

Managing River Basins as a System

Open meeting of the Special Policy Study on *River Basins* of the China Council

New York, 20 March 2023

Full names of the entities:
Special Policy Study on High-Quality Development of River Basins and Adaptation to Climate Change
China Council for International Collaboration on Environment and Development

This a short version of the report. A comprehensive version, with prints of the presentations and photos of the speakers, is available (33 MB).

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Introduction

Thematic focus

Climate change complicates and exacerbates the already large challenges of managing river basins. The complications include not only adaptation (of cities, ports, nature conservation and security systems) but also the decarbonization and deep change of economic sectors – from energy to agriculture. Restructuring and engineering on a massive scale during the past two centuries have created significant path dependencies for future management of basins.

There is a growing insight among river managers and knowledge organizations that river management extends, or should extend, beyond water supply and sanitation, transport and flood protection. Effective and future-oriented management needs to include the whole basin and their governance, from source to sea but also including activities on land. This is exiting and difficult at the same time, especially in terms of governance. Nobody has demonstrated the perfect approach yet. But here is a great opportunity to learn from the many ongoing initiatives worldwide.

The China Council for International Cooperation on Environment and Development (CCICED) was established in 1992 with the approval of the Chinese government. Over the past 30 years, consisting of leading international and Chinese experts and senior officials, and chaired by one of the leaders of China's State Council, CCICED serves as a high-level advisory body and has played an active role in advising Chinese senior leaders on policies related to environment and development and in sharing China's vision and practice on ecological civilization with the rest of the world. CCICED has set up five-year research framework during Phase VII (2022-2026) to learn from promising cases worldwide, and extract policy recommendations and peer insights and encouragement.

This River Basin Special Policy Study is one of CCICED's current ongoing SPS programs. It is co-led by Chinese and international knowledge organizations and involves a good network of multilateral development organizations and others. Its program is structured along five guiding principles: (i) make good on your responsibility stretching from the headwaters to the coastal seas; (ii) adopt a 100-year perspective and plan your steps; (iii) engage everybody who can contribute and develop a shared vision; (iv) adapt to climate change and other principal river stressors in every aspect of the management of river areas; and (v) continue to strengthen and innovate.

Cross-sectoral partnerships

The very nature of the three organizations leading the Special Policy Study demonstrates its broad, cross-sectoral scope: The China Academy of Urban Planning and Design; The Nature Conservancy; and a Dutch team comprised of Deltares, PBL Netherlands Environment Assessment Agency, with close connection to the Ministry of Water and Infrastructure. Speakers and panellists at the event represent a good mix of senior officials and experts, senior basin managers and development leaders, from China and elsewhere.

Comments, Addresses and Discussion

Hans Mommaas provides opening comments on behalf of the Kingdom of The Netherlands. The UN Water Conference will be the third in a row of high-level meetings on responsible management of the planet's environment resources: CoP Climate in Egypt, CoP Biodiversity in Montreal and now the second-ever UN Water Conference. Global coalitions, registered in the Water Action Agenda, will be the most important outcome of the Water Conference. The SPS has defined a great programme of work, worthy of being registered in the Action Agenda. Adding cases of the Global South would be a good idea.

Li Yuanyuan outlines the challenges ahead. They include increased variability, in many respects, for example in precipitation and in land use in each basin; a still-increasing pollution load; large-scale withholding of sediment; and increased linkages, in many ways, between basins. For details, see the attached presentation and the report of the 'Rotterdam' seminar.

Li Yuanyuan lays out three principles for effective approaches, namely (i) respecting biophysical and other scientific givens; (ii) a systematic approach, by embedding integrated river basin management in other development plans, including spatial planning; and (iii) a holistic approach, with integrated river basin management as a key component of various sector-oriented security policies, such as food security. Among the key measures is consolidation of stakeholder partnership. Key measures are all in the domain of planning, including priority setting and use of various types of redlining. Importantly, they require shared objectives throughout its components and phases.

Li Xiaojiang summarizes the main concepts and plans of the SPS. He expands on three cases CAUPD is exploring this year. The SPS is about the challenges and opportunities of managing river basins in times of climate change, with climate issues complicating ongoing concerns. To the SPS, integrated management has to consider everything in the basin: cities (this was the original entry point); manufacturing and energy industry; agriculture; nature; cultural heritage. While the necessity of integrated approaches is widely recognized, this is work in progress everywhere. Therefore, the SPS focuses on promising cases from practice across the world.

By way of illustration, Li Xiaojiang sketches how governance of the Yangtze basin evolved from 1949 to the present. He highlights two major interventions from the recent past, namely removing unsuitable chemical industry from the river's shores, and a ten-year fishing ban. He provides a preview of the three cases CAUPD will analyse in view of this year's research focus on mechanism of regional collaboration. The three cases represent very different situations: Jialing River, with issues around water, energy production and agriculture; Taihu Lake, with the complexities of being in the Shanghai metropolitan area and issues about flooding, water logging, and diffuse pollution from agriculture; and the Pearl Estuary, with the prospect of regional collaboration involving mainland, Macao and Hongkong, focusing on a joint biodiversity area and coastal zones.

Willem Ligtoet presents key findings of the worldwide report *The Geography of Future Water Challenges: Bending the Trend*. For eight key water-related issues the report explores what can be done by system-wide measures and, in particular, what the worldwide impact would be. It does so for four landscape types and all global regions. Emerging as particularly tough problems are nutrient loading (with urban development, especially on the African continent, offsetting potential gains in agriculture) and

accelerated erosion of many of the world's delta areas (sediment withholding by dams + sand mining + man-made soil subsidence + sea level rise).

Nicole Silk states that we have years, not decades, to take on the connected crises of climate change and biodiversity loss. She explains the logic of TNC setting itself ambitious overall targets and tells of TNC's guiding vision of balance at the landscape level. In this vein, she quotes Minister Li Guoying of Water Resources, China. TNC's regionally distributed portfolio of projects provides many opportunities to learn while doing, with learning to collaborate being the most important. Key objectives are striving for connections; realizing benefits beyond the benefits of water alone; working for nature and people. For this work, the basin scale is the most promising.

Gerry Galloway reminds that the need for a systems approach to managing the Mississippi River was recognized in law as early as 1927. Implementing that approach was another matter, because of state-federal dynamics. Moreover, at that time, the 'system' was to serve navigation (shipping). Current management of the Mississippi is very divided and diverse. Upstream-downstream differences are large, and the question is: how do you manage as system this big? At the same time, river-related problems are large, especially in terms of sediment disappearing out to sea.

The key to building a collaborative approach (alliances), seems to be in communication and public participation in various forms. A systems approach can work if there is collaboration through all levels.

Lv Xiaobei focuses on the economically dense Pearl River Delta – in fact, the economic center of gravity of China. At the same time as hosting a global concentration of ports, industries and urban agglomerations, it is also home to nature reserves and its wetlands are an important waypoint in bird migration. Urban expansion and establishment of new towns is increasingly going in the direction of the coast. The percentage of natural coastlines has decreased fast. At the same time, the public's attention for the significance of the estuary's wetlands is growing and the Chinese government engages in, for example, wetland restoration projects.



Bob Tansey, master of ceremony

Ms. Lv suggests that there is scope for productive collaboration between the jurisdictions facing each other across the water (Guandong province on the mainland; Macao and Hongkong across the water). Concrete topics for collaboration could be:

- a common nature reserve in the wetland area, and, around that asset, concretely harmonize regulation, monitoring and reporting;
- a regional coordination mechanism in environmental impact assessment for the construction of large infrastructure such as ports, bridges and roads in the Pearl Estuary region.

Jodie Bignall sketches the vision of the International River Foundation of thriving and resilient rivers. Achieving that vision requires dialogue across sectors and implies a connected landscape and going far beyond the traditional agenda of drinking water, sanitation and hygiene (WASH). She characterizes the work of the International River Foundation as a champion of thriving and resilient rivers by pointing to four underlying lines of activity: Collaboration (in particular the Resilient Rivers Blueprint and Hub), Convening (for example the annual IRF symposium), Communication (right now through a series *Voices for Rivers*) and Celebrating success (through river prizes and twinning). The IRF is keen to partner with the SPS River basins and could help to connect with important cases in the global South. Mining in Indonesia, in relation to river basin management, would be an example.

Huang Yan describes how river basin management works in China, by example of the Changjian basin, which comprises the Yangtze. Details are in the attached presentation. Key features are an extensive management structure and engineering works; the river chief system (typically a mayor or governor is the river chief for a given section of the basin), a comprehensive mandate, including off-river aspects. The current Master Plan 2012-2030 is the fourth since 1956. Concerns include:

- increasing severity of both floods and droughts, with the prospect of continued increases, in a basin that already had an uneven spread of rainfall along its length and over the year;
- additions to the water diversion from Yangtze to Han River, under construction
- illegal sand mining and lake reclamation to be addressed.

Extensive coordination with various sectors and parts of government is in place and/or foreseen. Future plans include a thirteen-point action list. Of this, strict enforcement of the maximum allowable water use is a key item. Like the previous speaker, Ms. Huang looks forward to expanded international collaboration and exchange of experiences, including through the SPS *River Basins*.

Hans Mommaas states that 'water' is a good entry point into a much wider discussion about the future organisation of our lands, especially in spatial terms. By way of example, he shows gigantic pumps that structurally keep low lying lands dry, and thereby, structurally, keep that land subsiding. Such situations are not tenable, vested interests are large, and how do you prepare the public for a discussion about that? Water may be a good, natural entry point.

Applying a systems perspective in these discussions requires frequent zooming in and zooming out. Therefore, it is good that the SPS' approach is open and case-based. Methodologies exist for connecting substance and governance, in preparation of this kind of complex discussions. One example is strategic environment impact assessment. Its methods have evolved over the past forty years, useful international experience and international collaboration exist, including with Chinese colleagues. Perhaps it is an idea

to look into its potential for the kind of governance issues that the SPS River Basins focuses on.

Anders Jagerskog (World Bank) comments that basically the same challenges appear everywhere, sometimes with added national issues. Transboundary basins carry extra issues. He alerts to the circumstance that donors (the Bank's Board of Directors) are currently asking for more attention to be given to global public goods. In relation to water, this goes beyond concern for water per se and includes relations with, for example, biodiversity, river resilience and conflict.

A supporting comment from the floor underlines that it will be critical to generate the revenue streams to get the necessary systems in place.

Gerry Galloway observes that while there is considerable insight represented in the room and through the recorded addresses, 'no prophet is honoured in his own town'. International visits and peer support are often surprisingly effective in getting pre-existing insights acknowledged and acted upon.

Li Yuanyuan sums up the discussion in five points:

- Keep thinking strategically, seeing the forest rather than the trees
- consider all factors and assets
- consider both natural systems and man-made systems.
- keep the long-term perspective; minimize disasters; consider past, present and future, based on multiple scenarios.
- consider all the people, all the benefits and all interventions including economy and finance.

Points emerging from the event as a whole

A number of insights from the meeting seems pertinent to the future work of the SPS. Almost all of these were tabled by multiple participants, in different words and using different examples.

1. The **spatial organisation of river basins** remains key to integrated approaches from source to sea, with a 100-year horizon, etcetera. This was identified by the SPS early on. During the New York Water Week, it was voiced repeatedly in various events, with geographic focus ranging from regional seas to megacities. Specifically, pleas were made for marrying sectoral planning systems and for matching land-oriented and marine-oriented planning systems.
2. For effectively managing basins as a system, **content and governance** should be brought together. Classical instruments for this exist, and it would be valuable to investigate how these instruments have evolved and how they can be, or are being, redeployed in integrated river basin management.

Strategic Environment Assessment is a case in point. Although a long-standing system, it is evolving. For large and complex systems such as river basins in times of climate change it may be worthy of repositioning as a tool to map out issues and responsibilities and establish a framework for future reference and follow-on decisions.

3. The concept of 'managing river basins as a system' **must be understood dynamically**. Perceptions of what the basin system is, and its key functions to be safeguarded, have in many cases evolved since the time the term was first used. A striking example is the Mississippi, where a 'systems approach' was officially endorsed in 1927, but with reference to shipping only.

Current understanding of the term, worldwide, involves steeply increasing socio-economic pressures, biophysical variability, and material flows and dependencies between basins.

4. In river basin management **current challenges are daunting**, and expectations of even the most ambitious policies must therefore be realistic.

For some issues the very best that could be achieved at global scale would be a halt to the increase of the problem. Nutrient loading is one example. Against this background, it is necessary to keep thinking strategically and consider all people affected, all issues and all relevant scale levels.

5. While this meeting was being held in connection with the second-ever water conference, **changes in sediment flows are emerging as the hardest issue**. That is because of the combined effect of large dams, especially for non-fossil power generation or pumped storage, sand mining, human-induced soil subsidence and, at the same time, sea level rise. In other words, integrated management of river basins requires that the development of new energy infrastructure considers a broad spectrum of environmental goods, including biodiversity and sediment flows that are needed to prevent the world's deltas from disappearing.

6. The SPS would be well-advised to **consider cases on the Southern hemisphere**, too. This is a matter of credibility in view of North-South economic relations such as in mining, and Africa being the next continent with massive issues in management of its river basins. In other ways, too, cases in the global South will broaden the informative basis of the SPS.
7. In regional collaboration for managing river basins, a number of common issues are becoming clear from this event and from meetings earlier this season:
 - **An explicit and concrete obligation to collaborate is needed** and should typically come from the top of government and require active reporting
 - **Communication is key** to overcome fragmented responsibilities (see presentation by Gerry Galloway and comments by Hans Mommaas)
 - **Uncertainty needs to be embraced, not hidden**. This is about the inherent uncertainty of, for example, regional climate change in combination with the necessarily long time horizon of this work. Planning needs to consider multiple scenarios and strategic flexibility in mind. Explicitly addressing uncertainties may require modernization of the culture of government in many places.
 - **Path dependencies are an important factor**. These relate to collaboration/distribution of responsibilities as well as physical circumstances/hard infrastructure. Typically, we think about path dependencies as inherited from the past. It is useful to also think about the new path dependencies we are now unavoidably creating.
8. As an overall framework, various speakers reminded of what said at the Rotterdam seminar of the SPS, namely that after an era of physical circumstances of a location dictating its social and economic possibilities, followed by a few centuries of hard engineering dominating the environment in favour of urbanisation and production, the challenge of the next decades is to **establish a new balance between economy and environment** in many places of the world. Management of river basins in times of climate change is one of the clearest examples of this challenge. One addition voiced at the current event is that, meanwhile, there is a duty to minimize disasters.
9. Management of river basins in times of climate change faces interconnected challenges at **multiple scales** and thus requires coordinated approaches at multiple scales. In his presentation for the Rotterdam seminar, Li Yuanyuan suggested three levels, each with its specific focus.

At the current event, a number of speakers underlined the importance, and potential, of strategy development at the landscape scale – for example, a delta. Discussion afterwards reminded that for large river systems the discourses around upper, middle and lower reaches can be very different, in terms of complexity as well as topics. Source-to-sea approaches should speak to the issues in focus and pragmatically and consistently work towards a comprehensive understanding and agenda.

10. The bottom line for the SPS is that it remains necessary to maintain an open, case-based line of work and to illuminate **what works, where, and under what circumstances**.

Attachments

Event programme and speakers' affiliations

Date: 20 March, 10:30-12:30 EST. Venue: Water House (666 Third Avenue, New York City, 21st floor). In-person event, not on-line. Simultaneous translation between English and Chinese provided. Approximate number of participants: 60

Master of Ceremony: **Robert TANSEY** (Senior Policy Advisor, China & Global Policy Lead, Degraded Lands and Restoration, TNC, he/him)

Overview Remarks

Hans Mommaas (Netherlands Commission for Environmental Assessment, Chair; Special Advisor of CCICED; former Director-General of PBL, he/him)

LI Yuanyuan (Vice President, General Institute of Water Resources and Hydropower Planning and Design (GIWP), China; President, International Water Resources Association (IWRA), he/him)

LI Xiaojiang (President Emeritus, CAUPD, Special Advisor of CCICED and co-leader of Special Policy Study, PR China, he/him). Recorded address. Mr. Li Xiaojiang provides a ten-minute overview of SPS River Basins.

The Geography of Future Water Challenges: Bending the trend

Willem Ligtoet [Programme Leader International Water, PBL; he/him]

Addresses highlighting challenges, opportunities and cases of governing river basins as a system

Nicole SILK (Global Director for Freshwater Outcomes, TNC, she/her)

Gerry GALLOWAY (emeritus Professor, University of Maryland, and former Commander, Mississippi Basin, US Corps of Engineers, he/him)

LV Xiaobei (Vice Director, Shenzhen Institute of CAUPD, she/her) Recorded address
Brief discussion

Jodie Bignall (CEO, International River Foundation, she/her)

HUANG Yan (Deputy Chief engineer, Changjiang Water Resources Commission, she/her), recorded address

Hans MOMMAAS (Netherlands Commission for Environmental Assessment, Chair; Special Advisor of CCICED; former Director-General of PBL, he/him)

Final discussion

- Provisional recapitulation in keywords; what should be carried forward?
- Discussion (audience and speakers)

Summing up and closure

End of short report

For prints of presentations, download the full version