IOB Terms of Reference

Water for Development

Evaluation of Dutch development cooperation for improved water management, 2017-2025

April 2026
Policy and Operations Evaluation Department (IOB)
Ministry of Foreign Affairs of the Netherlands

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1 Introduction

The Policy and Operations Evaluation Department (IOB) is the independent evaluation service of the Ministry of Foreign Affairs of the Netherlands. IOB conducts evaluations of the effectiveness and efficiency of Dutch foreign policy. These insights can help the Dutch Ministry of Foreign Affairs (MFA) to account to parliament and inform the design and implementation of future policies (for learning purposes).

This evaluation focuses on the developments and results of the policy on Integrated Water Resource Management (IWRM) in the period 2017-2025. It builds on the IOB periodic review of the Dutch development aid policy for improved water management (2006-2016),[1] and is scheduled to be finalised by the end of 2026. Furthermore, it will be part of the upcoming periodic review of article 2 of the budget of Foreign Trade and Development Cooperation (in Dutch: BHOS), which is scheduled to be completed in 2029.

2 Subject of the evaluation

2.1 Context and problem analysis

Water as precondition for human development
Water is fundamental to sustainable development, human well-being, and planetary health. Water systems consist of natural resources (rivers, lakes, coastal zones, groundwater, etc.), socio-economic water uses and needs (such as agriculture, fishing and navigation, including competing needs and uses and power relations influencing these), and administrative and institutional arrangements (such as laws and regulations).[2] When water systems fail, the effects are swift and far-reaching: harvests decline, energy systems are disrupted, public health is endangered, cities become increasingly unliveable, livelihoods are lost, communities are displaced, and tensions escalate.[3]

UN Sustainable Development Goal 6 (SDG 6) captures this centrality of water by committing the world to ensuring the availability and sustainable management of water and sanitation for all. SDG 6 incorporates both sub-goals on WASH (SDG 6.1 and 6.2), and on IWRM (SDG 6.3-6.6). As this evaluation targets IWRM, it mainly focuses on SDG 6.5 which aims for the implementation of IWRM at all levels, including through transboundary cooperation where appropriate. Closely related to this are SDG 6.3 (improve water quality, wastewater treatment and safe reuse), SDG 6.4 (increase water-use efficiency and ensure freshwater supplies) and SDG 6.6 (protect and restore water-related ecosystems).[4] Furthermore, IWRM is seen as an important enabling factor for many other SDGs (i.e. on WASH, food security, health).

A global water crisis
According to the UN, the world has entered an era of 'global water bankruptcy', as water systems can no longer return to their historical baselines due to persistent water shortage. Nearly 75% of the world's population now lives in countries classified as water-insecure or critically water-insecure.[5] Global levels of water stress are projected to worsen, doubling the

[1] IOB (2017), 'Tackling major water challenges: Policy review of Dutch development aid policy for improved water management', 2006-2016.
[2] Deltares, (2022). Strategic Water Systems Planning, pp. 11-12 (accessed March 2026).
[3] Firas, J. (2025), The Global Water Crisis: Challenges and Solutions for a Sustainable Future, Hydrology: Current Research, 16: 562.
[4] 'Goal 6: Clean water and sanitation', (n.d.) The Global Goals, Goal 6: Clean water and sanitation - The Global Goals, (accessed February 2026).
[5] UN University (2026), 'Global Water Bankruptcy: Living Beyond Our Hydrological Means in the Post-Crisis Era.

global urban population facing water scarcity, and posing increased risks to social stability.[6] Similarly, the World Bank concludes that continental drying - i.e. long-term decline in freshwater availability across large landmasses - is already happening, and that it poses a threat to our common future, threatening economies, ecosystems, and lives.[7]

Water crises elsewhere can also impact the Netherlands, for instance through increased food prices. The global water crisis has a multitude of interrelated causes, including climate change, deforestation, population growth, urbanisation, inadequate investment in water infrastructure, economic activity (including expansion of agriculture), and poor governance.[8] Poor governance is also reflected in the slow progress recorded for SDG 6.5 on IWRM, with insufficient financing identified as a major barrier.[9]

IWRM as a response to sectoral water management

IWRM was designed to replace a sectoral management approach which resulted in fragmentation and unsustainable water resource use. Sectoral water management focuses on single issues and objectives (e.g. irrigation of a specific area) and as such may fail to address other, sometimes competing objectives (e.g. environmental protection in a bordering region). Such a siloed approach thus does not take into account the interconnected nature of water.[10] In contrast, IWRM takes a *systemic approach* which fits into the broader concept of sustainable development.[11] The IWRM approach finds its roots in four key principles that were adopted at the 1992 Dublin Conference on Water and endorsed at the Rio de Janeiro Summit on Sustainable Development in the same year:

1. Freshwater is a finite and vulnerable resource, essential to sustain life, development, and the environment;
2. Water development and management should be based on a participatory approach, involving users, planners, and policy-makers at all levels;
3. Women play a central part in the provision, management, and safeguarding of water; and
4. Water has an economic value in all its competing uses and should be recognised as an economic good.[12]

These principles have been widely adopted by countries around the world, and they are actively promoted by the intergovernmental organisation Global Water Partnership (GWP).[13]

Dimensions of IWRM

IWRM consists of four related dimensions.[14] First, it considers all water resources: blue water (surface or ground water from lakes, rivers and aquifers), green water (soil moisture) and grey water (water needed to dilute pollution).[15] Second, it considers all types of water users (i.e. industries, households, ecosystems). Third, it considers multiple spatial scales both in terms of hydrological system boundaries and administrative levels. Often there is a mismatch between

[6] UN (2025), The Sustainable Development Goals Report 2025, UN: New York.
[7] World Bank (2025), Continental drying: A threat to our common future, Global water monitoring report, World Bank: Washington, DC.
[8] Firas, J. (2025) "The Global Water Crisis: Challenges and Solutions for a Sustainable Future." Hydrology: Current Research, 16: 562
Di Vaio, A. et al. (2021) Water governance models for meeting sustainable development Goals: A structured literature review, Utilities Policy, Volume 72
Ward, F.A. (2025), Addressing Global Water Challenges in 2025: an Integrated Framework for Research, Policy, and Resource Management, Water Resource Management 39, 7885–7918.
[9] UN (2025). The Sustainable Development Goals Report 2025. New York.
[10] Water Knowledge Hub, 'IWRM explained', IWRM Explained | Water Knowledge Hub, (accessed January 2026).
[11] SIWI (2020), Manual 1: Principles and Practices of Integrated Water Resources Management, SIWI: Stockholm
[12] IELRC (1992), The Dublin Statement on Water and Sustainable Development, pp. 3-4.
[13] SIWI (2020), Manual 1: Principles and Practices of Integrated Water Resources Management, SIWI: Stockholm
[14] Zaag and Savenije (2014), Principles of Integrated Water Resources Management, IHE: Delft
[15] 'What Is a water footprint', (n.d.), Water Footprint Network, https://www.waterfootprint.org/water-footprint-2/what-is-a-water-footprint/, (accessed February 2026).

both, as river basins are usually appropriate units for water management while institutions have different spatial boundaries. Fourth, it considers the temporal distribution of water demand and supply, where there is also often a mismatch. IWRM then "seeks to manage water resources in a comprehensive and holistic way, taking account of the entire water cycle and the interests of all water users, while acknowledging the temporal and spatial variability in availability and the interactions with water quality and ecology."[16]

The strategic goals of IWRM

The GWP defines IWRM as "a process which promotes the coordinated development and management of water, land, and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment".[17] Water management then mainly revolves around balancing trade-offs at different levels between three fundamental goals, often referred to as the three "E's":[18]

- **Social equity**: To ensure that all people have access to adequate quantity and quality of water. This comes from the notion that water is a public good and that access to it is a basic human right. It includes the recognition of indigenous water rights, that have historically been neglected.[19]
- **Environmental sustainability**: To protect vital ecosystems so they can continue to provide water for future generations.
- **Economic efficiency**: To use scarce water sources with the maximum possible efficiency, with institutional arrangements that safeguard cost recovery.

Next to these goals, cultural and spiritual aspects can also be of importance, for instance the protection of cultural heritage or sacred sites.[20] As trade-offs between these goals are inevitable, clear policies, guidelines and assessment frameworks for setting priorities are key.[21] Alternatively, the Global Commission on the Economics of Water[22] argues that the three "E's" are equally important, and that attaining them requires correctly pricing water and redefining the water cycle as a global common good.[23]

Action framework for implementing IWRM

To balance and attain the strategic goals of IWRM, the GWP has developed a four-pillar action framework for implementing IWRM. It applies a system perspective which looks at:

1. **policy and legislation** for an enabling environment (i.e. sustainable development and management of water resources);
2. **institutions** with sufficient capacity to perform their role and provide coordination on managing water resources;
3. **finance** for investment in water infrastructure, and for operation and maintenance; and
4. **management instruments** for informed decision-making (i.e. water resource assessments and allocation tools, climate scenarios).[24]

These four pillars operate at multiple levels, often in nested systems, reaching from local to global scales. Also, these pillars are not limited to formal government rules and organisations, but explicitly include informal aspects such as indigenous water rights, organisations and techniques for water management.

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[16] Zaag and Savenije (2014), Principles of Integrated Water Resources Management, IHE: Delft, p. 11
[17] GWP (2000), Towards water security: a framework for action. Global Water Partnership, Stockholm
[18] Postel, S. (1992), Last oasis, facing water scarcity. W.W. Norton, New York.
[19] Jackson, S. (2018), Water and Indigenous rights: Mechanisms and pathways for recognition, representation, and redistribution. WIREs Water.
[20] SIWI (2020), Manual 1: Principles and Practices of Integrated Water Resources Management, SIWI: Stockholm.
[21] Zaag and Savenije (2014), Principles of Integrated Water Resources Management, IHE: Delft.
[22] The Commission is convened by the Government of the Netherlands and facilitated by the OECD.
[23] GCEW (2024), The Economics of Water, Home | The Economics of Water (accessed February 2026),
[24] Water Knowledge Hub, 'IWRM explained', IWRM Explained | Water Knowledge Hub, (accessed on 28 January 2026).

Successful implementation of these four pillars relies on five cross-cutting principles, that partly echo the principles of the 1992 Dublin conference. First, it requires a participatory approach, involving all relevant stakeholders in decision-making, including traditionally marginalised groups.[25] Second, it requires subsidiarity, managing water resources at the lowest appropriate level.[26] Third, it requires gender centrality, recognising the central role women play in the provision and management of water.[27] Fourth, it requires interdisciplinary knowledge, blending expertise from different disciplines (i.e. engineering, law, finance, sociology) and combine this with indigenous knowledge and practices (i.e. customary water laws) to inform holistic decisions.[28] Fifth, it requires factoring in climate change as it affects all areas of IWRM.

In the figure below, IOB reconstructed these different principles, dimensions and goals in an analytical framework for guiding this evaluation. Annex C provides further detail on how various elements in this framework can be measured.

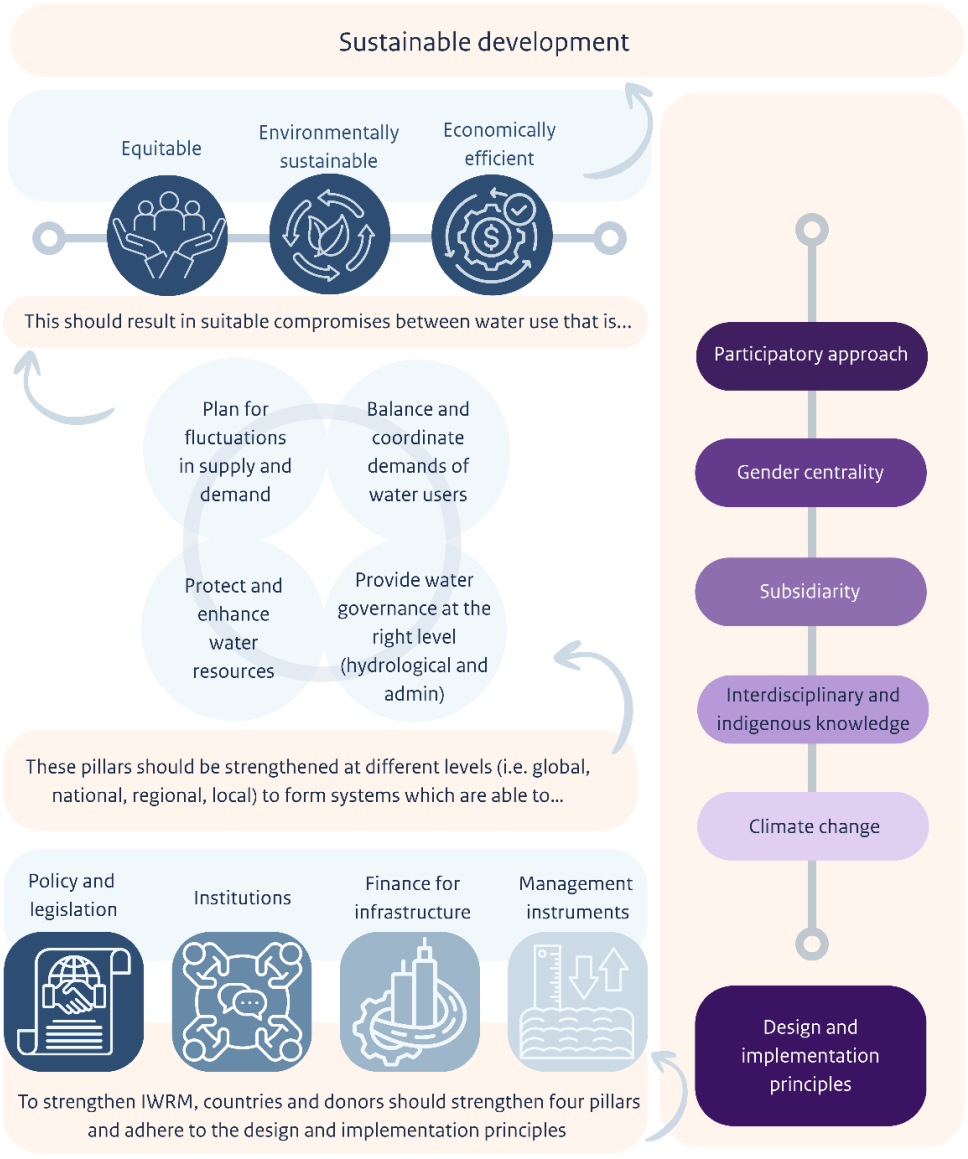


Figure 1: Analytical framework for IWRM.

[25] Di Vaio, A. et al. (2021) Water governance models for meeting sustainable development Goals: A structured literature review, Utilities Policy, Volume 72.
[26] Zaag and Savenije (2014), Principles of Integrated Water Resources Management, IHE: Delft.
[27] SIWI (2020), Manual 1: Principles and Practices of Integrated Water Resources Management, SIWI: Stockholm.
[28] 'IWRM explained', (n.d.), Water Knowledge Hub, IWRM Explained | Water Knowledge Hub, (accessed on 28 January 2026).

2.2 Policy development between 2017-2025

The Netherlands seeks to play a role in the (growing) water challenges discussed above through its IWRM policy. Collaboration on water management with countries worldwide goes back many years, in part thanks to the strong Dutch reputation in the sector. Across the evaluation period Dutch policy on IWRM is characterised by both continuity and change (see Table 1). Below, these trends are elaborated for subsequent cabinet-periods.

Continuity	Change
• Integrated approach • SDG 6 focus • Water as Dutch expertise • Involvement of Dutch water sector • Combining aid and trade	• Growing focus on Dutch interests • Growing importance of climate change • Growing importance of water diplomacy • Growing importance of marginalised groups • Shifting geographic foci, i.a. towards conflict-affected countries • More nexus (water-food-energy-climate)

Table 1: Trends in Dutch IWRM policy.

Cabinet Rutte II (2012-2017): The International Water Ambition
In 2016, the International Water Ambition (IWA) was drawn up under Minister Ploumen. This policy note laid the foundation for the Netherlands' international water commitment along two tracks: 1) drinking water, sanitation and hygiene (WASH), and 2) water safety and delta management (IWRM) as an export product of the Dutch water sector, partly financed through the Partners for Water programme. IWRM had an explicit, but limited role in the IWA in terms of operationalisation.[29] It aimed at promoting synergies between policies such as balancing competing water uses, water governance and sustainable use of freshwater resources at river basin level. In 2017, this is expanded to include both bilateral and multilateral programmes on safe deltas. Institutional strengthening and transboundary water management are already mentioned as important elements of improved water management.[30]

Cabinet Rutte III (2017-2022): An integrated approach
In 2018, the new policy notes explicitly positioned water as part of an integrated approach and positions the Dutch water sector, with its knowledge and expertise, as an important actor for achieving results in this area.[31] Without explicitly mentioning IWRM, it focuses on the links between WASH, food security, climate adaptation and water governance. This integrated approach is also present in the SDGs, which became the guiding principle for the BHOS budget.

Following the 2017 IOB IWRM evaluation, institutional capacity building and long-term programming gained prominence. The evaluation found that IWRM programming was effective in obtaining results, but that the sustainability of improved water management at local and sub-national levels was insufficient. IOB furthermore observed a pattern of 'build-neglect-repair' of both institutions and infrastructure . The policy response by the policy department Inclusive Green Growth (IGG) to the IOB recommendations included amongst others:

1. to continue with improved water management and improve the ToC (including assumptions) to improve the design and monitoring of programme activities, including adaptive programming and local participation and ownership;
2. improving direct results at output level while continuing to build an enabling environment through long-term interventions;

[29] RVO-2016-International-Water-Ambitie.pdf
[30] MFA, kst-34950-XVII-1, 16 May 2018, pp. 47-48, (accessed 10 February 2026).
[31] MFA, kst-34952 nr. 1, (18 May 2018), Beleidsnota Investeren in Perspectief (accessed February 2026).
MFA, Jaarverslag BHOS 2018, Beleidsprioriteiten, rijksfinancien.nl (accessed February 2026).

3. maintain a balance between water management objectives (to the SDGs) and trade objectives; and
4. lessen the coordination burden and improve monitoring, evaluation and learning (including baselines and specific indicators).

The Theory of Change (ToC) on water of IGG from 2018 addressed the IOB evaluation and stated that "the effectiveness of Dutch efforts must be demonstrated by the number of people who have sufficient, safe, and clean water at their disposal. This is achieved through institutions that perform their functions effectively with regard to (cross-border) water management, (national) plans and legal frameworks that have been drawn up in the field of climate-proof water management, and the construction of infrastructure."[32] New programmes were launched to address these needs for long-term service delivery, such as WaterWorx and the Blue Deal programme. The Netherlands also started the Water, Peace and Security Partnership with the aim of preventing water-related conflict.[33]

Integration of IWRM in other policy domains (i.e. the "nexus" or interconnection between water, food, energy and climate) continued in consecutive years.[34] From 2019 onwards, integration of vulnerable groups also started receiving specific attention. For instance, with the launch of the Valuing Water Initiative.[35] The 2019 new Dutch International Water Ambition (NIWA) also explicitly mentions vulnerable groups as important target groups,[36] and places more emphasis on balancing water needs of ecosystems, versus people and economy. During COVID-19 (2021-2022), policy documents demonstrated increased awareness of the importance of IWRM (and WASH) in combatting the pandemic and, more in general, for responding to health crises.[37]

Cabinet Rutte IV (2022-2024): Trade, climate and diplomacy
Building on the policy introduced by Minister Ploumen in 2012, minister Schreinemacher placed strong emphasis on combining aid and trade, with a focus on areas in which the Netherlands "excels", such as water, agriculture, and sexual rights and health. IWRM as an independent concept largely disappeared to the background in this policy note; the focus shifted to the sectoral added value of the Dutch water sector (knowledge, innovation, business) and to climate adaptation as an overarching theme. Water was embedded in the climate agenda and linked to trade instruments via so-called “combi tracks” in the designated 'combination countries'.[38]

During this period, international water-diplomacy gained prominence. In 2023, the Netherlands co-hosted the UN Water Conference together with Tajikistan. For organising this conference, a new water-diplomacy group was formed at IGG, which still functions today.[39] The conference called attention to capacity strengthening within UN institutions, amongst other things, and led to the appointment of a UN special envoy on Water and an action plan on water.[40] The conference aimed to put water high on the international agenda and mobilise (private) funding. The Netherlands also used the conference as an opportunity to reinforce its reputation in the

[32] MFA, 'Theory of Change: Water - Narratief', 2018, p. 5.
[33] MFA, kst-35200-XVII-1, 15 May 2019, pp. 46-47 (accessed 10 February 2026).
[34] MFA, kst-35 830 XVII-1, 19 May 2021, p. 47 (accessed 10 February 2026).
MFA, kst-35 300 XVII-2, 17 September 2019, p. 45 (accessed 10 February 2026).
[35] MFA, kst-35470-XVII-1, 20 May 2020, p. 49 (accessed 10 February 2026).
[36] MFA (and others), ‘Nederlandse Internationale Waterambitie (NIWA)’, kst-32605-217, 4 July 2019, p. 5, (accessed February 2026).
[37] MFA, kst-36 100-XVII-1, 18 May 2022, p. 46 (accessed 10 February 2026).
MFA, kst-35 570 XVII-2, 15 September 2020, pp. 53-54 (accessed 10 February 2026).
MFA, kst-35 925 XVII-2, 21 September 2021, p. 48 (accessed 10 February 2026).
[38] MFA (2022) – Doen waar Nederland goed in is, via rijksoverheid.nl; Kamerstuk 36600-XVII nr. 10
[39] Interview IGG, November 2025.
[40] UN Water, 2023, Summary of Proceedings - UN 2023 Water Conference | UN-Water, p. 19 (accessed on 13 April 2026).

field of water.[41] Despite a slight decline in budget the following year, the ministry intended to uphold this ambition.

Cabinet Schoof I (2024-2025): Linking water management to Dutch interests
The Schoof cabinet announced large-scale budget cuts in development cooperation: a structural reduction of more than €2.4 billion per year from 2027 onwards.[42] However, water management was presented as one of the three priority themes in the strategy note of minister Klever, next to health and food security.[43] Klever's policy letter presented water as an opportunity for promoting Dutch interests in the area of trade, security, stability, and migration.[44] Instruments for this objective included deployment of Dutch water expertise, water diplomacy, attracting private finance, and increasing flood and drought prevention.[45]

2.3 Policy aims and indicators

Policy aims, assumptions and indicators have shifted during the evaluation period, which mirrors both shifting priorities and a struggle to capture this highly complex field of IWRM. The 2018 water-ToC by IGG focused on achieving water security and water safety for (vulnerable) people and ecosystems. It identified two priority themes:

1. Improved water productivity and, in particular, increased agricultural production per hectare, including through more efficient water use and improved water management (the economic good) (SDG 6.4); and
2. Improved management of river basins and safe deltas (the public good) (SDG 6.5 and 6.6).[46]

With regard to the first goal, the ToC formulates various assumptions, namely that: (1) information, institutions and behaviour change should are crucial elements for increased water productivity; (2) the provision of information and the establishment of well-functioning institutions encourages water-smart entrepreneurship; (3) innovation and regulations which enforce minimum requirements stimulate the development of cost-effective water productivity systems; (4) Satellite data provides on water balance at river basin level provides input for the adaptation of agricultural policy. With regard to the second goal, the main assumptions are: (1) that a third party such as the Netherlands can positively influence cooperation between stakeholders in a river basin or delta, partly on the basis of available data and by initiating pilot projects; and (2) that genuine impact on water security takes decades, through strengthening institutions and building and maintaining infrastructure.

In 2021 IGG produced a ToC-figure (see Annex D) which shifted the goals to: (1) Universal, equitable and sustainable access to water of good quality available for all users; (2) People and infrastructure are protected against water-related disasters and resilient to (climate related) water stress and shocks, and (3) Sustainable and inclusive water governance, leading to reduced water-related conflicts. While this ToC-figure contains a set of assumptions (see Annex D) it did not contain a narrative explaining them. As they are formulated in the form of preconditions, rather than as explanatory mechanisms, further explanation is needed.

[41] MFA, kst-36 560-XVII-1, 15 May 2024, p. 48 (accessed 10 February 2026).
[42] BHO-begroting 2026, Artikel 2: Duurzame ontwikkeling, voedselzekerheid, water en klimaat, via rijksfinancien.nl
BHOS-Jaarverslag 2024, Bijlage 4 Toelichting op streefwaarden, via rijksfinancien.nl
[43] MFA, 'Doen waar Nederland goed in is – Strategie voor Buitenlandse Handel en Ontwikkelingssamenwerking', kst-36 180-164, 28 May 2025, p. 19.
[44] MFA, Beleidsbrief Ontwikkelingshulp, 2025, p. 1, (accessed February 2026).
[45] MFA, Beleidsbrief Ontwikkelingshulp, 2025, p. 9, (accessed February 2026).
[46] MFA, 'Theory of Change: Water - Narratief', 2018, p. 2.

These priority themes were again updated in 2024 with a renewed results framework (see figure 2 below), including a methodological note with specific indicators.[47] The objectives of water management (result area 2) are:

- Contributing to sustainable, safe and healthy river basins and deltas. In other words, to promote sustainable withdrawals and supply of freshwater to address water scarcity (SDG 6.4);
- Promoting implementation of IWRM at all levels, including through transboundary cooperation (SDG 6.5); and
- Protecting and restoring water-related ecosystems (SDG 6.6).

Result Area 2: Water management SDG target(s): 6.4 to 6.6	Result Area 3: Enabling environment SDG target(s): 6					
Sub-result area 2.1 IWRM, water efficiency in agriculture and water governance	Sub-result area 3.1 Knowledge development and research (knowledge for policy)	Sub-result area 3.2 Regulatory frameworks and quality control	Sub-result area 3.3 Capacity building and technology transfer (policy for knowledge)	Sub-result area 3.4 Empowerment of groups in vulnerable situations	Sub-result area 3.5 Market development and mobilizing additional financial means	Sub-result area 3.6 Policy development and diplomatic outreach

Figure 2: Section of the IGG Water results framework – 2024.

In terms of assumptions, the result framework states that IGG seeks to enhance water management through collaboration with Dutch, international and local partners, and that sustainability of interventions is paramount in all activities to ensure durable solutions to complex water challenges. Moreover, the ministry aims for system change by enhancing the enabling environment for water management (see Figure 2 above). Gender, digitalisation, locally-led sustainable development, climate change and biodiversity are cross-cutting themes in its programmes. IGG specifically targets marginalised groups living in Africa, , the Middle East, and to a lesser extent in Southeast Asia and Latin America.[48] It does this via institutional capacity strengthening, watershed protection, early warning systems, infrastructural projects (including nature-based solutions), data-driven monitoring systems and enhanced efficiency and capacity in the water-energy-food nexus.

For result area 2, the overall target that IGG reports to parliament (indicator 10) is the "number of people reached with water management services aimed at river basins and deltas with good water quality and quantity, as a result of Dutch support". The target for this indicator is set at reaching 3 million people annually. Underlying indicators also focus on the number of hectares reached, but do not mention specific targets. These indicators focus on physical interventions for water management (indicator 7), water governance interventions (indicator 8), and on physical interventions aimed at protection and/or restoration of water-related ecosystems (indicator 9). For result area 3 (enabling environment), no indicators are formulated. These areas are checked with qualitative result- and learning questions, and reflected upon in the narrative reporting. In Annex E, these objectives, indicators and result areas from the 2024 result framework are linked to the analytical framework developed in section 2.1, to see where they fit in.

2.4 Resources and actors

This paragraph presents an overview of IWRM activities financed by the MFA during the evaluation period. First it specifies overall allocations to IWRM under the various budget articles of the BHOS budget. Second, it distinguishes between central and delegated spending on IWRM.

[47] MFA, 'Results Framework IGG', 2024, p. 1.
[48] Ibid.

This overview serves to subsequently select which programmes will be included in the evaluation.

Overview of financial allocations to IWRM activities
Between 2017 and 2025, 2,64 billion was allocated to activities with an IWRM objective. Of these total spendings, EUR 1,03 billion went to activities with IWRM as principal objective and EUR 1,61 billion to activities with IWRM as significant objective.[49] Figure 3 shows total IWRM spendings per budget article (spendings under art. 1.1, 3.1, 3.4 and 5.2 are under EUR 3 million and barely appear in the figure).

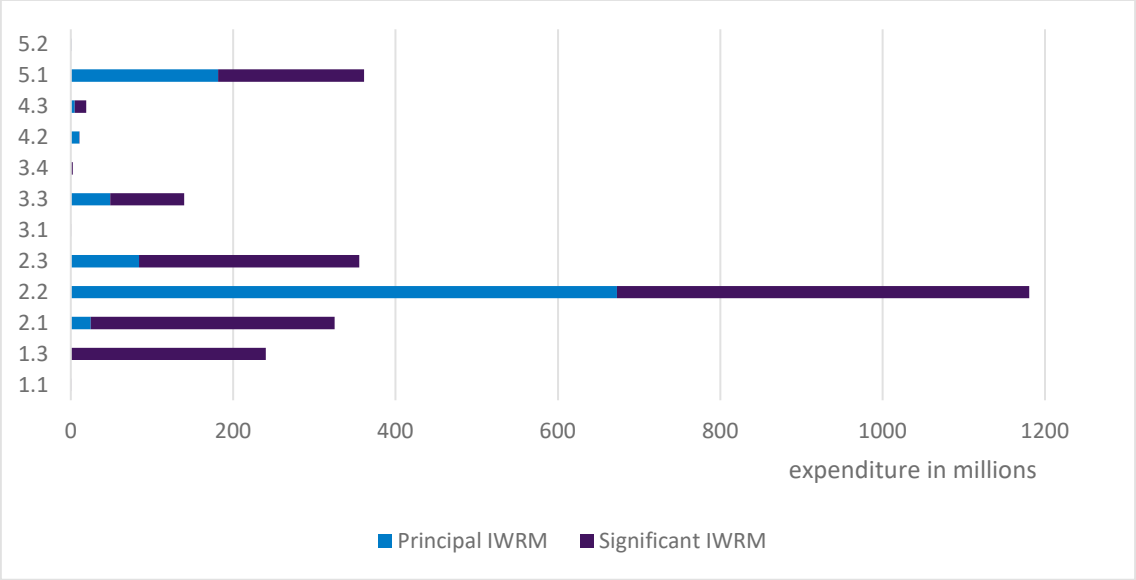


Figure 3: Principal and significant IWRM spendings per budget article, 2017-2025.

The figure shows that IWRM activities were primarily financed from BHOS budget article 2.2 (Water), with a total spending of EUR 1,18 billion, of which EUR 673 million for principal IWRM activities and EUR 508 million for significant IWRM activities (of which EUR 275 million has a principal WASH objective and has been evaluated as part of IOB's WASH evaluation).[50]

Figure 4 below zooms in on principal IWRM spendings across budget articles. It shows that, besides art 2.2, principal IWRM activities were financed from BHOS art. 2.1 (food security), art. 2.3 (climate), art. 3.3 (civil society), art. 4.2 (regional refugee reception), art. 4.3 (security and rule of law), art. 5.1 (multilateral cooperation) and art. 5.2 (other poverty reduction policies).

[49] There are two different markers indicating whether IWRM is a goal of an activity: one for IWRM being a principal goal, and one for IWRM being a significant goal. An activity receives a principal marker when the objective cannot be achieved without a focus on IWRM. Therefore, only activities with a principal marker are included in our evaluation.

[50] Two Asian Development Bank programmes were given a "significant" IWRM marker, but should have received a "principal" IWRM marker. In this portfolio analysis, these programmes are counted as significant IWRM spendings. Together these programmes were worth EUR 28 million between 2017-2025.

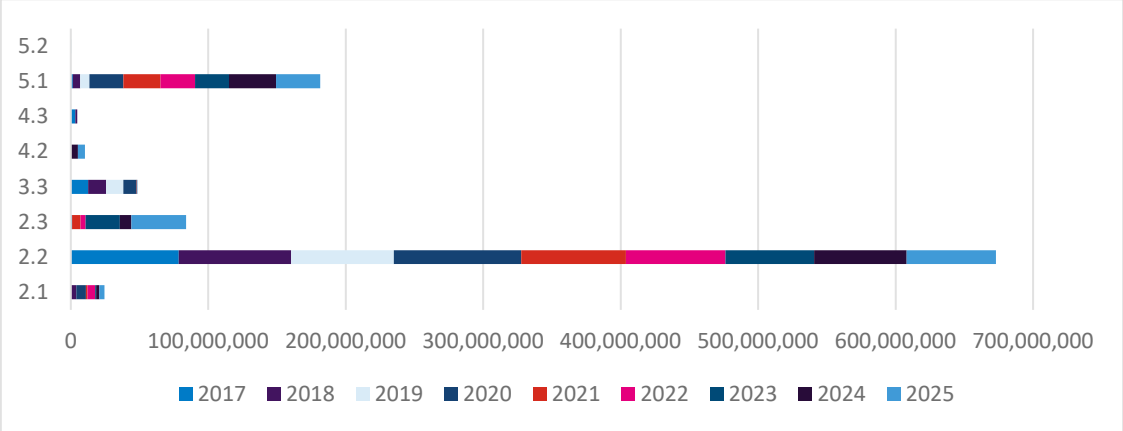


Figure 4: Principal IWRM expenses per budget article, 2017-2025.

This evaluation is limited to activities funded from article 2.2, as this is the main budget article for IWRM activities. Additionally, the evaluation will only look at activities that received a principal "IWRM marker". Expenditure on principal IWRM activities financed from article 2.2 has remained fairly stable over the years, as shown in figure 5.

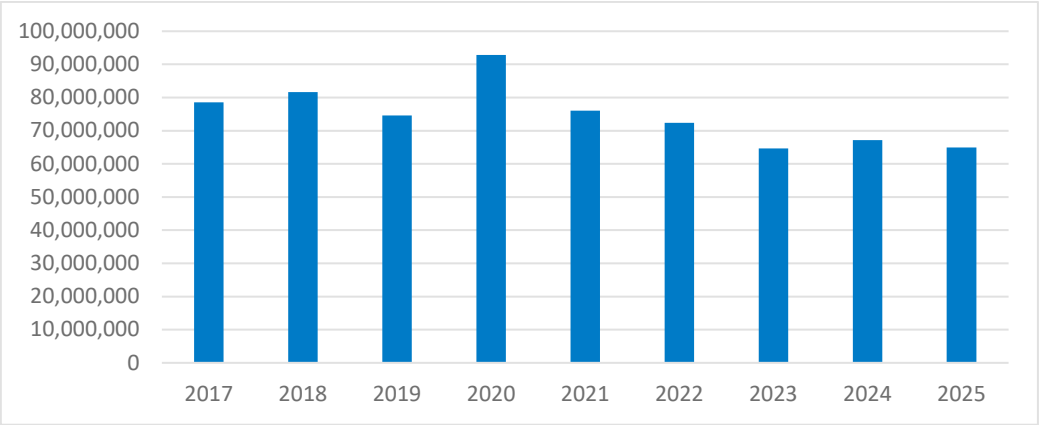


Figure 5: IWRM expenditure from article 2.2, 2017-2025.

Central and delegated expenditure

The department of Inclusive Green Growth (IGG) is responsible for the centrally funded IWRM programmes and activities, which amount to 45% of total IWRM expenditure (EUR 288 million). Delegated expenditure, i.e. the financial resources managed by the embassies, make up 55% (EUR 349 million). Figure 6 shows the division between central spendings (IGG) and embassy spendings.

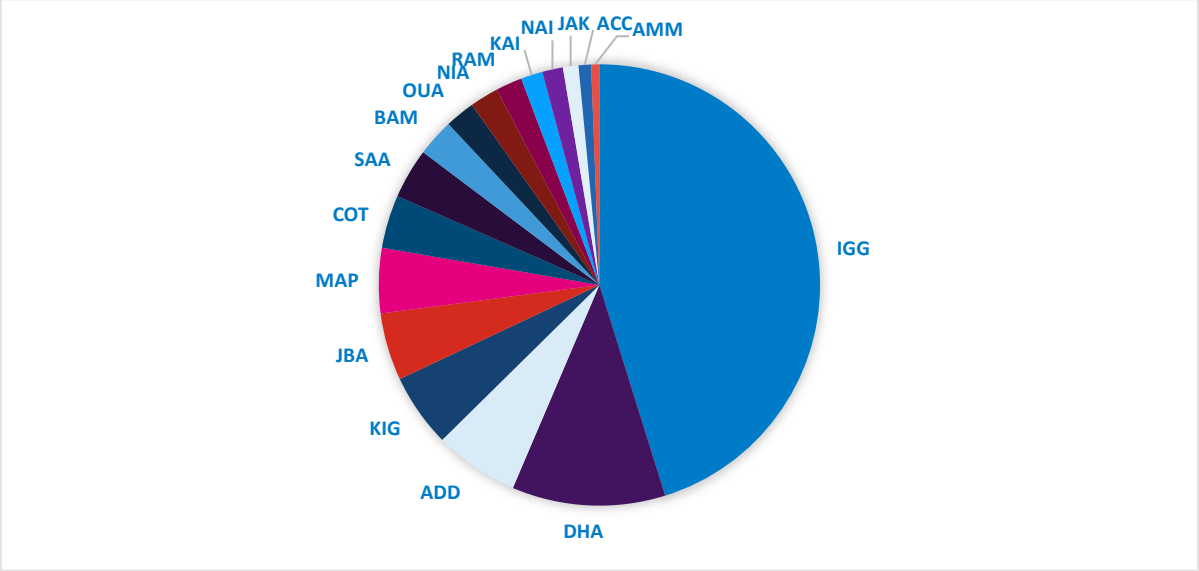


Figure 6: Division between central and delegated expenditure, 2017-2025.

In the period 2017-2025, most delegated IWRM disbursements were made by the embassies in Dhaka and Addis Abeba.[51] Other embassies that financed IWRM programmes and activities are listed in Table 2.

Embassy	Total delegated spending 2017-2025 in EUR
Bangladesh / DHA	71,526,039
Ethiopia / ADD	39,503,838
Rwanda / KIG	34,222,899
South Sudan / JBA	31,495,605
Mozambique / MAP	30,360,962
Benin / COT	24,811,878
Mali / BAM	17,424,980
Burkina Faso / OUA	13,934,452
Niger / NIA	13,402,602
Palestinian Territories / RAM	12,312,950
Yemen / SAA	11,910,377
Egypt / KAI	10,145,861
Kenya / NAI	9,684,314
Indonesia / JAK	7,249,997
Ghana / ACC	5,808,865
Jordan / AMM	3,818,003
Total	349,119,694

Table 2: Embassy spendings 2017-2025.

Figure 7 shows the division of central funding across channels.

- The largest share of central funding was spent through the multilateral channel: EUR 180 million, i.e. 63% of total central spendings. Most of this multilateral funding went to four World Bank programmes (EUR 126 million in total), followed by the Water Productivity Database programme of the FAO (EUR 26 million), two UN Water programmes (EUR 8 million) and the Water, Peace & Security partnership by UNESCO (EUR 10 million).

[51] The embassy in Dhaka has lowered its spendings since 2021. The Embassy has to phase out the bilateral programming in Bangladesh before 2031 because Bangladesh is expected to graduate to middle income country in 2026.

- 22% of central spendings went to public-private partnerships, two in total: the Sustainable Water Fund (EUR 45 million) and payments to RVO for project management of various water projects (EUR 18 million).
- Government-to-government support accounts for 7% of expenditure, primarily through the Blue Deal (EUR 6 million) and the Valuing Water Initiative run by RVO (EUR 8 million).
- EUR 17 million, i.e. 6% of central spendings, went to networks, research and knowledge exchange and institutes ("Other"). Examples are the Water for Development Support programme (EUR 5 million) and a strategic partnership with the Stockholm International Water Institute (EUR 4 million).
- The private channel represents 3% of total expenses, all of which went to the Water and Energy for Food programme (EUR 9 million).
- Finally, a small amount of EUR 571k (0.2%) was spent through the NGO channel.

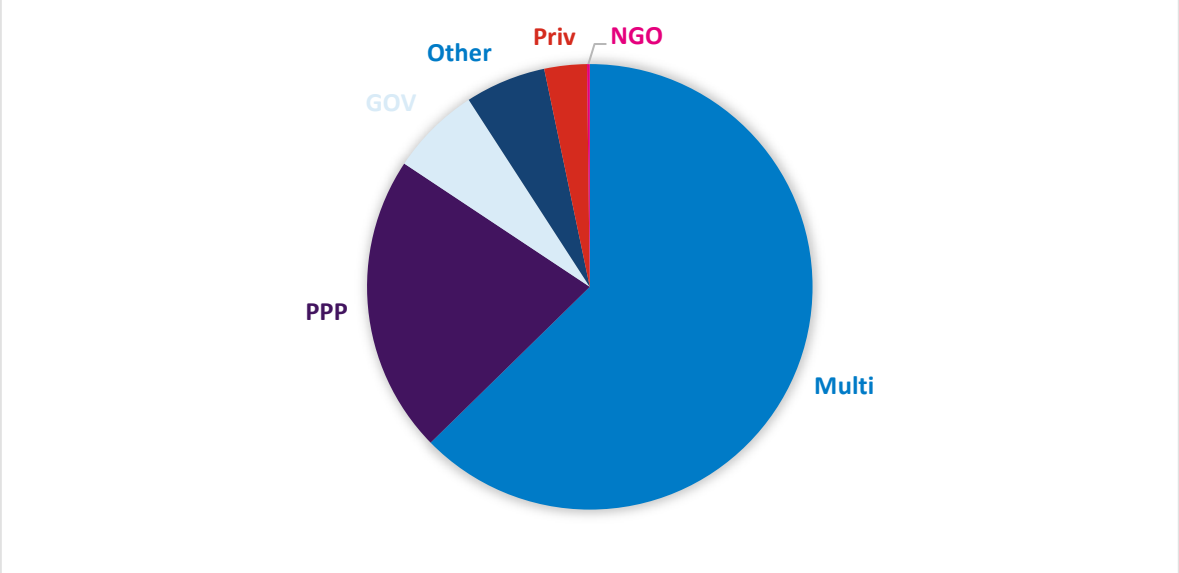


Figure 7: Disbursement of central expenditure, divided by channel.

Figure 8 presents the division of embassy spendings across channels.

- The main share of delegated funding took the form of private sector support: 27% of total delegated spendings, i.e. EUR 94 million. The three main private sector programmes were the Integrated Water Resource programme (EUR 26 million) financed by the embassy in Kigali; the ProWas SSN EES and ProWas SSN Lakes programmes (EUR 11 and 20 million), financed by the embassy in Juba; and the IWRM Fund (EUR 16 million) of the embassy in Maputo.
- NGOs received 21% of delegated spendings, with most funding having been disbursed by the embassies in Cotonou (EUR 24 million), Ouagadougou (EUR 13 million), and Cairo (EUR 9 million).
- Government-to-government support accounts for 19% of delegated spendings, with Blue Gold in Bangladesh being the largest programme (EUR 35 million).
- 17% went to knowledge institutes and research ("Other"). The two largest funds went to the Water & Land Resource Center and Addis Ababa University, through the BRIGHT and Integrated Landscape Management and WASH programmes in Ethiopia (EUR 17 and 19 million respectively).
- 14% went to multilateral organisations, with the World Bank, FAO and UNICEF being the main recipients.
- The remainder went to public-private partnerships (2%).

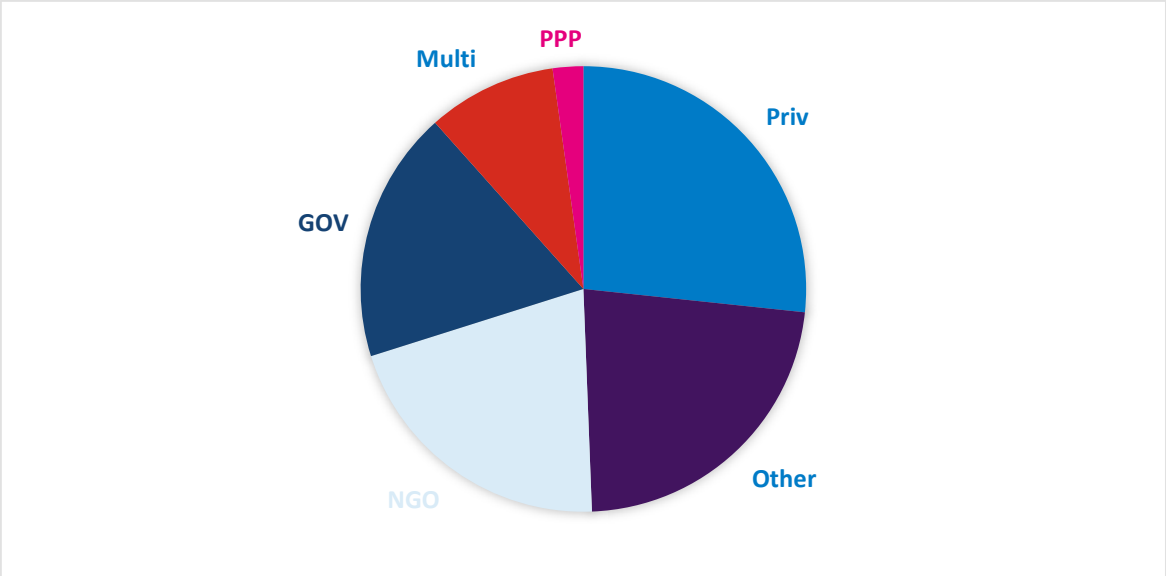


Figure 8: Disbursement of delegated expenditure, divided by channel.

3 Evaluation objectives and scope

Objectives

The aim of this evaluation is to provide insight in the relevance, effectiveness, efficiency and (conditions for) sustainability of IWRM policy instruments and expenditures. It will be one of the building blocks for the periodic review of BHOS article 2 (sustainable development, food security, water and climate). Next to accountability, this evaluation has a clear learning-objective for both IGG and its partners to improve and stimulate the implementation of a system approach (see Annex B). Additionally, it will help IGG to formulate a new strategy. Preliminary interviews with IGG-staff that such an overarching approach was currently missing.

Scope

This study includes activities funded from article 2.2 – the principal budget article for IWRM activities– between 2017 and 2025. Article 2.2 consists of two thematic areas: IWRM and drinking water and sanitation (WASH).[52] Both themes are evaluated separately,[53] with IWRM being the theme of this evaluation. WASH and IWRM are often intertwined in activities. Therefore, linkages with WASH interventions may be considered if programmes consist of both an IWRM and WASH component. Although the MFA works with other ministries on IWRM, these expenditures will not be included due to the limited time available for this evaluation, and their limited size.

IWRM instruments funded under 2.2 include:

- Direct budget support to governments of partner countries, i.e. government-to-government support (through both central and delegated funding).
- Programmes carried out by multilateral institutions (through both central and delegated funding).
- Public-private partnerships (through both central and delegated funding).
- Programmes carried out by NGOs and CSOs (through both central and delegated funding).

[52] Ministerie van Buitenlandse Zaken, XVII Buitenlandse Handel en Ontwikkelingshulp - Memorie van Toelichting -Artikel 2: Duurzame ontwikkeling, voedselzekerheid, water en klimaat, 2025, pp. 6-7.

[53] Information on IOB's WASH evaluation is available on Home | Policy and Operations Evaluation Department (IOB).

- Financing for the private sector (through both central and delegated funding).
- Water diplomacy, primarily the Dutch co-hosting of the UN Water conference in 2023.
- Other instruments such as knowledge institutes, networks and research.

This evaluation aims for a balanced selection of activities across these channels, across central and decentral activities, and coverage in terms of spending. About fifteen activities can be reviewed for this evaluation, so a strategic selection needs to be made. This selection will be discussed with IGG. Assessing water diplomacy on effectiveness, efficiency and sustainability (research questions 3 and 4) as part of the desk review will not be possible, because there are hardly evaluations available. And, since water diplomacy is quite a distinct policy instrument, evaluation would require a separate case study with tailored methodology. Given the limited time available for this evaluation, that would not be feasible. The study therefore includes Dutch water diplomacy only in research questions 1 (policy development) and 2 (relevance).

4 Evaluation questions, criteria and operationalisation

The main research question is:

How has Dutch development cooperation on integrated water resource management been shaped and implemented over the period 2017-2025, what are its main results, what explains these results and to what extent are these results sustainable?

The main question will be addressed through the following sub-questions:

1. *How has IWRM policy been shaped and implemented over the period 2017-2025?*

   Answering this question entails a reconstruction of the (development of the) policy theory, by linking portfolio developments to strategic policy goals and pathways towards change. The reason to do so is that one overarching IWRM policy framework, including a portfolio overview, is currently not available. This has partly been reconstructed in chapter 2 of this ToR, but will be further elaborated on during the research.

2. *How relevant was this policy for actors in recipient countries?*

   Relevance of development interventions for important actors, such as vulnerable and marginalised communities, government bodies and/or companies is a precondition for effectiveness. This question relates to the design and implementation principles (participatory approach, gender centrality, subsidiarity, and the use of interdisciplinary and indigenous knowledge). Part of answering this question will be to define and specify important target groups (such as vulnerable and marginalised communities).

3. *How effective and efficient has this policy been for improved IWRM, and why?*
   - Intermediate outcome: What are results on the four IWRM implementation pillars (policy & legislation; institutions & coordination; finance for infra; management instruments)?
   - Outcome: What are results on the IWRM system (plan for fluctuation in supply and demand; balance and coordinate demand of users; protect and enhance water resources; provide water governance at the right level)?
   - Impact: What are the results on improved social equity, environmental sustainability and economic efficiency?

It is expected that most results will be recorded for the intermediate outcome level because this lies within the sphere of influence of programmes. Nevertheless, outcome and impact are mentioned, as some programme evaluations might produce findings at this level. Annex C presents a more detailed operationalisation of these result areas.

Efficiency is mainly included in operational and procedural terms, for instance relating to the principle of subsidiarity, and aspects such as transparency, coordination, and flexibility. Also, the evaluation might find that certain funding modalities are more appropriate than others. When programme evaluations succeed in recording cost-effectiveness (value-for-money) of certain measures, this will also be included.

4. *How sustainable are results on all these levels, and why?*

   This question focuses on the assumption that a more integrated and systemic approach leads to more sustainable results. It looks at how interactions between the implementation pillars influence outcome and impact results. Since making this link is difficult, it primarily looks at conditions for sustainability. Climate change adaptation and local ownership are part of this analysis as these are cross-cutting areas of the policy.

This evaluation will apply the following OECD-DAC evaluation criteria:

OECD-DAC criterion	Proposed operationalisation
Relevance	E.g. extent to which policy objectives, the design of policy interventions, and their implementation align with the needs of target groups; and extent to which policy interventions are based on prior, context-specific knowledge of possible effectiveness and necessary pre-conditions (i.e. evidence-based).
Effectiveness	See Annex C.
Efficiency	Procedural aspects, funding modalities and cost-effectiveness.
Sustainability	E.g. continuation of activities, and whether activities had lasting effects. Climate change adaptation and local ownership are part of this analysis.

Table 3: Evaluation criteria.

5 Methods

5.1 Research methodology

Research design

The evaluation uses a qualitative case study design to determine how IWRM policy is implemented and which results it produces. A case study design is appropriate for understanding complex phenomena within their natural context, and is especially suited for answering *how* and *why* questions.[54] The *case* serves as the unit of analysis, the choice of which depends on the goal of the research.[55] For this evaluation the unit of analysis is the IWRM policy of the Netherlands MFA, and the aim is, amongst others, to understand how and why the policy produces certain results.

The case study consists of two connected parts. The first part is a systematic desk review of available external evaluations to gather and interpret results of selected IWRM programmes. The research team will make sure the selection of programmes includes various types of both central and delegated programmes, covering a wide range of countries to increase generalizability. The second part consists of fieldwork in two countries to provide in-depth understanding and context. The evaluation starts with analysing evaluations of IWRM

[54] Yin, R. K. (2009). Case study research: Design and methods (Vol. 5): Sage.

[55] Ragin, C. C., & Becker, H. S. (Eds.). (1992). What is a case?: exploring the foundations of social inquiry. Cambridge university press.

programmes that are implemented in the fieldwork countries. This provides concrete input and angles for data gathering, follow-up questions and reflections for the fieldwork that follows. After the fieldwork, the systematic review continues with programmes that are implemented in different countries.

Data sources and data gathering techniques

To prevent bias, it is important to triangulate data sources and data gathering techniques. This is done by capturing IWRM through different data collection methods such as observations during site visits, semi-structured interviews, and collecting relevant documentation. The main data sources for the desk review are independent evaluations or mid-term-reviews of the selected IWRM programmes. When necessary, this can be complemented by internal appraisal documents (BeMos) and annual reports. During the fieldwork, both insider and outsider perspectives will be included to balance and check findings. This takes both perceived effectiveness and ascribed effectiveness by outsiders into account. Insider perspectives for instance include policy officers, project staff and beneficiaries who have been involved in the selected programmes. Outsider perspectives include external experts, and in-country government officials and CSOs who are not (directly) involved in the programmes.

Data analysis process

Data analysis will be structured through an iterative process of inductive and deductive coding.[56] Qualitative data analysis software MaxQDA will be used to ensure reliability and transparency of this process. The analytical framework presented in Figure 1 (see par. 2.1) guides both data gathering (i.e. for creating interview guides) and data analysis (i.e. for providing coding categories). In the systematic review, evaluations / MTRs of selected programmes will be coded with a semi-structured coding form. Filled out forms per programme will be discussed with one other team member to create a shared understanding and increase inter-coder-reliability. Through inductive coding, the form can be adapted to emerging insights, preferably in the beginning of the coding-process. The quality of each MTR / evaluation determines to what extent findings can be incorporated. For programmes visited in the selected countries, other data sources (interviews, observations, documents) are incorporated in the analysis, providing context and triangulation.

The incorporation of a systemic perspective

Incorporating a systemic perspective is important as IWRM aims for a holistic approach, strengthening water systems rather than isolated components. While this evaluation will not perform a full system analysis, it will use elements of system thinking to structure the analysis. A full system analysis would consist of three main parts: (1) identifying the constituting parts of a system,[57] (2) defining the boundaries of a system, and (3) describing the interactions between the various parts of a system.[58] As IWRM programmes address different systems at different levels in different countries, it is impossible for this evaluation to analyse them all. This evaluation will check how governments, donors and programmes have performed such analyses to pinpoint and monitor their system strengthening activities. Furthermore, it will use elements of the first and third part of system analysis by looking at the constituting parts of systems (i.e. results on the four implementation pillars), and at system interactions for explaining the (dis)functionality of water systems (i.e. results on the four dimensions and three 'Es', see Figure 1). Causal Loop Diagrams (CLDs) are particularly useful for depicting system interactions,[59] and can be applied in this evaluation. Especially as systems become more complex, CLDs can help

[56] Skjott Linneberg, M., & Korsgaard, S. (2019). Coding qualitative data: A synthesis guiding the novice. Qualitative research journal, 19(3), 259-270.

[57] System components can be tangible, like the quality of water infrastructure, or intangible, like the level of political will or community participation.

[58] Valcourt, N., Walters, J., Javernick-Will, A., & Linden, K. (2019). *Understanding complexity in WASH systems*. Paper presented at the All systems go, The Hague.

[59] Senge, P. M. (2006). *The fifth discipline: The art and practice of the learning organization*: Broadway Business.

identify and explain unintended consequences of policy programmes.[60] See Annex B for background information on system thinking and CLDs.

5.2 Selection of countries

Country studies

Country selection is based on the following criteria:

1. Size of the financial disbursements on IWRM within BHOS budget article 2.2;[61]
2. Country has no/limited travel restrictions in terms of security;
3. Country has a variety of central/delegated activities and of funding modalities;
4. Country has not been visited for a recent IOB evaluation under BHOS article 2;[62]
5. Country has continued IWRM programming financed from article 2.2.

Benin is the only country meeting all of these criteria and has thus been selected as one of the countries for this evaluation. In consultation with IGG, the team will decide on a second country at a later stage.

5.3 Risks and limitations

Risk	Mitigating measure
Limited time available, as finalisation of this study is foreseen for the end of 2026.	Only 2 country studies. Narrowing of scope to IWRM expenses within BHOS article 2.2. Limiting the number of programmes selected for the systematic review.
Conflict and fragility in various partner countries: countries receiving much IWRM funding, such as Mali, Burkina Faso and the Palestinian Territories, are facing conflict or instability. This means IOB cannot visit them for this study.	Use available evaluations and/or other data such as annual reports. If necessary, remote interviews can be planned with stakeholders to gather additional data.

Table 4: Risks and mitigating measures.

Limitation	Mitigating measure
Limited quality of evaluation reports.	Only evaluations that largely meet the IOB quality criteria will be included.
Findings from the two country studies cannot be generalised to other contexts.	Country studies are complemented with a systematic desk review of programme evaluations in other countries.
Bias in collected data, since many respondents have a direct or indirect stake in the programmes under evaluation.	Data will be triangulated using a range of data sources, including independent sources; respondents' anonymity will be protected to enable them to share their insights freely.
Whilst IWRM is a cross-sector system approach to water management, observed results may be sectoral - especially at output-level. It may be challenging to place such results in a wider system of IWRM interventions. Conversely, at outcome-/impact-level, it might be difficult to attribute results to lower-level, sectoral changes.	The analytical framework (par. 2.1) helps locate results in larger pathways of change, sometimes across sectors. The operationalisation of this framework (Annex C) provides further guidance in this process.

Table 5: Limitations and mitigating measures.

[60] Dyball, R., & Newell, B. (2023). *Understanding Human Ecology: A Systems Approach to Sustainability* (2nd ed. ed.): Routledge.

[61] This includes both central and delegated expenditure. The central country allocations are an estimation as no country specific expenditures are available in MIBZ, see Annex B for the strategy to calculate country allocations.

[62] Mainly to include a wider selection of countries in the various evaluations that serve as building blocks for the periodic review of article 2, to enhance representativeness.

6 Products

The research will result in a report and a summary. Both the report and the summary will be written in English. This enables wider dissemination and makes it possible to have international ERG members. The summary will be translated into Dutch, to ensure accessibility for Dutch audiences. The report will be published on the IOB website and shared with Parliament. IOB reserves the right to share reports prior to publication - under embargo - with third parties, including the media.

7 Planning

Milestone	Planning
Deadline first draft ToR	6 March
KBG and ERG 1: ToR	March
Incorporating feedback KBG and ERG	April
Approval of ToR	12 May
Coding programme evaluations and interviews	May/September
Preparations for country studies	May/June
Country study 1	June/July
Analysis of findings	July/September
KBG and ERG 2: First findings and outline of report	August
Country study 2	August/September
Writing draft report	September/October
KBG and ERG 3: draft report	End of October
Incorporating feedback KBG and ERG	2nd half of November
Final report	End of December
Approval of final report	January 2027
Editing, translation of summary	January / February 2027
Publication	March 2027

8 Quality assurance

8.1 Evaluation team

The research will be carried out by IOB. The research team consists of the following persons:

Name	Role
Jelmer Kamstra	Team lead
Pim de Beer	Team member

Marian Noppert	Team member
Tess de Rooij	Team member

8.2 Sounding board group

Inter-collegial quality control will be done by a sounding board group with the following IOB staff members:

Name	Role
Wendela Haringhuizen	Chair
Jan-Willem le Grand	Sounding board member
Cécile Reinkingh	Sounding board member
Martin van Vliet	Sounding board member
Alexander Otgaar	Quality assurance

8.3 External reference group

The evaluation will be supported and quality assessed by an external reference group (ERG) with the following members:

Name	Function/organisation	Role in ERG
Wendela Haringhuizen	Cluster manager (cluster BHO), MFA: IOB	Chair
Jeroen Vos	WUR	ERG member
Maarten Gischler	Thematic Expert Water, MFA (IGG)	ERG member
(Benin)	To be decided	
(country 2)	To be decided	

The ERG is responsible for external quality control of this evaluation. Its task is to provide methodological and substantive feedback on the ToR, sub-studies and the final report. The ERG advises the research team, IOB's director and quality assurance manager. Its advice is not binding; the responsibility for approving reports for publication lies with IOB's director. If a member of the ERG continues to disagree with the content of a report, they can inform IOB in writing. If necessary, a statement can be included in the report.

8.4 Ethical considerations

The desk-study includes existing reports, most of which are publicly available. If information is not publicly available, no confidential information is included that can be traced back to individuals or that might impose security risks to individuals or organisations involved.

Next to that, interviews and focus group discussions will be held with a range of stakeholders. Prior to the interview, they will receive the necessary information about the study to be able to give informed consent. For example, the interview's purpose, its voluntary and confidential nature, and the method of storing interview notes. All transcripts will be anonymised before they are archived. The final report will not contain statements that can be linked to individuals or that might impose security risks to individuals or organisations involved.

IOB aims to thoroughly include local perspectives in this evaluation. To this end, the research team will visit two countries, and work together with a local consultant. The team visited Ethiopia whilst writing this ToR, to take local realities, questions and perspectives on board.

9 Annexes

A. Evaluation budget

Budget line	Costs including VAT in EUR
Contract local consultant country study 1	7,500
Travel costs country study 1	15,000
Contract local consultant country study 2	7,500
Travel costs country study 2	15,000
Printing and lay-out costs	7,000
Daily rates and travel costs of ERG members	10,000
Translation and editing costs	7,000
Optional: Outreach	1,000
Total	70,000

Table 6: Evaluation budget.

B. Background information on system thinking

Systems and systems thinking

A system can be defined as multiple components or elements interacting with each other to fulfil a certain purpose.[63] It is a method for building a shared understanding of how systems operate and how they could be changed to produce desired effects.[64] Examples of elements that can be part of a system include financial, institutional, political, environmental, infrastructural and social factors. Systems thinking originated in the 1950's to tackle increasingly complex and interrelated problems. According to Senge,[65] systems thinking is holistic rather than reductionist, looking for interrelations rather than looking at separate entities. Another important element of systems thinking is embracing complexity and uncertainty, especially in social systems. This involves incorporating multiple perspectives or 'worldviews' as there is seldom a single problem definition or solution. Systems thinking is about reaching shared understanding about a problem-situation and about problem-resolution (improving the situation) rather than providing a single solution.[66] As such, systems thinking has been important for moving researchers in sustainable development beyond linear thinking and analysis.[67]

[63] Meadows, D. H. (2008). *Thinking in systems: A primer*: chelsea green publishing.

[64] Arnold, R. D., & Wade, J. P. (2015). A definition of systems thinking: A systems approach. *Procedia computer science, 44*, 669-678.

[65] Senge, P. M. (2006). *The fifth discipline: The art and practice of the learning organization*: Broadway Business.

[66] Checkland, P., & Poulter, J. (2020). Soft Systems Methodology. In M. Reynolds & S. Holwell (Eds.), *Systems Approaches to Making Change: A Practical Guide* (pp. 201-253). London: Springer London.

Reynolds, M., & Holwell, S. (2020). Introducing Systems Approaches. In M. Reynolds & S. Holwell (Eds.), *Systems Approaches to Making Change: A Practical Guide* (pp. 201-253). London: Springer London.

[67] Hjorth, P., & Bagheri, A. (2006). Navigating towards sustainable development: A system dynamics approach. *Futures, 38*(1), 74-92. doi:https://doi.org/10.1016/j.futures.2005.04.005

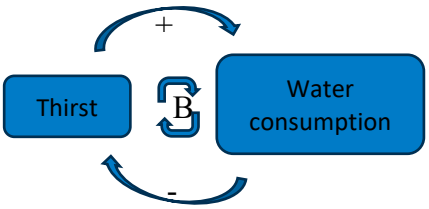
Monat, J., & Gannon, T. (2015). What Is Systems Thinking? A Review of Selected Literature Plus Recommendations. *International Journal of Systems Science, 4*, 11-26. doi:10.5923/j.ajss.20150401.02

System analysis

A system analysis consists of three main parts: (1) identifying the constituting parts of a system, (2) defining the boundaries of a system, and (3) describing the interactions between the various parts of a system. Components of a system can be tangible, like the quality of water infrastructure, or intangible, like the level of political will or community participation.[68] Drawing a boundary around a system is important as the analysis can otherwise become overwhelming. A concise definition of the problem-situation or geographic scope can help in that sense.[69] This should be combined with stakeholder and expert consultations to make sure boundaries are meaningful.[70] The most important part of a system analysis is uncovering the interactions between the various parts of the system, as systems are more than a collection of their parts.[71] Different components of a system can influence each other through direct and indirect relations. These relations can be strong or weak and can have positive or negative polarities. A positive relation (+) means that if component A increases or decreases, component B does the same. A negative relation (-) means that when component A increases, component B decreases, and vice versa.[72]

System Dynamics

To understand how a system functions, looking for dynamic patterns of change instead of static snapshots is key.[73] Important elements in explaining system behaviour are feedback loops: multiple components linked together can start creating 'reinforcing' or 'balancing' feedback loops.[74] Reinforcing feedback loops amplify change, while balancing loops have a stabilising effect. When looking at water consumption, an example of a balancing feedback-loop is that thirst leads to an increase in water consumption, which decreases the feeling of being thirsty, which in turn decreases water consumption. An example of a positive feedback loop is that increased water supply can increase water consumption (i.e. because people start watering their lawn), increasing the demand for water, resulting in increased water supply (if possible), which can provoke even more water use. Such systems can be depicted in a causal loop diagram which is a visual tool for analysing the interplay between multiple factors.[75] Figure 11 provides a simple example of a causal loop diagram.



[68] Valcourt, N., Walters, J., Javernick-Will, A., & Linden, K. (2019). *Understanding complexity in WASH systems*. Paper presented at the All systems go, The Hague.

[69] Valcourt, N., Walters, J., Javernick-Will, A., & Linden, K. (2019). *Understanding complexity in WASH systems*. Paper presented at the All systems go, The Hague.

[70] Nabavi, E., Daniell, K. A., & Najafi, H. (2017). Boundary matters: the potential of system dynamics to support sustainability? *Journal of Cleaner Production, 140*, 312-323. doi:https://doi.org/10.1016/j.jclepro.2016.03.032

[71] Durland, M. M., & Fredericks, K. A. (2005). An introduction to social network analysis. *New Directions for Evaluation, 2005*(107), 5-13.

Meadows, D. H. (2008). *Thinking in systems: A primer*: chelsea green publishing.

[72] Winz, I., Brierley, G., & Trowsdale, S. (2009). The use of system dynamics simulation in water resources management. *Water resources management, 23*, 1301-1323.

[73] Senge, P. M. (2006). *The fifth discipline: The art and practice of the learning organization*: Broadway Business.

[74] Dyball, R., & Newell, B. (2023). *Understanding Human Ecology: A Systems Approach to Sustainability* (2nd ed. ed.): Routledge.

[75] Morecroft, J. (2020). System Dynamics. In M. Reynolds & S. Holwell (Eds.), *Systems Approaches to Making Change: A Practical Guide* (pp. 201-253). London: Springer London.

Figure 11: Example of a Causal Loop Diagram with a balancing feedback loop.

In realistic multi-loop systems, the interplay between balancing and reinforcing feedback loops can explain dynamic behaviour of systems through time. Causal loop diagrams help in identifying the main loops in the web of causal connections, and as such can help identify leverage points for impacting the system's behaviour.[76] Especially as systems get more complex, causal loop diagrams can also help identify and explain unintended consequences of policy programmes.[77] Within these loops, the existence of delays adds to the dynamics. Water shortage for instance spurs the construction of dams, but as construction takes a lot of time, a resulting decrease in shortage is delayed. Another element which adds to the dynamic is the changing of relations through time. For instance, after a period of increase, water demand can level out with water supply, ending a reinforcing feedback loop. Also, policies or worldviews of actors in a system might change, affecting underlying behaviour and relations.[78] And finally, the availability of resources in a system can change its performance. A drinking water system can for instance collapse if an aquifer is depleted due to climate change.[79]

C. Operationalisation of analytical framework

Operationalisation of analytical framework, to measure effectiveness (to be complemented with results that emerge during the research process)[80]	
Intermediate outcomes	Results on the four implementation pillars: policy and legislation, institutions and coordination, finance for infra, management instruments. For instance: **Policy and legislation:** • Drafting of (sub-)national laws and regulations, and/or recognition of existing customary laws and/or water rights, regarding sustainable, equitable and efficient water use and supply. • Drafting of IWRM policies and (multi-annual) plans at (sub-)national levels, such as catchment or basin plans. • Drafting of agreements for transboundary water management. • Public participation in drafting of policy and legislation, such as consultation and co-creation (including women and vulnerable groups) • Private sector participation in drafting of policy and legislation. **Institutions and coordination:** • Identification or establishment of inclusive water governance bodies at various government levels, both formal and informal (eg. communities, water user associations, local water boards, basin management authorities, ministries). • Clear division of roles and responsibilities between different water governance bodies (eg. laid down in a charter or policy documents). • Enhanced capacities of water experts at various governmental levels (eg. technical expertise or management training). **Management instruments:** • Functioning water monitoring systems and databases, water resource assessments and allocation tools, and drafting of climate scenarios (examples are tools for

[76] Monat, J., & Gannon, T. (2015). What Is Systems Thinking? A Review of Selected Literature Plus Recommendations. *International Journal of Systems Science, 4*, 11-26. doi:10.5923/j.ajss.20150401.02

Morecroft, J. (2020). System Dynamics. In M. Reynolds & S. Holwell (Eds.), *Systems Approaches to Making Change: A Practical Guide* (pp. 201-253). London: Springer London.

[77] Dyball, R., & Newell, B. (2023). *Understanding Human Ecology: A Systems Approach to Sustainability* (2nd ed. ed.): Routledge.

[78] Martín, E. G., Giordano, R., Pagano, A., Van Der Keur, P., & Costa, M. M. (2020). Using a system thinking approach to assess the contribution of nature-based solutions to sustainable development goals. *Science of the Total Environment, 738*, 139693.

[79] This relates to stock and flow diagrams, which involves the modelling of the flow of resources through a system, for instance with the help of computer simulations. This type of modelling is beyond the scope of this research.

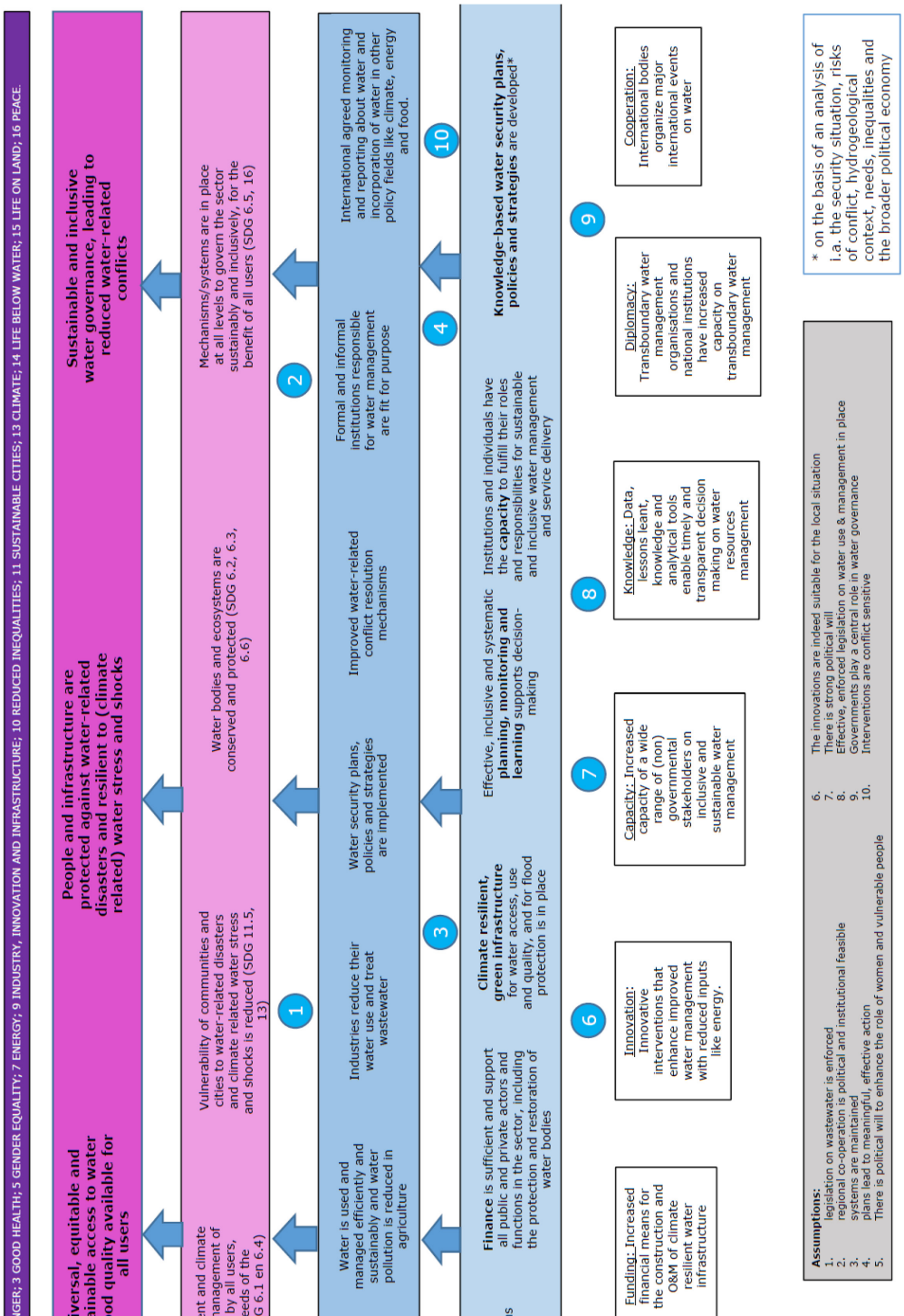
[80] Partly based on: Asian Development Bank, Asian Water Development Outlook 2025: The Index of Water Security for Asia and the Pacific, 2025, chapter 6.

	monitoring of water availability, water quality, sustainable and efficient water use, pollution control, water-related ecosystems and biodiversity, of and water-related disasters). • Integration of climate change impacts in management instruments. **Finance for infrastructure:** • Expanded public budget allocations (eg. through water tariffs), both at national and sub-national levels. • Aligned funding between water governance bodies at different governance levels. • Leveraged private finance (eg. through risk-sharing). • Construction of infrastructure such as dams, bridges, (natural) water purification sites, irrigation channels, wetlands, retention basins, flood barriers, etc. • Finance for operation and maintenance of infrastructure. • Finance for transboundary cooperation. • Integration of climate-related funding into financing for IWRM and vice versa.
Outcomes	Results on the four dimensions of IWRM: enhanced and protected water resources; balancing and coordination of water demands; water governance at the right governance level (hydro/admin); enhanced coordination of (temporal/spatial) fluctuations in supply and demand. For instance: Enhanced and protected water resources: • Increased water quality and/or quantity • Water infrastructure is being maintained (i.e. maintenance plans are in place, skilled maintenance teams present, and there are sufficient resources available to carry out maintenance). Enhanced balancing and coordination of water demands: • Implementation of laws and regulation regarding sustainable, equitable and efficient water use and supply. • Implementation of multi-annual IWRM strategies, such as catchment or basin plans and water allocation structures. Water governance at the right governance level (hydro/admin): • Water governance bodies fulfil the roles and carry out the responsibilities assigned to them. • Water governance bodies operate at the right administrative and hydrological scale. • Continuous dialogue within and between water governance bodies at various government levels (eg. within and between collectives at community-level, local water boards, water operator partnerships, and basin management authorities). Enhanced coordination of (temporal/spatial) fluctuations in supply and demand: • Water monitoring systems and other are being used to anticipate and respond to fluctuations in water supply and demand (eg. based on weather and climate forecasts). • Data and information sharing within and between countries. • Implementation of policies to spread/reduce water demand.
Impact	Long-term results on improved social equity, environmental sustainability and economic efficiency.[81] Social equity: • Equitable water access for all people, including marginalised and vulnerable groups such as poor communities, women and girls, indigenous peoples, and/or remote communities. • Increased resilience to climate change and natural disasters. • Reduced water-related conflict. Environmental sustainability: • Maintenance of the flow of the natural water cycle and other natural nutrient cycles. • Allocation of water resource to ecosystems to sustain terrestrial and aquatic biodiversity.

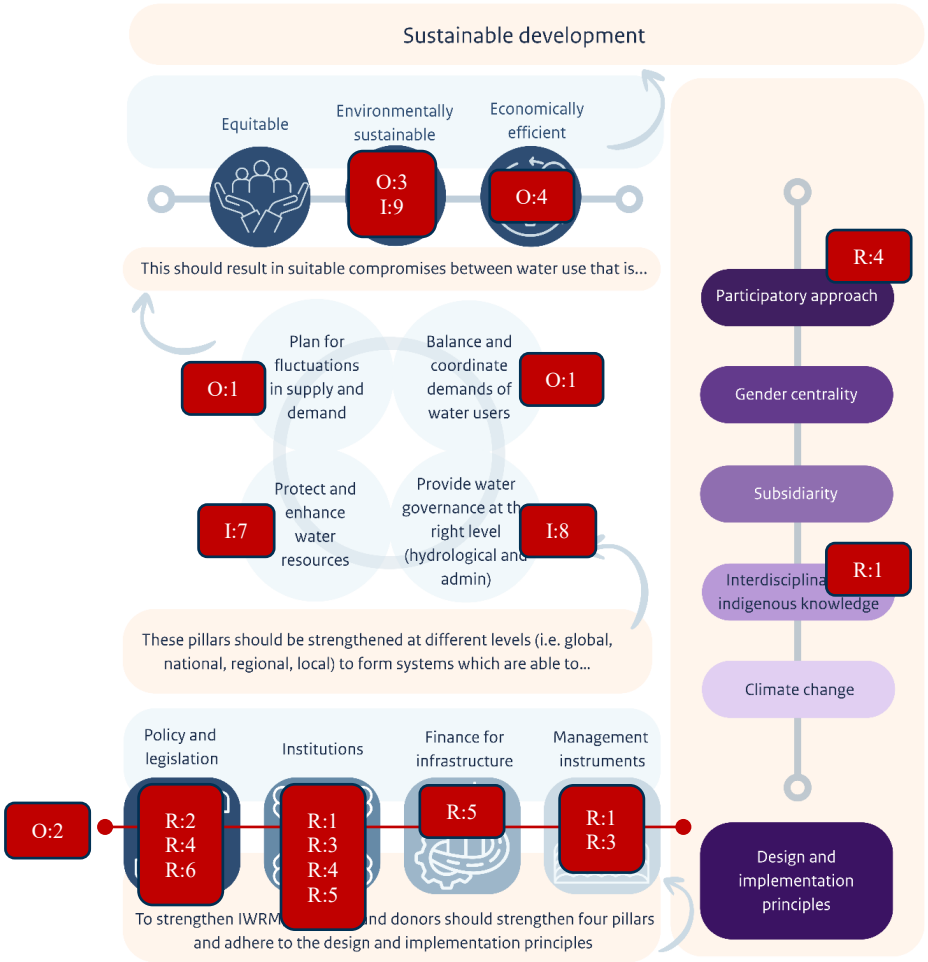
[81] SIWI (2020), Manual 1: Principles and Practices of Integrated Water Resources Management, SIWI: Stockholm, p. 17.

	• Ecosystems play a role in regulating i.a. floods, climate, water and air quality, pollution and erosion. Economic efficiency: • Efficient and sufficient supply of water for industry and agriculture. • Water recycling, reuse and waste reduction. • Sustainable sanitation (minimisation of pollution and waste reduction) • Efficient irrigation systems. • Maintenance of fishing and other natural resources for economic activities. NB: We do not expect to be able to draw many conclusions at impact-level, since data that would substantiate such conclusions is probably limited.

D. IGG ToC-figure 2021



E. Link between analytical framework and IGG result framework



Objective 1: Promote sustainable withdrawals and supply of freshwater.

Objective 2: Promote implementation of IWRM at all levels, including through transboundary cooperation.

Objective 3: Protect and restore water-related ecosystems.

Objective 4: Water efficiency in agriculture.

Indicator 7:	Number of hectares reached with physical interventions aimed at river basins and deltas with good water quality and quantity, as a result of Dutch support.
Indicator 8:	Number of hectares reached with water governance interventions aimed at river basins and deltas with good water quality and quantity, as a result of Dutch support.
Indicator 9:	Number of hectares in water-related ecosystems reached by physical interventions aimed at protection and/or restoration, as a result of Dutch support

Result area 3.1:	Knowledge development & research (knowledge for policy)
Result area 3.2:	Regulatory frameworks and quality control
Result area 3.3:	Capacity building and technology transfer (policy for knowledge)
Result area 3.4:	Empowerment of groups in vulnerable situations
Result area 3.5:	Market development and mobilizing financial means
Result area 3.6:	Policy development and diplomatic outreach