

WATER GOVERNANCE

02/2023

INTERNATIONAL

REDACTIONEEL

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ELLEN MINKMAN, SHAHNOOR HASAN**
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A GLOBAL HYDRO-HUB

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WATER GOVERNANCE 02/2023

INTERNATIONAL



REDACTIONEEL INTERNATIONAL

■ Because the Dutch people have been forced to engage in practicing water management since they inhabited the land known today as The Netherlands, water-related problems have become challenges rather than unsolvable problems. In our low-lying country located, in the Rhine, Scheldt and Meuse delta, it is our conviction that we have become quite good at water management for safety and economic goals. An old saying goes: “God created the world, but the Dutch created the Netherlands”. Our worldwide reputation in the field of water management is widely respected and the Dutch water sector is regularly asked to assist in addressing international water-related challenges.

At a certain point, we started to see our knowledge on water management as an export product for the international market. We started to promote our own involvement in international water-related challenges. During the second stage of the Tour de France in 2015, the slogan “Water You Thinking? Bring In The Dutch!” was presented on the ir J.W. Topshuis, while the best cyclists of the world sprinted for victory over one of the Dutch hydraulic engineering icons: The Eastern Scheldt Barrier.

Dr. Gerard van den Berg said regarding ‘Bring in the Dutch’: “It is often joked that if you bring in Dutch experts, they’ll certainly come with a solution”. This does not mean that the Dutch knowledge on water-related challenges is unprecedented, but it is certainly valuable and widely requested to help tackle water-related challenges. To meet the needs, we set up international orientated programs, built relationships with water professionals all over the world and established partnerships. We would say that exporting our knowledge on water management for acquisition is not the focus anymore. Dealing with climate change is the challenge we all share. And as Annemieke Nijhof said during the 2023 UN Water Conference: “competition is immoral under the conditions we are facing”.

In this edition, the authors shed light on several Dutch projects with an international orientation. It includes republishing, updated and newly written articles. Bangladesh, Romania, Kenya and Pakistan are being covered and the edition also reflects on what the Dutch water sector itself learns from their activities abroad. The famous caricature dr. Poldergeist holds up a mirror to our Dutch perspective on the water management and climate futures.

Water Governance Magazine is a Dutch professional magazine covering institutional, administrative, social, legal, and financial aspects of water management. We wish you an interesting read and hope that you will be able to find our magazine for Anglo-Dutch publications in the future.

Hans Schouffoer, *chief editor*
Marijn Stouten, *editorial secretary*

THE NETHERLANDS AS A GLOBAL HYDRO-HUB

*Farhad Mukhtarov, Ellen Minkman, Shahnoor Hasan**

■ On 1 November 2021, Prime Minister of the Netherlands Mark Rutte delivered a speech at COP-26 in Glasgow, Scotland. He stressed the history of the Netherlands in “battling the elements for centuries. From North Sea floods to Caribbean storms” (GoN, 2021). He further stated that “(climate) adaptation is in our DNA” and stressed that sustainability innovations carry economic opportunities. He finished the speech with a statement that the world “can count on the Kingdom of the Netherlands”, in other words, that the Netherlands is open for business.

This speech fits perfectly in the policy of the Netherlands in the past 12 years – to present climate change as a set of business opportunities for the Dutch water sector and to position the Netherlands as the ‘world champion’ in this field. An image of a small, yet mighty country with a world-class water sector is founded on impressive domestic technological and governance achievements. Jan Tinbergen, the first winner of the Nobel Prize in Economics, wrote prophetically in his 1969 cost-benefit analysis of the Delta-works that “the reputation and the goodwill of the Netherlands in the world will increase” thanks to the Delta-works, which would in turn provide opportunities to recruit new business projects (cited in van Der Ham, 2018, 375). However, such reputation has not arrived automatically. It has been the product of decades-long careful cultivation through government policy, branding and political maneuvering (Minkman and van Buuren, 2019; Mukhtarov, et al. 2021b; Hasan et al. 2022).

The Netherlands has explicitly aspired to an international profile of excellence in water resources management (e.g. Government of the Netherlands, 2016; 2019; Mukhtarov et al. 2021b). Merrill Lynch and The Bank of America estimated the annual global water industry market at USD 800 – 1000 billion (Ahlers and Merme, 2016). The Netherlands hopes to expand in this lucrative area. Its

exports of water-related infrastructure and services have grown steadily since the early 2000s onwards; for example, from 4,1 billion EUR in 2004 to 8,1 billion EUR in 2019 (Panteia, 2020). The Netherlands aspires to be viewed as a “Global Hydro-Hub” (or a GHH-NL) — a center of excellence in water engineering, management and governance (Mukhtarov, 2020; Mukhtarov et al., 2021a). To achieve this, it has sought to present itself as a capable, reliable, results-oriented and neutral partner in international water affairs.

As a response to aggressive branding and various international activities of GHH-NL, an increasing number of voices in journalistic, scientific and professional circles question the economic logic that largely drives its climate resilience efforts (e.g. Kuijpers and Muntz, 2016). An influential Dutch TV pundit Arjen Lubach remarked jokingly in 2017 that “even the destruction of the planet is nothing less than a business opportunity” for the government of the Netherlands (HP De Tijd, 2017). In reference to self-promotion of the Dutch water sector, Chris Seijger of Wageningen University was quoted in 2018 saying that “we could be a little more modest... It is horrible how we think that we have the wisdom” (Stravens, 2018). This is an important debate about how GHH-NL engages with other countries, especially from the Global South, in order

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to advance the Netherlands' trade aspirations, achieve geopolitical objectives and promote climate resilience at once.

Critical voices at home and abroad have already harmed the global reputation of the Netherlands as it risks to acquire the image of a "climate-profiteer" (e.g. Corder, 2017; Colven, 2017). It is hence imperative in our view to have an open and inclusive conversation on how the Netherlands has engaged in climate resilience efforts internationally and where improvements are necessary.

Building on our recent work with regard to international branding, transfer and translation of water governance expertise from the Netherlands to countries in the Global South such as Bangladesh, Indonesia and Vietnam, we have identified six key narratives that actors engaged in branding GHH-NL have created and persistently repeated across various venues. These narratives are as follows:

- 1 'GHH-NL offers **unique** historically contingent expertise that is not available elsewhere'
- 2 'The past and present domestic achievements of GHH-NL avail it with expertise that is **universally relevant**, also in diverging socio-economic, cultural and geographical contexts'
- 3 'GHH-NL provides well-articulated **technocratic and apolitical** solutions'
- 4 'GHH-NL can secure **win-win outcomes** where client needs and Dutch interests complement each other'
- 5 'The **demand** for GHH-NL expertise is **natural** as countries approach the Netherlands for help themselves'
- 6 'The Dutch water sector is **a tight homogenous community** with the same goals, vision, and approach to solving water challenges.'

These key narratives serve the creation of a hegemonic discourse of the Netherlands as a "water country" capable and willing to engage internationally and that seeks its own benefits. These statements are carefully crafted, strategic representations of the Netherlands. They are discursively and linguistically constructed by marketing and communications experts, repeated and advanced in various venues domestically and internationally, and carry significant material effects in a myriad of water-related projects where GHH-NL works. These narratives matter – they legitimize an industry that has collectively earned 8,9 billion EUR in gross added value in 2019 (Panteia, 2020).

Some Points for Discussion

Our research points to the dangers of "over-selling" the Netherlands globally as a GHH. In lieu of conclusion, we

would hence like to advance a few suggestions that may encourage the debate among water professionals on the pages of this magazine and broader.

- 1 The Netherlands can be more nuanced in branding itself and should avoid claiming universal relevance of its water management expertise;
- 2 The Netherlands should cultivate long-term trust and relationships and avoid short-term pursuit of profits solely based on commercial bottom-lines;
- 3 The Netherlands should listen to local partners from client-countries, including communities they serve. At the same time, the policy-makers in The Hague may benefit from open dialogues with experts from the Netherlands and abroad on the ground, in the embassies and at the operational level of private companies engaged in water projects internationally;
- 4 The Netherlands should acknowledge its interest and avoid the language of "neutrality". In cases of conflicts between client-interests and commercial interests of GHH-NL, some procedure should be in place to regulate actions;
- 5 Revisit, rethink and re-brand what the GHH-NL understands and promotes as positive impacts of its expertise internationally. There is growing evidence of a mismatch between perceptions of climate resilience and development by the by the actors from the Netherlands and those of the governments and local communities in the Global South. A deeper and more open conversation on these fundamental issues is required for a sustained success.

The topic of this essay is sensitive as it touches upon both national and professional identities of the Dutch, expertise in water management, money, and different framings of climate change and resilience. There are many good-hearted and highly competent professionals working in the sector, who seek to achieve real and sustained impact for a better world. Making the work of diplomats, managers, communication experts and politicians explicit in branding, negotiations and management of GHH-NL's activities is very important (Hasan et al. 2019; 2020). At the same time, it is important to resist the temptation to see this often altruistic work in separation from advancing political and economic agenda of the Netherlands (Raev & Minkman, 2020; Mukhtarov et al. 2021b). How to combine multiple objectives, motivations and impacts remains an important question. We hope than an open debate will follow on the subject on the Netherlands as a preeminent global water policy actor and its roles and responsibilities globally.

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BANGLADESH PREPARES ITSELF FOR A CLIMATE RESILIENT FUTURE 2019

*Jaap de Heer, Martien Aartsen**

■ This article focuses on a practical example of applying and elaborating water governance and strategic management in Bangladesh. By preparing the Bangladesh Delta Plan 2100 the Government of Bangladesh utilizes state of the art insights and possibilities of what has been called Adaptive Delta Management, which embodies long term visioning and strategy making under different scenarios to deal with developments and uncertainties over time. Back-casting the long term vision and goals makes it possible to develop short and medium term strategies with measures and actions to be taken, as well as elaboration into an Investment Plan and to prepare the Government and governance to act upon it. Both authors work with consulting company TwynstraGudde and are closely involved in the Bangladesh Delta Plan formulation and implementation process.

Introduction and Background

The Bangladesh delta is the largest dynamic delta of the world. It is a land of many opportunities for a population of more than 165 million people. The soil is fertile and productive with the opportunities for multiple cropping. The plentiful rivers and water bodies provide ample scope for fisheries and livestock resources. The inland water transport offers a cheap mode of transportation. The open access to sea is a huge advantage opening up the opportunities for blue economy and trade. Modernization and economic growth have been substantial last decade.

Bangladesh faces however rigorous challenges, like increased flooding, freshwater unavailability, drought, groundwater decline, riverbank erosion and sedimentation, clogged drainage, water logging, salinity intrusion, deteriorated water quality, decreased trans-boundary water flows, sea-level rise, increased frequency of cyclonic storms and associated surges. Other challenges concern population growth and impacts of rapid modernization and economic growth as fast industrialization, unplanned urbanization accompanied by pollution and environmental degradation.

In the face of all adversaries, the country has gained considerable progress in the last decade in development activities which has inspired the Government to aim even higher. In view of the long term challenges presented by climate change and natural hazards, the Government wants to take measures to increase water safety and food security and to safeguard the socio-economic development of the country. This is the background for the government's request to prepare an integrated, techno-economic, water centric Bangladesh Delta Plan 2100 (BDP2100).¹ The background studies and making of the Delta Plan were assisted by the Government of the Netherlands. BDP2100 was approved by the Government of Bangladesh (GoB) in the National Economic Council chaired by the Prime Minister on 4 September 2018. Presently, implementation of BDP2100 has been started end of 2018, again with assistance from the Dutch Government and private sector.

Governance Challenges

Bangladesh is a fast growing delta country with many already existing water related issues at the forefront of

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serious climate change effects. Building on a long history of living in a dynamic delta, Bangladesh reduced poverty, improved human development and increased the growth rate to an average of 6,5% per year. The government of Bangladesh is presently looking ahead to become upper middle income country and to strengthen their progress to adverse effects of climate change by expressing the ambition to become a resilient and prosperous nation. The expected effects of climate change include dry and wet season water shortages and surpluses; vulnerability from being a lower riparian country of the river inflows; sea level rise and salinization. So many already existing and growth related challenges mentioned before coincide with climate change induced issues and problems. Physical climate change effects pose large governance challenges for Bangladesh: how to organise and prepare oneself as country to become resilient to uncertain climate change shocks and trends and to avoid socio-economic setbacks?

In view of the special long term challenges for development outcomes presented by climate change and natural hazards, the Government has decided to formulate a long term Bangladesh Delta Plan 2100 (BDP 2100) and to establish an institutional framework for its implementation. Initially, here was some confusion among the key participants in the process because they thought it would be impossible to make such long term plan. The outcome of discussions was that the short term (2030) of BDP2100 would cover 2 Five Year Plans for short term investments, that the medium term (2050) would be used for further improvements and climate adaptations and for preparing longer term need based measures and that the long term orientation offers more insight in climate change and provides a vision that serves as strategic direction. The government's ambition on this is to take the long term challenges of existing water problems and climate change impact into consideration, to look at the delta from a holistic point of view and to relate the various challenges of sustainable water management, food production, economic growth, ecology and environment and land resources to natural disasters and climate change. In defining the scope of the BDP, the government also insisted that long term developments like population growth and urbanization needed to be addressed and that the Chittagong Hill Tracts would be included. These

ambitions resulted in a much broader scope of the BDP and of background studies and strategy making than e.g. with the Delta Program in the Netherlands. Moreover, the Delta Plan had to provide an Investment Plan up to 2030 with an adequate institutional framework related to core governance principles of decision making, budget allocation, stakeholder participation and performance feedback. Based on that, BDP2100 including this Investment Plan are to be mainstreamed in the Five Year Planning cycle of GoB and in the Budget Programming and Allocation procedures to make swift implementation possible. This not only implies preparing the strategic Delta Plan but also initiating institutional reform and investment planning. The expectations in the early stage of the project are because of this much higher and broader than expected by the consultant team, which puts responsible government agency and consultant consortium under high pressure and debate whether it would be possible to deliver. The Inception phase was important to make the necessary adjustments in Workplan and process design. During the whole process very close collaboration and good relationships with the GoB led to efficient procedures with broad public consultation and participation and swift decision making.

Towards an adaptive Delta Plan BDP2100

Strategic Management approach

The extent of delta-related developments and uncertainties and their adverse effects on the natural system, society and economy is uncertain. Yet, the BDP-strategies had to anticipate these uncertainties, analyse the likely adverse effects on development outcomes, and identify possible strategic responses to counter them. This is a complicated issue to deal with during long range strategy making. A strategic management approach concerning main drivers of developments and their impacts and uncertainties provided options for formulating different scenarios. Analysis showed that future water conditions in Bangladesh are based on two main drivers: climate change and transboundary developments (Bangladesh is as downstream country dependent of interventions in India and China). Another major driver is economic development and land use changes. Based on the axes water conditions and economic development, four scenarios have been

Principles of Adaptive Delta Management

1. Holistic Analysis of Challenges and Knowledge Gaps in relation to Multisectoral Planning
2. Considering main External Trends / Drivers, their Uncertainties and Impact Characteristics
3. Connecting Short Term Action / Investments with Long Term Vision and Higher-Level Policies
4. Elaborating alternative Adaptation Pathways checking for possible Tipping Points to act upon
5. Avoiding Over- and Under Investment
6. Connecting Public and Private (investment) Agendas
7. Developing Institutional Framework for Mainstreaming BDP2100, Coordination and RBM&E

Figure 1.
BDP2100 principles
of Adaptive Delta
Management.

formulated: Resilient, Productive, Moderate and Active. These External Scenarios are elaborated in a participative way as narratives of possible futures which may happen and which one can hardly influence. We faced two problems of acceptance here. One is about the type of scenarios and the way they are used, because GoB normally works with, and chooses from several policy scenarios. External scenarios as narratives of futures which may or may not happen, which one cannot choose from are new and feel uneasy. Secondly, the naming of the scenarios is sensitive. Only positive labelling was acceptable e.g. congestion and stagnation as label was not preferred because government policy was aiming at growth and development. The scenarios were discussed many times, further refined, also with calculations on the main drivers and accepted for checking the BDP-strategies on robustness. Another method used to address uncertainties on the very long time span is accepting that there is no one best way to achieve goals and instead designing various alternative adaptation pathways. Focus is then also on monitoring the drivers and state of the water system, looking for tipping points and acting upon it by adaptation, avoiding strong structural interventions as long as possible also to avoid lock in situations.

The Adaptive Delta Management (ADM) approach underlying BDP2100 involves essentially making strategic choices to facilitate development under these uncertainties. ADM has been introduced to clarify the strategic character and aims of BDP 2100 as a long term, holistic and techno-economic water centric plan. ADM as applied in the BDP 2100 aims to support holistic strategy making, planning and implementation as well as improved water governance in the Bangladesh delta under conditions of uncertainty; relevant principles are mentioned in Fig.1.

To be able to prepare the BDP2100, information and understanding are required to learn how the natural system behaves and e.g. how the governance system has been organized and functions. Holistic analysis resulted in identification of main issues, challenges and knowledge gaps. For this purpose 19 Themes were indicated to study to achieve the right background to be able to understand the delta related systems and processes. In the end however, 26 Studies² were conducted on many topics and

to BDP related sectors given the broader scope mentioned earlier and upcoming issues during the strategy process. The information and outcomes of these Studies were used to discuss the problems at the local level in so called Delta Ateliers (interactive diagnostic and design workshops), held in almost all districts. The results led to final Baseline Studies and to indications of possible strategies and measures which were processed in a participative way and with expert judgement into potential ones and finally into preferred strategies and measures. BDP 2100 has developed strategies and measures in light of various possible futures that lie ahead and is designed to be changed over time as new information becomes available or GoB priorities change. Instead of only focusing on short-term ‘trial and error’ actions and projects, BDP 2100 developed the long-term vision while prioritizing short-term ‘no regret’ projects and offering alternative adaptation pathways depending on developments taking place over time with possible tipping points coming up regarding these developments or in relation to political choices, changes in funding or in public acceptance of certain measures by stakeholders or public.

ADM aims to support the development of an adaptive and integrated plan to enable robust and flexible decisions in deltas under uncertain changing conditions. This adaptive planning approach is directed towards the long term vision and goals and is at the same time flexible in how and when to implement strategies and actions. To be sure that designed strategies contribute to the goals for achieving the vision, the strategies were discussed and tested against the different scenarios. Although the approach is inspired by delta planning in the Netherlands, Bangladesh added specific features to the approach. While in the Netherlands the application of ADM focuses on the question: *“How can we protect our country from adverse impacts resulting from uncertain changing conditions”*, in Bangladesh the application of ADM focuses on development goals and thus aims to answer the question *“How can we enable socio-economic development under uncertain changing conditions especially regarding climate change and (transboundary) water resources issues?”* BDP2100 thus focuses on investments for achieving development goals including protection that should be robust or adaptive under uncertain changing conditions.

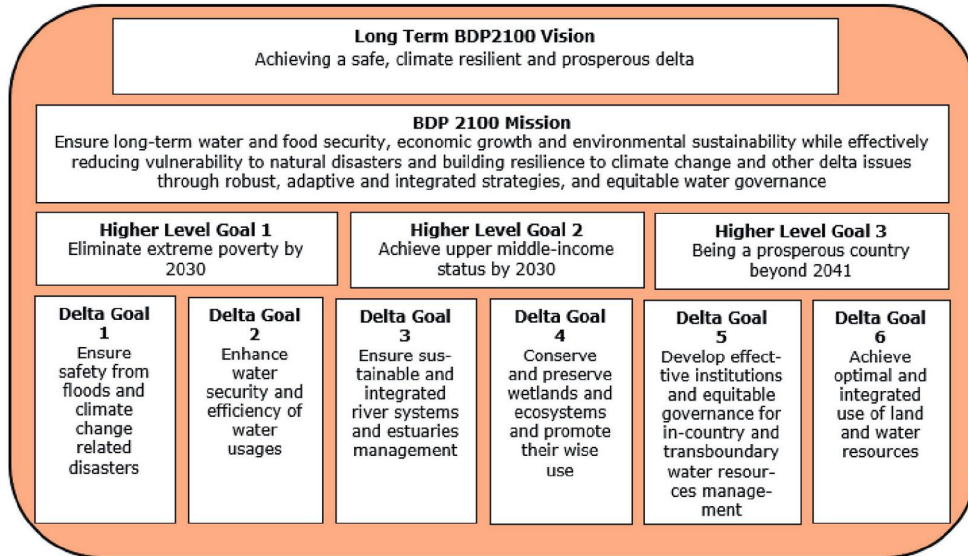


Figure 2. Strategic ambition of BDP2100 in terms of Vision Mission and Goals.

Government’s ambition with BDP 2100

Setting long term goals in an uncertain environment: BDP2100 is envisioned as an integrated plan that considers how the many aspects and issues of water resources, climate change and environmental challenges affect long term development of Bangladesh. This long-term vision has been translated into specific goals or and targets for its implementation. This was done by combining long term development outcomes in terms of economic growth and poverty reduction (also in relation to UN-SDGs) with goals for reducing long term vulnerability from water and climate change related hazards plus targets for environmental conservation.

The Delta Plan gives a vision of ‘achieving a safe, climate resilient and prosperous delta’ for a desired future spanning up to 2100. Its mission is to ensure long term water and food security, economic growth and environmental sustainability, while effectively coping with natural disasters, climate change and other delta issues to robust, adaptive and integrated strategies and equitable water governance. The Delta Plan has provided nation-wide strategies on flood risk and freshwater management. It has also provided strategies on water supply and sanitation, waste management; transboundary water management, inland water transportation, agriculture, food security, nutrition and livelihood. Other thematic strategies focus on sustainable land use and spatial planning, environment, ecology and bio-diversity, advancing the blue economy; renewable energy and earthquakes. Besides, the plan has provided six hotspots strategies, addressing area specific challenges of water shortage in drought-prone Barind region; river erosion problems of the river and estuary areas; coastal inundation and salinity problems of the coastal area; flash-flooding and wetland management issues of the Haor region; water shortage, sanitation and drainage problems of the urban areas; and the water

shortage problem of the Chattogram Hill Tracts. The Bangladesh Delta Plan strategies include many measures such as water related infrastructure, protection works, river dredging, land reclamation, innovative water management solutions, governance improvements, knowledge management, finance and result based monitoring and evaluation. The characteristics of the Bangladesh Delta as well as the multi sectoral and authentic way the BDP has been developed under the Planning Commission results in a specific and unique Bangladesh Delta Plan.

In all these strategies, BDP 2100 seeks to integrate the short to medium to long term aspirations but is mindful that decisions taken today have implications up to 2050 and beyond. The choice by GoB for a long term (up to 2100) perspective was a deliberate one given expected climate change impacts over the long run and the necessity to act. An ex ante evaluation (carried out independent from the consultant team) with and without a BDP2100 indicated a positive effect of BDP investments on poverty reduction and contribution to the GDP. GoB accepts the uncertainties associated with existing water challenges and climate change by embracing adaptive strategizing and programming to utilize the available time to become resilient. In this line, the Steering Committee and the highest level National Advisory Committee (consisting of 7 ministers) treated the strategy process and formulation of BDP2100 in their frequent meetings in a positive-critical way which contributed significantly to the final decision making in the National Economic Council. The Delta Plan aims to reach the Delta Vision through achieving 3 higher policy goals of eliminating extreme poverty and achieving upper middle-income status by 2030 and being a prosperous country by 2041 and six delta specific goals that contribute to achieving these higher level goals. In this perspective, the preparation of the Investment Plan was a joint effort of the consultant team and a World Bank team.

Implementing BDP2100 concerns factors of policy and plan implementation:

1. **Integration and Mainstreaming** of BDP2100 in Five Year Plans and Sectoral Plans
2. **Institutional Framework** BDP2100 approved Institutions: Delta Wing, Delta Gov. Council, PSC, Fund
3. **Coordination and Execution** by forming and executing Implementation Programs with Agencies and Stakeholders
4. **Selection and Prioritization of Investments** during preparing the Implementation Programs
5. **Funding Arrangement and Financing:** Delta Fund; Annual Block Provision of 2,5% of GDP
6. **Result Based Monitoring and Evaluation**, focused on progress and performance
7. **Knowledge and Research**, BDP2100 is adaptive, always knowledge and science driven

Figure 3.
 Relevant factors of implementation.

After a year of additional consultations and improvements of BDP2100 and Investment Plan, decision making took place in several rounds in a process of approval. During the final decision making on September 4th 2018 of BDP2100 and its Investment Plan, Prime Minister Sheikh Hasina related the Delta Plan development to the inspiration and ambition of father of the Nation Sheikh Mujibur Rahman and indicated that BDP2100 will play a crucial role in ‘building Bangladesh’.

From Planning to Implementation

Governance Issues

The government plans to spend 2.5% of the GDP annually (about \$ 6 bln a year) for delta-related interventions, through new projects and maintenance of new and old projects. A total of 80 projects: (65 physical projects, 15 institutional and knowledge development projects) will be implemented in the first phase up to 2030, with a total capital investment cost of \$ 37,5 billion. Early 2019, GoB already approved two projects (dredging of small rivers and canals and construction of a cross dam related to land reclamation) of \$ 60 mln each, funded with GoB-budget. Given the large and far reaching investment decisions to be taken, being cross-sectoral in nature with involvement of multiple line agencies, GoB faces various governance

issues as coordination and collaboration of the involved ministries and agencies, alignment of sectoral plans to the BDP2100, funding of investments and timely budget allocation to projects. GoB decided with the approval of BDP2100 to form a dedicated institutional framework by establishing a Delta Governance Council chaired by the Prime Minister, a Project/Program Selection Committee and a Delta Wing within the Planning Commission as well as setting up a Delta Fund (with a block provision of 2,5% of GDP per year) for smooth implementation of the Delta Plan. Whether or not the integrated Water Act 2013 needs to be modified is still in consideration.

Capacity Building and Training

Implementation of such a large plan as BDP2100 generates different dynamics than the Plan formulation. Figure 3. shows important factors related with preparing implementation.

Elaboration of these factors requires involvement of many agencies and stakeholders. Capacity building about what’s the BDP2100 all about and organisational readiness for implementation are therefore of crucial importance for managing the indicated factors. To assist implementation, 5 implementation capacities will be strengthened, as indicated in Figure 4.

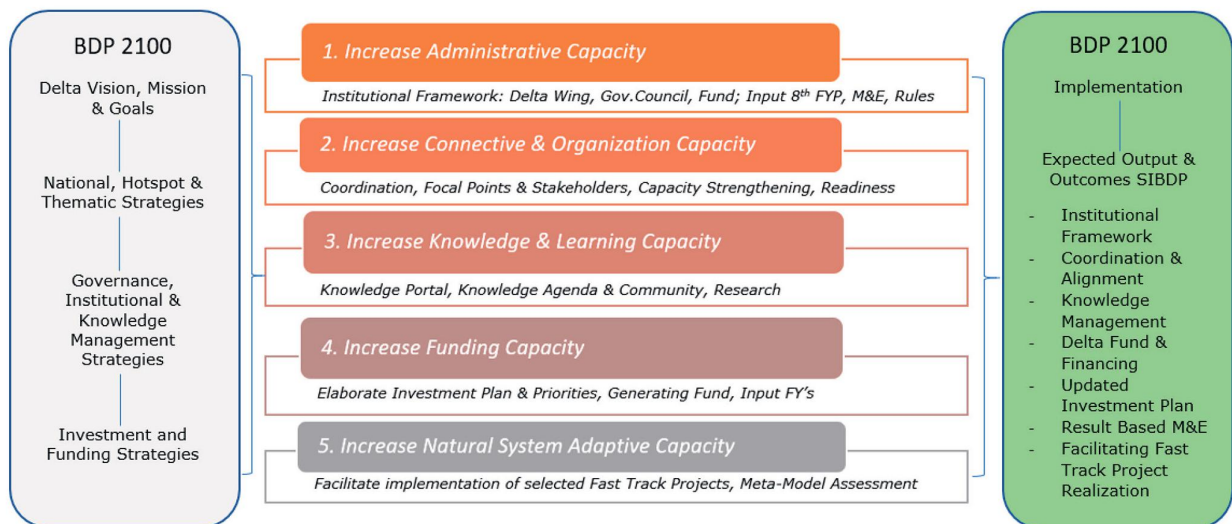


Figure 4. Increasing 5 implementation capacities.

Since the Delta Plan is an adaptive and long term plan, it will be periodically reviewed, updated and integrated into future Five-Year Plans. Moreover, new knowledge and technologies will be integrated to enhance the present status of the plan.

Adaptive Programming

The main goal of the implementation phase is organising ways to bring coherence in all efforts and projects in the Delta and to execute selected projects coming forward from the strategies and Investment Plan. River Basins and the Coastal Zone are chosen as logical units of consistent regional planning with stakeholder involvement and integrated implementation because hydrological, morphological, agro-ecological characteristics differ widely throughout the delta. Implementation of the BDP 2100 in the regional context faces many challenges:

- Fragmentation of efforts on local and regional level due to national institutions working in silos. Coordination is needed to bring coherence into the firm division of mandates and responsibilities;
- Lack of insight in overlaps between ministries and agencies in a coherent and holistic way; effective communication is needed to improve integration and collaboration;
- Current efforts are only aimed at realizing project results. A long-term planning view in which multiple alternatives are considered with a focus on goal-achievement is to be developed.

The river basin and coastal zone wise program management approach offers a systematic approach to conveying the holistic and adaptive BDP2100 philosophy into goal-focused regional implementation of projects. The first Implementation Program is under construction, including the 2 projects already approved by GoB: 1) Dredging small rivers/canals all over the country, 2) Urirchar cross dam. The institutional framework including the Delta Fund and Financing Strategy are in preparation and will enter procedures for establishment and reform soon. Currently, interaction with Development Partners, International Financial Institutions and e.g. UN on Sustainable Development Goals and the Green Climate Fund are taking place.

Conclusion

This case shows that the Government of Bangladesh is well aware of developments which could threaten the progress already made and could reduce options for becoming a resilient and prosperous nation. Many already existing and growth related challenges coincide with climate change issues. This posed an urgent question to the Government: “how to organise ourselves as country

to become resilient to uncertain climate change shocks and trends”? GoB choose to enable socio-economic development under uncertain changing conditions especially regarding climate change and (transboundary) water resources issues by preparing the comprehensive Delta Plan, BDP2100 which builds on recent insights of water governance and strategic management. The utilization of adaptive delta management concepts and principles developed in delta planning and programming in the Netherlands relates to a long term vision and development ambitions as well as to delta specific goals and scenarios and focuses on strategies and investments for achieving development goals including protection that will be robust and adaptive under uncertain changing conditions. GoB’s choice to prepare the BDP2100 in a multi-sectoral way, close to its core governance agencies, resulted in a typical Bangladesh Delta Plan 2100 and contributed to the successful approval process and final decision making. Within this process, there was specific attention to mechanisms and design of an institutional framework as well as an Investment Plan fitting in this governance setting. Continuity of the process from strategizing towards implementation, with staff and assistance from plan formulation into implementation is an important aspect in terms of progress, knowledge management and interactions. It is recommended to elaborate the implementation programs in a goals and results focused manner by application of adaptive programming in the making of basin wise and coastal zone participative programs.

SAMENVATTING

Dit artikel beschrijft een praktisch voorbeeld van strategisch management en water governance, toegepast in Bangladesh. Met het opstellen van het Bangladesh Delta Plan 2100 heeft de overheid van Bangladesh laten zien hoe Adaptive Delta Management in de praktijk kan worden toegepast. Op basis van de missie, visie en doelen is met behulp van scenario’s een strategie opgesteld voor de korte- en middellange termijn. De realisatie van de strategieën is financieel gedekt door het opstellen van een investeringsplan. Op 4 september 2018 heeft de minister president van Bangladesh, Sheikh Hasina, het plan vastgesteld en toegezegd dat het Delta Plan een belangrijk onderdeel is van het ‘Bouwen aan Bangladesh’. Sindsdien is de implementatie begonnen, onder andere door het opstellen van regionale implementatieprogramma’s. Beide auteurs werken bij adviesbureau TwynstraGudde en zijn nauw betrokken bij het opstellen en implementeren van het Bangladesh Delta Plan 2100.

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- 1 See for BDP2100 and Investment Plan documents: <http://www.plancomm.gov.bd/site/files/fd6c54f6-dfab-4c71-b44a-e983ffd2bdee/>
 - 2 Baseline Studies are clustered into 6 Volumes, see: <http://www.plancomm.gov.bd/site/files/0adcee77-2db8-41bf-b36b-657b5ee1efb9/>

BANGLADESH PREPARES ITSELF FOR A CLIMATE RESILIENT FUTURE

Jaap de Heer*

■ Update to the original article of Jaap de Heer and Martien Aartsen (03/2019)
The 2019 article ends with initial description of the implementation of the Bangladesh Delta Plan 2100. It shows in Fig. 4 the five Implementation Capacities which need to be developed to achieve successful implementation of BDP 2100. This update provides information and insights mid 2023 about the development of the five capacities by the 'Support to the Implementation of the Bangladesh Delta Plan 2100' (SIBDP) Project.

The Early Stage of BDP 2100 Implementation

Support to the Implementation of the Bangladesh Delta Plan 2100 (SIBDP), is one of the projects directly related to the tasks of the General Economics Division (GED) of the Bangladesh Planning Commission within the Ministry of Planning. The role of GED concerning BDP 2100 implementation and updating consists of (1) coordination of the 11 with BDP 2100 involved ministries, (2) facilitating data and information exchange for decision making in the BDP 2100 institutional framework on planning and investments and (3) monitoring and evaluating the progress of BDP 2100 implementation, resulting in feedback to the Ministry of Planning and Cabinet on goal achievement, recent updates on climate change and impacts with possible need to modify strategies and measures.

Because of the multisectoral approach of the Delta Plan, the considerable number of ministries and their implementing agencies require coordination and support e.g., for setting implementation priorities and selection of projects, assessing feasibility and impacts as well as preparation of projects and for investment decision making. The Project Management Unit (PMU) under the International Wing of GED carries out these tasks which is a real challenge to start up. It is recognized that the strategic planning concept and adaptive approach of BDP 2100 imply a paradigm shift in the national planning approach, accompanied by institutional reforms and

changes of working procedures. Most of these reforms and changes were already indicated in BDP 2100 and endorsed with the final approval of the delta plan in 2018. Currently, most of these reforms and changes have been initiated by GED. The Technical Assistance (TA) Team (SIBDP Consortium consisting of 3 Bangladeshi and 3 Dutch companies) assists the PMU. The SIBDP TA Team was appointed by the Government of the Netherlands in 2018 and finalizes most of its tasks for the PMU in June 2023. In connection with the BDP 2100 approach and content, and based on experiences with strategy making and implementation, five implementation capacities are considered necessary for effective BDP 2100 implementation. SIBDP is focused on developing these five capacities by performing studies, analysis and providing training, but also provides relevant content, additional documents, procedures and frequent communication, participation and consultation of many institutions and stakeholders. The PMU with the TA Team are being guided by a Project Implementation Committee, a Technical Advisory Committee and an overall high level Steering Committee. Besides, an Inter-Governmental Committee consisting of a Bangladeshi and Dutch delegation, provides advice on a yearly basis regarding implementation issues. The period of 2020 until 2022 was, due to Covid19, dominated by a hampered process with absence of team members and officials, closed offices, travel restrictions and limited face to face

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interactions. However, numerous online meetings and adjusted working procedures resulted in continuity and progress.

Activating the Institutional Framework

Implementation of a comprehensive and significant long-term plan like BDP 2100 with its focus on adaptation to climate change, contribution to food security as well as socio-economic development, requires an adequate institutional framework for further operationalization of strategies and measures and for decision making on investments. The institutional framework as approved with the endorsement of BDP 2100 in 2018, is incorporated in the core governance of Bangladesh in two ways. First, the approved BDP 2100 has been integrated into the legal framework, governance rules, regulations and national five-year planning cycle, to mainstream BDP 2100 within policies and plans like the National Five-Year Plans, the Perspective Plan 2041 and the yearly budget programming and allocation plan. BDP 2100 related projects have been included as priority one in the Annual Development Programme (ADP) formulation guidelines. Therefore, BDP 2100 projects get priority for inclusion in, and having allocation of ADP. BDP 2100 has already been added to the relevant items of the Development Project Proposal (DPP) format with other plans like Perspective Plan, Five Year Plan, and SDGs action plan.

Second, institutional reform was carried out as follows. A strong institutional basis has been elaborated for performance of the (horizontal) coordination, facilitation and monitoring tasks of GED, with respect to the multi-sectoral tasks and investments of the involved ministries and for the (vertical) coordination of agencies within those ministries and of regional/ local government. To perform these tasks at GED, a dedicated Delta Wing (with about 45 officials) has been designed and is in the final stage of approval while a temporally Delta Wing has been established. Moreover, a new dedicated political body, called Delta Governance Council (DGC) has been established and officially announced in 2021. This is the political decision-making body consisting of eleven ministers, chaired by the Prime Minister, with the

aim of providing BDP 2100 guidance and decision making on BDP 2100 matters and investments. The first meeting of the DGC was held on 22nd of May 2022. The meeting focused on the progress of BDP 2100 implementation and made a number of policy decisions. The DGC has, among others, decided to take the initiative for formulation of a Delta Act and for establishment of the Project/Programme Selection Committee (PPSC). The meeting also decided on actions for creating a Delta Wing in the relevant ministries. The Project / Programme Selection Committee has been formed in 2022 at the level of Secretary of the involved ministries, chaired by the Member (Secretary) of GED. This PPSC was established under the Delta Governance Council to coordinate selection and preparing decision-making on programmes and projects to be funded and executed. Clearly, the institutional framework requires adequate coordination by GED and involved ministries. That's why a Focal Point network was formed and trained. Each involved ministry is with its Focal Point linked to GED / Delta Wing on a daily basis. A number of Ministries and agencies formed a dedicated Delta Wing or Cell for this Focal Point, to take care of BDP 2100 matters. A draft Delta Act (still in process) has been developed to provide a legal basis and proper mandates for this BDP 2100 institutional framework.

Improving Connective and Organization Capacity

Prerequisites to implementation of BDP 2100 are interaction and coordination, as well as 'readiness' of involved implementing agencies, knowledge institutions and main stakeholders. 'Readiness to implement' is a well-known concept covering many factors for being prepared to implement: 1) knowing and being trained on the BDP 2100 content with its methodology and strategies, 2) bringing involved agencies in good shape (e.g., decision making and coordination, structure and tasks, rules and procedures, human and financial resources, other capacities), 3) contributing to execution of projects. BDP 2100 implementation requires strong emphasis on coordination and interaction, creating an implementation network with pro-active focal points and effective procedures for planning at meso and micro level, decision-making, funding and project execution.

Building capacity of the GED and other ministries, divisions and agencies related to BDP 2100 implementation is crucial. With the support of SIBDP 2100 project, GED has implemented a massive capacity development programme for its own officials and officials of Delta related ministries, divisions, agencies and institutions. A large number of officials were appraised about BDP 2100 vision, mission, goals, challenges of hotspot areas, strategies and measures, investments, funding, M&E framework and knowledge management. A series of seminar and workshops were held on the investment plan, study reports, policy briefs and knowledge products of the SIBDP 2100 project. As of November 2022, 10 seminars/workshops on BDP 2100 related issues, 3 Workshop-cum training and 19 short training courses (3-4 days) were organized with the support of SIBDP. A total of 615 officials has been trained on the various mentioned items. These activities are also supported by public relations and communication actions with many parties and stakeholders, supported by communication material as brochures, video documentary and Knowledge Portal.¹

The 1st International Conference on the 'Bangladesh Delta Plan 2100: Issues and Challenges of Implementation' took place on 26-27 May 2022 in Dhaka with a series of events and sessions. The conference was arranged by GED under the auspices of the Delta Governance Council (DGC). GED was assisted by SIBDP and the Embassy of the Kingdom of the Netherlands, the World Bank (WB). The Prime Minister opened the Conference and emphasized the importance of BDP 2100 for the safety and socio-economic development of Bangladesh. A number of events were arranged during this international conference; they were one Plenary session on Institutional challenges and opportunities with international experiences; 4 breakout sessions on Coastal Zone, River Systems, Urban Areas and Agriculture Transformation along with 2 side events on Valuing Water and Youth Panel Dialogue, one Round Table Discussion on improving and accelerating BDP2100 Implementation and a concluding session. The aim is to repeat such conference frequently.

Another important item is to strengthen the connective capacity through participation and consultation by the formation of a new Water User Institution. Several

institutions in Bangladesh are responsible for the management of water resources and related aspects of the delta plan. Within and around the ministries and agencies, there are many stakeholders with diverse and often conflicting interests. There is competition for obtaining government resources or assignments and most water related services including operation and maintenance (O&M) can be improved. Consequently, many BDP 2100 issues are managed more as an individual service in each entity rather than an integrated service.

In the absence of basic institutional arrangements for the proper use of water and infrastructure in terms of ownership, responsibilities and cost sharing, new infrastructure will not sustain up to their economic lifetime. Here, sustainability is the key issue. Investments in water services and infrastructure are rationalized when these are durable and deliver benefits to a larger section of the population to the required extent. Coordination at the macro level and community participation at the micro level are key to success. The question is how to integrate and mainstream delta governance and integrated water management in a manner that would facilitate its transformation from temporary ad hoc project-driven efforts to long-term self-sustained programs with ownership and responsibility of the community. BDP 2100 envisages effective approaches that go beyond specific projects and instead give local government institutions and associated communities and representatives from the private sector a voice in water decisions at the national and regional level. In a nutshell, the formation of Water User Institutions addresses three major issues of concern. These are: coordination among implementing organizations, stakeholder participation at all levels and financing of O&M with, besides the GOB funding, contributions based on the 'beneficiaries pay' principle. The proposed approach has been elaborated and will have follow up within the government.

Developing Knowledge Management and Learning

Implementation can only take place when information, data, maps and knowledge of sufficient quality are available. Knowledge management, feasibility studies

No.	Name of the Project	Executing Agency
01	Drainage Improvement of Dhaka-Narayanganj- Demra (DND) project phase 2	BWDB
02	Revitalization of khals all over the country	BWDB and LGED
03	Development of Water management infrastructure in Bhola island	BWDB
04	Char development and settlement project-V (CDSF)	BWDB, M/o Land, Forest Dept.
05	West Gopalganj integrated water management project	BWDB
06	Improvement of drainage congestion & flood control for Chittagong City	CDA
07	Improvement of sanitation systems in city corporation areas of Bangladesh	DWASA, CWASA, Khulna WASA
08	Kurigram Irrigation project	BMDA
09	Southern Agriculture Improvement project	DAE and BWDB
10	Village protection against wave action in Haor area and improved water management in Haor basins	BWDB
11	Water Supply and sustainable sanitation in Pourashavas of CHT	CHT Board and DPHE
12	Improvement of drainage network, flood control and solid waste management for Khulna City	Khulna city Corporation
13	Greater Dhaka integrated water and sewage improvement project	Dhaka WASA
14	Water supply project for city corporation areas in Bangladesh (Phase I & II)	Chattogram WASA, Dhaka WASA, Rajshahi WASA
15	Piped Water Supply project in 100 Pourashavas	DPHE
16	Village Piped Water Supply System Project	DPHE
17	Water Supply project in the Urban areas of Bangladesh (Secondary Towns)	DPHE

Table 1. BDP 2100 Investment Plan projects under implementation (Source: GED, Ministry of Planning, 2 February 2023).

including assessments of environmental impacts and socio-economic development, research and learning are therefore of crucial importance. These include e.g., flood management, sediment, river and polder management, food security, water quality in urban areas. Integrated assessment modelling with the ‘Bangladesh Meta-Model’ offers support for taking decisions on interventions and investments. Data, information, and understanding are needed to deal with the drivers of change and developments in a pragmatic way, supporting and managing interventions in the natural system as well as in institutional, organization and management and financial matters. This will build on the already developed Knowledge Agenda, the created Knowledge Portal and data layers in many different data bases and models. Additionally, a 3-yearly periodic review of BDP 2100 implementation will offer systematic insight in progress of implementation, natural system behaviour and goal achievement. In parallel, a Bangladesh-Netherlands Joint Cooperation Programme (JCP) is being carried out, involving Deltares, WR, CEGIS and IWM, in which specific knowledge needs will be addressed.

Support to Funding of Investments

Proper investment planning, funding and financial mechanisms are a must to any implementation. Especially for the implementation, BDP 2100 committed a provision of 2.5% of GDP annually. The allocation to this provision is gradually increasing while additional financial resources still need to be allocated by the GoB, development partners, IFI’s with a linkage to e.g., the Green Climate Fund and

Public-Private Partnerships. Updating the Investment Plan and building trust and relationships with development partners and IFI’s to this are important elements.

The Investment Plan (IP) of the BDP 2100 comprises 80 projects to be undertaken by the year 2030 i.e., during 8th and 9th Five Year Plan period. However, implementation of these projects will take longer time beyond 2030. It may be noted that most of the projects of BDP 2100 IP are multi-sectoral and programmes in nature. Out of these 80 BDP IP projects/programme, 17 are now at different stages of preparation and implementation. Table 1. presents the BDP 2100 IP projects presently under implementation and Table 2. depicts BDP 2100 IP projects which are at preparation stage.

Table 2. Projects under study / preparation stage for implementation. (Source: GED, Ministry of Planning, 2023).

No.	Name of the Project
01	Jamuna River Economic Corridor Development Project
02	Revitalization and Restoration of Chalan Beel, Bangladesh
03	Dhaka Rivers Ecological Restoration Project
04	Climate-Smart Agriculture and Water Management Project

A total of 315 projects, directly or indirectly linked to BDP 2100 strategic objectives, are included in the current year Annual Development Programme (ADP). It is to be noted that, the delta related annual public investment in pre-Delta Plan stage was 0.8% of GDP, which has gradually increased to about 1.13 percent of GDP in 2022.

Many of the BDP 2100 IP programme/projects are good candidates for funding from the Green Climate Fund (GCF). Project Concept Notes for six BDP IP projects have been developed according to the prescribed format of GCF.

Area/Basin Wise Programming for Natural System Adaptation

BDP 2100 implementation builds on the previous planning exercise, which delivered project preparations and investment priorities per Hotspots projects with feasibility study (see Ch. 11, BDP 2100) belonging to the so called “0+ category”, which after final approval and financing can be implemented. Projects will be selected with stakeholders, tested for coherence and goal achievement, linked to the overall investment portfolio for each Hotspot / river basin, subsequently improved where needed and programmed. Implementation requires a well-considered approach, a systematic sequence and participation of with the intervention involved stakeholders. To facilitate this, six Programs have been developed for basin wise implementation of strategies and river basin investment plans, which will be further developed in close interaction with stakeholders and key decision-maker/ implementing agencies. The Meta Model assessment has already partly been integrated into support of decision-making by planning and implementing agencies.

Reflection and Way Forward

The Bangladesh Delta Plan 2100 has been developed as techno-economic, adaptive, long-term integrated science and knowledge driven plan. With the adoption of the BDP 2100, Bangladesh experiences a paradigm shift in its planning and implementation systems. This paradigm shift consists of (1) following adaptive delta management with emphasis on adaptation to climate change, (2) contributing to food security and (3) to socio-economic development, with related cyclical instead of linear planning, a holistic and multi sectoral instead of a sectoral (silo) approach, a new institutional framework concerning decision making, coordination and funding as well as organization of decentral water / delta institutions. Consequently, significant institutional and policy implications, vast financing challenges and many new managerial and

organizational tasks needed to be developed and practiced. By working on these implications, challenges and tasks, GOB and involved sectors are going through a transition process, aimed at readiness for climate change adaptation and realization of related delta vision, goals and investments.

The, by BDP 2100 triggered, transition process consists of several transformations e.g. in the GOB Institutional Framework on decision making (Delta Governance Councils), the role of the Planning Commission with the upcoming Delta Wing in (horizontal) coordination with the involved sectors and (vertical) coordination with (partly new) regional institutions. Important is also to further utilize ways for involvement of the Private Sector, for adequate funding and utilization of the Green Climate Fund as already proposed and utilize other funds as well. The transition process has not been finalized yet, partly due to the challenges of the transition itself, partly due to the Covid19 pandemic and partly due to the GOB administrative systems and culture. Changing the water governance related institutional framework, administrative systems and culture, also with respect to frequent updating of BDP 2100 and adaptive programming, sustainable project preparation and adaptive design, require pertinent choices and robust GOB action. These actions have been started and initial results have been achieved but they will take more time and budget for continuous learning and innovation as will be required for ongoing and adequate adaptation to climate change. Given the latest developments, extended support to BDP 2100 implementation by contributions of development partners, international financial institutions and climate funds can be expected shortly to gear up the preparation of adaptation projects and increase project execution. We don't know whether successful adaptation to future climate change and probably severe impacts will be possible in this complicated dynamic delta but by then, Bangladesh will have shown its experience with learning to adapt and increasing its resiliency. ■

1 Address of the Knowledge Portal: <http://bdp2100kp.gov.bd>

IMPLEMENTATION WATER GOVERNANCE ASSESSMENT BLUE DEAL IN ROMANIA AND KENYA

Johan Remijn*

■ According to the World Resource Institute the world's water systems face formidable threats. More than a billion people currently live in water-scarce regions, and as many as 3.5 billion could experience water scarcity by 2025. Increasing pollution degrades freshwater and coastal aquatic ecosystems. And climate change is poised to shift precipitation patterns and speed glacial melt, altering water supplies and intensifying floods and drought.

Since the 1980s, Integrated Water Resource Management (IWRM) was implemented (Sustainable Development Goal 6.5), whereby the protection and restoration of water-based ecosystems (Sustainable Development Goal 6.6) has been given a stronger position. Also in the Netherlands concerning IWRM there are still a lot of things to work on. Still sectoral work is key at a number of places and insufficient attention is paid to the organization of the creative process whereby integrated solutions are achieved by integrating water related issues and spatial quality.

Regional Water Authority (RWA) Rijnland participated in the implementation of a number of Blue Deal Government Assessments, for instance in Romania and Kenya. In this case study the lessons learnt concerning the implementation of Water Governance Assessments in Romania and Kenya are exposed.

Governance assessment Jiu Region Romania

Part of the Blue Deal starting up process for an international partnership is a Governance Assessment. There are four regional partnerships formed in Romania. The partnership in the Jiu Region is one of them.

Romania is one of the EU countries with the lowest water availability per capita. Water demand is expected to increase in the future, mostly from irrigation due to the

increasing frequency and magnitude of droughts. At this moment 62% (1,863,392 ha) of the irrigation schemes are not viable.

The partnership between the Dutch RWA (Rijnland, Noorderzijlvest, Limburg, Hunze and AA's) and Jiu Water Basin Administration in Craiova focuses on the problem of desertification in the Craiova region as a result of climate change and an obsolete, economical unviable and malfunctioning irrigation system.

The rehabilitation of drought affected areas, the increase of number of temporary rivers, the expansion of the arid areas in South West of Romania, are issues/topics known not only for Oltenia region but also in other areas of the country. All these situations require some decisions regarding integrated water management in the affected areas.

Overall, the combination of adaptation measures will have to strike a right balance between agricultural productivity and sustainable water management.

In each river basin there are the water management plans but the proposed measures involve agreement and the effective participation of local communities, land owners, state institutions and the administrators of protected areas. In this context the implementation of these plans through the implementation of rehabilitation

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INTERNATIONAL
IMPLEMENTATION BLUE DEAL IN ROMANIA AND KENYA



Desertification in the Craiova Region in Romania, visit DWA September 2018.

measures in certain areas, the projects of rehabilitation/ restoration of wetlands are in deadlock due to the refusal of landowners to cooperate in such projects/activities. This is the reason why a methodology of wetlands recovery, with the involvement of all stakeholders, could be beneficial for the river basin administrations.

Based on this, choices have been made for the interventions to be implemented. The Theory of Change (ToC) is leading.¹ Basis for this are the “Building blocks for good water governance” of the Water Governance Center and the twelve principles of the Organization for Economic Cooperation and Development (OECD). Four work packages have been developed from the ToC and can be found throughout the program:

- 1** Technical knowledge and capacities: strengthening and developing technical knowledge and capacities in water management
- 2** Institutional: institutional and organizational improvements to achieve good water management
- 3** Relational: cooperating, organizing participation and generating support among the local stakeholders
- 4** Program coordination: activities to implement the partnership adequately (within budget, on time and with the right quality)



Water Governance Assessment in Romania, September 2018.



BLUE DEAL

The Blue Deal agreement (2018) between the water boards and central government (Ministry of Foreign Affairs and Ministry of Infrastructure and Water Management) aimed at strengthening the international capacity of the Dutch Regional water Authorities to international projects.

The Blue Deal projects have the ambition to reach 20 million people in 40 water catchment areas. The focus is on a better

protection against floods, more access to water and better water quality. At the moment the RWA's boards have set up international partnerships in 11 countries worldwide and a number of partnerships are under construction. These projects are carried out with various other Dutch and foreign organizations. All partnerships are based on the equality of the partners. The collaboration focusing on a long relationship between the partners, till 2030.

Partnerships are the backbone of the Blue Deal program. A partnership is based on cooperation between partners based on a joint agreement. Such a work form is very ambitious because it reaches much further than the work forms that were used historically such as consultation, participation and representation. Working together in partnerships requires commitment and responsibility on both sides.

Lessons learnt in Romania

To identify in which layer (Knowledge and expertise, Institutional or Relational) the biggest challenges occur, on the basis of which interventions can be constructed, each project starts with a Governance Assessment.

The first experiences with performing a governance assessment in Romania (Jiu Water Basin Administration in Craiova) learned that the context in which an assessment is carried out is essential for its success. The existing cultural values play an important role in this. It is therefore not the case that a model that works quite well in the Netherlands can simply be rolled out into a different culture.

Large power distances exist in Romania. This means that for the purpose of a creative workshop, the break up into small groups, which is common in the Dutch approach, is not always appreciated by the management. Working in groups can pose risks for employees who are lower positioned in the organization. As a result, communication cannot go smoothly. A solution can be to focus attention on

senior management instead of a group approach. It is important to investigate what is going on in the rest of the organization.

Another lesson learnt in Romania was that it is important to emphasize that not everything is perfectly arranged in the Netherlands. There was a tendency by the Romania partner in the first stage to rate almost all aspects of the work packages too high. By indicating our own situation on these aspect, the scores were adjusted downwards in many cases.

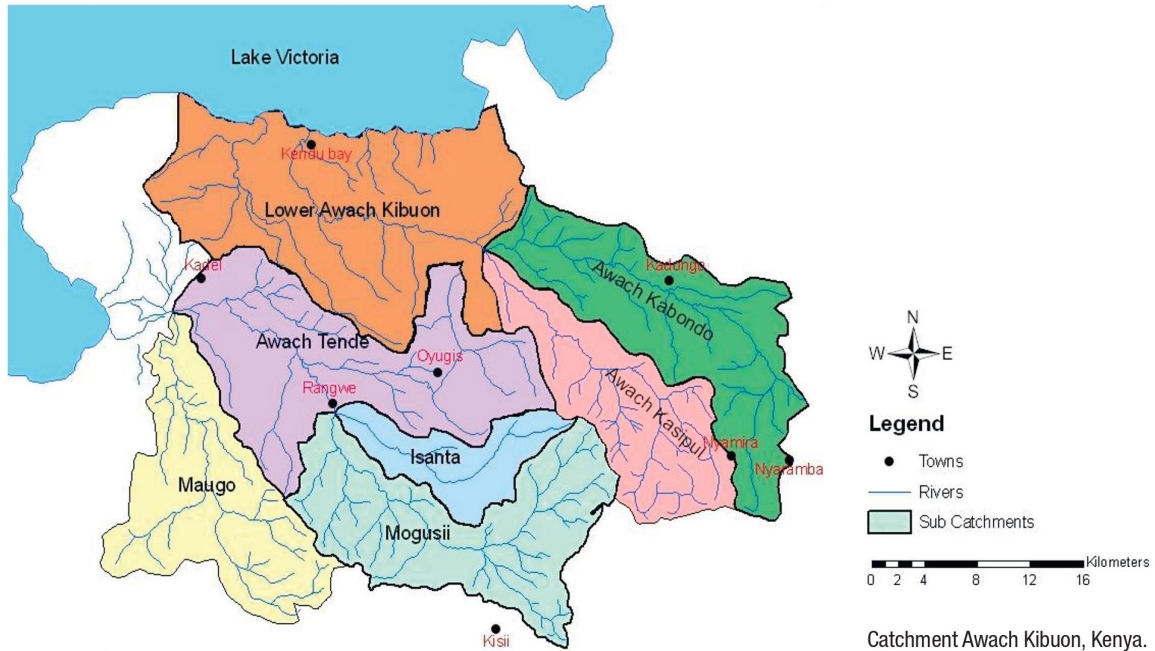
It was also emphasized that this Government Assessment is a self assessment that can be used to determine which interventions could have the most effect on the organization. Intervening on the relational layer may be an effective approach. The relevant stakeholders to be consulted are The National Administration Romanian Waters, the Romanian National Agency of Land Reclamation, large agricultural commercial farms and commercial companies (holdings), Romanian Irrigation and Drainage Water Users Associations, County Council Dolj, Environmental Protection Agency Dolj, University of Craiova Horticulture Faculty, Mayors of localities from the area affected by drought, Research and development Station for plant culture on sand from Dabuleni and NGO's.

Water Governance assessment in Kenya

RWA Rijnland was also involved in a Government Assessment in Kenya. The lessons learnt from



Water Governance assessment carried out by DWA for the partnership with Water Resources Authority Lake Victoria South Catchment Area and Homawasco, Homa Bay Count in Kisumu Kenya in 2019.



Romania were used to organize and plan the water governance assessment in Kenya. In this partnership DWA (RWA Rijnland, De Stichtse Rijnlanden, Aa en Maas en Brabantse Delta) together with Drinking Water Company Dunea and the Dutch Laboratory AQUON worked on a water governance assessment with Water Resource Authority Kenya, District Lake Victoria South and Water chain company Homawasco in Homa Bay.

The Awach Kibuo catchment was selected as a pilot.

Awach Kibuo river water is used for domestic and agricultural purposes. Homa Wasco is abstracting water from the river in Kendu Bay to produce drinking water. The drinking water plant in Kendu Bay was rehabilitated in 2018 which was part of the Waterworx program executed by drinking water company Dunea in cooperation with Amref Flying Doctors. The major problems concerning the water quality of the Awach Kibuo river are high turbidity, nutrients, pesticides and domestic effluents.

High sediment loads are undesirable for activities down stream. Because of the high turbidity the influent water in Kendu Bay has to be treated with chemicals. High sediment loads have also direct deteriorating effects on the fish spawning areas. A trend of prolonged low flows would affect the performance of irrigation schemes and pose risks for the downstream habitats.

Deterioration of the water quality in Lake Victoria would have consequence on the flourishing

commercial fishery providing income and food to a large number of local people. Yet nutrient build-up is increasing in Lake Victoria. A direct effect of eutrophication in Lake Victoria is the spread of the water hyacinth in the Lake and other water bodies in its catchment. Many activities such as fishing, transport and recreation are being hampered and efforts to control its spread have proved largely unsuccessful up to now.

Traditionally, many projects of the Dutch water authorities have focused on the transfer of Dutch technical knowledge and expertise (the content layer). By performing a Water Governance Assessment, more attention is paid to the other work packages, namely the institutional layer and the relational layer. This will in many cases increase the effectiveness of the partnership.

In addition, the Blue Deal is having a 12-year horizon. In the first phase the partnership is build or strengthened. In the second phase plans are made. In the third phase plans are implemented. This Blue Deal approach differs from the traditional approach. It turned out that in Kenya the partners had to get used to this Blue Deal approach. Kenya was focusing on building physical infrastructure. The first phase of the Blue Deal is not focusing on building physical infrastructure.

In the water governance assessment in Kenya the Dutch Team found out solutions could be found in the adoption of a proper Integrated Water Resource



Waterhyacinth floating on lake Victoria at the inlet for drinking water in Homa Bay Kenya.

Management (IWRM) approach focusing on empowerment of communities with proven technology, information on opportunities and financial resources to make the best investment decisions in land and water management. Income generating and value adding activities are necessary to provide incentives for adoption. The focus for the Blue Deal Project should therefore in the first stage be more on the institutional layer and not on the content layer. It turned out that this Blue Deal Project approach was not in line with the Kenyan wishes for investments in physical infrastructure. Therefore the Dutch team had to decide not to start the project with Water Resource Authority Lake Victoria South Catchment Area and the other partners.

The Blue Deal water governance assessment turned out to be a useful instrument. In Romania we found out it is important to take into account the local cultural values. Another lesson learnt in Romania was that it is important to relate to the Dutch situation in which we also face challenges.

In Kenya the Blue Deal water governance assessment was helping to expose the Kenyan need for IWRM. The assessment helped the Dutch partners to focus on the right issues to work on in Kenya. A governance assessment can help to discuss the right issues and the right stakeholders. Therefore a water governance assessment can help to prevent that the wrong decisions are made.

1 zie ook publicatie The Blue Deal Water: clean, sufficient and safe water for 20 million people van Emilie Sturm e.a. in Water Governance 02/2018.

INTRODUCING DR POLDERGEIST

Simon Richter*

■ Introducing Dr Poldergeist: Using Animated Video to Motivate New Attitudes towards Climate Adaptation in the Dutch Water Sector.



Sometimes a controversial point of view is best introduced by an invented character, however transparent the fiction. For my foray into debates about climate adaptation in the Netherlands, I took inspiration from Johann van Veen, father of the Delta Works. In the foreword to the fourth edition of *Dredge, Drain, Reclaim. The Art of a Nation*, he mentions the addition of two new chapters. “Being too busy myself I was much pleased to find that Dr. Cassandra, an expert in dike affairs ... was found willing to add the last of these two chapters to my book.” In case anyone needed a reminder, he explained that Cassandra “was the name of the princess who saw the insufficient strength of the defense of Troy, but could not prevent a calamity.”

The chapter in question bore the title, “A New Storm, A New Start.” It delivered a startling message to the “abnormal country” (195) he called home. In the aftermath of the 1953 flood, he envisioned a Netherlands transformed into an “ordinary country.” With due awareness of historic sea level rise, subsidence, and the threat of siltation and fresh water scarcity, Dr. Cassandra proclaimed that “the most difficult engineering undertaking of the whole Dutch water history, past and future, confronts the engineers of the present day” (195). He was not exaggerating. The country, he said, should “be heightened” by “pumping a thick layer of sand and silt into the Netherlands, burying all its history as it were” (195). “Ultimately the Netherlands may not be a pit any longer; it may become an ordinary country, artificial it is true, but above sea level” (195).

Far from following this advice delivered in English by Van Veen’s prophetic alter ego, the Netherlands continued its

eternal struggle with water. But accelerated sea level rise is a game changer, as Marjolijn Haasnoot says. Engineers, designers, adaptation experts, and ecologists are starting to envision what a climate-resilient Netherlands might look like. Two distinct lobbies have formed around diametrically opposed ideas: 1) advance against the sea with an imposing sea dike or a string of barrier islands (bringing all that sand Van Veen was talking about into play) or 2) accommodate in combination with managed retreat in a way that protects heritage, transitions to salt water agriculture, and eventually moves sizeable populations to higher sandy soils in the East. The government meanwhile sees climate change as a lucrative business opportunity for the Dutch water sector, clearly expressed in the International Water Ambition. While dredging and servicing offshore drilling rigs remain the dominant source of revenue, high profile delta plans and coastal protection strategies for US cities and low-lying countries in the global South are proliferating.

Enter Dr Poldergeist, with messages for the Dutch water sector both at home and abroad. Launched in September 2021, Project Poldergeist is a series of animated videos that investigate the complexities of life below sea level in the Netherlands and other coastal regions. The host of the series is Dr Poldergeist, an animated character created by my team of student researchers and artists at the University of Pennsylvania. He was designed to express novel insights about climate adaptation in the Netherlands. These insights are not technical in nature. Dr Poldergeist is not an engineer. We think of him as a psychologist of Dutch culture. And for good reason: The Dutch have some

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YouTube channel

<https://www.youtube.com/channel/UCQrvu36tni8MEpLR4ZqFJsQ>

powerful flood-related traumas in their background and they're grappling with a unique and high stakes climate situation. Under that kind of pressure, it's not surprising that we see a variety of responses, among them denial, deferral, deflection, defiance, and even despair. These behaviors and states of mind can get in the way of implementing effective adaptation strategies. An outsider's perspective might be helpful.

The Dutch live with a kind of schizophrenia. On the one hand, they're celebrated all over the world for their extraordinary water defense system, the famous Delta Works. It's not wrong to say that the Dutch live in the safest delta in the world. But climate change makes things very complicated. If nations don't manage to limit global warming to 1.5°C—and that seems increasingly unlikely—accelerated sea level rise may overwhelm their capacity to reinforce their dikes, dunes and barriers in time. When you put these two things together, you have the Dutch paradox: The Netherlands is both very safe and very vulnerable at one and the same time. Dr Poldergeist tries to shed light on the cultural consequences of living with that paradox.

Many people don't know that Sigmund Freud was a big fan of the Netherlands. While living in Vienna in the late 1920s and early '30s, he followed the story of the Afsluitdijk and the Wieringermeer and Flevoland polders in his favorite newspaper, *Die Neue Freie Presse*, with great interest. When he introduced his concept of the three parts of the human psyche—the id, the ego, and superego—to the public in 1932—the same year the Afsluitdijk was completed—he implicitly compared himself to Cornelis Lely. “The work of psychoanalysis,” he said, “is to strengthen the ego, to make it more independent of the superego, to widen its field of perception and enlarge its organization, so that it can appropriate fresh portions

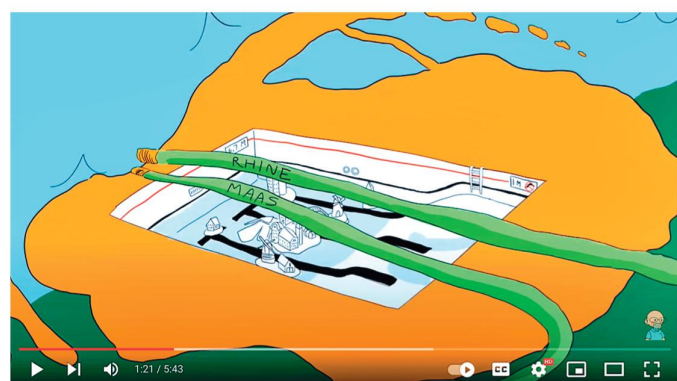
of the id. Where id was, there ego shall be. It is a work of culture—not unlike the draining of the Zuider Zee.”

What an honor for the Netherlands! At least, I think it is. Everyone has heard of the Oedipus complex. Should we also speak of a “polder complex”? For Freud, creating polders, pumping out water, converting wetlands into dry land—all those things the Dutch do so well—amount to an analogy for what psychoanalysis does. The lower Netherlands is like the ego, in need of protection and reinforcement. Water and marshy wetlands are like the id. Freud saw the Zuiderzee Works as an admirable case of cultural labor—“the art of a nation,” to quote Van Veen. I'm sure he would have thought the same thing about the Delta Works: *Droge voeten* for the human soul. However, to refer to another of Freud's insights, all that hydrological pumping and all those defenses that have been erected to protect the collective Dutch ego result in what he calls repression. In other words, you expel problems and contradictions without confronting them. But, as Freud well knew, repressed material has a tendency to resurface and haunt the ego or, in our case, the nation that expelled the water and created the defenses. This is what he calls “the return of the repressed.” Subsidence, siltation, drought, and, in a larger sense, accelerated sea level rise—this is what the return of the repressed looks like for the subsiding ego of the Dutch.

This is why we call our cultural psychologist Dr Poldergeist. He's animated by the spirit of the Dutch polder. And, like his German cousin, the Poltergeist, he's a bit of a troublemaker. We see this in the first Poldergeist video, “How much of the Netherlands is below sea level?” We wanted this video to establish Dr Poldergeist's function, which we call “peering beneath the surface,” by providing a convincing example of the kind of psychological and cultural phenomenon we want to

Ein Epos der Technik.

Das gewaltige Werk besteht aus zwei Hauptteilen, dem Sperrdamm und den dahinter trockenliegenden vier Gebiets- teilen, den vier Poldern, wie der Holländer sie nennt. Der Sperrdamm zieht sich von der Küste der Provinz Nord- holland über die Insel Wieringen, dem Ver- bannungsort des deutschen Kronprinzen, zum Ort Zuring in Friesland und ist etwa 30 Kilometer lang. Niedrige Schleusen dienen teils der Entwässerung, teils der Schifffahrt. Er ist ein Wellenbrecher und durch ihn kann die Höhe des Wasserstandes reguliert werden. Hochinteressant ist es, daß dieser Damm, für sich selbst betrachtet, bereits genügend Gründe für seine Erbauung bietet, auch wenn keine Polder dahinter trockengelegt würden. In das Zuiderseebecken münden verschiedene Gewässer, vor allem der Rheinarm, die IJssel. Wenn der Sperrdamm fertig ist, wird nur mehr Süßwasser zurückfließen. Langsam wird sich ein Süßwasserbecken mit Süßwasserflut bilden, und dieses Becken, dessen Wasserfläche nach Belieben gerodet werden kann und das mit



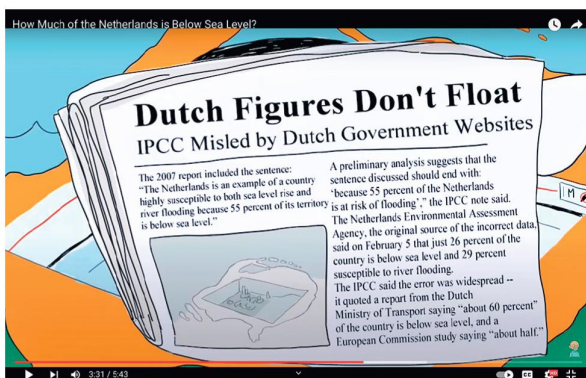
illuminate. In our research, we noticed that some Dutch people, even Dutch government agencies and officials, tend to exaggerate how much of the Netherlands is below sea level. The numbers we encountered were all over the map, from one third on the low end to eighty percent on the high end. We got the feeling that people just gave a number that felt right to them—it was, in other words, an expression of how vulnerable or invincible they felt, or both! No big deal, you say. But it is. Credibility is important. In 2007, official government web pages and documents misled the IPCC into making false claims about the Netherlands, at a time when it was under scrutiny by climate change deniers. International journalists with a stake in being accurate have also fallen victim to the exaggerations. In *The Water Will Come*, well known climate journalist and author, Jeff Goodell, states that 75% of the Netherlands is below sea level. He was not happy when I asked him about that. “There are only two errors in the book and that’s one of them.” He fell for the hype. Given the paradoxical precariousness of the Dutch situation, it’s not surprising that something is going on beneath the surface.

Our second video also sought to cast light on what seems irrational behavior. This one is called “Is the Netherlands too deep to fail?” It focuses on the housing crisis and the controversy surrounding plans for housing developments in Zuidplaspolder and other vulnerable areas. To an outsider, these plans seem crazy. Why not place a moratorium on building in the riskiest areas and incentivize building at higher elevations in the East? Deltares and the Delta Commissioner issued express warnings about the danger of “lock-ins” that limit adaptation options. You know you’re in psychologically interesting territory when people resort to spectacular forms of denial. In the presence of the Minister of Public Housing and Spatial Planning, the local dike reeve said, “Het Vijfde Dorp [in de Zuidplaspolder] moet,

ook door commitment van het Rijk, hét klimaatdorp van Nederland worden. Een voorbeelddorp waar we laten zien hoe bouwen in lager gelegen gebieden van Nederland kan.” To American ears this sounds suspiciously like counterfactual claims about “clean coal.” In our video, we wonder if the reason the Dutch continue to invest heavily in risky areas has to do with an unspoken belief that the government will protect those investments at any price. By building up those areas even more, you increase the likelihood that the government won’t let them drown, literally or figuratively. We call this the “too-deep-to-fail” strategy.

Some people think we go out of our way to be critical of the Dutch. They’re mistaken. It’s precisely because the Netherlands is such a unique and remarkable nation with a strong international reputation that we are drawn to both its dilemmas and its defiance. Infrastructure such as the Eastern Scheldt storm surge barrier astounds us. We sense the relentless force of the water rushing in and out of the estuary. We recognize the extreme conditions under which the engineers built this technological marvel. We honor the intention to keep the estuary open in order to preserve habitat and livelihoods—even if it didn’t quite work out. And we are moved by the fact that this structure and others like it protect millions of people. How can we not appreciate the culture that brought this piece of infrastructure into being?

We feel similarly about Room for the Waal in Nijmegen. Pulling back the dikes, expanding the floodplain, relocating households, and providing residents with new forms of recreational river access while increasing their safety—this shows that the Dutch can find new ways to live with water. When the peak discharge of the Rhine is gracefully accommodated within the city, and pedestrian bridges, foot paths, meadows and fields submerge according to plan—it takes our breath away. This is a



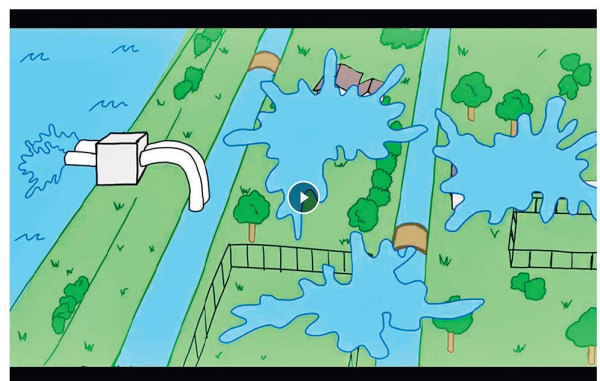
brilliant manifestation of design intelligence that is not at cross purposes with nature.

But that’s one of our points. So much of the Netherlands is at odds with nature. And climate change makes that a dangerous proposition. There are numerous Dutch climate adaptation experts, geologists, landscape architects and urban designers, ecologists, engineers, and activists who know this. They’re trying very hard to tell the public and the government that the Netherlands needs to modify its approach, and they’ve had some success, but not enough. The purpose of the Poldergeist videos is to support them in that process. We do that through culture. To be more specific, what we’re trying to do is to “re-write the Dutch water story.” It’s therefore not surprising that some people who are really attached to the old water story about the Netherlands’ “eternal battle against water” don’t like what we’re doing.

What do we mean by rewriting the Dutch water story? We often hear Dutch people say, “We have water in our DNA.” This is obviously a metaphor, but there’s something to it. What people mean is that the Dutch experience with water management has been so intense that it’s become second nature. Water is a major part of who they are. It’s in their cultural makeup. They feel they understand water like no one else. Put all that experience and memory, trauma and triumph into narrative form and voila—that’s the Dutch water story, the epic tale of a heroic war against the element. The basic components are familiar. “Long ago, these were wetlands and peat bogs. We lived on terps. We built dams on the river Rotte (Rotterdam) and the river Amstel (Amsterdam). We drained the wetlands and built dikes. Compelled by common vulnerabilities to work together, we created the earliest forms of Dutch democracy. When windmill technology was introduced, we scaled up. We drained lakes and converted them into fertile polders: the Beemster, the Purmer, and many more.

Sure, there were occasional tragic floods that we preserved in song and image, with wildly exaggerated victim tallies. The St Elisabeth Flood of 1421, they say, took the lives of more than 100,000. But we always bounced back—that’s our legendary resilience. After the flood of 1916, the Dutch found the resolve to build the Afsluitdijk, converting the Zuiderzee into the freshwater Lake IJssel and adding the vast polders that impressed Sigmund Freud. Fossil-fueled pumps instead of windmills made that possible. The Flood of 1953 punctured our sense of invincibility. More than 1800 died and it could have been much worse. It was the Dutch Katrina, except we learned from it. The Delta Works went a long way toward restoring our self-confidence and earned us renewed respect in the world. The old saying attributed to René Descartes, who lived in the Netherlands from 1628-49, is still on people’s tongues today: God created the World, but the Dutch created the Netherlands.” That’s the Dutch water story in a nutshell.

We could indulge the Dutch. Every country has its national myth. Why can’t they have theirs? There are two problems with the way the Dutch water story operates today. We call them polder complacency and polder arrogance. The former concerns the internal, domestic workings of the Netherlands. The latter is international. Let’s start with polder complacency. The newest chapters of the Dutch water story—the Delta Works and Room for the River—end pretty triumphantly. The river flooding that took place in West Germany, Belgium, and Limburg in the summer of 2021 caused some consternation, but the major take-away was the success of the Dutch flood protection measures in comparison to the tragic failures in Germany and Belgium. There has been no loss of life due to flooding in the Netherlands since 1953 and that’s saying something! The paradoxical result is a kind of complacency on the part of the public and the government, and even, though in a different way, on the part of engineers. The success of the water defense system has lulled people into a false sense



of security. “We live in the safest delta in the world.” That’s not what bothers the engineers. In an article published in June 2022 with the reassuring title, “The Water is Coming, But Don’t Be Afraid,” a spokesman for the technocratic position claims that the Netherlands would be able to defend itself against 10 meters of sea level rise. It’s not sea level rise that causes him to lose sleep. It’s people who suggest that technology has limits and that it may be necessary to move to higher ground. If investors get rattled, he argues, they may withdraw capital from the low-lying parts of the Netherlands and that—not any flooding event or inability to keep pace with sea level rise—would make the system precarious. From his perspective, complacency is a good thing. Our videos, by contrast, aim to trouble polder complacency because it gets in the way of actively confronting the uncertainties and extremes that lie ahead.

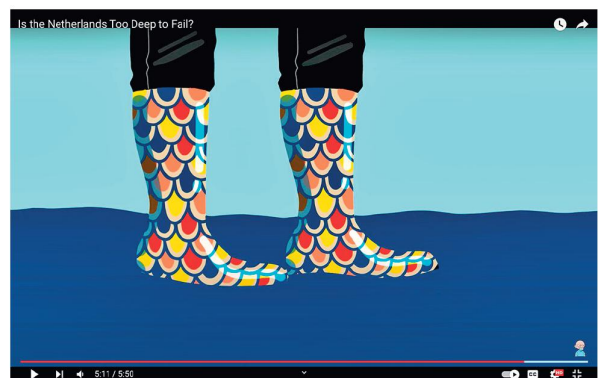
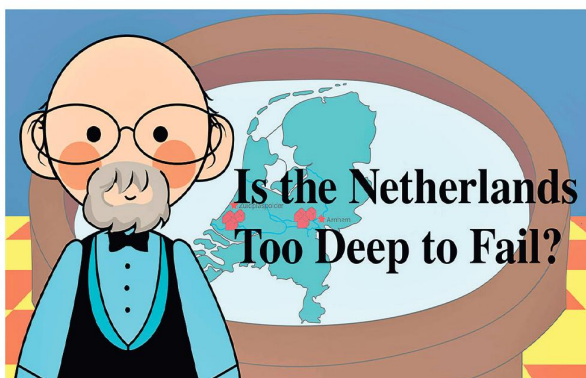
So much for the domestic situation. The Dutch water story operates differently abroad. Wherever governmental and private sector interests are busy drumming up opportunities for the Dutch water sector—whether in the United States, Bangladesh, Indonesia, Colombia, the Philippines, Vietnam or elsewhere—people tell versions of the Dutch water story. Their self-branding efforts have been so successful that every flooding disaster and every climate change threat provides free PR for the Dutch. Just look at the headlines: “Holland has solved this problem. Why can’t the US?” or “The Dutch have solutions to rising seas. The world is watching.” Domestic vulnerability and divided opinion at home are forgotten. Instead, the international Dutch water sector basks in the reputation it has strategically cultivated. A smug, self-satisfied attitude sets in. We have solved the problems. We have the solutions. Listen to us. (And buy our wares.) In its crassest form, the government openly concedes that climate change is a business opportunity for the Netherlands. This is what I call polder arrogance. I think it

gets the Dutch in trouble and hinders the achievement of their foreign policy goals.

The videos of Project Poldergeist address polder complacency and polder arrogance by proposing polder humility as an alternative. We do this by rewriting the water story in a less heroic mode. We alter the narrative and introduce new metaphors. In “Is the Netherlands too deep to fail?” we rewrite the story of the eternal war against water as a tale of gambling: “The Dutch have been gambling with the sea for centuries! The land winnings have been good, even if there were occasional busts.” Climate change is like a new high stakes casino that our Dutch gambler finds irresistible—hence the planned investments in low-lying and vulnerable areas. By reframing the narrative, we hope to open up space for critical reflection. “What role does risk play in our calculations? Does climate change increase risk? Are we placing wild bets? Should we be more cautious about where we build new homes?”

In our most recent video called “How will the Netherlands defend itself against climate change?”, we assess the four adaptation pathways developed by Deltares from the perspective of biodiversity, which, as the nitrogen crisis reminds us, is in a degraded state due to a combination of factors including industrial agriculture and keeping the water table low. What if we imagined the impacts of the water defense system and the maintenance of polders on biodiversity as an extension of the eternal war against water? And what if nature responded with a rescue mission called Operation Climate Change with the objective of liberating biodiversity? After all the collateral damage that the epic battle of Dutch water management has caused, isn’t it time to make peace with nature?

The reception of our videos has gone beyond our wildest expectations. According to YouTube analytics, 68% of our



This English version of **Introducing Dr Poldergeist** is published separately

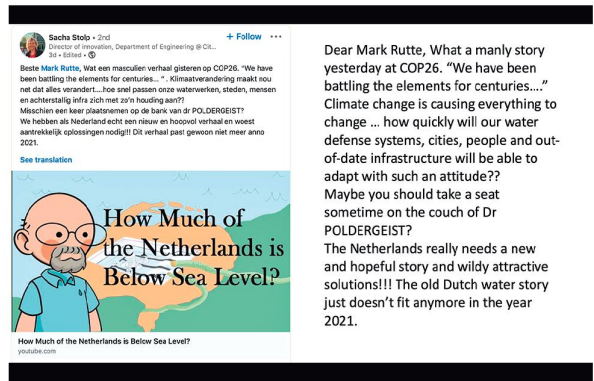
viewers are in the Netherlands. Anecdotaly, we know that a few policy makers of note have seen them, including the Delta Commissioner who has a cameo in “How will the Netherlands defend itself.” We made a big play to get Hugo de Jonge, the new minister of social housing and spatial planning, to watch “Too Deep.” We have no confirmation that he has, but we’re hopeful. What has been very gratifying is seeing others use the videos on social media to advance their approach to adaptation. One person has been especially inventive: Sacha Stlop, the director of innovation in the department of engineering for the city of Amsterdam. When Prime Minister Rutte gave a chest-thumping version of the Dutch water story at COP26 in Glasgow, she invited him to take a seat on Dr Poldergeist’s couch! And when “Too Deep” was released, she used the occasion to write an open letter to Housing Minister De Jonge. The resonance on LinkedIn was considerable. I hope many others will find ways to use the video to get conversations going in meetings or workshops. That’s what they’re there for.

We have a fourth video in production that addresses the Dutch international water sector. It asks how the climate futures of Jakarta and the Netherlands compare. Although the common perception is that they could hardly be more different—with North Jakarta threatening to submerge in a decade, not to mention moving the capital city to Kalimantan, and the Netherlands offering solutions to the entire world—we argue that the differences are exaggerated. In telling Jakarta’s water story, in which the Netherlands plays a supporting role, we inevitably have to touch on the Great Garuda Sea Wall, one of those occasions when polder arrogance got out of hand. For a while the plan was the posterchild of the International Water Ambition. No longer. We regard the story of the National Capital Integrated Coastal Development (NCICD) as an unresolved trauma that the Dutch water sector has for the most part repressed. We argue that

recognizing common vulnerabilities could form a better basis for working together with Indonesia and other Dutch Water Partnership members. Polder humility, in other words. There are sporadic signs that this reorientation is beginning to take place.

For all of our videos, we consult with experts every step of the way. As we develop the script and the storyboard, my co-director, fine arts professor Joshua Mosley, and I convene online meetings between our team of undergraduate artists and a remarkable line-up of Dutch and international experts. We want to be sure that we’re accurate, up-to-date, and effective in communicating our message. The willingness of people at institutions such as Deltares, NIOZ, Wageningen University and Research, IHE Delft, Ecoshapes, Ark Natuurontwikkeling, and Rewilding Europe, to name just a few, to explain the science and give their feedback has been astonishing. The students love these zoom meetings with the experts. It opens them up to a world of dedicated and innovative people who are passionately working to help communities adapt and thrive under adverse conditions. They’re thrilled that they can put their creativity as artists to work for a good cause.

What we’re building is a media platform, not for our own sake, but for climate adaptation science in the broadest sense, including culture. We want to help people in the Netherlands and other low-lying areas understand their situation. We want to encourage policymakers to work with residents to develop plans for adaptation and land use that take climate change and sea level rise into account. We’ll keep using humor and animation to rewrite the Dutch water story and encourage polder humility. It’s an amazing story, more amazing now than ever before. If there are scientists, architects, designers, engineers, journalists, community organizers, activists or policymakers out there who want to contribute to the new Dutch water story, we’d love to share our platform. Call us! We’d love to talk to you.



SOCIAL INCLUSION IN WATER CLIMATE ADAPTATION

WHAT WE CAN LEARN FROM WATER AS LEVERAGE IN ASIA

*Stephanie Janssen, Dennis van Peppen, Annet Kempenaar, Henk Ovink, Margo van den Brink**

■ In a world of increasing climate change induced crises (such as droughts, floods, hurricanes) across the globe, especially in the places of high risk, there is a growing disconnect between sector focused big institutions' international water and climate projects and other issues (e.g. (Boltz, Freeman, Tront, & Rodriguez, 2020) such as the local needs of people. National governments, in conjunction with International Financial Institutions (IFI's), spend billions on, often, monofunctional projects aimed at protecting economic interests, cities, highly populated river basins and coastal zones against flooding, droughts and other impacts of climate change. Dominant infrastructure development practices generally leave little space for organizing socially inclusive processes that consider the local situation and connect with the people affected by the project(s).

While challenges in the physical and economic systems are usually well addressed, local values and perspectives – often having a social or cultural background – are not. In order to address different values and perspectives, genuine inclusiveness from the very beginning of any initiative, up to the implementation and exploitation of a project is required, organizing interaction, building trust, and developing coalitions with inhabitants, communities, local governments and NGOs (Laeni et al., 2021).

Over the past years, attention to inclusive planning and development processes in international water and climate projects has increased, and new approaches are emerging. The Water as Leverage for Resilient Cities Asia (WaL Asia) program is such a new approach. WaL Asia was initiated by the Dutch government in 2018 and aimed to be radically integral and inclusive by embracing a completely holistic approach (The Netherlands Enterprise Agency, 2018). Six design teams in three cities (Chennai in India, Khulna in Bangladesh and Semarang in Indonesia) took up the challenge to build locally grounded multi-stakeholder coalitions and develop holistic, integrated and inclusive strategies and transformative projects for improving urban livelihoods and climate resilience (The Netherlands Enterprise Agency, 2018).

The Community of Practice (CoP) of the Dutch Water Sector on social inclusion is an initiative to exchange ideas and insights and work together to improve social inclusive practices. In the CoP, WaL Asia was put central as a case study. WaL Asia stakeholders and 18 organizations in the CoP discussed insights and lessons from the WaL Asia program on enabling social inclusion. This article, reports on the collaborative learning results from this effort. We identify *entry points* for social inclusion in water climate adaptation projects, relating to inclusive community engagement, inclusive project development and inclusive commissioning. These entry points can be used as inspiration for the set-up of other inclusive practices aimed at developing locally grounded international water climate adaptation projects.

Background

Social inclusion in international efforts of the Dutch water sector

Since the 1970s, Dutch water related aid and knowledge exchange programs have been developed and implemented in Asia, Latin-America, and Africa. Global water challenges have only increased since and are

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expected to increase further in the future (Ligtvoet et al., 2018). Rapid urbanization, land subsidence, over-exploitation of water resources, pollution and insufficient water management are affecting water security in many places (ibid.). Climate change exacerbates this situation with increased storm and hurricane incidence, rainfall intensity and longer spells of drought. Efforts undertaken to ameliorate these challenges are not always successful. Examples of inflexible and unadoptable designed and built water infrastructure are numerous (Brown et al., 2020). Such interventions have negative effects upstream and downstream, benefit some people but negatively affect others and/or negatively affect the environment (Liao, 2014). For example, when homes and livelihoods are destructed for water infrastructure or when water infrastructure has adverse effects on local ecosystems.

Dutch international water programs and projects have been criticized in publications by academics, NGO's and Dutch government evaluators. Critiques point at a largely (technical) single-focused solutions-oriented approach, and the lack of connection across challenges (intersectoral) as well as with communities, culture and local governance (e.g. Bakker, Kishimoto, & Nooy, 2017; Tesselaar, Turner, & De Beer, 2017; Yarina, 2018). Instigated by these kinds of critiques, a wider discussion was initiated in the Dutch water sector and with international partners, on social inclusion in international work. Among other actions, a Community of Practice (CoP) on social inclusion was initiated. While understanding social inclusion usually dwells on the inclusion of excluded or vulnerable groups, such as women, youth, the poor, or the disabled (e.g. The World Bank, 2013), the discussion in the Dutch water sector also includes the transfer of delta planning expertise to other countries (Hasan, Evers, & Zwarteveen, 2020), which reflects a broader understanding of social inclusion. The travel and transfer of Dutch water knowledge and expertise to different places is actively promoted by the Dutch government. Such transfer processes are very complex and with risk of implementation failure and impasses (Minkman, Letitre, & van Buuren, 2019), for example, due to a lack of attention to specific socio-economic, cultural and institutional conditions, local capacities and ownership. A central question regarding social inclusion is therefore: how to

translate, transfer, evaluate, re-think, evolve and localize Dutch water management knowledge *and* contribute to socially inclusive water climate adaptation?

Water as Leverage for Resilient Cities Asia

In 2018 the Dutch government together with international partners launched a new program with an explicit ambition to be inclusive: Water as Leverage for Resilient Cities Asia (WaL Asia). Three considerations formed the underlying rationale for WaL Asia. Firstly, it was recognized that water impacts on almost all 17 Sustainable Development Goals. WaL Asia therefore considered water a leveraging mechanism for climate adaptation action, environmental regeneration and social-economic development. Consequently, WaL Asia's focus and ambition was broader than 'just' improving water security. Rather, water was considered a catalyst for *integrated* (urban) development, providing opportunities to simultaneously address and improve multiple aspects of life on various scale levels. Secondly, a lack of funding and attention is given to capacity building and planning process in which (international) water and climate plans and projects are developed. Because of this, these processes tend to have a mono-sectoral orientation and those affected by the project are generally not included or heard, while this is exactly the basis for inclusion and resilience. WaL Asia therefore had an orientation on building local coalitions and the development of plans and project initiatives in the 'pre-project preparation phase'. It aimed for the development of 'comprehensive proposals for urban water projects' (The Netherlands Enterprise Agency, 2018) and the *inclusion* of all actors with a stake in the planning of such projects, including (international) donors and financiers as well as local communities (in all capacities: institutional, individual and informal). Thirdly, to develop integrated and inclusive plans and projects *innovative* approaches are needed. WaL Asia therefore followed a design-based planning process (Kempenaar et al., 2022; Laeni et al., 2020) aimed at adaptability to a changing environment and involving all stakeholders. The 2018 WaL program was focusing on Asia, currently the WaL process approach is being applied in other situations and environments, among others the Wadden Sea region in the Netherlands, Germany and Denmark and in Cartagena, Colombia.

The aim of WaL Asia was to develop concepts for water climate adaptation strategies and transformative and bankable resilience projects in three Asian cities: Khulna in Bangladesh, Semarang in Indonesia, and Chennai in India. Four main phases in the process can be distinguished (Kempenaar et al., 2022; Laeni, 2021). The first phase focused on preparing and setting up the WaL Asia program including the selection of three cities in close collaboration with international partners and the cities. This culminated in the launch of the actual program with a ‘Call to Action’ (The Netherlands Enterprise Agency, 2018) on Earth Day, 22 March 2018, inviting international multidisciplinary teams to take part in a challenge. In the second phase, for each city two design teams were selected to develop full-fledged climate resilient strategies and related transformative project initiatives based on creative designs in close collaboration with local governments, communities, NGO’s and various knowledge-, and financial partners. The second phase ended in the summer of 2019 when the teams delivered and presented their visions, strategies, and project initiatives. Currently, WaL Asia is in its third phase, which is focused on the development of bankable and implementable projects, and slowly moving towards the fourth phase, which is set out to implement – and where possible scale – the projects and spread the innovative approach of WaL Asia to other places.

Method: collaborative learning in the CoP

WaL Asia was used as case study in a meeting of the Community of Practice (CoP) on social inclusion in water climate adaptation. The intention was to understand social inclusion in a practical example and to learn and improve social inclusive practice using a four-step collaborative learning approach.

1 Gain understanding of the case study through interviews and document analysis

12 interviews were held with Dutch, Indian and Indonesian stakeholders in WaL Asia. Stakeholders represented different perspectives including local, international, NGO, consultancy and government perspectives and people with involvement in all

three cities. Interviewees were asked about their role, activities, ambitions, and challenges and they were invited for participation in the CoP meeting. For WaL Asia also various WaL policy documents (e.g. Government of the Netherlands, 2021; The Netherlands Enterprise Agency, 2018) and academic articles (e.g. Laeni, 2021; Laeni et al., 2021) were reviewed to explore the case.

2 Scoping the CoP meeting by developing relevant perspectives

After developing an understanding of the case study, the CoP meeting can be ‘scoped’. For WaL Asia, the following three perspectives emerged from the interviews and document study that were relevant for understanding the case and social inclusion in the case: community engagement, the project development process by design teams, and the way of commissioning.

3 Collaborative discussion, reflection and learning in CoP meeting

In the CoP meeting the case is discussed with CoP participants and case stakeholders. The WaL Asia meeting was a 5-hour online meeting on April 1st 2021 with 30 CoP participants and 20 WaL Asia stakeholders. The CoP meeting followed the three main phases of the ‘theory-u’ framework (Scharmer, 2016): first *understanding* the WaL Asia case study, second *collect insights*, and third *identify next steps* or actionable directions. Henk Ovink, initiator of WaL Asia, gave an introduction, and one of the design team leads presented their work. Three group interviews were held, each focusing on one of the three perspectives and with three different stakeholders in every group. Based on all this input break-out groups collecting *insights* and in the last part of the meeting, follow-up *actions points* were identified.

4 Capturing results in a report

The results of the CoP (both preparation and meeting) are captured in a meeting report. The WaL Asia meeting report (Janssen, Verder, & Burchard Levine, 2021) was sent to the CoP participants and stakeholders who participated in the meeting.

Table 1:
Entry points for social inclusion from the WaL Asia case.

Inclusive commissioning	Inclusive project development	Inclusive community engagement
<ul style="list-style-type: none"> ■ Active presence of commissioner. ■ Team selection based on <i>how</i> they intend to work (not on what). ■ Work in partnerships with teams and co-create an enabling environment. ■ Organize flexibility and adaptation throughout the process. ■ Be trustworthy, transparent, open and inclusive to all stakeholders. 	<ul style="list-style-type: none"> ■ Create multidisciplinary teams. ■ Co-creation of local, indigenous, knowing with international expertise. ■ Employ a design-based iterative learning process. ■ Use water as a leverage for integrated urban development. ■ Apply a people-oriented approach. 	<ul style="list-style-type: none"> ■ Don't bring pre-defined problems and plans. ■ Listen to understand the local context. ■ Value local, indigenous knowledge. ■ Cocreate solutions with local communities. ■ Be present on the ground and have strong partnerships with grassroots organizations.

Based on the interviews and documents (step 1), the developed perspectives (step 2), the reflection and discussion in the CoP meeting (step 3) we report the learnings of this collaborative learning journey through ‘entry points for social inclusion in water climate adaptation’. These entry points are developed for each of the three perspectives.

Results: entry points for social inclusion in water climate adaptation

Every situation is different. However, we can learn and take inspiration from other situations. This is one of the basic notions behind this collaborative learning effort. We found ideas on social inclusion in the WaL Asia case which we name ‘entry points’, as these are points that others can consider and take inspiration from when entering a process aiming for social inclusion. Depending on the situation, some points might be highly relevant, others less.

The entry points focus on three perspectives: inclusive commissioning, inclusive project development, and inclusive community engagement. An overview is provided in Table 1. The entry points are explained and elaborated in the following subsections.

Inclusive commissioning

WaL Asia was innovative in its approach to commissioning. Instead of a traditional top-down, linear commissioning approach, the Dutch commissioners were an integrated part of the process.

Active presence of commissioner

The first entry point is to invest in the process of commissioning and to be actively present as commissioner. The time spent on the commissioning side of WaL Asia was at times as costly and intense as the work on the side of the teams. Commissioning was considered a ‘verb’. Being present meant actively be(com)ing part of the network of teams and stakeholders, and being able to facilitate, lend a helping hand, intervene

and adjust the program process when needed. In Khulna, for example, the commissioner intervened halfway and started a conversation with one of the teams re-directing their strategy to ensure that the standards of WaL Asia were met.

Select multidisciplinary teams based on ‘how’ they want to do it (instead of ‘what’)

Second, to select teams, WaL Asia asked for multi-disciplinary teams and a strategy towards developing a vision and project initiatives. The team selection focused not on what teams had achieved or wanted to achieve, but on *how* the teams intended to enable innovation and foster a new ways of working. This approach came with uncertainties as the outcome of the process is unknown and required trust in the capacity of the teams.

Work in partnerships with the teams and co-create an enabling environment

The third entry point emphasizes partnerships: rather than acting as supervisors or evaluators of the final outcome, WaL Asia commissioners worked in partnership with the teams and the various stakeholders involved. The commissioner holds the purse, yet in contrast to more common approaches of accountability on pre-determined outputs, here the donor country – and the city – acted as a partner who supported the teams in achieving desired outcomes through co-creating an enabling environment for teams. Such a role involved a close relation between contractor and commissioner and trust in the partnership. In WaL Asia the commissioner supported the teams by organizing local and regional workshops; building relations with local, regional and national authorities; connecting with IFI’s to get them interested in WaL Asia concepts; organize workshops and (informal) soft-space dialogues (Allmendinger & Haughton, 2009) to connect the teams and all kinds of stakeholders; promoting WaL Asia concepts for uptake in bilateral and multilateral programs; and promotion of WaL Asia outcomes in international meetings. As a result, in WaL Asia the teams felt they were not left on their own, but rather part of something much bigger. For some it felt ‘like being part of a movement’.

Organize flexibility and adaptation throughout the process
The WaL Asia commissioner outlined the process, which was at the same time flexible and adaptive. The WaL Asia program allowed for changes, new ideas and responsiveness to what came up during the process. New insights grew in the course of the development of strategies and project initiatives, which did not always align with the earlier formulated 'Terms of Reference'. Being adaptive allowed these kind of developments, as well as experimenting, mistakes and being open to, for example, community-based initiatives. This approach facilitated 'learning-by-doing' and continuously improving. For the commissioner, teams and communities to be reliable partners in such a process rigorous transparency from the beginning is key. It also calls for the above-described active role of the commissioner.

Be trustworthy, transparent, open and inclusive to all stakeholders

In WaL Asia, being inclusive at all levels and towards all stakeholders was needed to further program development and implementation: (vulnerable) communities, NGOs, financiers, national, regional and local governments all have a part to play. Normally these stakeholders do not meet easily, or if they do, mainly in formal settings. In the informal 'soft space' dialogue setting stakeholders were able to interact and explore new perspectives. Be trustworthy, transparent, open and inclusive to all stakeholders is the final entry point related to inclusive commissioning.

Inclusive project development

'The ambitions set in WaL Asia were mind-blowing', according to one of the team leads. Inclusiveness was one of the key ambitions of the program, which challenged the design teams to develop inclusive strategies and project initiatives. What elements, or entry points, enabled inclusive development of the project proposals by the design teams?

Create multidisciplinary teams

First, WaL Asia called for multidisciplinary design teams. Different professional disciplines including engineers, architects, urban planners, and social experts, both international and local, worked jointly on strategies (first) and project ideas. Locally grounded team members, often NGO's, provided and organized local perspectives, including indigenous knowledge. Urban planners and

architects conceptualized ideas through design, and engineers provided and applied technical knowledge and solutions. This was a new approach for many of the professionals participating in the teams, an indication that genuine multidisciplinary teams are far from common. Team members evaluated their cooperation as highly valuable, enlightening, and inspiring.

Co-creation of local, indigenous knowledge with international expertise

A second important entry point related to inclusive project development is the importance to combine local, indigenous knowledge with international expertise. In WaL Asia, design teams successfully combined international and local knowledge. International experts became part of the local setting and locals became part of the team. The teams had to invest time to learn about local stakeholders thinking, their culture and indigenous knowledge and understand their mindset (Umans, 2021). This resulted in a valuable combination of local and international knowledge development, and a solid knowledge base for developing smart tailor-made project ideas.

Employ a design-based iterative learning process

Third, a design approach was employed when developing project proposals. In a design approach challenges are explored in coevolution with possible solutions in order to learn and develop an understanding of the challenges at hand and possible future situations. The technical feasibility and elaboration followed. This provided an iterative learning process stimulating creativity and room for developing integrated projects instead of single focused water infrastructure projects. For example, in WaL-Asia Chennai, historic temple tanks, existing water ways, and existing drainage canals were combined and redesigned for both flood management, water retention, water storage and water quality improvement, while at the same time improving the greening, beautification, and livability of the local urban environment. Such integrated ideas provide solutions to multiple issues and can provide additional benefits such as heat stress reduction and CO2 absorption capacity.

Use water as a leverage for integrated urban development

Fourth, in contrast to traditional water engineering projects, WaL Asia was not focused on developing solely single

focused water infrastructure projects. Water was instead used as a leverage for urban societal transformation and urban climate adaptation. Water was thus used as a means for broad urban transformation and improvement. For example, in Semarang one of the project initiatives that was developed focused on a network of resilient kampungs (neighbourhoods). It included proposals for a floodable park, alternative sources for water supply and a low-tech waste-to-energy facilities that bolsters the local energy supply. It illustrates how WaL Asia aimed to be holistic and integrated, and set out to use water as a leverage for integrated urban development.

Apply a people-oriented approach

Finally, the WaL Asia teams employed a 'people-oriented approach'. Understanding the local context and the people who live and work in this context marked the start of the process. Teams, supported by an enabling environment, interacted with all relevant actors and stakeholders: from local inhabitants and communities, to various levels of government, to NGO's and International Financial Institutions. The teams reached out and interacted with communities and stakeholders in multiple ways varying from additional workshops, to interviews, to games, to interviewing to 'just' talking to people on the street.

Inclusive community engagement

Involving local communities is central in social inclusive practice. Co-creating solutions with local communities and stakeholders, using local and indigenous knowledge and creating ownership is key. International initiatives like WaL Asia come with great responsibility to local people through the expectations such initiatives raise. In WaL Asia we have identified five *entry points* for inclusive community engagement.

Don't bring pre-defined problems and plans

WaL Asia left pre-defined problems and plans behind – the first important entry point for inclusive community engagement. In WaL Asia, the commissioner and teams shared influence and decision-power over the outcomes of the process. Moreover, the interaction and collaboration with the communities focused on problem definition and solution development. First step was creating an understanding of the local physical, social and cultural

circumstances and history by researching the local challenges (physical, governance, etc.) and interacting with local stakeholders and communities. After collaboratively exploring the 'problem space', participation was used for the development of plans and ideas. Local participants indicated afterwards that they experienced influence and ownership over the outcomes of the participation process, creating a level of genuine participation.

Listen to understand the local context

Second, in WaL Asia, listening to the local stakeholders was key to inclusive community engagement. Real listening requires empathy and an open mind. It can be (or usually is) quite difficult. Scharmer (2016) distinguishes four levels of listening. First level is listening by downloading, implying confirming what you already now. Level two is 'factual' listening: focusing on facts and whether these differ from what you already now. Level three is empathic listening, where you shift your position by stepping into another person's shoes. The fourth level is generative listening where you listen to the entire system of players and context. Truly connecting and inclusive approaches require level three and level four listening, as here you let go of predetermined frames and ideas and are open to listen what is actually happening. In Chennai, the WaL teams partnered with local Community Based Organisations (CBOs) to engage with people in several neighborhoods to listen to their concerns and challenges and to listen to their own ideas.

Value local, indigenous knowledge

Third, indigenous knowledge contribute 'locally-appropriate sustainable development' (UNESCO, 2023) as it contains local values and historical knowledge and practices related to the local natural systems. It is indispensable and has proven so in WaL Asia's strategy and project conceptualization. The city of 1000 tanks for the city of Chennai builds on the historic existence of tanks or ponds all over the city as part of the local natural system. This system has been destroyed for a large part as a result of urbanization and suboptimal urban planning. However, many of these natural ponds have been converted into temple tanks over the last decades. These temple tanks are now used in the city of 1000 tanks strategy as water retention, storage and aquifer recharge mechanisms.

Cocreate solutions with all local communities

WaL Asia set out to include all sorts of local communities and stakeholders. A diverse range of specific inclusion methods were applied in WaL Asia, such as an analysis of the most vulnerable and the most knowledgeable; youth engagement; townhall meetings; and collaborative drawing and sketching sessions. The insights gained enriched the process and designs, while local people gained awareness of their coexistence with water, often for the very first time. WaL Asia's local partners in Chennai, for example, messaged that 'true inclusion of vulnerable communities never happens in other programs', indicating the unique attempt of WaL to also include vulnerable groups in the process. In cities like Chennai and Khulna the poor are often being blamed for water problems because of illegal settlements in flood prone areas. Their voices are often excluded and not heard. However, they are part of the urban system and have valuable local indigenous knowledge. The fourth entry point for inclusive engagement is therefore the cocreation of solutions with all local communities and stakeholders.

Be present on the ground and have strong partnerships with grassroots organizations

Finally, WaL Asia was built on local presence and strong partnerships with local organizations; WaL Asia team members worked on the ground and in the city. The Chennai representatives indicated this was not seen often before. Local partners in the teams and being locally present enabled and fostered social inclusion in the project. Long(er)-term partnerships with grassroots organizations turned out to be able to close gaps between the international and local communities. Nevertheless, the local-international balance was subject to continuous reflection: to what extent is international expertise needed? What is the ideal combination of international and local expertise in strategy and project development? This balancing act was needed to create an equal partnership, and to build local capacity and ownership.

Discussion and conclusion

In the Dutch Water Sector, a need and curiosity towards more socially inclusive practices is experienced. In response to this need, Water as Leverage for Resilient

Cities Asia (WaL Asia) served as a case study in its Community of Practice on social inclusion. WaL Asia was an innovative approach for developing integrated and inclusive international water and climate projects. It aimed to use water as a leveraging mechanism for broader urban development taking into account the true needs of local people.

In discussions and debates about social inclusion there is a strong focus on vulnerable and excluded groups. A striking and innovative insight from WaL Asia is that social inclusion is about more than involving vulnerable communities. We should rather focus on the entire ecosystem of project development. Commissioning, project development as well as community engagement are important to take into account in the creation of inclusive planning processes. Consequently, based on the preparatory interviews, previous research on WaL Asia, and the talks and conversations during the CoP meeting, we identified various *entry points* for 'inclusive commissioning', 'inclusive project development', and 'inclusive community engagement'. The entry points are no guidelines, nor do they guarantee inclusiveness. The entry points were mainly formulated to provide inspiration for setting up inclusive processes in other water climate adaptation initiatives.

Taking the local specifics into account in setting up an inclusive process is crucial. No situation is the same. This makes that some entry points might be more relevant than others in a certain situation, or that inclusiveness calls for other actions or postures. Furthermore, inclusive project development comes with a range of additional challenges, such as language, social and cultural barriers, power structures, limited resources etc. Therefore, a blueprint recipe for social inclusive program or project development does not exist. WaL Asia also illustrates that inclusiveness is about being adaptive, flexible and having the willingness to struggle. Easy routes to integrated and inclusive climate adaptation projects therefore do not exist. But doing nothing is also no option and doing it wrongly should be avoided at all costs.

This brings us at a final point. There is still a lot to learn about what social inclusion truly means and how genuine inclusiveness is created in various situations. Therefore, we

call out to others who have set up planning processes with the aim to be inclusive, to share with us their insights and experiences. We are particularly curious to learn from non-Dutch cases as we acknowledge WaL Asia was a Dutch induced program, which we discussed in a Community of Practice with Dutch practitioners. We are eager to continue and enrich our learning journey on social inclusion in water and climate related planning projects. Social inclusion is an important and critical topic, if not essential in the creation of resilient urban areas and regions across the globe.

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LEARNING FROM ABROAD

OPPORTUNITIES AND BARRIERS TO IMPLEMENTING KNOWLEDGE IN THE DUTCH WATER SECTOR

Ellen Minkman, Brenda Vermeeren*

■ The Netherlands is internationally known for its water knowledge. The Dutch system of water boards is unique, drinking water is of good quality and flood risk is low, despite the low elevation of the country. The Dutch way of working therefore attracts interest from abroad. However, it is unclear what Dutch water boards and drinking water companies themselves learn from such exchanges. Through survey research, a focus group meeting and interviews it was investigated how individual experiences abroad are used in the daily practice of water boards and drinking water companies. This article describes the results of this research.

The Dutch water sector actively shares its expertise with other countries. Besides short exchanges of knowledge, technology and policy, there are also several long-term partnerships. Two examples are the BlueDeal of the Dutch Water Authorities (the international organization of the regional water authorities in the Netherlands) and the drinking water sector's WaterWorX program. Both programs aim not only to 'give' knowledge, but also to 'take' it in a two-directional exchange. After all, there is still room for improvement in Dutch water management sector (Havekes, 2022). Yet this proves difficult in practice: *"(...) knowledge consists mainly of experiences, not so much of concrete lessons learned. In general, people find it difficult to make the knowledge gained insightful. This hinders conscious application elsewhere, as well as knowledge transfer to colleagues."* (Van Hunen, 2013).

The BlueDeal and WaterWorX pay explicit attention to governance. This includes institutional aspects, the organization of water management, and the way decisions are made and implemented. Both programs are therefore a form of policy transfer, where knowledge about policy instruments, (technical) solutions and organizational forms from the Netherlands are used to shape policy and measures in other countries.

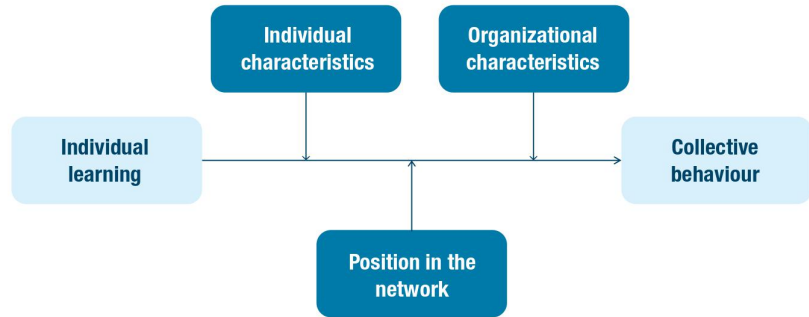
Policy transfer revolves around transferring and incorporating external knowledge and is therefore conceptualized as a form of learning by some scholars (e.g., Minkman et al., 2018). Previous studies have identified lessons learned by recipients (Webber, 2015), examined the conditions under which recipients learn (Marsden & Stead, 2011), and have evaluated the effectiveness of certain channels of policy transfer (Thomas & Bertolini, 2015).

Surprisingly, almost all academic research focuses on the learning process of receivers, and little attention has been paid to the question of what senders learn from their efforts to share policy knowledge. In this article, we therefore focus on the learning experience of senders. It is plausible that senders could also learn in a policy transfer process. There is increasing interest from the Dutch water sector for experiences from elsewhere as a source of inspiration for Dutch water management. A recent example is the interactive world map with international examples, commissioned by the Dutch Water Authorities (Kronenberg et al., 2022).

Our research aims to gain insight into the extent to which Dutch water experts learn from policy transfer. In addition, we want to find out under which conditions insights are translated into the senders' organization, or in other words, how the process of 'reverse policy

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Figure 1: Conceptual model used for this study. Individual learning experiences can be transferred through social learning into collective change, a relationship hindered or strengthened by characteristics of the individual, the organization (=water board or drinking water company) and the broader network.



transfer’ contributes to changing the way of working in Dutch water boards and drinking water companies. Therefore, the research question is: “To what extent do characteristics of the **individual**, the **organization** and the **network** explain why **lessons learned from international activities** (do not) lead to change within Dutch water boards and drinking water companies?”

The rest of this article describes the theoretical framework, in which we link characteristics of the individual, organization and network to collective action. Next, we discuss the design of the study. We then present the results of the quantitative and qualitative research. We conclude with a conclusion and discussion.

Theoretical framework

Policy transfer as a learning process

Policy transfer should not be seen as a linear transfer between sender and receiver; instead, policy transfer is a network activity, in which knowledge is transferred between but also within organizations (Dolowitz, 2017; Tsai, 2002). The transferred knowledge must be internalized and adapted to the frame of reference of the receivers; in other words, actors must try to translate policy to the local context (for in-depth discussion, see, among others: Minkman & Van Buuren (2019) and Mukhtarov & Daniell (2016)). In this process, *all* stakeholders are expected to integrate new knowledge into their existing frame of reference and revise their ways of working, i.e. senders can also learn.

From individual experiences to collective action

Learning is primarily an individual process, but it takes place in a social context through social interactions, in which individuals share their insights with others. This stimulates group learning (Heikkila & Gerlak, 2013; Pahl-Wostl, 2006). In this study, we are interested in the individual learning taking place and whether and how, through group learning, this culminates in collective action. We hypothesize:

H1: Individual learning is positively related to collective behavior.

We follow a methodological individualist approach, which means that we measure individual actions and choices to understand (absence of) collective action in the larger social network (Heikkila & Gerlak, 2013). Characteristics of the individual, the organization, as well as the broader network in which they operate potentially influences translation of lessons learned. We therefore propose the model in Figure 1. In the next sub-sections, we elaborate on these levels and formulate hypotheses based on existing theories and research.

Individual characteristics

Regardless of the circumstances, an individual should have certain competencies to transform newly acquired knowledge into transferable information. Thus, individuals must be aware of their responsibility to learn (Marquardt, 1996 – in Vassalou 2001). In this study, two dimensions can be distinguished: a proactive personality and self-efficacy.

H2: A proactive personality moderates the relationship between individual learning and collective behavior where the effect of learning on behavior is greater when there is a more proactive personality.

H3: Self-efficacy moderates the relationship between learning and behavior where the effect of learning on behavior is greater when there is more self-efficacy.

Organizational characteristics

To achieve collective action, the organization in which the individual works should, to some extent, be a learning organization. A learning organization “empowers employees, encourages experimentation, rewards learning, supports innovative suggestions and regularly generates learning opportunities” (Vassalou, 2001, p. 356). Three aspects are particularly important: organizational structure, learning culture and the manager’s leadership style.

Organizational structure

Internal aspects, particularly bureaucratic rigidity, may limit individuals' intentions to turn their learning experience into action, because people believe there is little chance of actual change occurring (Bennett & Howlett, 1992). We therefore hypothesize that:

H4: Bureaucratic rigidity moderates the relationship between individual learning and collective behavior whereby the effect of learning on behavior is smaller when there is more bureaucracy.

Learning culture

Making lessons learned stick is especially challenging in an international environment where organizational structure and context tend to differ (Hachmann, 2012). Therefore, an organization's learning capacity also plays a role in turning individual learning experiences into collective behavior. In this respect, we mean the ability to "create, acquire, transfer and integrate knowledge, and adapt its behavior to the new cognitive situation, with the purpose to improve its performance." (Jerez-Gómez et al., 2005, p. 716).

H5: Learning culture moderates the relationship between individual learning and collective behavior where the effect of learning on behavior is larger when there is a learning culture.

The manager's leadership style

There is compelling evidence that certain management styles stimulate innovation in an organization, in particular empowering leadership (Konczak, Stelly, & Trusty, 2000; Van Dierendonck & Nuijten, 2011; Vassalou, 2001). An empowering manager encourages employees to think for themselves and make their own decisions. As such, an individual with this type of manager is expected to be more inclined to actively share insights, which enables group learning, and collective behaviour.

H6: Leadership moderates the relationship between learning and behavior with the effect of learning on behavior being greater when there is more empowering leadership.

Characteristics of the network

Previous studies point to the importance of networks for policy transfer (see e.g., Dolowitz, 2017). Learning, among others, occurs in policy networks and communities of scholars or other experts with authoritative knowledge claims (Dunlop, 2009; Granovetter, 1973). Therefore, a close and active network will encourage the transmission of lessons learned. Information spreads faster in high-density networks (Borgatti et al., 2009; Granovetter, 1973), while knowledge spreads further when there are

more informal connections (Jansen, Van Den Bosch, & Volberda, 2006) and "weak ties" (Granovetter, 1973). These connect the different clusters within the network and ensure that the entire network is mobilized.

H7: Network size moderates the relationship between individual learning and collective behavior with the effect of learning on behavior being greater when there is a more extensive network.

Methodology

To answer the research question, different types of data were combined. First, a questionnaire was distributed to employees of water boards and drinking water companies that are engaged in international knowledge sharing through BlueDeal or WaterWorX. In addition, a focus group meeting was held with the 'foreign coordinators' of the water boards. Finally, 10 qualitative interviews were re-analyzed.

Questionnaire water boards (BlueDeal) and drinking water companies (WaterWorX)

In 2021, the researchers distributed a questionnaire to employees of water boards (February) and drinking water companies (September) using Qualtrics. Respondents completed an informed consent form while completing the questionnaire and data was processed in accordance with the General Data Protection Regulation (GDPR). In addition, this study was approved by the *Human Research Ethics Committee* of the TU Delft.

The questionnaire was largely based on validated scales from scientific literature. For learning and collective behavior, no appropriate validated scale was available and therefore the researchers developed scales themselves (see Appendix 1 for the scales and references). The questionnaire was discussed with representatives of the BlueDeal and WaterWorX prior to the fieldwork to ensure the questions matched the specific context. We furthermore extensively tested the questionnaire with 7 participants in the international training group 'KIWI' of the water boards (Knowledge and Introduction Program Water Boards International). This qualitative test was conducted with each respondent individually. The test respondents were asked to share their screen, complete the questionnaire, and think out loud while answering. The researchers paid attention both to verbal communication when completing the questionnaire and to how participants completed the questionnaire in terms of, for example, speed, lingering on certain questions and use of the full response scale. Based on this, adjustments were made to the phrasing of some of the questions.

In total, 79 people from a water board and 97 people from a drinking water company participated in the survey. For the analysis, the researchers did not include respondents who did not belong to the target group or did not complete the questions on learning and behavior. The final response rates the researchers used in the analysis was 67 for the water boards and 93 for the drinking water companies. The representativeness of the response in terms of gender, contract type, job level and working hours was discussed with the contacts and is no concern.

After the fieldwork, an Exploratory Factor Analysis in SPSS was conducted to validate the scales. Based on this validation, several items were excluded in the final analysis. Appendix 1 describes the items for each scale that were included in the analysis. In addition, the references of the original scale and the Cronbach's Alpha scores are presented.

Focus group with foreign country coordinators

In June 2022 a focus group was held with the foreign coordinators from the water boards. The results from the questionnaire were presented, followed by a group discussion that was structured through 3 statements (see Appendix 2).

Qualitative interviews

To find out which obstacles water experts experience regarding transferring lessons learned, 10 interviews were re-analyzed. These interviews were conducted by bachelor students from the 'Technische Bestuurskunde' program (Technology and Public Administration), who studied various aspects of "learning from abroad". 7 interviews were held with World Waternet employees, including experiences involving both BlueDeal and WaterWorX as Waternet is a combined water board and drinking water company. One respondent works at the water board of Schieland and Krimpenerwaard. Finally, 2 interviews were conducted with employees of the overarching organization Dutch Water Authorities. These respondents are closely involved in shaping and evaluating the international activities of the water boards. The transcripts of the interviews were recoded based on the model introduced in Figure 1.

Results

What is learned?

The average scores per variable are shown in Table 1. For both individual learning and collective behavior average scores are below the middle of the scale, meaning limited learning and collective behavior based on lessons learned is reported.

Table 1 Average scores

Variable	Scale	Average score
Individual learning	1-5	2,36
Collective behaviour	1-5	2,39
Proactivity	1-5	3,78
Self-efficacy	1-5	4,21
Bureaucracy	1-5	2,35
Learning culture	1-5	4,09
Leadership	1-7	5,16
Network	1-5	2,59

Drinking water companies

When researching within the drinking water companies, we asked an additional question regarding which competencies people developed most by being active in international projects. The top 3 most frequently mentioned competencies gained are:

- Intercultural communication (56x)
- Coaching and training skills (34x)
- Flexibility (31x)

The 3 least mentioned competencies are:

- Planning and organizing (1x)
- Writing skills (1x)
- Persuasion (0x)

Water boards

Within the water boards, the same information was gathered in the focus group. This showed that people mainly learn soft skills, such as ways of communicating and dealing with setbacks (flexibility and patience), and other – more subtle and indirect – ways of conflict resolution and cooperation. Content-related learning occurs as well though. Other countries have more experience with certain extreme weather conditions (e.g., drought, peak rains) or technological innovations, such as the use of solar energy, reversed osmosis, desalination, and alternative payment systems (e.g., mobile money service M-Pesa in Kenya to pay water bills). In addition, Dutch mechanics and other technicians frequently exchange practical information about their work with their international colleagues.

Transfer of learning

To test the hypotheses, Z-scores were created for all variables to calculate the moderations. Table

2 shows the results of the regression analysis. The beta coefficient represents the strength of the relationship. If there is an asterisk after the beta coefficient, it means that the relationship is statistically significant. First, the results show a significant relationship between the sector where we did the survey and collective behavior. Respondents at the drinking water companies are significantly more likely to indicate collective behavior than respondents at the water boards. In addition, in line with Hypothesis 1, it appears that individual learning is positively related to collective behavior. Furthermore, one of the moderation hypotheses is confirmed. Namely, we found that a proactive personality moderates the relationship between individual learning and collective behavior where the effect of learning on behavior is greater when there is a more proactive personality. We also find a significant moderation effect of network, but not in the hypothesized direction. We find that frequent contact with a sizeable network affects the relationship between individual learning and collective behavior. When there is little individual learning, frequent contact with a large network contributes to more collective behavior. However, when there is high individual learning, frequent contact with a large network actually causes less collective behavior.

Table 2 Regression on collective behaviour (N=110)

Variable	Bêta
Gender (0=man, 1=woman)	,031
Years of service in years	-,057
Job level (1=junior, 2=medior, 3=senior)	-,073
Management tasks (0=yes, 1=no)	-,071
Sector (0=water board, 1=drinking water company)	,256**
Foreign experience in years	-,023
Individual learning	,671**
Proactivity	,030
Self-efficacy	-,015
Bureaucracy	-,075
Learning culture	,081
Leadership	,032
Network	,033
Individual learning x Proactivity	,164*
Individual learning x self-efficacy	-,094
Individual learning x bureaucracy	-,117
Individual learning x learning culture	,021
Individual learning x leadership	,111
Individual learning x network	-,211*

** P < 0.01, * p < 0,05

In the interviews we find possible explanations for the limited translation of individual learning to collective behavior within the water boards. The BlueDeal has been running since 2018 and until now, the emphasis has been on “bringing knowledge”. The debriefing of people who have been abroad is mainly focused on the BlueDeal goals, and thus the emphasis is also on bringing knowledge. In BlueDeal2 (launched in July 2022), more attention will be paid to knowledge retrieval, or learning.

Moreover, the debriefing is a decentralized process at the water board, consequentially the evaluation method differs per water board. Although experiences differ, several respondents indicated that colleagues and managers are mainly interested in the ‘experience’ of the trip and hardly interested in what was learned (in terms of content). Not everywhere a defined structure is provided for passing on lessons learned to colleagues within the water board.

Finally, we find an explanation in the partnership itself. Many partnerships are with countries in the so-called “Global South”, which creates the perception that the Dutch are higher in hierarchy or that they have more advanced knowledge than their counterparts. This makes an equal relationship impossible (see also Hasan, 2021) and makes knowledge retrieval more unlikely.

Conclusion

The central question of this study was to what extent characteristics of the individual, the organization and the network explain why lessons learned from international activities (do not) lead to change within Dutch water boards and drinking water companies. First, the results of the quantitative research show that the average scores on both individual learning and collective behavior are quite low. We find a possible explanation for this unexpected finding in the qualitative research, in the perception regarding the possibility to learn from another country and the (unintentional) emphasis in both programs on bringing knowledge.

In addition, the quantitative research shows that some characteristics influence the extent to which individual learning contributes to collective behavior. These include pro-activeness of the individual and the amount of cooperation with the network. A proactive personality enhances the effect of individual learning on collective behavior, regardless of how much learning has occurred. However, a large, active network does this only when learning was limited. Less collective behavior is reported when there was a lot of learning by individuals active within a large network. From the qualitative research, two additional factors emerge that may influence the extent to which individual learning leads to collective behavior. Both can be thought of as organizational characteristics, namely the way debriefing and evaluation takes place (on

bringing knowledge or getting knowledge) and the presence or absence of a structure to transfer the lessons learned to colleagues within the organization.

Discussion

This research is one of the first studies to focus on what “senders” learn in a policy transfer process. This study specifically focused on what Dutch water experts learn from policy transfer. It is striking that, on average, relatively little is learned. A first possible explanation is that indeed very little is learned. If so, follow-up research could focus on why this is the case. This research offers some initial starting points. A second possible explanation is that the questions in this study are too abstract, making the low score primarily a methodological effect. However, this did not emerge in the testing phase in which, among others, 7 people with foreign experience carefully went through the questionnaire. A third possible explanation is that the lessons are limited to personal insights that are not directly applicable to daily work in the Netherlands. This could be due to characteristics of the respondents. The focus group indicated that technicians (such as mechanics and operators) seem to exchange knowledge more often than consultants. While this study asked about the type of work (technical, governance or support), years of (foreign) experience and managerial duties, it is unknown what the ratio of technicians to consultants is.

In addition, this research shows that the extent to which collective behavior occurs offers room for improvement. As described in the conclusion, this research provides some initial guidance for increasing the extent to which individual learning leads to collective behavior. Interestingly, the quantitative study shows that all organizational characteristics (bureaucracy, learning culture and leadership) have no influence, while the qualitative study does mention organizational characteristics as influencing factors. More research is needed to find an explanation for this.

The conclusions apply only to the target group studied – water experts working abroad – and cannot be generalized to other groups, such as fellow water experts working only in the Netherlands. A limitation of this study is that this target group is not that large. Despite a good response rate, the number of respondents is quite low which affects the options for statistical analysis. To gain more insight into how collective behavior-based learning experiences abroad can be increased, this research could be repeated in another (larger) sector that also works on foreign projects, such as engineering firms or contractors. In this way, it would also be possible to examine which findings are specific to the target group studied and which findings reflect general mechanisms.

Finally, the primary question of this research was how lessons learned transfer from the individual to the collective, using theory on individual learning and organizational

learning. A logical follow-up question is how the organization may not only learn but can actually change and what is required to do so. Lessons learned at the operational level require a different approach than insights related to the strategic direction of the organization. Some findings of this study point in that direction, such as the experienced lack of interest regarding content-related lessons from colleagues and managers within water boards. An extension of the study could therefore include the perspective of organizational change, such as people's willingness to change (Armenakis & Harris, 2009) or the factors that target successful organizational change in the public sector (Fernandez & Rainey, 2006).

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SUMMARY

The Dutch water sector actively shares its expertise in various international knowledge exchange projects, and thus engages in exchanging knowledge with other countries. Examples are the multi-year programs BlueDeal (water boards) and WaterWorX (drinking water companies). However, it is unclear what Dutch water boards and drinking water companies themselves learn from such exchanges. Survey research, a focus group and interviews were used to examine how individual experiences gained abroad translate into the daily practice of water boards and drinking water companies. As expected, there is a positive relationship between individual learning and collective action. However, it is notable that limited individual learning is reported (2.36 on scale 1-5). Furthermore, we found that individual learning is more often converted into collective action in the drinking water companies, than in the water boards, possibly due to limited evaluation and debriefing within the water boards. A proactive personality enhances the effect of learning on behavior, while a large, active network does so only when little learning has occurred. Less collective behavior is reported when high degrees of learning were reported by individuals that were active within a large network.

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— APPENDIX 1 —

In this appendix, we used ‘water board’. In reality, ‘water board’ was of course replaced with ‘drinking water company’ when conducting the survey in drinking water companies.

Individual learning¹

Developed for this study, based on Simonin (2017)

Scale from (1) totally disagree to (5) totally agree.

Cronbach's Alpha .83

Thanks to my activities abroad...

- 1 ...I have discovered that we can do our work better within my water board.
- 2 ...I have discovered shortcoming in our daily work practice within my water board.
- 3 ...I have discovered that we have to adjust our current way of working in order to achieve our goals.
- 4 ...I have discovered new ways to do the (same) work within my water board.
- 5 ... I started to have doubts about the way in which we determine within my water board what is important to us as water board.
- 6 ...I started to think differently about the current strategic direction within my water board.
- 7 ...I realized that the prevailing standards within our water board are insufficiently in line with real-world practice.
- 8 ...I have my doubts about the underlying policy model within my water board.

Collective behaviour

Developed for this study, based on Simonin (2017)

Scale from (1) totally disagree to (5) totally agree.

Cronbach's Alpha .94

Within my water board, based on my own or colleagues' experiences abroad...

- 1 ...we regularly make small adjustments to the way we do our work.

- 2 ...we regularly discuss how we can tackle shortcomings.
- 3 ...we regularly evaluate whether our working method is sufficient to achieve our goals.
- 4 ...we experiment with new ways of doing our job.
- 5 ... we regularly discuss what is important to us as a water board.
- 6 ... we regularly discuss about making changes to the strategic direction.
- 7 ... we regularly discuss the prevailing standards within our organisation.
- 8 ...there have there been updates to the underlying policy model in recent years.

Proactivity

Adapted from the existing proactive personality scale from Bateman and Crant (1993).

Scale from (1) totally disagree to (5) totally agree.

Cronbach's Alpha .75

- 1 If I see something I don't like, I fix it.
- 2 No matter what the odds (are), if I believe in something I will make it happen.
- 3 If I believe in an idea, no obstacle will prevent me from making it happen.
- 4 When I have a problem, I tackle it head-on.

Self-efficacy

Self-efficacy scale, adopted from Van der Meer et al. (2022).

Scale from (1) totally disagree to (5) totally agree.

Cronbach's Alpha .81

- 1 I am confident that I could deal efficiently with unexpected events in my work.
- 2 I can remain calm when facing difficulties because I can rely on my coping abilities.
- 3 I can usually find several solutions, when I am confronted with a problem,
- 4 I can usually handle what happens in my job.

Bureacracy

Centralization of Decision Making scale, adopted from Jansen et al. (2006).

Scale from (1) 'totally disagree' to (5) 'totally agree'.

Cronbach's Alpha .92

In my organisation:

- 1 There can be little action taken here until a supervisor approves a decision.
- 2 A person who wants to make his own decisions would be quickly discouraged.
- 3 Even small matters have to be referred to someone higher up for a final decision.
- 4 Unit members need to ask their supervisor before they do almost anything.
- 5 Most decisions people make here have to have their supervisor's approval.

Learning culture

Questions 3 and 4 form the dimension Experimentation scale, adopted from Chiva, Alegre and Lapiedra (2017).

Scale from (1) 'totally disagree' to (5) 'totally agree'.

Cronbach's Alpha .84

- 1 Within my organisation, we are given time to elaborate new ideas.
- 2 Within my organisation, we are given time to share lessons learned (from abroad).
- 3 People here receive support and encouragement when presenting new ideas.
- 4 Initiative often receives a favourable response here, so people feel encouraged to generate new ideas.

Empowering leadership

Empowerment scale, adopted from Van Dierendonck and Nuijten (2012).

Scale from (1) 'totally disagree' to (5) 'totally agree'.

Cronbach's Alpha .94

- 1 My manager gives me the information I need to do my work well.
- 2 My manager encourages me to use my talents.
- 3 My manager helps me to further develop myself.
- 4 My manager encourages me to come up with new ideas.
- 5 My manager gives me the authority to take decisions which make work easier for me.
- 6 My manager enables me to solve problems myself instead of just telling me what to do.
- 7 My manager offers me abundant opportunities to learn new skills.

Network

Developed for this study.

Scale: (1) 'never or less than once a month'; (2) about once a month; (3) multiple times per year, but less than once a month; (4) monthly; (5) weekly.

Cronbach's Alpha .80

How often do you discuss about the current foreign project with (...)?

- 1 colleagues from my current team, within my organization
- 2 colleagues from my organization (but from other teams/projects).
- 3 colleagues from another water board or the Dutch Water Authorities, with whom I am currently collaborating in another project.
- 4 colleagues from another water board or the Dutch Water Authorities, with whom I am currently not collaborating in any project.

— APPENDIX 2 —

During the meeting with the foreign coordinators of the water boards, we used three statements that participants could agree or disagree with. We asked them to ‘step across the line’ if they agreed, to add an interactive element to the session.

- 1** Step across the line if... you think that there is a lot to learn from other countries for the Dutch water boards.
- 2** Step across the line if... you regularly encounter knowledge* about climate change adaptation in other countries that you consider to be something useful, relevant or to learn from.
** it was shortly explained that knowledge includes interesting approaches and ways of working too.*
- 3** Step across the line if... there is an international knowledge agenda in your water board (i.e., an explication of what your water boards wants to learn abroad).

THE PAKISTAN FLOODS OF 2022

A PLEDGE FOR SYSTEM THINKING IN WATER MANAGEMENT

*Willem van Deursen**

■ In Sindh, Pakistan, devastating floods have caused loss of life, displacement, and economic damage. The severe floods of 2022 underscore the urgent need to enhance resilience to flooding. However, traditional approaches to flood management have often focused on reactive measures such as rebuilding damaged infrastructure and providing relief to affected communities. While these measures are important, they fail to address the underlying causes of flooding or to build resilience to future events. Without addressing these underlying causes, there is a risk of misallocating funds without making progress towards development goals. Pakistan seems to be on a track of being worse off after the funding has become available. No actual progress on the development track, but increased debt burden.

To address the challenges posed by flooding in Sindh, there is a need for a more holistic, system-level approach that considers the complex interactions between social, economic, and environmental factors that contribute to flood risk. By adopting a system thinking perspective, policymakers and stakeholders can develop more effective strategies for increasing resilience to flooding in the region. In this essay, we will explore the importance of system thinking in analyzing the floods of 2022 in Sindh and in developing strategies to increase resilience in the region.

Sindh floods of 2022

During the summer of 2022, Pakistan saw one of its most devastating floods. Extreme precipitation inundated large areas, more than 1,300 people died and hundreds of thousands have been displaced by the extreme flooding that has destroyed more than 1 million homes. Experts in water management from all over the world turned to help Pakistan during this crisis and financial aid has been widely provided. Both result in plans and proposals, that are now being developed, to try and deal with the aftermath.

The floods of 2022 were not an isolated event in Sindh. The province has a long history of flooding, with devastating floods occurring almost every year. This recurring pattern of flooding highlights the urgent need to increase resilience to

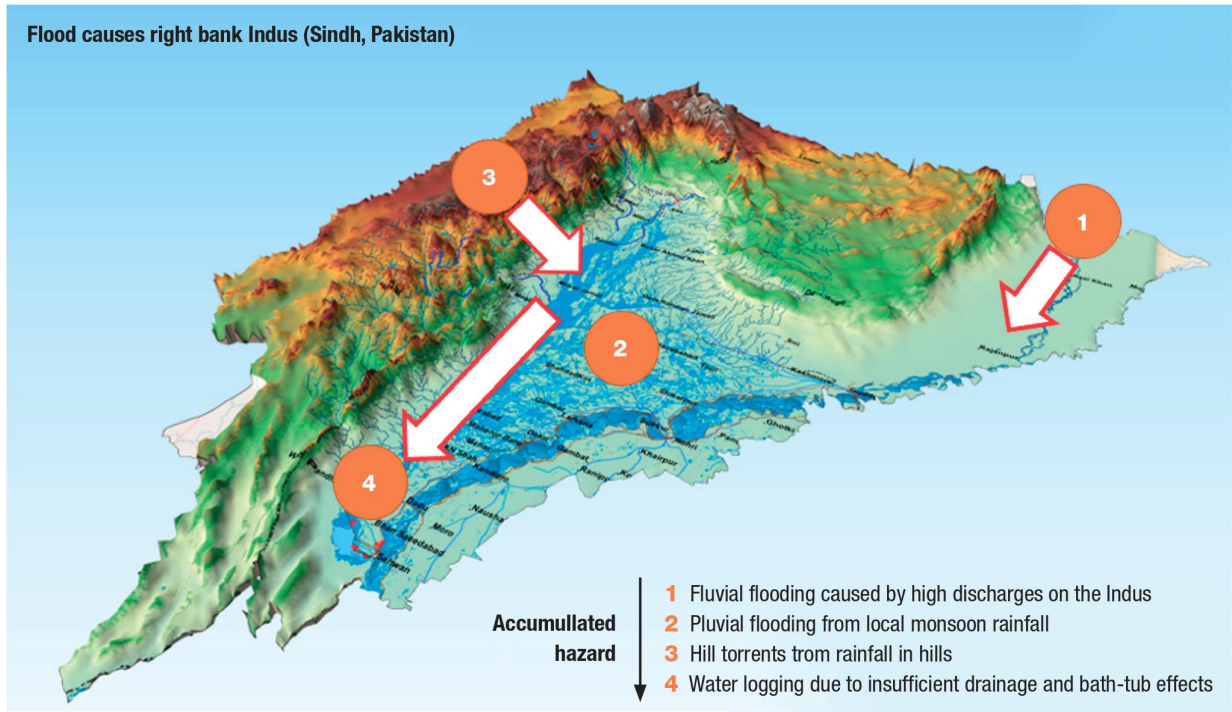
floods in the region and to adopt more effective strategies for managing flood risks.

In order to do so, a more comprehensive understanding of the challenges that Pakistan is facing needs to be developed. A step needs to be taken beyond understanding the disaster as a water management challenge, to an understanding of the disaster as a pattern of interrelated dynamics in a complex system. Water management in Pakistan can be seen as a complex system because there are many interacting and interrelated components, that each play their individual role. Only the combined patterns of all these individual components resulted in the disaster that unfolded, and so we should consider all these interacting components as part of the cause. We should step beyond viewing the water management challenges and see the disaster for what it really was, malfunctioning of a complex system of many interrelated components.

Complex systems in water management

When we start manipulating a complex system, it will never go back to its original state. Yes, it will find a new state, and some equilibrium will establish there. And once we start manipulating that equilibrium, we enter into a new transition towards a new equilibrium.

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Moreover, you cannot break the system apart and re-assemble it from the parts. Remember your mother’s mechanical alarm-clock, you tried to repair it, but the parts didn’t fit anymore? And it was not even broken. You cannot take one component from the system, improve that part and place it back. All components are interconnected, so changing one does not necessarily improve the system.

Dr. Russell Ackoff is one of the founding fathers of system thinking. He argues that our analytical focus actually prevents us from seeing interconnections. We focus on the parts, we analyze the parts, we break the system apart, and we wonder why the system does not improve after our analysis. Ackoff argues that understanding a system does not come from breaking the system apart. This approach produces no understanding, it produces knowledge (“how” things work instead of “why they work the way they do”). If you apply analysis to a system, you take it apart, and it loses all its essential properties. A system is never the sum of its parts. It is the product of the interactions of its parts. He uses the example of a car, a complex system made up of many parts. Could you find out why the motor is in front by taking the car apart? Could you find out why it’s a six-passenger vehicle by taking the car apart? Could you find out why the English drive on the other side of the road by taking a British car apart?

Ackoff introduces synthesis – the art of bringing together the individual parts – as another way of thinking which provides explanations of the behavior of the system. Synthesis consists of three steps that are exactly the opposite of analysis. Synthesis tries to find the overarching functions, not the functioning of the parts. The questions to be

answered are similar to: What is this a part of? Identify the containing whole of which this is a part? Synthesis helps to explain the behavior of the containing whole.

Water management is dealing with a complex system that steadily evolves because it is constantly pushed by social forces, economic conditions, hydro-geo-physical forces, but also communications, technology, education, language, music, art, and a thousand other forces. It will never return to the same state it was in in the 1970s, or 90s, or 2010s, or even to last year. Our complex system is constantly morphing into something new and different. Good? Bad? Who knows.

System patterns in the floods of 2022

Now think about the floods of 2022 in Pakistan. The straightforward hydrological-geological-meteorological-physical analysis (see the parts?) is relatively simple: it rained a lot and the system got choked. The Sindh experienced 5 times more rain than normal situations. And because of high discharge on the Indus River, the water could not easily drain from the lands. That is the easy part of the analysis. Exactly how much it rained, and exactly how much the system could handle before it would choke is the analytical approach. It considers just one of the components of the complex system. We can surely analyze that part and we usually are very good at that. Our analytical models can handle this with ease, and we have done it many times before: in 2010, 2015, in other regions and for other events... Flood, Analyze, Repeat...

Why don’t we take a step back and look at the bigger picture that is emerging? The other components of

the complex system? The interactions between all components? Because if we fail to see these interconnections, Ackoff warns, we are bound to repeat the same mistakes again. The first issues that come to mind have to do with humans managing the system. Who controls the system, and why? What are the incentives? What makes a large irrigation system, such as in the Sindh, Pakistan, what makes it tick? And, what is time doing to this system? What are the processes and patterns that slowly but steadily undermine the function of the system? What is the drainage condition of the system? Why is it deteriorating? Who manages the system? And under which assumptions? Why were we not prepared? What is the bigger picture?

I see some patterns emerging that will help us understand the Sindh floods. In this case the why of the disaster. I argue the Sindh floods are a man-made disaster as much as a natural disaster.

The first underlying mechanism I would like to point out is the siloed approach that experts and decision-makers often take when dealing with complex systems. Instead of focusing on partial problems and solutions, we should adopt an integrated management approach that considers hydrology, salinity, sediments, soil conditions, and livelihood as interconnected components of a larger system. When we fail to recognize these interconnections and focus just on one aspect, it can lead to negative implications for other components and undermine any gains achieved. Therefore, we need to rethink our operations and management of the entire irrigation system to ensure that we address all relevant factors in a holistic manner.

The second pattern that emerges is related to efforts to increase the resilience, sustainability, and modernization of the entire system. These efforts should not only aim at modernizing the infrastructure but also the management practices and social and institutional frameworks that underpin the system. However, modernization is often viewed too narrowly as simply upgrading canal irrigation systems to piped systems or employing more technology like computerization and sensors, or lining canals. Such a narrow approach to modernization runs the risk of

ignoring the importance of social and institutional practices and knowledge from farmers and local communities that already exist. Concentrating solely on hardware modernization runs the risk that formal and expensive engineering procedures steer the rehabilitation process and that these new technologies do not match the social and institutional practices and knowledge from farmers and inhabitants that is already there.

The third pattern that emerges relates to the lack of a shared vision in the Pakistani society regarding the role of water management in the country's development. This challenge highlights a broader lack of shared vision for development and a weak 'social contract' between those in power and civil society. In the aftermath of the 2022 floods, we see large budgets becoming available, but we also see a lack of a comprehensive plan. This results in overspending on infrastructure. Given that much of this funding will come in the form of loans, it will inevitably add to Pakistan's already significant debt burden. This situation risks wasting development budgets and emergency funding without contributing to actual progress towards development goals. Pakistan seems to be on a track of being worse off after the funding has become available. No actual progress on the development track, but increased debt burden. Unless we are careful, we may fall into the same trap.

We should start dealing with these issues as a management challenge of controlling a complex system. Therefore, we should stop water management which focuses on just a part of the problem. We should start to develop complex system management and apply a systemic approach to it. Only then we can have some hope of making sustainable adjustments to our complex system that really might change the course of countries such as Pakistan.

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