

# PolyUrbanWaters Symposium 2024

## Summary Report

*From 24<sup>th</sup> to 27<sup>th</sup> September, 2024 at the Asian Institute of Technology*



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### **About the PolyUrbanWaters Project and this report**

This publication is an output of the research project “Polycentric Approaches to the Management of Urban Water Resources in Southeast Asia – A Localization of the Sustainability Goals of Agenda 2030 and the New Urban Agenda at the City/Municipality Level” [www.polyurbanwaters.org](http://www.polyurbanwaters.org) (PolyUrbanWaters, 01LE1907A1-C1)

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We also express our gratitude to Prof. Dr. Thammarat Koottatep from the Asian Institute of Technology (AIT) for his keynote presentation, which provoked thought and meaningful engagement on sanitation challenges.

The symposium benefited immensely from the participation of delegations from Laos, Cambodia, and Indonesia, whose local knowledge and insights enriched the dialogues. We deeply acknowledge the involvement of representatives from various institutions, including the Department of Housing and Urban Planning, Ministry of Public Works and Transport, Laos; the Vice-Head of Housing, Urban Planning, and Water Supply of Houaphanh; the Department of Public Works and Transport, Administration Office, and Urban Administration and Service Office of Sam Neua, Laos. Additionally, the engagement of his Excellency Sopheap Sreng Deputy Provincial Governor of Kratié Province, Cambodia, the Director of the Technical and Development Office of the General Department of Wastewater Treatment Systems Research, MPWT, the Deputy Director of the Department of Public Works and Transport, Kratié, and the Deputy Municipal Governor, Kratié, was invaluable. From Indonesia, key contributions came from the Head of Development Administration at the Regency Secretariat (Bappeda), the Head of the Environmental Department, and the Head of DPUPKP Kabupaten Sleman (Public Works Department). Their and their colleagues' active engagement in discussions, questions, and collaborative exchanges underscored the importance of multi-stakeholder collaboration in tackling urban water challenges.

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Lastly, we sincerely thank the German Federal Ministry of Education and Research (BMBF) and the German Aerospace Center (DLR) for their support in facilitating the second PolyUrbanWaters Symposium and this report.

This event exemplified the power of collaboration and knowledge sharing in advancing sustainable and resilient urban development, and we appreciate the contributions of all who made this significant milestone possible.

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## I. Executive Summary

The Symposium examined the outcomes of the PolyUrbanWaters research initiative (2021–2024) among participating cities, governmental bodies, professional partners, and academic institutions from Indonesia, Cambodia, Laos, Thailand, Vietnam, and Germany. The focus was on the relevance of these outcomes in facilitating water-sensitive urban transitions in Southeast Asia.

Mr. Curt Garrigan from UNESCAP underscored the critical importance of water-sensitive transformation in urban and climate policy. He emphasized the alarming speed of climate change in the Asia-Pacific region, where temperatures have increased more rapidly over the last 60 years than the global average. Additionally, the region has seen a rise in both the frequency and intensity of extreme weather events and natural disasters while ranking poorly in environment-related Sustainable Development Goals, notably in climate action.

Representatives from the partner cities expressed appreciation for the contributions of PolyUrbanWaters and the insights gained regarding their unique urban water management challenges. Baseline assessments conducted in partner cities, Kratie (Cambodia), Sam Neua (Laos), and Sleman (Indonesia), in their specific urban districts, were pivotal in facilitating informed decision-making. These assessments revealed vulnerabilities, such as susceptibility to flooding and rising temperatures driven by climate change, along with their effects on health, private and public assets, and ecosystems. Furthermore, they stressed the significance of existing blue-green infrastructures, such as urban wetlands, in ensuring water security, public health, and climate change adaptation. There was a broad agreement on the necessity for robust modelling of urban and climate change impacts to formulate effective strategies and measures.

The Symposium emphasized the need for incremental approaches that allow cities to engage in a structured process towards water-sensitive transitions. Given their governance structures and institutional and financial capacities, many secondary and tertiary cities currently lack the capacity to adopt complex systems, such as Integrated Urban Water Management (IUWM). City representatives recognized that the granular approach of PolyUrbanWaters promotes capacity building. However, any conceptual framework must be anchored in specific, realistic, and actionable measures to deliver effective services for enhanced water and urban management. The consensus was that participatory and consultative planning processes are crucial for shaping resilient infrastructure development and management schemes.

It was also acknowledged that integrated infrastructure and development approaches, which effectively merge grey and blue-green infrastructure (including Nature-based Solutions), are vital for creating resilient and livable cities. Nonetheless, discussions highlighted an urgent need for appropriate regulatory, governance, financial, and sustainable management mechanisms to back the development of such integrated systems. Additionally, it became clear that proactive engagement from cities and

governmental bodies is necessary to safeguard existing blue-green infrastructures, with a particular call for national institutions to establish the required enabling conditions.

The anticipated implementation phase of the PolyUrbanWaters project, scheduled for 2025 to 2027, will emphasize the application of strategies developed during the research and development stage. The objective is to assist partner cities and national governmental entities in scaling up these outcomes across entire urban areas and, potentially, contributing to national level discourse, guidance and regulation.

## II. Introduction

Polycentric approaches to urban water resource management are pivotal for the water-sensitive transformation of secondary and tertiary cities in Southeast Asia, enhancing their resilience, inclusivity, and livability. The PolyUrbanWaters project, which engages local and national stakeholders, including public authorities, civil society, communities, the private sector, and academia, has developed and tested this strategic concept in three partner cities: Kratié in Cambodia, Sam Neua in Laos, and Sariharjo/Sleman in Indonesia, from 2021 to 2024. This initiative, which includes entities from Cambodia, Germany, Indonesia, Laos, Thailand, and Vietnam, is funded by the German Federal Ministry of Education and Research (BMBF).



Figure 1: Participants of the PolyUrbanWaters Symposium in Bangkok (source: PUW own photo, 2024)

The Symposium's primary objectives were to evaluate the relevance and applicability of polycentric approaches to urban water management within various Southeast Asian urban contexts. Additionally, it aimed to assess the effectiveness of key tools from the

PolyUrbanWaters project, such as Baseline Assessments, Vision Building, Strategic Projects, and Capacity Building Processes. The discussions focused on identifying practices, challenges, and opportunities to transition successful initiatives into a sustainable framework for water-sensitive urban transformation. Participants also prepared for the forthcoming Implementation Phase of the project, set for March 2025 to February 2027, which seeks to empower cities and national authorities in Southeast Asia to expand these polycentric management approaches. Each day of the Symposium was dedicated to specific themes, explored through presentations, interactive discussions, and workshops, allowing participants to engage in group discussions and plenary sessions.

### III. Symposium Agenda

<b>24.09.2024 // Understanding water challenges within a rapid urban transformation process of secondary and tertiary cities in Southeast Asia</b>
8.30 - 9.00 Registration
9.00 - 9.20 Welcome by AIT, BORDA, Technical University of Berlin and University of Applied Science Cologne, program and introduction of participants
9.20 - 10.00 Keynote Speech from UNESCAP by Mr. Curt Garrigan, Head of ESCAP's Sustainable Urban Development Section
10:00 - 10.30 Polycentric Approaches for Water-Sensitive Urban Transformation in Southeast Asia by Dr. Gutterer
10:30 - 10:45 Coffee break
10:45 - 12:00 Instruments and Tools for Water-Sensitive Urban Transformation and the Importance of Baseline Assessments by TUB and ITT
12:00 -13:00 Lunch break
13:00 - 13:45 Assessing water sensitive challenges in Indonesia: the case of Sariharjo/Sleman by Indonesian Delegation (Bappeda), ITT and TUB
13:45 - 14:30 Assessing water-sensitive challenges in Lao People's Democratic Republic: the case of Sam Neua by the Lao People's Democratic Republic (LPDR) Delegation and BORDA Laos
14:30 - 15:15 Assessing water sensitive challenges in Cambodia: the case of Kratié by the Cambodian Delegation and BORDA Cambodia
15:15 - 15:30 Coffee Break
15:30 - 16:15 Interactive Discussion: Potential and water sensitive challenges in South-East Asia and Q&A
16:15 - 16:30 Summary of results Day 1 and outlook for Day 2
From 18:00 Evening reception

<b>25.09.2024 // Framing water sensitive urban transformation: Strategy Development, Participatory Urban Planning and Vision Building</b>
8:30 - 8.45 Wrapping up of Day 1 Results and Preview of Day 2 Program
8:45 - 9:30 Keynote Speech from Prof. Dr. Koottatep (AIT): Challenges to establish comprehensive sanitation schemes in context of polycentric urban development and Q&A
9:30 - 10:00 Shaping Strategic Vision: Participatory urban planning concepts and tools for water sensitive transformation in secondary and tertiary cities in Southeast Asia by BORDA Germany, TUB, ITT
10:00 - 10:15 Discussion and Q&A
10:15 -10:30 Coffee Break
10:30 - 11:15 Participatory Urban Planning: The case of Lao People's Democratic Republic (LPDR), Sam Neua by Lao PDR Delegation and BORDA Laos and Q&A
11:15- 12:00 Participatory Urban Planning: The case of Cambodia, Kratié by the Cambodian Delegation and BORDA Cambodia and Q&A
12:00 - 13:00 Lunch Break
13:00 - 13:45 Participatory Urban Planning: The case of Indonesia, Sariharjo/Sleman by Indonesian Delegation, ITT and TUB and Q&A
13:45 - 14:45 Breakout groups: Integrating Participatory Urban Planning into City Administrative Procedures and Agencies
14:45 - 15:00 Coffee Break
15:00 - 16:00 Forum on Participatory Urban Planning: Challenges, Integration, and Presentation of Results
16:00 - 16:30 Summary of results Day 2 and outlook for Day 3
From 18:00 Dinner

<b>26.09.2024 // Infrastructure Development for Water Sensitive Transformation</b>
8:30 - 8.45 Wrapping up of Day 2 Results and Preview of Day 3 Program
8:45 - 09:45 Hybrid infrastructure for water sensitive urban transformation in Southeast Asia by BORDA, TUB, ITT
09:45 - 10:30 Forum: Effectively Overcoming Challenges in Implementing Hybrid Solutions combining grey infrastructures and Nature Based Solutions
10:30-10:45 Coffee Break
10:45 - 11:00 Presentation of Discussions: Addressing challenges in implementing hybrid solutions effectively
11:00 - 12:00 Water Sensitive Transformation in Lao PDR the case of Sam Neua: Insights from the PolyUrbanWaters Project by Linnea Fölster (Hamburg Wasser)
12:00 - 13:00 Lunch Break
13:00 - 17:00 Site Visit/Study Tour
From 18:00 Dinner



<b>27.09.2024: From planning to action. Operationalizing Water-Sensitive Transformation</b>
8:30 - 8.35 Wrapping up of Day 3 Results and Preview of Day 4 Program
8:35 – 09:00 Learning from Past Flooding Disasters for Future Resilience by Dr. Bernd Gutterer, BORDA Germany
9:00 - 9:30 Turning Concepts into Concrete Projects: Identifying entry points for water sensitive transformation, insights from Lao PDR, the case of Sam Neua by Lao PDR Delegation and BORDA Laos
10:15-10:30 Coffee Break
10:30 - 11:15 Implementing water sensitive transformation projects through Standard Operational Procedures (SOPs) by Linnea Fölster (Hamburg Wasser)
11:15 - 12:00 Forum: Implementing SOPs in Indonesia, Lao PDR, and Cambodia – Insights from three Living Labs
12:00 - 13:00 Lunch Break
13:00 - 13:15 Implementation Phase – Outlook for concept and activities 3/2025 until 2/2027
13:15 - 13:35 Scaling Up Water-Sensitive Community Development at the Regency Level in Indonesia, the case of Sleman by Indonesia Delegation, TUB, ITT
13:35 – 13:55 Strategic Input for the Sustainable Management of Urban Wetlands: Advancing Water-Sensitive Transformation in Cambodia, the case of Kratié by Cambodia Delegation and BORDA Cambodia
13:55 – 14:15 Leveraging Tools Developed in Secondary Cities for Crafting Regulatory Frameworks, insights from Lao People's Democratic Republic (LPDR), the case of Sam Neua and BORDA Laos
14:15 – 14:30 Summary of workshop and closing remarks
14:30 – 14:45 Closing remarks by Prof. Dr. Koottatep (AIT)
14:45 – 15:00 Certificate Presentation to all Participants
15:00 Closing Coffee Break

## IV. Key Themes and Discussion

The following section provides a summary of the key themes presented and discussed during the symposium, including new methodologies, a shift in the 'business-as-usual' approach, a climate resilience focus, and the need to consider the application of new technologies or approaches based upon international experiences.



Figure 2 During the symposium, participants engaged in presentations and interactive workshops aimed at advancing water-sensitive transformations for cities in Southeast Asia. (source: PUW own photo, 2024).



Figure 3 Participants of the final PUW symposium at the Asian Institute of Technology, including consortium partners from Germany and Southeast Asia, as well as representatives from public authorities and administrative bodies (source: PUW own photo, 2024).

### A. Day 1: 24th September 2024

Upon the opening of the symposium, Mr. Curt Garrigan, Head of UNESCAP's Sustainable Urban Development Section gave an informative key note speech on the vulnerability of South-East Asia to the impacts of climate change: **the Challenges of Rapid Urban Transformations** (Figure 4 & Figure 5).



Figure 4 Opening presentation of the symposium by Mr. Garrigan, UNESCAP (source: PUW own photo, 2024).

In his opening speech, Mr. Curt Garrigan, representing the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), highlighted the alarming rate of climate change in the Asia-Pacific region, where temperatures have increased more rapidly than the global average over the past 60 years. This situation, along with the rising frequency and severity of extreme weather events and natural disasters, underscores the urgent need for transformative climate strategies. These challenges reflect the region's difficulties in meeting environmental Sustainable Development Goals, particularly in the area of climate action. Mr. Garrigan pointed to pressing urbanization challenges, noting that over 50% of the region's population currently resides in urban areas, a figure expected to rise to 70% by 2050, particularly affecting secondary and tertiary cities that are central to the PolyUrbanWaters project.

These cities are confronted with significant issues including over-extraction of groundwater, inadequate water management systems, poor wastewater treatment capabilities, and heightened vulnerability to disasters exacerbated by climate change and rapid, unplanned development. Although access to safe drinking water has improved significantly in Asia—from 74% in 1990 to 94% recently—and sanitation access has increased from 44% to 65% (mostly in urban areas), critical challenges remain. Alarming, wastewater treatment remains at only 4%, with pollution and poor water quality continuing to impact numerous communities. Furthermore, the over-extraction of freshwater sources poses a pressing concern, with urban water demand projected to increase by 55% by 2030, further stressing cities already facing water scarcity. Insufficient infrastructure hampers the capacity to meet rising demands for domestic water, manufacturing, and energy generation.

The PolyUrbanWaters project is particularly pertinent in addressing these interconnected challenges faced by secondary cities, as the need for realistic, resilient and sustainable urban planning is paramount. By focusing on secondary and tertiary cities, the project not only underscores the often-overlooked significance of these urban centers but also provides a roadmap for data-driven planning, policy integration, and capacity-building to support transformative urban growth throughout the region.



Figure 5 The Symposium Hall and a Token of Appreciation Presented to Mr. Curt Garrigan (source: PUW own photo, 2024).

Dr. Bernd Gutterer’s, PolyUrbanWaters Project Manager, presentation followed on the role that polycentric approaches have in the sustainable development of the three living labs: Sleman, Indonesia; Kratié, Cambodia and Sam Neua, Lao PDR (Figure 6).



Figure 6 The second presentation set the tone for the event, providing a framework for discussions and activities. Presentation by Dr. Gutterer (source: PUW own photo, 2024).

PolyUrbanWaters consortium partners, Prof. Dr. Lars Ribbe (ITT) and Mr. Adrian Hodgson (TUB), presented on the Key Tools for Water-Sensitive Urban Transformation and the Role of Baseline Assessments (Figure 7).

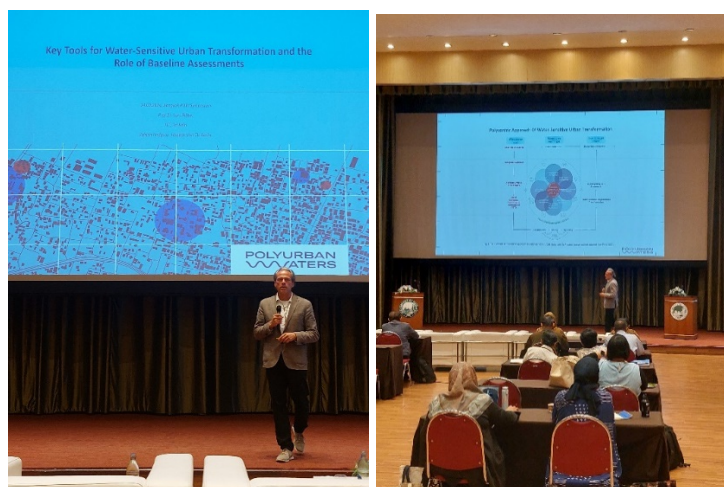


Figure 7 PolyUrbanWaters Consortium partners presentation about the tools for water-sensitive transformation and the Key components for integrating polycentric water-sensitive urban design (source: PUW own photo, 2024).

The next segment of the symposium's first day focused on ***understanding the water challenges within a rapid urban transformation process of secondary and tertiary cities in Southeast Asia.***

Each partner city presented on their experiences conducting baseline assessments in their living labs to explore water-sensitive challenges and identify opportunities for transformation in the region. There was then a discussion on the benefits and main challenges of conducting baseline assessments, how local public authorities can and should be involved and how decision-makers can benefit from the results.

### ***Findings from the Baseline Assessments per Living Lab***

**Sariharjo, Indonesia (Figure 8):**



*Figure 8 Consortium partners from Indonesia presenting their experiences conducting baseline assessments (source: PUW own photo, 2024).*

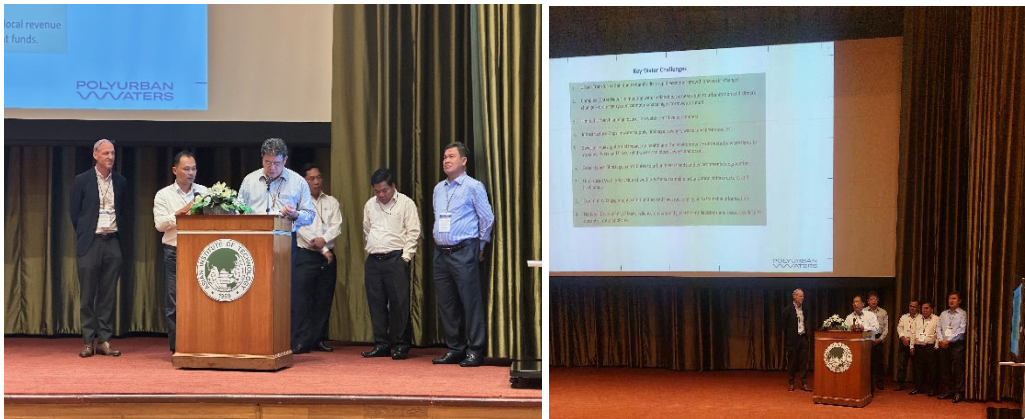
The PolyUrbanWaters project developed a specific form of Baseline Assessment that can act as a crucial tool for initiating an informed choice driven water sensitive transition of the cities. The Baseline Assessment plays a crucial role in raising awareness among decision-makers, thereby ensuring their active participation in the process of developing water-sensitive urban planning strategies. It promotes the formation of a task force that includes government officials and local communities, fostering a collaborative approach. Additionally, it shifts stakeholders' mind-sets towards proactively addressing environmental threats. In this case study, the team identifies settlement and population growth as significant drivers of vulnerability, highlighting the important connection between upstream activities and their direct impact on downstream areas, particularly in relation to volcanic proximity.

**Sam Neua, Lao PDR (Figure 9):**

*Figure 9 Consortium partners from Germany and Lao PDR shared their experiences in conducting baseline assessments. The presentation sparked active engagement and discussions about the results, with significant interaction from participants representing public authorities and administrative bodies in Lao PDR (source: PUW own photo, 2024).*

The Baseline Assessment serves as a valuable repository of information and data that can inform decision-making processes and prompt further actions among decision-makers. It underscores the importance of collaborative efforts among officials, provincial and local governments, and communities to achieve effective solutions and implementation. The assessment outlines key steps necessary for action and facilitates the sharing of lessons learned from other pilot cities for broader applicability. It fosters cooperation between governments and financial institutions, such as the Asian Development Bank, while supporting capacity-building through the identification of needs, training, and workshops. Importantly, it emphasizes community involvement and local partnerships, and encourages the adaptation of urban planning manuals for use in other cities nationwide. The extreme flooding in Sam Neua in September 2024 highlights the importance of robust modelling of the existing and emerging vulnerabilities in the context of the topography of the specific city, in this case characterized by its steep valleys, land use changes within the water catchment and the city area itself, and climate change impacts.

**Kratié, Cambodia (Figure 10):**



*Figure 10 Public authorities and administrative bodies and BORDA Cambodia shared their experiences in conducting baseline assessments in Kratié, Cambodia. Main challenges were showcased (source: PUW own photo, 2024).*

The Baseline Assessment offers a comprehensive understanding of the current situation, facilitating the development of processes that align with existing strategies and plans. The data and information gathered from the assessment serve as essential guides for decision-making and can inform subsequent actions. Its insights can be disseminated among various stakeholders, thereby influencing further steps in the decision-making process. Additionally, the assessment highlights the necessity for participatory planning, given the ongoing implementation of multiple infrastructure and social projects throughout the city. Moreover, it recognizes the Lake Area as a critical asset that must be integrated with donor-funded grey infrastructure projects to enhance overall urban development.

**Challenge:** How to simplify complex baseline assessment information for less-educated audiences?

**Solution:** Engage stakeholders and affected communities in an interactive process to help them understand the key insights from the baseline assessment.

**B. Day 2: 25th September 2024**

***Focus on Framing Water Sensitive Urban Transformation: Strategy Development, Participatory Urban Planning and Vision Building***

The second day’s keynote speech was by Prof. Thammarat Koottatep, Co-Director Global Water and Sanitation Center at the Asian Institute of Technology. He emphasised the challenges to establish comprehensive sanitation schemes in the context of polycentric urban development (Figure 11).



Figure 11 Prof. Thammarat Koottatep, presenting the challenges to establish comprehensive sanitation schemes in context of polycentric urban development (source: PUW own photo, 2024).

The day's discussions centred on the vital importance of participatory planning in developing strategic urban visions for water-sensitive transformation in secondary and tertiary cities throughout Southeast Asia. The session introduced essential concepts and practical tools for participatory urban planning, alongside strategies for integrating these approaches into city administrative processes to ensure lasting impact. Drawing from the PolyUrbanWaters project, participants examined real-world applications of participatory planning, identifying challenges, successes, and areas for improvement.

The session also identified specific administrative, logistical, and community-related obstacles that could hinder effective implementation. Emphasizing cross-sectoral collaboration, participants aimed to define "water-sensitive" cities tailored to their unique local contexts, establishing relevant goals and strategies that enhance stakeholder acceptance and facilitate implementation. Case studies illustrated participatory planning practices in various cities, while participants reviewed tools and methods to support inclusive planning and decision-making, with a particular focus on selecting and assessing Nature-based Solutions (NbS) for sustainable urban transformation.

*Participatory Urban Planning: The case of Lao People's Democratic Republic (LPDR), Sam Neua by Lao PDR Delegation and BORDA Laos (Figure 12)*



Figure 12 Key presenters Mr. Khamphilayvong (BORDA Lao) and Mr. Hodgson (TUB) during the presentation about participatory urban planning in Lao PDR (source: PUW own photo, 2024).



The discussions in Lao PDR emphasized the challenges, key benefits, limitations, and the critical need for capacity building and peer learning in participatory planning, particularly in terms of community-based sanitation efforts. An illustrative example highlighted the significant role that private landowners play by voluntarily contributing their land to enhance the project's benefit for the wider community and the city. This demonstrates how participatory planning can foster a collaborative environment where community involvement is essential for project success.

Key insights emerged regarding the dynamics of community engagement in participatory planning. While there are specific entry points to enhance community involvement, it is often the government and its partners that primarily drive the development process. Engaging the community at the appropriate stage of a project is vital, as is the local government's support, which typically proves to be a crucial factor in ensuring effective community participation. Additionally, addressing conflicting opinions requires careful selection of key individuals and organizations, such as the local public works department and administration, with the Village chief playing a pivotal role in conflict resolution due to their familiarity with local residents. For projects sited within a village, community involvement begins early to facilitate discussions around relevant compensation, eventually leading to a community action plan supported by local government.

Participatory planning offers numerous potentials and benefits for Laotian partners. It fosters collaboration among various departments, preventing project overlap and supporting the fulfilment of planned objectives. The coordination of projects with similar goals, exemplified by partnerships with organizations like BORDA and ADB, becomes more effective through participatory approaches, allowing for the unification of disparate information and data while providing opportunities for data validation. Furthermore, participatory urban planning addresses specific urban challenges, particularly in the realm of water management, by promoting local involvement that can yield significant contributions, such as land donations by private owners for community-based initiatives, thereby enhancing overall project implementation and sustainability.

*Participatory Urban Planning: The case of Cambodia, Kratié by the Cambodian Delegation and BORDA Cambodia (Figure 13)*



*Figure 13 Public authorities and administrative bodies and Mr. Hocking (BORDA Cambodia) during the presentation about participatory urban planning in Kratié, Cambodia (source: PUW own photo, 2024).*

In Kratié, Cambodia, the examination of tools and methods related to stakeholder engagement highlights the benefits and challenges associated with participatory urban planning. A noteworthy example is a recently implemented community-based solid waste management project on the island sangkat (district), which demonstrates the effectiveness of this approach in addressing local issues. By assessing these tools, stakeholders can better understand how to engage effectively with the community and enhance project outcomes.

Key insights from the development planning process indicate that yearly meetings occur between city councils, provincial councils, and ministry councils, where each council votes on priority projects. If funding is unavailable at the city or provincial levels, the project may be referred to the ministry, and if necessary, partnerships or investments from entities like the Asian Development Bank (ADB) are sought. Furthermore, in the allocation of land for development projects, authorities emphasize a gentle negotiation process for compensation, ensuring that affected individuals are not coerced into compliance.

Participatory planning presents numerous potentials and benefits for Cambodian partners, offering a platform for idea generation and issue identification that local governments can leverage to meet public needs and demands. It fosters the harmonization of stakeholder voices and disseminates vital project information, which enhances understanding among the community. Additionally, the transparency engendered through participatory planning contributes to more socially inclusive results, with local community involvement being crucial to a project's success. By gathering and sharing successful experiences from other countries, stakeholders can effectively illustrate project concepts to local communities, as demonstrated by the solid waste management initiatives on the island sangkat of Koh Trong in Krong Kratié, which empower local residents to manage waste collection independently with the proper information and planning.

**How do you involve the local community in planning for spaces they will use?**

In the case of Kratié, Cambodia and the Spean Sor (White Bridge) location:

- All communities discuss about what they want, such as a green environment and a place to exercise.
- Local authorities and communities will allocate land for the project.
- Municipality will inform people about the plan.
- Even if no budget, municipality will integrate into 5 and 3 year planning.
- Use social media to attract partners.
- Include in agenda of regular municipal authority and inform stakeholders.
- Inform wider public at public events at the provincial and national levels.

*Participatory Urban Planning: The case of Indonesia, Sariharjo/Sleman by Indonesian Delegation, ITT and TUB (Figure 14)*



*Figure 14 Indonesia delegation during the presentation about participatory urban planning in Sleman, Indonesia (source: PUW own photo, 2024).*

In Sleman, Indonesia, the discussion centred on the various benefits and challenges of participatory planning within urban contexts, emphasizing the necessity for appropriate handover and long-term maintenance to ensure the sustainability of investments in addressing specific urban challenges over time. A key point made was that the government is dedicated to incorporating community input in the planning process, reflecting a long-standing tradition of engaging rural communities in development initiatives. This commitment is crucial for fostering a sense of ownership and responsibility among residents, which is essential for the long-term success of urban projects.

Several insights were shared pertaining to the nature of participatory planning, noting that it requires substantial time and commitment, as well as a learning process for both facilitators and community members. The government allocates a designated budget for the implementation of PolyUrbanWaters projects based on project plans, which is fundamental for ensuring adequate resources for effective action. The assessment process for flood-related issues begins with identifying their causes, leading to the development of solutions aimed at mitigating these challenges. However, it was noted that many issues often originate from problems outside the village, prompting discussions about how to protect communities by addressing upstream causes of flooding, necessitating cooperation with neighbouring cities and institutions beyond the local level.

The potential advantages of participatory planning for Indonesian partners are significant, as it enhances the relevance and effectiveness of initiatives by aligning them with the needs, preferences, and priorities of the community. This approach builds local capacity by equipping residents with necessary skills and knowledge while giving them a voice in decision-making processes, which encourages innovative solutions. Furthermore, participatory planning fosters a more collaborative working environment, engenders community buy-in, empowers local populations, and promotes social

inclusion within projects, thereby significantly contributing to the overall success and impact of urban development efforts.

The presentation and subsequent discussion provided valuable insights into how Participatory Urban Planning can effectively address specific urban challenges, highlighting key strategies tailored to tackle pressing issues in urban development. Participatory planning facilitates comprehensive discussions around community needs and challenges, emphasizing the crucial role of clear communication in understanding problems and finding solutions—ideally conveyed in simple language that resonates with community members.

Effective leadership, exemplified by the active participation of the mayor, underscores the importance of engaging key individuals to achieve development goals, necessitating the involvement of representatives at various levels. While budgeting often occurs incrementally, proposals are occasionally elevated to higher levels of government for additional funding, indicating a need for a cohesive approach to resource allocation (Figure 15).

Understanding the planning process in its entirety enhances the ability to replicate successful strategies in other cities, where tools and processes employed in one region can serve as models for others, albeit with challenges, particularly in areas with fewer resources and less leadership. It is essential to clarify roles regarding project implementation and maintenance, including the upkeep of newly developed areas, such as nurturing trees post-planting. Ultimately, projects will transition from government ownership to village management, with the objective of instilling a sense of responsibility in communities before this handover occurs, as local residents frequently do not perceive ownership of government-funded initiatives.



*Figure 15 Active discussion between participants of the symposium and the Indonesia delegation (source: PUW own photo, 2024).*

*Integrating Participatory Urban Planning into City Administrative Procedures and Agencies and the Challenges Faced by City Administrative Procedures and Agencies in Implementing Participatory Urban Planning*

Limited local facilitation skills and budgets are notable themes constraining effective participatory approaches across locations with different levels of participation.

**Lao, PDR (Figure 16)**



*Figure 16 Short interactive workshop sessions were part of the PUW symposium. In this session Lao PDR, delegation reflects on the challenges and options for integrating participatory urban planning into city administrative procedures and agencies (source: PUW own photo, 2024).*

There exists a notable lack of skills and knowledge regarding participatory planning within urban development, coupled with limited budgets to organize workshops and implement resulting plans. Facilitators must possess a comprehensive understanding of the communities and villages they serve, as there can be challenges in conveying flood threats to residents effectively. Additionally, the planning of workshops and development activities should align with officials' schedules, as government staff often face significant work burdens. To maximize participation, it is essential to hold meetings when local residents are available, which may necessitate evening sessions due to daytime commitments. Furthermore, discussions may sometimes diverge from the primary focus, with residents raising unrelated issues such as drainage needs instead of solid waste management concerns.

Cambodia (Figure 17)



*Figure 17 Short interactive workshop sessions were part of the PUW symposium. In this session Cambodia, delegation reflects on the challenges and options for integrating participatory urban planning into city administrative procedures and agencies (source: PUW own photo, 2024).*

There is a notable lack of sufficient information and data to support participatory planning activities, coupled with limited finances and human resources necessary for effective implementation. Institutional support is required to secure the resources needed for project financing. Furthermore, there is a low level of knowledge regarding the participatory planning process, resulting in relevant stakeholders often showing disinterest in attending planning sessions, as expressed with the sentiment, "We want them involved but they do not come." Although local teams consistently invite experts to participate, their involvement is frequently hindered by time constraints. At the subnational level, there is only a small pool of technical personnel available, and even when a project committee is established, stakeholders may not engage due to conflicting interests or lack of interest, complicating efforts to inform them of project outcomes. Additionally, conflicting interests may arise, posing challenges in helping participants understand the collective benefits of the initiatives, while controversial subjects outside the scope of the participatory planning process may also be introduced during discussions.

Indonesia (Figure 18)



*Figure 18 Short interactive workshop sessions were a key feature of the PUW symposium. In one session, the Indonesian delegation reflected on the challenges and opportunities of integrating participatory urban planning into city administrative procedures. The workshop findings were later presented, followed by an engaging discussion with all participants. The Indonesian team's presentation sparked great interest, as participatory urban planning is well-established in Indonesia, allowing them to share valuable experiences and insights with others. (Source: PUW own photo, 2024).*

While participatory planning is mandated by national law, navigating the numerous bureaucratic layers presents significant challenges. Effectively conducting participatory planning necessitates both time and financial resources, with a strong emphasis on ensuring inclusive processes that primarily engage marginalized groups. Furthermore, it is essential that data, including complex scientific information, be presented in an understandable manner for all stakeholders involved. Involving large and influential entities in participatory planning can be difficult, as fostering open dialogue among them is often a challenge. To address these issues, stakeholders strive to engage communities in an interactive manner, seeking innovative and participatory methods for solution development rather than relying solely on formal, traditional media.

**C. Day 3: 26th September 2024**

*Infrastructure development for water sensitive transformation*

On the third day of the Symposium, ITT Köln presented on Hybrid Infrastructure for water-sensitive urban transformation in Southeast Asia, highlighting the necessity to move beyond traditional approaches to foster the development of water-sensitive areas.

The presentation covered potential hybrid solutions and illustrated their practical application through examples from Sam Neua in Lao PDR and Sariharjo Village in Sleman, Indonesia. Following this, an interactive forum was held to delve into various criteria such as challenges, opportunities, operation and maintenance, ownership, and the potential for replicating these solutions across different contexts.



Figure 19 Ms. Fölster from Hamburg Wasser presenting technical insights to improve stormwater management in Sam Neua, Lao PDR case study (Source: PUW own photo, 2024)

Ms. Fölster from Hamburg Wasser then provided technical insights into enhancing stormwater management systems in Sam Neua, particularly in light of recent flooding events, linking her discussion to the hybrid solutions presented earlier (Figure 19). The afternoon concluded with a field visit to the Drainage and Sewerage Department of the Bangkok Metropolitan Administration (BMA). This visit offered participants a first-hand understanding of stormwater management practices in a vast metropolitan area increasingly threatened by sea-level rise, where the department plays a crucial role in flood control through monitoring precipitation forecasts, issuing warnings, and coordinating responses to flood events throughout the city.

*Hybrid Infrastructure for Water Sensitive Urban Transformation in Southeast Asia by BORDA, TUB, ITT<sup>1</sup> (Figure 20).*



Figure 20 Ms. Hoxha from ITT presenting the concept of Hybrid Infrastructure for water sensitive urban transformation in SEA. Insights on tool developed by ITT for the PolyUrbanWaters project (source: PUW own photo, 2024).

<sup>1</sup> Grey hard infrastructure, when combined with blue-green infrastructure, forms what are known as hybrid infrastructure solutions. In many cases and contexts, this is a comprehensive approach to sustainable urban development.



Key points from the presentation and subsequent discussion highlighted the importance of assessing river structures and the impacts of deforestation to understand the potential for hybrid infrastructure solutions. Due to the limited availability of specific data for assessments, there is a necessity to formulate general recommendations based on the existing information. Erosion challenges, notably prevalent in countries like Lao PDR, must be effectively managed in the context of infrastructure development, emphasizing the need for thorough risk assessments as part of baseline evaluations. In Sam Neua, a clear distinction exists between small-scale improvements that can alleviate localized flooding and the substantial flood events that arise from mountainous regions. To tackle severe flooding, larger-scale interventions upriver are essential, indicating the importance of a comprehensive analysis of various water challenges, climate change effects, and other influencing factors prior to the design and implementation of infrastructure solutions. Ultimately, while Nature-based Solutions can be beneficial for mitigating small-scale floods within communities, they may be insufficient for larger-scale flood events, necessitating the consideration of engineered grey infrastructure in conjunction with blue-green and nature-based approaches, thereby advocating for a mixed infrastructure system (hybrid) as a viable strategy.

**Where should efforts begin to implement hybrid or integrated infrastructure?**

1. Protect existing green and blue infrastructure in cities, such as lake areas.
2. Focus on restoring areas that can facilitate water infiltration—first define these areas, then explore potential solutions.
3. Green-Blue infrastructure is just one of many options identified for flood management. Large scale flooding may require robust supplementary grey-infrastructure.

*Interactive workshop sessions and forum: Effectively Overcoming Challenges in Implementing Hybrid Solutions Combining Grey Infrastructures with Nature-based Solutions (NbS)*

The interactive session aimed at identifying challenges and opportunities in integrating Nature-based Solutions (NbS) with grey infrastructure for urban water management, where participants engaged in discussions informed by country-specific case studies and utilized a newly developed tool from ITT featuring solution maps and cards showcasing nature-based water management options (Figure 24). This session generated notable interest and fruitful discussions; however, it was acknowledged that a more comprehensive workshop would be necessary to adequately evaluate the potential of the solutions presented. A deeper understanding of the technologies, their context-specific applicability, and their respective advantages, disadvantages, and constraints is essential for successful implementation. Despite these needs, the session served as a positive first step in introducing a tool designed to tackle complex urban water management challenges.

The primary obstacle faced by the living labs was the significant constraint posed by financing in the development of hybrid solutions, particularly regarding land ownership

issues, and fragmented mandates were also recognized as a challenge that could impact long-term maintenance and operation.

**Lao, PDR (Figure 21)**



*Figure 21 Delegation Lao PDR during the interactive session and presenting first results of the discussion. The solution map presented showed possible locations where nature-based solutions could be implemented (source: PUW own photo, 2024).*

Key urban infrastructure projects include budget constraints and the complexities involved in acquiring privately owned land, which often necessitates substantial funding. Additionally, various locations are managed by different mandated institutions, each serving distinct public and functional purposes, further complicating management efforts. The presence of publicly and privately owned land creates additional difficulties in the implementation of infrastructure projects, as coordinating between diverse ownership types can hinder progress and complicate decision-making processes.

**Cambodia (Figure 22)**



*Figure 22 The Cambodian delegation, including members from public authorities and administrative bodies, discussed the potential integration of Nature-Based Solutions (NBS) in the context of Kratié, exploring possible locations for implementation. This was followed by an active discussion on the challenges and options for combining NBS with traditional grey infrastructure, highlighting the opportunities and considerations for their integration (source: PUW own photo, 2024).*

The primary challenge faced in the development of large-scale projects is securing adequate funding, as such initiatives demand significant resources and national support. Two critical areas identified for development include the simultaneous construction of roads and the planting of trees, alongside the creation of green public spaces, particularly playgrounds for children. In Kratié, Cambodia, a substantial project planned

by the Asian Development Bank (ADB) seeks to establish a new drainage system and a large pumping station, aimed at mitigating and preventing localized flooding effectively.

**Indonesia (Figure 23)**



*Figure 23 The Indonesian delegation, building on their existing experience with Nature-Based Solutions (NBS). They discussed specific challenges and opportunities, particularly in relation to combining NBS with traditional grey infrastructure. Representatives from ITT and TUB were present to assist and facilitate the discussions, providing support and addressing questions during the interactive workshop session (source: PUW own photo, 2024).*

Ownership structures for water management solutions vary among individual, community, and local government ownership, complicating the implementation of hybrid solutions. Additionally, there exists a regulation mandating that households install water infiltration systems on their properties; however, questions arise regarding the monitoring and enforcement of this regulation at the local level. Project options differ in cost, ranging from affordable to more expensive, which means that not all proposed projects can be realized. Nevertheless, successful initiatives have the potential to be replicated in other villages, fostering broader application of effective water management practices.



*Figure 24 The tool developed by ITT, which included cards with nature-based water management solutions applicable to SEA context and a guidebook to this solutions (source: PUW own photo, 2024).*

### Field Visit on 26 September, 2024 to the Drainage and Sewerage Department, Bangkok Metropolitan Administration (BMA)

The informative visit to the Drainage and Sewerage Department of the Bangkok Metropolitan Administration (BMA) highlighted the department's efforts in monitoring real-time data and weather forecasts to efficiently manage drainage and sewerage in this extensive metropolitan area. Participants toured the control centre, where advanced technologies for flood monitoring and management were showcased, including a network of cameras for real-time flooding observation, sensors within drainage pipes to measure water levels, and a dedicated call centre for reporting flooding incidents. The system also facilitates the issuance of warning messages via social media and mobile phones, alerting residents to potential dangers. Additionally, dynamic maps displaying real-time storm movements were presented, illustrating how Bangkok employs technology to enhance urban resilience to flooding. Given its status as a coastal city vulnerable to sea-level rise, it is essential for the administration to understand regional meteorological events and ensure access to appropriate technical data and teams for managing and operating the city's water gates effectively.



## D. Day 4: 27th September 2024

### *From Vision to Action. Operationalizing Water-Sensitive Transformation*

The final day of the symposium opened with Dr. Bernd Gutterer's reminder of the importance of learning from past extreme weather events in Thailand and Germany and the current flood situation in Sam Neua (Figure 25).

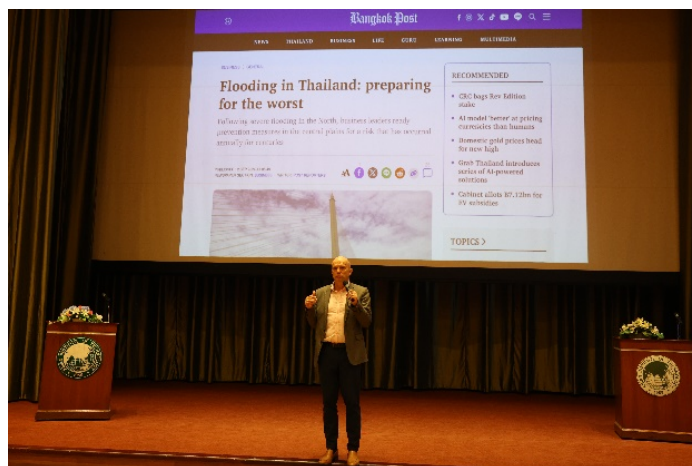


Figure 25 Dr. Gutterer during his final closing speech of the PUW symposium (source: PUW own photo, 2024).

The Laotian delegation then presented on their experiences of turning the water-sensitive concepts into specific actionable project concept notes to reduce stormwater flooding and the identification of key entry points (Figure 26).



Figure 26 Mr. Khamphilayvong (BORDA Lao) and Mr. Hodgson (TUB) shared their experiences on translating water-sensitive concepts into actionable project notes to reduce stormwater flooding and identify key entry points (source: PUW own photo, 2024).

Ms. Fölster from Hamburg Wasser provided the benefit of their expertise on Standard Operating Procedures (SOP) for operationalizing concepts into physical projects. This was followed by a breakout discussion in which the living labs discussed and presented on the implementation of SOPs in their contexts (Figure 27).



Figure 27 Ms. Fölster during her presentation about the Standard Operation Procedures (SOP) (source: PUW own photo, 2024).

The afternoon sessions presented the planned implementation phase projects for 2025 to 2026. This demonstrated how the planned strategies will be executed in the three living labs, highlighting practical steps, and expected outcomes.

The final activities of the day were the presentation of certificates to all participants and final wrap up remarks and comments from key symposium delegates.





Figure 28 Group photos of the delegation teams: Indonesia (top), Lao PDR (middle), and Cambodia (bottom) (source: PUW own photo, 2024).

*Opening remarks of the day from Dr. Bernd Gutterer: The Importance of Learning from Extreme Weather Events (Figure 29)*

The flood preparedness discussion and presentation by Dr. Bernd provided valuable insights into the flood challenges faced in Sleman and Laos, particularly in light of the recent flood disaster in Sam Neua. He referenced response strategies employed in Germany, notably the substantial infrastructure solutions implemented following severe floods, such as those that devastated the Ahr Valley in July 2021, resulting in widespread destruction and loss of life. Dr. Bernd emphasized Germany's approach to long-term infrastructure planning, which involves projects that can take years to complete and require significant financial investment. He also noted the measures taken by businesses in Thailand to prepare for the severe flooding that has been a recurring risk for centuries.<sup>2</sup>



Figure 29 Dr. Bernd Gutterer giving his opening remarks on the final day of the Symposium (source: PUW own photo, 2024).

Dr. Bernd concluded that addressing large-scale flood challenges extends beyond the scope of the PolyUrbanWaters (PUW) project, as these solutions necessitate coordination across multiple provinces and involve highly-engineered infrastructure that surpasses

<sup>2</sup> Source: Bangkok Post, 2 September, 2024

the district or county level, highlighting the need to acknowledge these limitations in future planning efforts.

*Turning Concepts into Concrete Projects: Identifying Entry Points for Water Sensitive Transformation, Insights from Lao PDR, the case of Sam Neua by Lao PDR Delegation and BORDA Laos*

The Laotian delegation emphasized the importance of first identifying water-sensitive challenges before proceeding to develop a strategic water-sensitive development plan, which is then followed by an action plan to transform concepts into implementable projects. This process involves several key steps: A. integrating various projects into the action plans, B. conducting community validation meetings as part of public consultation, C. drafting and costing concept notes, and D. obtaining final approval through a review conducted by local government authorities.

*Implementing Water Sensitive Transformation Projects through Standard Operational Procedures (SOPs) by Hamburg Wasser*

This presentation by Hamburg Wasser, Standard Operating Procedures for Water-Sensitive Development, featured a general introduction to SOPs, such as the accountability, procedures and those responsible for works; the development of the SOP for the operation and maintenance of stormwater management systems applicable to the living labs including specific steps, and the steps for the development of the SOP for the improvement of stormwater management systems (Figure 30).



Figure 30 Ms. Fölster during her presentation about the Standard Operation Procedures (SOP) (source: PUW own photo, 2024).

**Breakout Discussion Results**

The breakout discussion answered the question, ‘How can we ensure that SOPs are developed and actively maintained and adapted over time to support water-sensitive urban transformation?’ Below are the results from each living lab.



**Indonesia (Figure 31)**

*Figure 31 Delegation team from Indonesia during the workshop breakout session on SOPs to support water-sensitive urban transformation (source: PUW own photo, 2024).*

Each institution operates under its own Standard Operating Procedures (SOP), which can lead to challenges in implementation, particularly due to inconsistent follow-up by individuals within the organizations. Village leaders, elected by the community, serve as representatives of the local government, facilitating connections between the community and institutional frameworks.

**Cambodia (Figure 32)**

*Figure 32 Delegation team from Cambodia during the workshop breakout session on SOPs to support water-sensitive urban transformation (source: PUW own photo, 2024).*

Standard Operating Procedures (SOPs) are established to identify necessary projects, such as drainage systems, and to prioritize them based on their importance. A comprehensive plan is then created for the construction of these systems. If the budget is within established limits, the proposal is submitted to the provincial hall; otherwise, it is escalated to the national government for approval. Once a project receives approval, local authorities and residents are promptly informed. In cases where the project affects private property, landowners are compensated following negotiations. The Department of Public Works or the Ministry of Water Resources and Meteorology is tasked with the implementation of projects within the Kratié Lake Area.

### Lao, PDR (Figure 33)



Figure 33 Delegation team from Lao PDR during the workshop breakout session on SOPs to support water-sensitive urban transformation (source: PUW own photo, 2024).

Project development involves both management-level and technical-level processes that vary based on the project's location. At the ministry and provincial levels, projects are allocated to various organizations, where specific work procedures and assigned personnel are determined. Technical organizations are responsible for conducting assessments related to the projects and subsequently submitting their findings in the form of reports to the management for further action and decision-making.

#### *Drivers of the Development Process*

The Living Labs identified various drivers influencing the development process across different regions, highlighting the role of local regents in Sleman, Indonesia, while national-level ministries, particularly public works, serve as the primary drivers in Lao PDR and Cambodia.

In Indonesia, regents play a crucial role in steering the development process at the Regency level, which subsequently influences the Departments involved. The hierarchical structure encompasses the regency, district level, village level, and sub-village level, ensuring that initiatives progress through the appropriate channels.

In Cambodia, national-level authorities drive major construction projects, with oversight transitioning from the responsible company upon project completion to the ministry, which then allocates responsibilities to the relevant provincial departments. Although the maintenance of drainage systems is officially designated as a community responsibility, it is usually managed by the Department of Public Works.

In Lao PDR, the Department of Public Works at the ministry level drives the development process, while at the provincial level, this role is fulfilled by the Governor. Typically, a minimum of three official meetings are required before any development process can commence, ensuring a thorough examination and agreement among stakeholders.

#### *Implementation Phase – The way forward*

Each project location provided an overview of the upcoming phase, detailing how the strategies will be effectively implemented across the three living labs. The Symposium functioned as an essential platform for discussing the developed approaches and

determining how they could be sustained and executed in the next phase of the PolyUrbanWaters project. During this phase, the tested strategies and tools are expected to facilitate tangible urban transformations in additional potential study areas within Southeast Asia. Participants demonstrated a unified understanding of the key focus areas for the implementation phase, particularly among various cities, and expressed a strong eagerness to further engage in the forthcoming phase of the project.

In **Sleman, Indonesia**, the project's objectives will replicate and scale up Water-Sensitive Urban Planning (WSUP) practices, specifically in the Sariharjo area, by implementing established approaches and promoting best practices. This involves strategic tools and methodologies for climate-resilient urban planning, which will be adapted to align with BAPPEDA's Standard Operating Procedures. Key outputs include the execution of participative vision-building methodologies and the strategic implementation of WSUP guidelines.

Additionally, the project seeks to integrate and harmonize WSUP into local governance frameworks by enhancing participatory planning guidelines. Outputs from this objective involve the prioritization of water-sensitive elements in local short- and mid-term planning, alongside updates to the participatory planning guidelines. Furthermore, the third project objective focuses on the physical implementation of exemplary water-sensitive measures through capacity-building initiatives involving academia and the community. This includes an international interdisciplinary seminar on WSUP and training for local stakeholders on water-sensitive planning and climate adaptation.

The project's objective in **Sam Neua, Lao PDR**, focuses on scaling up the application of successful water-sensitive urban planning approaches and enhancing capacity building. This effort includes the development of an updated Urban Planning Manual that integrates water-sensitive principles across relevant sections to effectively address climate change and bolster urban resilience.

Additionally, a Roles and Responsibilities Framework will be established to delineate the specific roles and responsibilities of various institutions and stakeholders involved in the planning process. To support these efforts, existing tools, such as surveys and checklists, will be updated to incorporate water-sensitive components. Furthermore, the project will ensure that key government staff receive training on the updated manual, tools, and frameworks to facilitate effective implementation.

The project objective in **Kratié, Cambodia**, aims to embed the Development Plan for Urban Wetlands within the governance structures of both the province and city, with active involvement from local communities and the private sector. This plan will address crucial aspects of urban management, including stormwater and wastewater management, as well as the development of green spaces and recreational areas.

The initiative will also elaborate at least four strategic projects for the implementation of this Development Plan. Additionally, a policy brief will be developed to highlight the potentials, challenges, and best practices associated with the sustainable management of urban wetlands in Cambodia's secondary and tertiary cities. This brief will emphasize strategies for enhancing public engagement and fostering inter-sectoral collaboration.

Furthermore, experiences and approaches from water-sensitive urban development in Germany will be incorporated into the project, enriching the context and strategies employed within Cambodia and the other project living labs.

## V. Key Takeaways

The following section summarizes insights from the presentations and discussions, highlighting the challenges and barriers that need to be addressed, as well as opportunities for collaboration and future projects. Strategic recommendations for local governments and stakeholders are also included.

The structured approach of the PolyUrbanWaters (PUW) project to urban transformation emphasizes the progression from baseline analysis to vision-building, culminating in strategic urban planning and pilot measures, which has successfully guided cities toward sustainable urban water management. While the eight PUW pillars and the processes of baseline assessment and vision-building are generally understood, their implementation remains challenging due to time constraints and limited capacities. Tools and reports associated with the project are recognized as valuable resources for further guidance and understanding.

The PUW project offers a significant framework for identifying, analysing, and recommending solutions, yet it is imperative to acknowledge its technical limitations and the specialized expertise required for addressing complex issues such as water infrastructure design and flood control. Local administrations must take responsibility for advancing technical planning in collaboration with specialized experts, as the project can serve as a guide but cannot provide detailed technical input. Effective communication is essential to present complex concepts clearly and understandably, necessitating the use of local languages and resources, such as PowerPoint presentations in respective languages, to facilitate meaningful participation in workshops and symposiums. The capacity-building elements within the project have been highly valued, adopting a hands-on, learning-by-doing approach that has enhanced local skills in water-sensitive urban planning and management, highlighting the need for tailored capacity-building efforts in future project implementations.

Baseline assessments serve as justifications for prioritization and the dissemination of information while indicating potential tools and projects. Tools and instruments help to understand environmental aspects and contribute to the urban planning outcomes across the three living labs. Participants recognize the importance of inclusive participatory planning approaches, though they face challenges related to limited time frames and capacities. Engaging community and stakeholder participation throughout all stages of urban transformation—from baseline assessments to vision creation and strategic urban development—is crucial to ensuring that local needs and insights inform sustainable solutions. Moreover, varying participatory practices across different contexts and locations must be understood prior to planning activities. The discussions highlighted that cities cannot entirely replace traditional grey infrastructure with green or blue infrastructure, necessitating a multi-level approach to successfully implement hybrid solutions for both protection and restoration.

Participants noted the low levels of human resources and finances in cities, underscoring the urgent need for funding and expertise to support hybrid infrastructure developments. Establishing Standard Operating Procedures (SOP) is vital to ensure the efficient operation and maintenance of technical implementation, necessitating the development and availability of specific forms and instruments for conducting these tasks. The project results for Cambodia present opportunities to address recent calls from the Prime Minister to increase green spaces in urban areas, thereby enhancing livability and responding to climate change. Additionally, the Ministry of Land Management and Construction is increasingly recognizing the importance of natural water resources adjacent to urban areas in improving livability. The PUW project has also had a significant impact in Lao PDR, standardizing and scaling up project results for the benefit of other urban areas across the country. In Sleman, Indonesia, community involvement offers notable potential for public consultation on designs and funding methods, fostering a collaborative approach to urban development.

## VI. Challenges and Lessons Learned

The following challenges and lessons learned are summarised from the entire Symposium per some of the key themes and topics.

### *General Comments*

Participants expressed keen interest in the external presentations, including those from UNESCAP and Prof. Thammarat Koottatep, as well as the visit to the Drainage and Sewerage Department of the Bangkok Metropolitan Administration (BMA). They sought additional practical examples, implementations, and images beyond the familiar case studies, indicating a desire for diverse insights that could inform the future direction of the project. The discussions that arose during and after these presentations yielded valuable information regarding the genuine interests and capacities of the partners involved.

However, engagement in these discussions was predominantly limited to English-speaking representatives, highlighting the need for simultaneous and professional translation services as a priority for such high-level meetings. The translation and fast pace of the symposium presented significant challenges for some participants, impacting their ability to contribute effectively.

While participants appreciated having printed copies of reports available, it was recommended to ensure that each participant from local cities receives their own printouts of the materials and presentations. Providing these resources enables participants to take notes and encourages more questions and discussions afterward, enhancing the overall engagement and learning experience during the symposium.

### *Baseline Assessments*

- Baseline assessments can be overly complex and the objectives of the research need to be understood and achievable.
- Complete data sets are unlikely to be available. However, proxies need to be developed in order to develop relevant hypothesis or models.

### *Importance of Local Context and History*

- **Cambodia** – there is limited human resource capacity resulting from war and genocide and this highlights the difference in capacity in each living lab.
- **Indonesia** – communities are more used to inclusion in participatory planning from rural development experiences, but this experience is less suited to urban development contexts.
- **Lao, PDR** – the space for public consultation and participation is limited compared to other living labs, yet local stakeholders see the approaches as valuable but challenging to conduct.

### *Participatory Planning for Vision Building and Action*

A key challenge in participatory planning across different countries is identifying the appropriate level of public involvement that aligns with national planning protocols while also being beneficial, particularly in regions characterized by top-down governance. It is crucial to strike a balance between public participation and input from experts. Although public engagement is vital for understanding local needs and concerns, technical issues—especially those related to infrastructure design, engineering, or regulatory standards—require professional expertise. While public involvement plays a significant role in shaping priorities and identifying issues, technical decisions related to water infrastructure design or flood control should be led by experts to ensure safety, feasibility, and adherence to regulations.

Integrating public input with expert analysis fosters more informed and sustainable outcomes. It is important to assess how much public participation is realistic, feasible, and beneficial at different stages of the planning process to maintain a balanced approach that addresses both public and technical inputs. Moreover, effective participatory planning and vision-building demand considerable time, necessitating that facilitators and participants alike learn how to conduct these processes effectively. Additionally, the traditions of community-based participatory planning established for rural development may not be easily transferable to urban development contexts, presenting further challenges in adapting participatory methods.

### *Hybrid/Integrated Infrastructure*

There is an opportunity for hybrid solutions in urban planning; however, the availability of space and access to suitable land will heavily influence the form of intervention in many locations. This underscores the necessity for green/blue infrastructure to be supplemented by grey infrastructure, as resource-poor areas cannot bypass essential developmental transformations and must address critical needs such as sanitation. Additionally, land ownership issues and long-term maintenance responsibilities present challenges in integrating green/blue infrastructure into both existing and future urban settings.

The development of hybrid/integrated infrastructure necessitates long-term planning that spans decades rather than just a few years. It is imperative to involve expertise tailored to the specific case study at hand. Incorporating knowledge from other towns that have faced similar challenges or environmental contexts—such as mountainous, coastal, flat plains, or riverine areas—can greatly enhance planning outcomes. For

instance, urban planning in mountainous regions requires distinct considerations, including the management of steeper slopes, flood control, watershed management, erosion, and optimal infrastructure placement, which differ significantly from the challenges encountered in flatland or riverine towns. Therefore, customizing expertise to fit these unique local contexts is essential for ensuring that the planning process is targeted and that technical solutions are more effective.

#### *Standard Operating Procedures (SOPs)*

SOPs have an important role to play in ensuring infrastructure investments and associated planning are guaranteed to be effectively operated and maintained.

#### *Implementation Phase*

The implementation phase of the projects encompasses a wide range of activities, including scaling up efforts to update national urban development guidelines, replicating successful project activities in different locations, and addressing national priorities aimed at increasing urban green spaces while safeguarding urban water resources such as lakes, wetlands, rivers, and canals. Partner cities shared valuable insights from their real-world applications of the project's tools, highlighting the adaptability and relevance of these instruments in diverse local contexts. There was significant interest among city representatives and partners to learn from other case studies and experiences of partner cities.

#### *Varying Governance Structures*

The variety of governance structures across the living labs requires different implementing strategies, for example, public consultations may require very different approaches rather than a 'one-size fits all' approach as in more standard participatory planning approaches.

## VII. Outcomes and Action Points

#### *The Way Forward in the Living Labs*

The next phase of the project includes the replication of trialled activities in a new location in Indonesia, updating the national urban planning guidelines in Lao PDR, and implementing the Development Plan for Urban Wetlands in Kratié, Cambodia, in support of the national government's objective to enhance livability in urban areas. The symposium underscored the effectiveness of the empirically tested instruments developed through the PolyUrbanWaters network, which provide practical tools for facilitating water-sensitive urban transformations in secondary and tertiary cities across Southeast Asia. However, there remains a need for a thorough exploration and trial of these tools to gain a better understanding of their scope and potential applications.

Participants expressed interest in more technical training sessions, and specific sessions focused on selected tools pertinent to each case study could be beneficial. Due to time constraints during the symposium, there was insufficient opportunity to delve deeply into individual tools, preventing local practitioners from fully grasping how to apply them or for developers to learn how practitioners have utilized them in their contexts. Exchange visits between partner cities and others would enable partners to learn from

diverse experiences. Moreover, the Sleman delegation posed positive inquiries about how their city could engage in additional training, meetings, and workshops, such as those offered at the PUW symposium. They noted that the symposium was particularly enlightening, especially for newly involved government representatives.

## VIII. Conclusions

The PolyUrbanWaters Symposium 2024, held at the Asian Institute of Technology in Thailand from September 24-27, served as a crucial platform to assess and validate research and development phase results, while also outlining the next steps for project implementation. Key conclusions include:

*Climate Change Impacts:* The symposium highlighted the alarming rate of climate change in the Asia-Pacific region, with increased frequency and severity of extreme weather events. Notably, keynote speakers highlighted the increased vulnerability of Southeast Asia to climate change, exemplified by rising temperatures above the global average, an uptick in extreme weather events and natural disasters, and inadequate progress toward achieving critical Sustainable Development Goals related to climate action. Recommended responses include essential modifications to spatial planning, integrated water resource management, and infrastructure investments, which can only be effectively formulated if flood modelling and other risk assessments are robust, underscoring the need for accurate baseline evaluations. This emphasised the urgent need for transformative climate strategies and highlights the vulnerability of secondary and tertiary cities in Southeast Asia, which often lack adequate water management systems and infrastructure.

*Polycentric Approaches:* Polycentric approaches to urban water resource management were identified as pivotal for water-sensitive urban transformation. The symposium emphasized the importance and limitations of integrated water resource management systems, participatory planning, and community-driven approaches. Appropriate approaches need to be embedded within governance structures at city and national levels.

*Baseline Assessments:* Baseline assessments proved crucial for raising awareness among decision-makers, facilitating collaboration between government officials and communities, and identifying key challenges. However, the complexity of these assessments, and the limitations on data availability, necessitates simplified information for less educated audiences and the use of proxies when complete datasets are unavailable.

*Participatory Planning:* The symposium emphasized the importance of participatory urban planning. While effective, this method faces challenges related to time constraints, limited resources, and human resource capacity. The importance of cross-sectoral collaboration in defining "water-sensitive" cities tailored to each local context was emphasized, as it promotes the establishment of relevant goals and strategies that facilitate smoother implementation and greater acceptance among stakeholders. It also requires adapting approaches to align with the national contexts and governance structures, as well as striking a balance between community input and consultation and expert knowledge for technical issues, such as for infrastructure design.



*Hybrid/Integrated Infrastructure:* The potential and reality of Nature-based Solutions (NbS) and hybrid infrastructure (combining grey and blue-green infrastructure and NbS) for water-sensitive urban transformation was explored in terms of combatting flooding and extreme temperatures. However, the recent flooding event in Sam Neua illustrates that NbS alone are not sufficient to guarantee the city's flood resilience, grey infrastructure is the backbone of water sensitive urban transition. Furthermore, the financial feasibility and sustainable management of NbS must be clearly demonstrated while significant constraints posed by financing and land ownership are significant planning considerations. Moreover, the selection and design of solutions must consider local geographical factors, for instance mountainous compared to riverine topographies.

*Standard Operating Procedures (SOPs):* The importance of developing and implementing Standard Operating Procedures (SOPs) for the sustainable operation and maintenance of infrastructure was stressed. This requires consistent follow-up, clear roles, and strong institutional support. Greater exchanges between local agencies and partners to encourage mutual learning are advisable.

*Implementation Phase:* The symposium concluded with an overview of the planned implementation phase (2025-2027), which will involve replicating successful approaches in new locations, updating national urban planning guidelines, and implementing development plans. The implementation phase will refine the project's tools and adapt them to specific contexts and varying governance structures.

The symposium underscored the urgency of translating insights into practice and the pivotal role of robust modelling, effective governance frameworks, and practical implementation strategies in achieving the project's objectives. Further capacity development and project support is essential to addressing the challenges identified and ensuring the long-term sustainability of implemented measures.



Figure 34 Group photo with all participants of the PUW symposium outside the Asian Institute of technology (AIT), in Bangkok, Thailand (source: PUW own photo, 2024).

Annex Participants' List

1	Mr.	Bouavanh	Louangsay	Director at Housing and Urban Planning Research Division, Public Work and Transport Institute, Laos
2	Mr.	Saneha	Panyasavath	Department of Housing and Urban planning, Ministry of Public Work and Transport, Laos
3	Mr.	Phan	Vannavon	Vice-head, Housing, Urban Planning and Water Supply of Houaphanh, Laos
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14	Mr.	Phallin	Choup	Deputy Director of Public Works and Transport Kratié, Cambodia
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