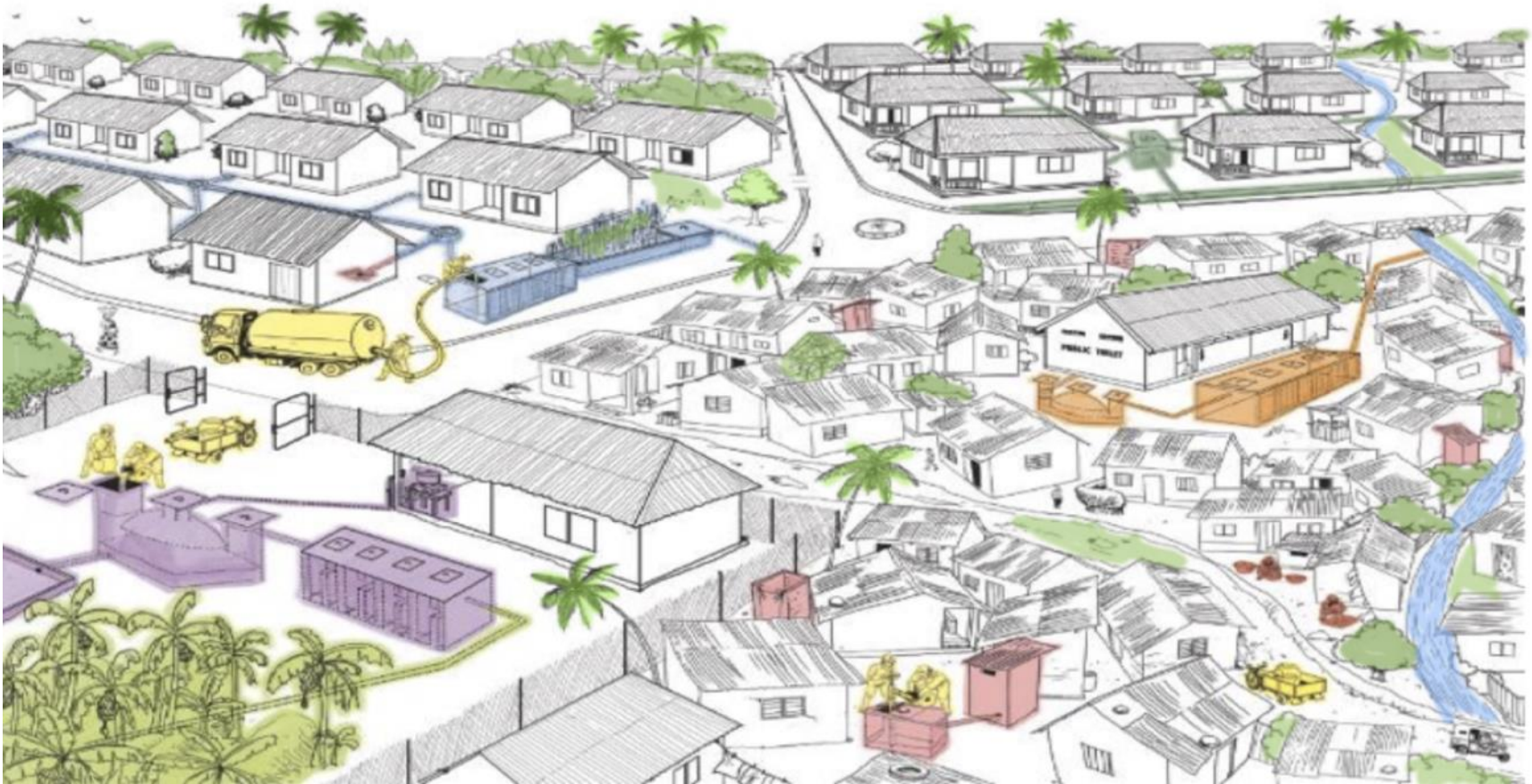
3. Technical tools for water-sensitive villages

Tools for improved water quality with stormwater and wastewater management



3. Technical tools for water-sensitive villages

Integrating tools: water-sensitive urban planning



Outcomes and outputs of PolyUrbanWaters in Sleman

- Outcome B

Outcome B

- **Capacities for water sensitive village development** in Sleman for **strategic urban planning** and **informed decision making** by the local government; and
- **co-production schemes** in selected villages between communities, local government, civil society organisation, water operators and private sector



Output 5: 200 government officials are trained, i.e., local government agencies gain the capacities to effectively plan, design and implement measures for water sensitive villages in Sleman



Output 6: 5 co-production schemes on village level are established that ensure **integrated management** of water resources



Output 7: 2 co-production schemes between public entities, water operators and private sector that ensure effective and sustainable **provision of water related basic needs**

Capacity building and co-design of PolyUrbanWaters in Sleman

Level	Stakeholder	Involvement	Benefits
Sleman Regency	<ul style="list-style-type: none"> - Planning Agency - Departments of Public Works, Housing and Settlement; Agriculture, Food, and Fishery; Environment; Health; Land and Spatial Planning & Community and Village Empowerment - Water utilities / PDAM - Kotaku & Local NGOs 	<ul style="list-style-type: none"> - Facilitation of process: contact to relevant stakeholders, access to study sites & data provision - Co-development of methods & tools for governance & planning - Upscaling of developed approach 	<ul style="list-style-type: none"> - Access to transferable water sensitive planning tools - Strengthened capacities in water sensitive planning - Access to generated data and knowledge - International cooperation with Germany, Laos, Cambodia, Thailand, Vietnam
Village Level (Desa)	<ul style="list-style-type: none"> - Village heads & councils - BKM - Community clean water provision (PAMDES) & Community-based wastewater organizations - Dukuh (a head of Padukuhan) - Citizen - Community clean water provision (PAMDES) - Community-based wastewater organization (Kelompok Swadaya Masyarakat/KSM) 	<ul style="list-style-type: none"> - Local facilitation of process: Contact to relevant stakeholders & access to sites - Participation in co-development and testing of methods & Tools - Upscaling of developed approach - Participation - Co-development of methods & tools - Testing of methods & tools 	<ul style="list-style-type: none"> - Baseline assessment of water resources and their value - Quantified possible development scenarios - Information on action hot-spots for water sensitive planning - Strengthened capacities in water-sensitive planning - Access to generated data and knowledge - Strengthened capacities in water sensitive land management - Knowledge on local adaptation measures - Access to sustainable business ideas

Capacity Development for water - sensitive villages in Sleman

Water Sensitive Governance

- Strategic integrated urban planning and water management on local government and village level
- Vision building on village level
- Design and implementation of co-production processes
- Financing schemes for water sensitive villages

Technical Training

- Tools for water resource assessment at village level
- Evaluation of water resources and spatial planning
- Spatial planning on the design of water sensitive villages (including ecosystem based solutions, green public spaces, etc.)

Participatory Workshops

- Co-creation of scenarios for water sensitive scenarios and process design for its implementation
- Process oriented planning + implementation of strategic interventions for the development of water sensitive villages

Co-management

- Support for the design and establishment of models of co-management on village level
- Support for the design and establishment of co-production schemes between public entities, communities, water operators and private sector

Outcomes and outputs of PolyUrbanWaters in Sleman

- Outcome C

Outcome C

Tools & methods for “Polycentric approaches for water sensitive villages of Sleman”:

- Are reflected in **strategic papers** of public entities of Sleman and Indonesia
- Contribute to an emerging economic/political/academic **discourse** in Indonesia and SEA



Output 8: 3 Tools and instruments

developed by PolyUrbanWaters are integral part of **planning procedures** of local government of Sleman



Output 9: Tools and instruments

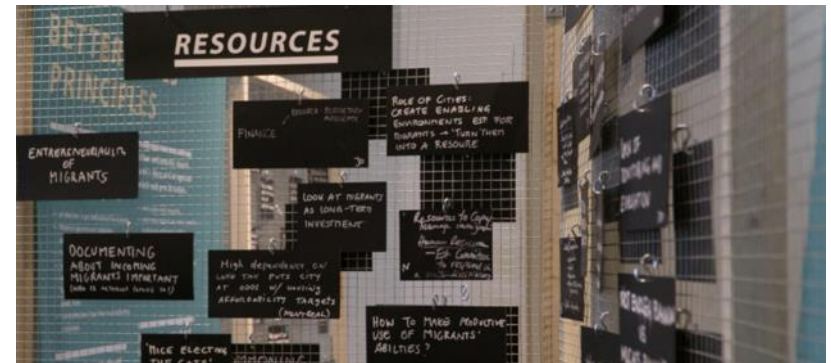
developed in Sleman are **discussed/integrated in strategic documents** of entities (government/business associations) on national level of Indonesia



Output 10: Tools and instruments

elaborated in Sleman are **continuously fed into a SEA** wide process on polycentric management of urban water resources

Organizing Sleman/nation/SEA wide network processes



Outcomes and outputs of PolyUrbanWaters in Sleman - Outcome D

Outcome D:

Technical and methodological capacities developed for **practice-oriented research** on polycentric approaches to water sensitive villages in Indonesia



Output 11: Universities/Academic institutions support local **government** and other stakeholders in the **design** of water-sensitive urban development through **practice-oriented research and capacity development**



Output 12: Universities/Academic institutions are active members of a **nationwide/SEA wide network** for practice-oriented research and capacity building

Organizing practice-oriented research and international exchange



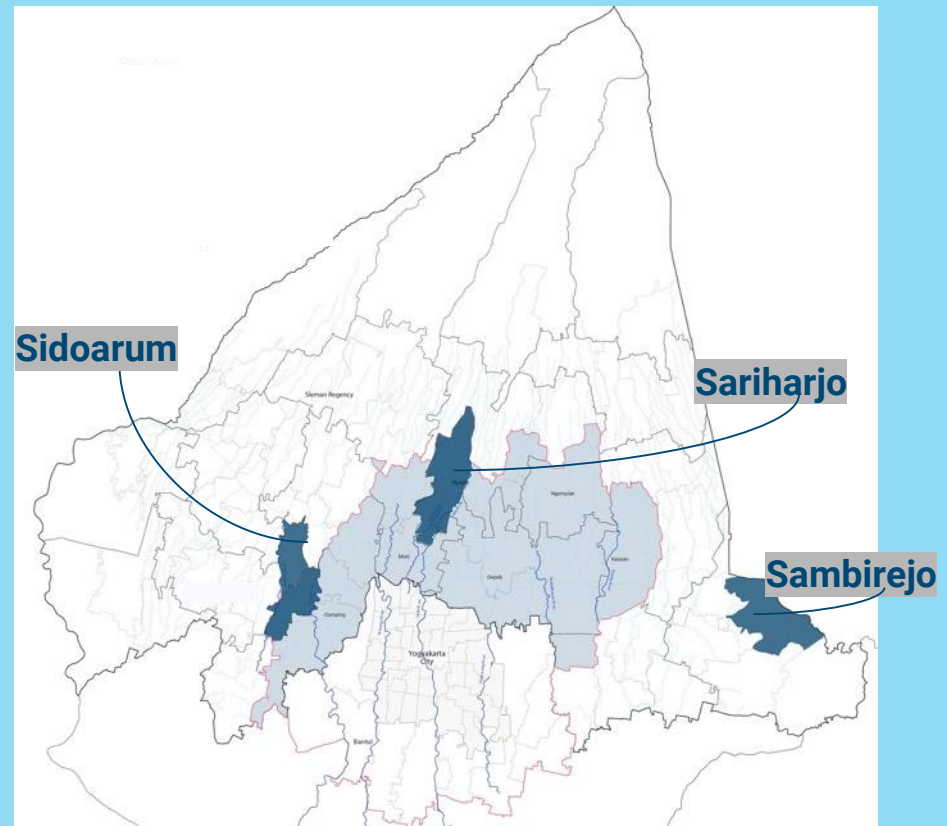
PolyUrbanWaters will work in selected villages

Developing transferable tools and models that can support village planning processes

PolyUrbanWaters will support stakeholders on different levels of urban planning.

Through various selection criteria, **three villages have been shortlisted.**

After the budget for next phase is approved, **two** of the shortlisted villages will be selected, in consultation with concerned stakeholders, for project implementation.



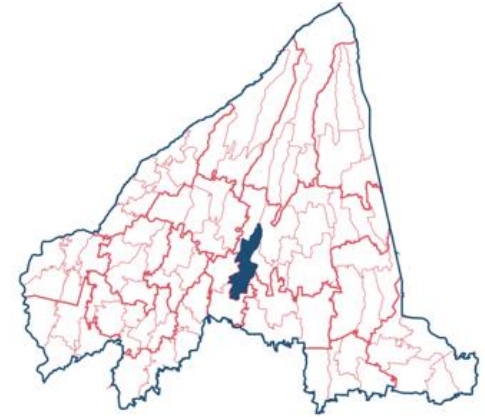
SARIHARJO

Challenges:

- **Rapid urban growth:**
 - **Water demand**
 - **Wastewater management**
 - **Water quality**
 - **Solid waste management**
 - **Investments**
 - **Vulnerability to climate change**

Possible focus areas:

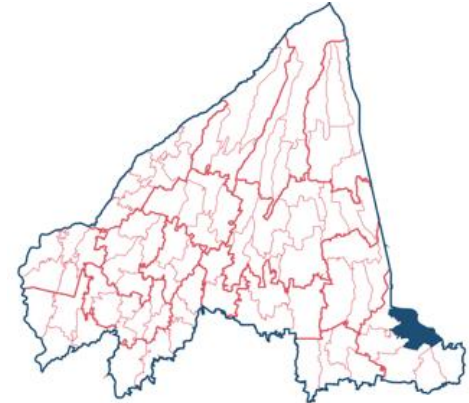
- Village-level scenario planning that leverages rapid growth of commerce, housing and rental dormitories - and investing in water-sensitive measures and inclusive growth
- Riverbank communities and potential transformations
- Catchment level water quality improvement and monitoring urban-agricultural transformations and potential synergies
- Decentralized community-based water and sanitation systems for new housing developments
- Leveraging village asset land for urban land management and water sensitive investments



SAMBIREJO

Challenges:

- **Rapid tourism development**
 - Water security
 - Water demand
 - Water conflicts
 - Wastewater management
 - Water quality
 - Solid waste management
 - Investments
- **Seasonal water scarcity**



Possible focus areas:

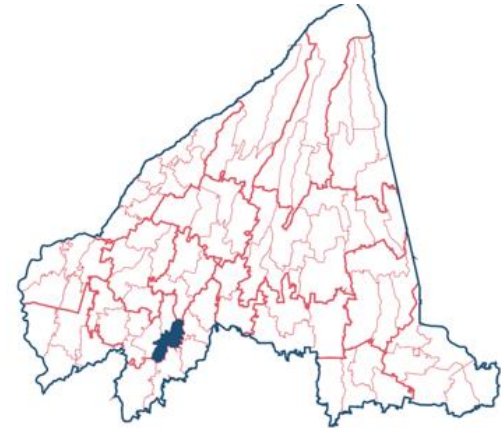
- Village-level scenario planning combining water security issues and tourism development
- Tools and strategies to improve water security for domestic use and irrigation
- Leveraging village asset land for urban land management and water sensitive investments
- Mitigation of water-sensitive conflicts



SIDOARUM

Challenges:

- Urbanization
- Protection of agriculture
- Water demand
- Wastewater management
- Water quality
- Land use changes



Possible focus areas:

- Village-level scenario planning that considers urban growth and conservation of agriculture (paddy fields)
- Interactions between urban drainage, irrigation and water quality
- Tools and strategies to improve water security for domestic use and irrigation
- Leveraging village asset land for urban land management and water sensitive investments



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References:

Slide 21 - (middle, bottom right) Habitat Unit 2019

Slide 24 (Top left): International Water Association, 2020 (<https://iwa-network.org/projects/nature-for-water-and-sanitation/>)

Slide 24 (Top right): Barry Wilson Project Initiatives, 2020. Accessed on 05.04.2020, via <http://www.initiatives.com.hk/sponge-city.html>

Slide 24 (Bottom left): Ixtenso Magazine for Retailers, 2020. Accessed on 07.04.2020, via <https://ixtenso.com/logistics/demand-for-drone-delivery-in-e-retail-is-high.html>

Slide 24 (Bottom right): Hageplex Technologies Limited, *A Simple Expectation Guide to GIS Training in Nigeria*. Accessed on 04.04.2020 via: <https://www.hageplex.com/ict-expectations-to-our-gis-training-in-nigeria/>

Slide 25 (Top left): Development Alternatives Newsletter, 2016. Accessed on 05.04.2020 via: https://www.devalt.org/newsletter/jun16/of_2.htm

Slide 25 (Top right & bottom): Solutions - BORDA, Accessed on 07.04.2020, via: <https://www.borda.org/solutions/>

Slide 26 (Figure): BORDA 2017, *Dewats Systems*.

Slide 31 -(Photos): Habitat Unit, WUF 2018, WS Medellin 2018

Slide 36 (Photo): Sacred Ruins of Yogyakarta, Globerovers. Accessed on 05.04.2020 via <https://globerovers.com/ruins-yogyakarta-indonesia/>

Slide 37 (Photo): Organisation des Nations Unies pour l'alimentation et l'agriculture. Accessed on 05.05.2020 via: <http://www.fao.org/fishery/photolibrary/photos/detail/fr/c/1260096/>

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