DYNOBA

Strengthening support to African transboundary basin organisations
for improved water resource management
in the context of climate change

2023–2026

Technical summary

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Transboundary river basin organisations partnering in the project:

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Executive summary

Transboundary river and lake basins play a central role in the development dynamics of the African continent and in the sustainable management of its water resources. They are the focus of major challenges relating to access to water, water security, energy production, agriculture, ecosystem conservation and adaptation to climate change. In these areas, transboundary basin organisations (TBO) serve as the primary frameworks for cooperation between states in implementing integrated water resources management (IWRM). It is within this context that the DYNOBA project – Strengthening support to African transboundary basin organisations for improved water resources management in the context of climate change, funded by the French Development Agency (AFD) and implemented by the International Office for Water (OiEau) between 2023 and 2026, has helped to strengthen the capacities of several African TBO, whilst promoting the pooling of technical and institutional support, as well as the sharing of experiences between basins.

The project was based on a partnership involving OiEau as operator and coordinator, several beneficiary basin organisations — the Niger Basin Authority (NBA), the Volta Basin Authority (VBA), the Lake Chad Basin Commission (LCBC), the Nile Basin Initiative (NBI-NELSAP) and the Organisation for the Development of the River Gambia (OMVG) — as well as the African Network of Basin Organisations (ANBO), responsible for facilitating exchanges and the dissemination of knowledge between institutions. The project's implementation was based on a multi-contractor framework agreement enabling the mobilisation of specialist expertise, in addition to the technical assistance provided directly by OiEau, and the commissioning of several consultancy contracts for the benefit of the basin organisations.

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Component 1: Governance and financing mechanisms

DYNOBA contributed to strengthening the governance and institutional capacities of several basin organisations. In particular, the project supported the institutional and technical strengthening of the Lake Chad Basin Observatory (LCBC) as well as the improvement of the financing mechanisms of the VBA and the OMVG. Technical assistance activities also helped to strengthen the institutional capacities of certain basin organisations, notably through the operationalisation of the NBA's Permanent Technical Committee.

Component 2: Water Information Systems and resource monitoring

The project has helped to improve knowledge and monitoring of water resources in several basins. Four hydrometric gauging stations have been installed in the Niger and Gambia basins, and the Water Information Systems of the NBA and the OMVG have been strengthened to better organise and utilise the available data. A study on groundwater resources was also conducted in the Nile basin. Furthermore, DYNOBA supported the development of satellite hydrology for the benefit of several TBO (NBA, VBA, LCBC, OMVG) through the use of satellite data and the implementation of hydrological modelling tools adapted to large transboundary basins.

Component 3: Strategic planning, infrastructure and nature-based solutions

DYNOBA also supported strategic planning and coordinated water infrastructure management in several basins. In particular, the project contributed to the development of the Volta Basin Climate Investment Programme and the updating of the NELSAP programme's strategic plan in the Nile Basin. Studies were also conducted on the coordinated management of hydraulic infrastructure in the Volta and Niger basins, as well as on the pre-feasibility of a transboundary hydropower project (NBI-NELSAP). Furthermore, several

initiatives focused on ecosystem protection and the promotion of nature-based solutions, notably through pilot actions for the restoration of headwaters in the Fouta-Djalon massif (NBA, OMVG, OMVS) and work on the resilience of transboundary wetlands (NBI-NELSAP, LCBC).

Component 4: Sharing of experiences and cooperation between basin organisations

Finally, DYNOBA has helped to promote new ways of sharing experiences and exchanging knowledge between basin organisations, notably through the activities of ANBO. Workshops, training sessions and technical meetings have strengthened interactions between institutions and encouraged the dissemination of practices and tools developed in different basins, thereby helping to foster regional cooperation and knowledge sharing among African river basin organisations.

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Beyond technical achievements and institutional support, DYNOBA has demonstrated the value of a shared approach across multiple basins, through an innovative multi-basin approach coordinated by OiEau, as well as by ANBO for the sharing of experience. The coordination of support through a single technical operator, combined with a framework agreement involving several specialist service providers, has thus enabled the streamlining of activity implementation and fostered the collection of lessons learned and knowledge sharing. This approach has also facilitated the introduction of innovative elements into the support provided to basin organisations, particularly in the fields of satellite hydrology and information systems to improve knowledge, as well as nature-based solutions for the protection of ecosystems and environments.

The project has also helped to strengthen synergies with other initiatives, notably the Team Europe Initiative dedicated to African transboundary basins, as well as various projects supported by different partners within the basins. These interactions enhance the project's leverage by facilitating the continuation of certain actions, the mobilisation of additional funding and the integration of achievements into broader regional dynamics, thereby opening up prospects for future complementary initiatives aimed at supporting river basin organisations in the sustainable management of water resources and adaptation to the effects of climate change.

1 Introduction

Africa's transboundary river and lake basins are strategic areas for the continent's economic development, regional stability and climate resilience. They are the focus of major challenges relating to access to water, energy, agriculture, ecosystem conservation and the prevention of conflicts over water use. In this context, transboundary basin organisations (TBO) represent the central institutional framework for implementing integrated water resources management (IWRM) at the transboundary basin level, based on inter-state cooperation, the equitable sharing of resources and benefits, and the anticipation of the impacts of climate change.

For over fifteen years, the French Development Agency (AFD) has been supporting several major African TBO, in line with its strategy promoting transboundary IWRM, climate change adaptation and regional integration. Feedback from these successive support initiatives has, however, highlighted the need to update the approach to intervention in order to enhance its efficiency, overall coherence and sustainability. It is with this in mind that the DYNOBA project was designed: 'Strengthening support to African transboundary basin organisations for improved water resources management in the context of climate change', funded by AFD and implemented by the International Office for Water (OiEau) between 2023 and 2026. The project is based on an approach of technical and institutional support pooling, capitalising on existing achievements and targeting interventions with a high leverage effect on the structural pillars of IWRM.

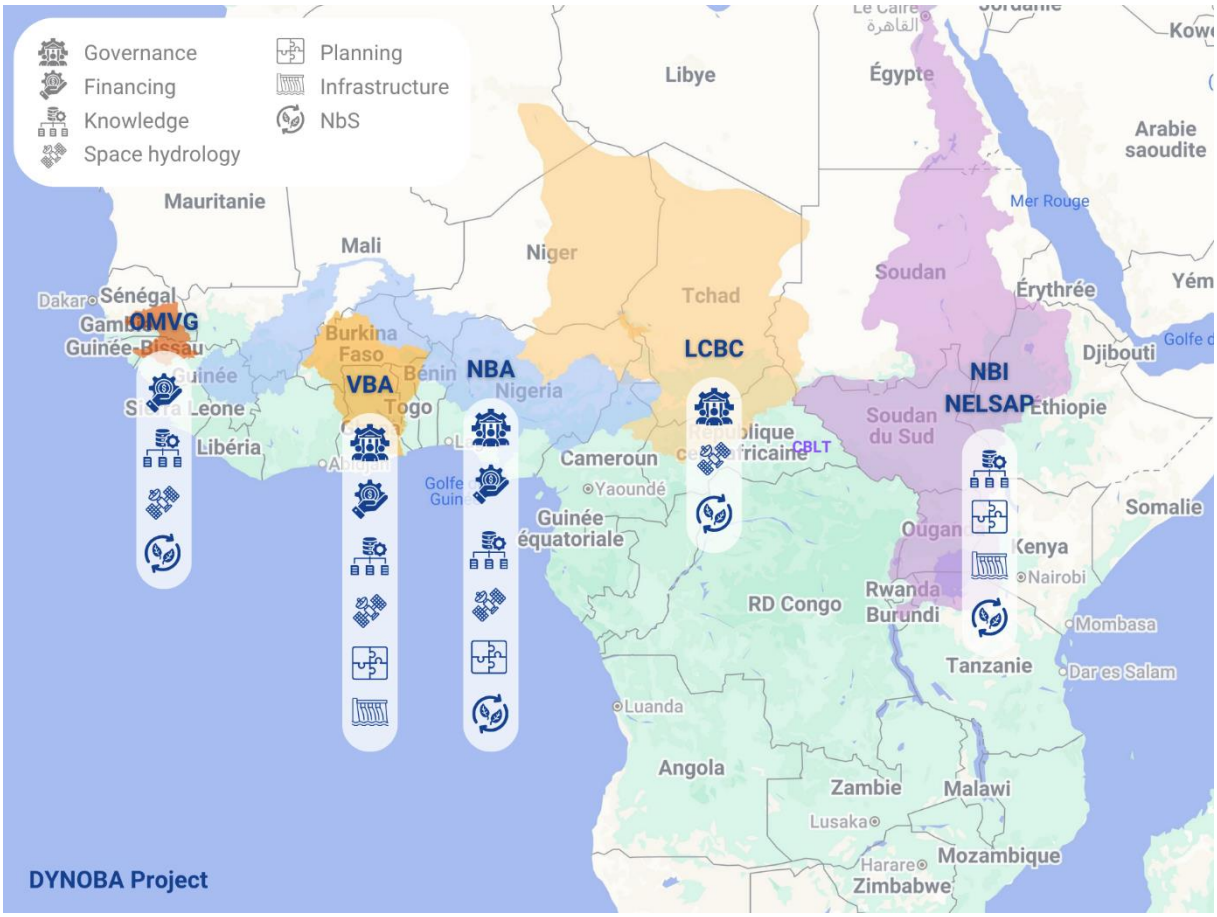
The specific objective of DYNOBA is to build the long-term capacity of partner transboundary river basin organisations to improve water resource management at the transboundary river basin level, in response to climate variability and change. The project is structured around four complementary sub-objectives:

1. Strengthening the governance of transboundary basin organisations and consolidating their funding mechanisms;
2. Improving Water Information Systems and developing decision support tools for climate change adaptation;
3. Supporting strategic action planning at the basin scale, as well as the development of transboundary projects, including water infrastructure coordinated management and nature-based solutions;
4. Promoting experience sharing, peer learning and cooperation between basin organisations.

Led by OiEau, acting as operator and technical assistant, DYNOBA primarily benefits the Niger Basin Authority (NBA), the Volta Basin Authority (VBA), the Lake Chad Basin Commission (LCBC), the Nile Basin Initiative (NBI-NELSAP), the Gambia River Basin Development Organization (OMVG), and the Senegal River Basin Development Organization (OMVS) for targeted actions. The African Network of Basin Organisations (ANBO) supports Component 4 of the project, thereby helping to extend the project's impact to all its members across Africa.

This technical summary aims to highlight the main achievements of the DYNOBA project (Annex 1). It highlights the concrete results produced, methodological and operational innovations (in particular satellite hydrology and nature-based solutions), the links and synergies between activities within a single basin or inter-basin cooperation (particularly with the ANBO), as well as the initial structural impacts observed on TBO capacities regarding IWRM and climate change adaptation, to be confirmed, expanded and sustained in the coming years. It is primarily aimed at AFD technical and decision-making teams, partner TBO,

regional and continental institutions involved in transboundary water management, as well as technical and financial partners wishing to capitalise on the project's lessons and inform future support.



Summary map of activities carried out under the DYNOBA project.

2 Component 1: Governance and financing mechanisms

2.1 Technical assistance and capacity building

Basin: Niger / Volta — *Activity 1.1.1&2*

Implementation: OiEau — *2024–2025*

Several workshops have been organised to select and define the technical assistance activities, provided directly by OiEau outside the framework agreement.

For the NBA, this involves the operationalisation of the capacity-building plan and the CTP. With regard to capacity building, this involved updating the Procedures Manual in Annex 2 to the Water Charter relating to the coordinated management of dams, as well as organising a workshop on the coordinated management of dams in the Upper Niger sub-basin (see Activity 3.1.2). Two experts from the NBA also participated in the 149th session of the OMVS Permanent Water Commission (CPE) in June 2025 in Conakry (Guinea).

For the VBA, the activities originally planned involved supporting the ratification of the Volta Basin Water Charter. As no meeting of the VBA Stakeholder Forum took place during the project, these activities were ultimately taken over by the GEF-funded Reversing Ecosystem and Water Degradation in the Volta River Basin (REWarD) project, which specifically provides for the establishment of an Inter-Parliamentary Committee.

2.2 Strengthening the Lake Chad Basin Observatory

Basin: Lake Chad — *Activity 1.1.3*

Implementation: SCP / Rives & Eaux du Sud-Ouest / IRD — *10/2025–03/2026*

The Lake Chad Basin Observatory is a key tool for the LCBC in collecting, analysing and disseminating information on the basin's water resources and environmental dynamics. In response to growing demand for reliable data shared among member states, the LCBC has expressed the need to strengthen the institutional and technical capacities of this Observatory in order to improve the organisation of available information and its use in decision-making processes.

The study conducted as part of the DYNOBA project involved carrying out an assessment of the Observatory's current operations and its tools, based on a literature review and discussions with LCBC teams and national focal points. The work focused in particular on the Observatory's institutional organisation, the systems for collecting and managing hydrological and environmental data, and the procedures for sharing information between the LCBC and its national partners. On this basis, a detailed assessment was drawn up, including an analysis of the basin's hydrological monitoring network and the mechanisms for producing and disseminating information. Surveys of the national focal points also helped to better identify the needs and constraints associated with the provision and use of data. The analysis also focused on the Observatory's main outputs — notably the hydrological bulletin, the annual strategic report and the summaries on the state of the basin — in order to clarify their objectives, content and structure, as well as the profiles and skills required to sustainably fulfil these functions.

The study led to the formulation of operational recommendations aimed at consolidating the Observatory's role as a reference platform for information on the Lake Chad basin. The

results identified areas for improvement concerning institutional organisation, database structuring, hydrological monitoring and the procedures for sharing information among Member States. These elements provide a working basis for the LCBC to sustainably strengthen the functions of observation and information dissemination at the basin level.

2.3 Consolidation of autonomous and sustainable funding mechanisms

Basins: Volta / Gambia — *Activity 1.2.2*

Implementation: BRLi — *02/2025–12/2025*

The Volta and Gambia basins (as well as the Koliba-Corubal and Kayanga-Géba basins under the jurisdiction of the OMVG) are characterised by a marked dependence of transboundary basin organisations on contributions from member states and external funding, with limited visibility regarding the evolution of available resources in the medium term. In this context, the VBA and the OMVG have expressed a need for analyses and tools to better structure their financing mechanisms and improve the predictability of their financial resources.

The work carried out began with an analysis of the existing funding mechanisms of the two organisations, including an examination of revenue sources, member states' contribution arrangements and the institutional frameworks governing their operations. For the VBA, this analysis enabled the development of a roadmap aimed at diversifying and structuring the institution's financial resources, specifying the principles of contribution, options for complementary mechanisms, and the link between operational funding and the programming of actions at the basin level. For the OMVG, the work led to the development of a financial modelling tool enabling the exploration of different scenarios for the evolution of revenue and expenditure, as well as their effects on the organisation's financial sustainability and on the prioritisation of expenditure.

The study's findings provide the VBA and the OMVG with consolidated financial guidance frameworks, based on an analysis of existing mechanisms and technical discussions with the relevant teams. The recommendations provide operational guidance to improve the clarity and structure of funding mechanisms, as well as to support decision-making regarding resource trends and the planning of actions at the basin level.

3 Component 2: Water Information Systems and resource monitoring

3.1 Procurement and installation of hydrometric gauging stations

Basins: Niger / Gambia — *Activity 2.1.1*

Implementation: ARTELIA / SHER — *06/2024–12/2025*

Strengthening hydrometric monitoring is a priority for the NBA and the OMVG, in order to have reliable and continuous data on changes in flow rates in strategic sectors of the basins. Indeed, several historic stations are now obsolete, limiting the availability of data required for the hydrological monitoring and analysis activities carried out by the basin organisations and national hydrological services.

Installation of staff gauges, Makurdi (Nigeria)

The project involved installing and commissioning four new automatic gauging stations at sites identified jointly with the relevant basin organisations and national hydrological services. A preliminary assessment mission confirmed the installation sites and the technical specifications of the equipment. The stations were then supplied, installed and configured at the selected sites, with the installation of sensors, data acquisition systems and data transmission devices. The work was carried out in coordination with the national institutions responsible for hydrological monitoring, to ensure the integration of the equipment into existing networks and its operational adoption.

Four automatic gauging stations are now operational in the Gambia and Niger basins, at the sites of Basse (Gambia), Guénéto (Senegal), Dima-Nianou (Guinea) and Makurdi (Nigeria). The installed equipment enables the regular collection and transmission of hydrological data. A user, operation and maintenance manual has also been produced to support the technical teams in the operation and long-term sustainability of the monitoring system.

3.2 Assessment of groundwater availability in the aquifers of the Western Rift Valley and Mgahinga

Basin: Nile (Great Lakes) — *Activity 2.1.2*

Implementation: BRLi / ANTEA — *02/2025–03/2026*

The NBI, through the NELSAP programme, identified the need to consolidate existing knowledge on groundwater resources in the Western Rift Valley and the Mgahinga sector, where existing information remained scattered and incomplete. The aim of the study was to characterise the main aquifers in this cross-border area in order to establish a technical information base on their occurrence, accessibility and uses.

The work combined the analysis of existing data with field investigations carried out in Uganda and Rwanda. Two field campaigns enabled the collection of georeferenced data on boreholes and springs, covering various hydrogeological contexts within the study area. The

information gathered includes, in particular, observed water levels, associated uses, basic physico-chemical parameters and flow rate estimates. All the data collected was organised into a georeferenced database, which was used to produce spatial analyses and regional maps of groundwater potential and constraints. For the part located in the Democratic Republic of the Congo, the analysis was based on the use of available secondary data.

The study provides a structured hydrogeological characterisation of the aquifers in the study area, as well as a harmonised database of water points and associated information. The maps produced enable the identification of areas with conditions more favourable to groundwater extraction, as well as sectors subject to more significant hydrogeological constraints, providing a basis for analysis for the technical work carried out by the NBI at the basin level.

3.3 Strengthening of satellite-based hydrological monitoring

Basins: Gambia / Lake Chad / Niger / Volta — *Activity 2.1.3*

Implementation: IRD / Hydro Matters — *07/2024–04/2026*

Several basin organisations partnering in the project have identified gaps in the coverage and continuity of in situ hydrological measurement networks, limiting the availability of data on changes in surface water resources at the basin scale. In this context, satellite hydrology has been deployed as a complementary approach based on the use of satellite data and their integration into hydrological modelling tools suited to large transboundary basins.

The work carried out has led to the implementation of operational configurations of the MGB (Modèle Grand Bassin) distributed hydrological model – developed by the IRD – for the Gambia, Volta, Niger and Lake Chad basins. Satellite altimetry data series were processed and validated to inform the hydrological analyses and model simulations. On this basis, networks of virtual hydrological stations were defined and documented for each of the basins. The results were integrated into visualisation tools providing access to time series and model outputs.

The tools and data produced as part of the activity were made available to the basin organisations to facilitate their use in hydrological analyses at the scale of the relevant basins. Technical training sessions supported the adoption of the methods and tools, notably during a workshop organised for the VBA in Lomé (June 2025) and during sessions dedicated to the OMVG and NBA teams (September 2025). In basins characterised by sometimes incomplete measurement networks and complex hydrological dynamics, satellite hydrology thus provides a useful complement to in situ observations to improve the availability and continuity of hydrological information at the regional level.

Satellite hydrology

Satellite hydrology encompasses methods for observing and analysing water resources using data from Earth observation satellites. These observations complement ground-based measurements and provide hydrological information across vast areas, particularly in regions where monitoring networks are sparse or difficult to access.

Satellite altimetry, in particular, enables the estimation of water levels in major rivers and lakes. Using this data, it is possible to define virtual hydrological stations — that is, water level monitoring points located along watercourses — even where no ground-based measuring stations exist. The water level time series thus obtained can then be integrated into hydrological models. As part of the project, the MGB distributed hydrological model is used to convert this water level information into flow estimates, thereby enabling the use of satellite observations in hydrological analyses.

In large transboundary basins, where measurement networks may be incomplete or inconsistent across countries, satellite hydrology thus provides a useful complement to in situ observations. It improves the spatial coverage of hydrological data and provides consistent information at the scale of the entire basin.

3.4 Water Information Systems and decision support tools

Basins: Gambia / Niger — *Activity 2.2&3*

Implementation: DHI — *12/2024–12/2025*

In many transboundary basins, hydrological data are produced by a variety of national institutions and often remain scattered across multiple systems or formats. This situation can limit access to information and the ability of basin organisations to utilise these data consistently for technical analysis and basin-scale planning. The project aimed to strengthen the organisation and operation of the NBA and OMVG Water Information Systems.

The work began with an analysis of the gaps and needs of the NBA's information system, based on technical workshops with the relevant teams. On this basis, an action plan was drawn up for the development of a decision support tool and the upgrading of the existing system. A platform for visualising hydrometric data has been set up to facilitate access to and use of the available information. In parallel, the NBA Water Information Systems Procedures Manual has been updated to clarify the procedures for managing, updating and disseminating data. However, improvements, additions and consolidation are still required through further training, the introduction of a maintenance contract or the acquisition of a dedicated server in a secure environment (IT standards, network outages, etc.).

For the OMVG, the work focused on structuring and making hydrological data available at the basin level, to support the use of the water resources management model (WEAP tool). Technical recommendations were formulated to adapt the use of this tool to the basin's hydrological context. The work carried out as a whole contributes to improving the organisation of hydrological data and the analytical tools available to basin organisations for their technical activities.

4 Component 3: Strategic planning, water infrastructure and nature-based solutions

4.1 Development of the investment programme to strengthen the climate resilience of the Volta basin

Basin: Volta — *Activity 3.1.1*

Implementation: BRLi — *06/2024–12/2025*

The Volta Basin is the focus of numerous initiatives and projects led by the riparian states and their partners, but coordination at the basin level remains limited in some cases. Given these challenges, the VBA has initiated the development of a Climate Resilience Investment Programme (PIC) aimed at structuring and prioritising actions likely to strengthen the basin's resilience and facilitate the mobilisation of funding for their implementation.

The work began with a comprehensive assessment of the basin, incorporating an analysis of sectoral pressures, identified vulnerabilities and existing initiatives. On this basis, a methodological framework for selecting and prioritising actions was developed in order to identify relevant interventions at regional and national levels. A structured portfolio of actions was then developed, organised into strategic priorities, strategic actions and specific actions. Standardised action sheets were produced for each of the PIC's interventions, including in particular their geographical scope, the institutions likely to implement them and the financial estimates.

This work led to the development of the Volta Basin PIC, incorporating an indicative programme of actions and a monitoring and evaluation framework. The document (which is yet to be approved by the VBA's governing bodies) serves as a reference tool for the VBA to structure dialogue with Member States and technical and financial partners regarding investment priorities at the basin level.

4.2 Operationalisation of the NBA Permanent Technical Committee

Basin: Niger — *Activity 3.1.2*

Implementation: OiEau — *2024–2025*

A capacity-building workshop on the coordinated management of dams and its operationalisation in the Upper Niger sub-basin was organised as an in-person event by OiEau (direct technical assistance, outside the framework agreement) in Conakry (Guinea) in September 2025.

Following a presentation on the challenges of coordinated dam management in African transboundary basins, particular emphasis was placed on the experience of the NBA and the OMVS, with a presentation by an expert from the OMVS's Permanent Water Commission (CPE). An international expert also outlined the technical and strategic lessons learned from dam management worldwide. Presentations by their managers then covered the Sélingué (existing) and Taoussa and Fomi (both planned) dams. Further presentations were given by the civil society representative, as well as on the Water Management Commission for the Sélingué and Markala Reservoirs.

Following group discussions, a specific session focused on preparations for a future Upper Niger sub-basin commission (in anticipation of the establishment of a CTP). A possible

agenda for such a commission could therefore include: a review of the fundamentals; an overview of the status of the Sélingué (existing) and Fomi (planned) dams; an update on data collection and decision support tools; annual water use requirements; and the development of the commission's roadmap.

4.3 Evaluation and update of the NELSAP Strategic Plan

Basin: Nile (Great Lakes) *Activity 3.1.3*

Implementation: BRLi *08/2024–01/2025*

The NELSAP (Nile Equatorial Lakes Subsidiary Action Programme) is one of the NBI's operational frameworks for the preparation and implementation of development actions at the basin level. Following the implementation period of the 2017–2022 strategic plan, the partner institutions initiated a process to evaluate and update this strategic framework in order to establish a new reference for the subsequent period, incorporating in particular issues related to water resource management, climate change adaptation and the preservation of aquatic ecosystems.

The work carried out began with a structured evaluation of the 2017–2022 strategic plan, including an analysis of its objectives, strategic priorities and associated monitoring mechanisms. This analysis identified the achievements documented during the period, as well as the main discrepancies observed between the initial guidelines and their implementation. On this basis, a process to update the strategic framework was carried out to clarify the programme's priorities and directions for the coming period, taking into account changes in the regional context and the needs expressed by partner states.

The work resulted in the development of an updated NELSAP strategic plan for the period 2023–2027, structured around clearly defined priorities. The document also includes a logical framework and a monitoring mechanism designed to support the implementation and evaluation of actions carried out under the programme, particularly in the areas of water resource management, climate resilience and the protection of associated ecosystems.

4.4 Detailed pre-feasibility study for the Soono mini-hydroelectric power plant

Basin: Nile (Great Lakes) *Activity 3.2.1*

Implementation: ISL *10/2024–03/2026*

As part of its remit to prepare and coordinate regional water infrastructure projects, the NBI's NELSAP programme supports the identification and development of projects likely to contribute to energy development and cooperation between riparian states. The Soono site, located on the border between Kenya and Uganda, has been identified as having potential for the development of a small-scale hydropower scheme, requiring preliminary analyses to assess its technical and institutional feasibility.

Site of the Soono hydropower scheme (Kenya/Uganda).

The study carried out as part of the project involved conducting a detailed pre-feasibility study of this development. The work focused on analysing the site's hydrological and topographical characteristics, defining a run-of-river scheme and estimating the associated generation capacity. The study also included a preliminary review of environmental and social issues, as well as an analysis of the institutional and regulatory framework applicable to the project in both countries concerned.

The results made it possible to specify the technical characteristics of the proposed project, estimate its potential capacity and output, and identify the main constraints and conditions for implementing the project. The study also provides a framework for the subsequent stages of project development, notably through the drafting of terms of reference for conducting the detailed design studies required for the following phases.

4.5 Tool for coordinated water infrastructure management in the Volta Basin

Basin: Volta *Activity 3.2.2*

Implementation: ISL *02/2025–11/2025*

The Volta Basin contains several major dams used for hydroelectric power generation, irrigation or flow regulation. The multitude of these infrastructure projects and the diversity of their uses raise coordination challenges between riparian states and dam managers. In this context, the VBA has undertaken work aimed at developing analytical tools to examine interactions between dams and evaluate different management strategies at the basin scale.

The work carried out was based on the development of a hydrological runoff model for the Volta basin, calibrated using satellite data, in situ hydrometric records and information on existing infrastructure. In parallel, a harmonised analysis of the characteristics, uses and management rules of the eight major existing dams in the basin was conducted. On this basis, performance indicators were defined to assess the effects of different coordinated water infrastructure management strategies. All these elements were integrated into a computer tool enabling the simulation and analysis of water infrastructure management scenarios at the basin level.

The results of the study were presented and discussed at a regional workshop held in Cotonou in November 2025, bringing together representatives of the riparian states and the VBA. The tool developed serves as an analytical framework for examining interactions between hydraulic structures and supporting technical exchanges between member states on water infrastructure management strategies at the basin level.

4.6 Pilot actions to protect the headwaters of the Fouta-Djalon basin

Basin: Gambia / Niger / Senegal *Activity 3.3.1*

Implementation: SCP / CNR / ACK / TROPIS / IRD *03/2024–04/2026*

The Fouta-Djalon massif is a major source area for several major rivers in West Africa, notably the Niger, Senegal and Gambia. These headwaters play an important role in regulating flows and maintaining the hydrological functions of downstream basins. However, they are subject to increasing pressures linked to agricultural uses, changing land-use practices and the gradual degradation of certain habitats. Given these challenges, the relevant river basin authorities have launched an initiative to identify and test protection and restoration measures at representative sites.


Headwaters in the Fouta-Djalon massif (Guinea).

The work began with a multi-site assessment of the Fouta-Djalon massif, combining the analysis of existing data, stakeholder consultation and field investigations to characterise the environments, land uses and the main drivers of degradation. On this basis, three pilot sites were selected in the Niger, Senegal and Gambia river basins. For each of these sites, action programmes were developed according to the types of degradation observed and local contexts. The interventions aimed in particular to establish training nurseries, to afforest or reforest areas (riverbanks, lateritic plateaus, headwater forests, villages) with suitable local species, to create living hedges in the floodplains, to construct wells sufficiently far from the river in the lowlands, to rehabilitate a borehole used for drinking water; but also to establish and support management committees for catchments and headwaters.

The approach was documented through a report identifying and assessing the pilot sites, an action plan and a final evaluation of the pilot projects. The results provide river basin organisations with a set of technical and methodological guidelines for identifying, planning and replicating actions to protect headwaters in comparable contexts, thereby contributing to the preservation of the hydrological and ecological functions of these source areas.

Nature-based solutions

Nature-based Solutions (NbS) refer to actions aimed at protecting, restoring or sustainably managing ecosystems in order to address challenges relating to water management, climate change adaptation and biodiversity conservation. In the field of hydrology, these include, for example, the restoration of wetlands, the protection of headwaters and the restoration of vegetation cover.

At the level of transboundary basins, NbS help to improve flow regulation, limit soil erosion and preserve water quality. They thus complement hydraulic infrastructure within an integrated water resources management approach, whilst generating benefits for ecosystems and populations across the entire basin.

4.7 Feasibility study on the implementation of nature-based solutions for flood resilience and the improvement of water quantity and quality in the Lake Chad basin

Basin: Lake Chad — *Activity 3.3.2*

Implementation: BRLi — *09/2025–03/2026*

The Lake Chad basin is characterised by complex hydrological and environmental dynamics, linked in particular to changes in land use, soil erosion and alterations in hydrological regimes. Given these challenges, the LCBC has launched a study to analyse the potential of nature-based solutions to contribute to water resource management, climate change adaptation and the preservation of the basin's aquatic ecosystems.

The work began with an assessment of existing initiatives and a spatial analysis of areas presenting hydrological and environmental challenges at the basin scale. This analysis identified the main drivers of degradation and the sectors where ecosystem-based interventions could be relevant. A typology of potential solutions was developed, including in particular the restoration of floodplains and wetlands, the reduction of runoff and erosion in river basins, and the stabilisation of riverbanks. The analyses were supplemented by a mapping of potential intervention areas and a survey of existing projects and initiatives employing similar approaches within the basin.

The study provides an analytical framework for examining the feasibility and prioritisation of nature-based solutions in the Lake Chad basin. The results have notably contributed to the work of the LACHAWAMA project (AFD funding), by providing useful analytical and prioritisation tools for the identification and design of ecosystem-based interventions in the basin.

4.8 Transboundary cooperation and wetland protection

Basin: Nile (Great Lakes) *Activity 3.3.3*

Implementation: BRLi *10/2024–09/2025*

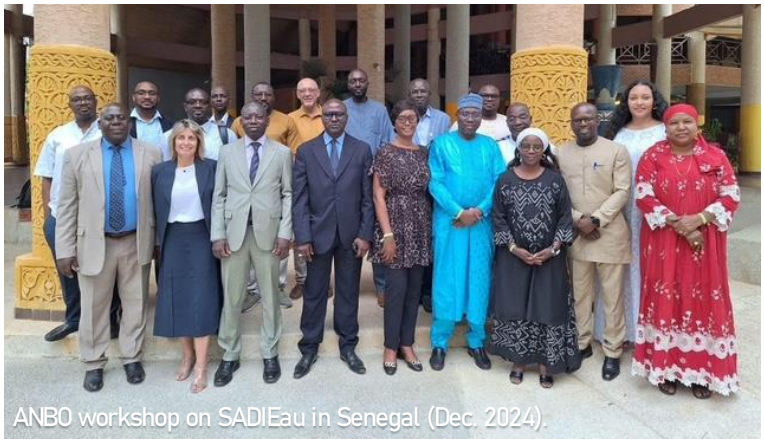
The transboundary wetlands of the Nile Basin, particularly in the Sango Bay-Minziro area on the border between Uganda and Tanzania, play an important role in the hydrological functioning of the basin and in the conservation of biodiversity. The management of these ecosystems requires coordination between national authorities, local institutions and riparian communities. In this context, the NBI's NELSAP programme has undertaken work aimed at strengthening transboundary cooperation and better structuring actions to protect these wetlands.

The work involved producing an updated mapping of the stakeholders involved in the management and use of the wetlands in the Sango Bay-Minziro sector. This analysis identified the relevant institutional, community and technical actors on both sides of the border. On this basis, capacity-building needs were analysed at institutional and local levels. Key messages and awareness-raising materials were then developed to facilitate the dissemination of information on the ecological and hydrological functions of the wetlands and on practices conducive to their conservation.

The results of the activity help to improve the knowledge of stakeholders involved in the management of these transboundary wetlands and to structure awareness-raising and capacity-building actions in this sector. They also provide useful elements to support cooperation initiatives between institutions and riparian communities engaged in the protection and sustainable management of these ecosystems.

5 Component 4: *Sharing of experiences and cooperation between basin organisations*

Between 2023 and 2025, the African Network of Basin Organisations (ANBO) played a central role in implementing Component 4 of the DYNOBA project, in coordination with the OiEau. This component aims to strengthen the sharing of experiences between BOs, technical exchanges and the capacities of the network's member institutions. This component also involved the International Commission of the Congo-Oubangui-Sangha Basin (CICOS) and the Organisation for the Development of the Senegal River (OMVS), which are also beneficiaries of other projects funded by AFD (PROGIRE-SIEACC and SCREEN respectively).


ANBO workshop on SADIEau in Senegal (Dec. 2024).

In this context, DYNOBA helped to strengthen the dynamics of exchange and learning among African TBO, whilst consolidating the ANBO's role as a regional platform for cooperation and knowledge-sharing on transboundary water resources management, in coordination with the secretariat of the African Ministers' Council on Water (AMCOW). Activities carried out included the organisation of workshops and webinars, the network's participation in international meetings, strengthening communication and the visibility of the ANBO, and the relaunch of the SADIEau information platform. They also supported the preparation and launch of the Peer-to-Peer initiative funded by the European Union, which builds on the momentum of exchanges initiated under DYNOBA.

These initiatives have thus contributed to strengthening the technical and institutional capacities of seven African basin organisations (OMVS, OMVG, NBA, VBA, CICOS, LCBC and NBI–NELSAP) in key areas such as governance, planning, financing mechanisms, hydro-diplomacy, the management of shared or jointly managed water infrastructure, and hydrological information systems (see the ANBO's SADIEau and AMCOW's WASSMO initiatives). These exchanges, organised in the form of workshops, webinars, technical training sessions and field visits, have facilitated the sharing of experiences between river basins and enabled the discussion of challenges related to climate change adaptation and ecosystem conservation in sectors such as agriculture, hydropower and navigation.

Finally, beyond the Peer-to-Peer initiative, DYNOBA has contributed to mobilising additional funding to support other European initiatives, notably within the framework of the Team Europe Initiative (TEI) dedicated to African transboundary basins. These include, in particular, the PROGIRESS project on the Senegal River basin, implemented by OMVS with AFD, the Italian Agency for Cooperation and Development (AICS) and other partners, including OiEau.

6 Lessons learnt and outlook

The DYNOBA project, funded by AFD and implemented by OiEau, has helped to strengthen the technical and institutional capacities of several African transboundary basin organisations in key areas of integrated water resources management. The support provided focused on several key pillars of IWRM: strengthening the governance and funding mechanisms of basin organisations, improving knowledge and Water Information Systems, supporting strategic planning and the management of water infrastructure, and enhancing cooperation and the sharing of experiences between basin organisations. Through these various components, the project has delivered concrete results in several river basins, whilst helping to develop tools, methods and technical guidelines that basin organisations can utilise in their future activities.

Beyond the achievements specific to the various activities, the DYNOBA experience highlights the value of a shared approach to supporting river basin organisations, enabling simultaneous action across several transboundary basins and promoting the exchange of experiences and tools between institutions. The coordination of interventions by a single operator has made it possible to mobilise specialist expertise and promote cross-cutting approaches between river basins and across themes. In this context, and in addition to its role as a coordinator, OiEau played a dual role: providing project management support for the preparation and monitoring of consultancy contracts carried out under the framework agreement, and offering direct technical assistance to certain river basin organisations for targeted support. This combination of technical and institutional support provided by specialist service providers and close support for the teams of the river basin organisations helped to strengthen the coherence and effectiveness of the activities implemented.

The component dedicated to the sharing of experiences and exchanges between basin organisations also played a key role in shaping the project's momentum. The activities carried out with the African Network of Basin Organisations (ANBO) have helped to strengthen interactions between institutions, disseminate lessons learnt from the various activities, and consolidate the network's role as a regional platform for exchange and knowledge-sharing on transboundary water management. This dynamic has involved not only the basin organisations that are direct beneficiaries of the project (NBA, VBA, LCBC, OMVG and NELSAP), but also other members of the network such as the Organisation for the Development of the Senegal River (OMVS), which also provides the ANBO secretariat, and the International Commission of the Congo-Oubangui-Sangha Basin (CICOS), thereby helping to broaden the dissemination of the project's achievements across the continent.

The project also helped to identify certain areas requiring attention in the delivery of this type of support. In several cases, the activities took the form of thematic studies, the scope of which did not always allow them to go beyond the diagnostic or scoping phases. Whilst this work has produced useful analyses and helped structure the thinking of basin organisations, putting these findings into operational practice may, in some cases, require further investigation or additional work in complementary projects or subsequent phases (such as PROGIRESS, for example, in the case of Fouta-Djalon). Furthermore, in contexts where basin organisations receive significant support from technical and financial partners, coordination with other ongoing projects has not always been fully developed, which highlights the importance of stronger coordination between initiatives operating within the same basin.

In this context, the sustainability and utilisation of DYNOBA's achievements depend largely on the basin organisations and their partners taking ownership of the results. The studies, tools and methodological frameworks developed as part of the project serve as useful references to support their future actions and, where appropriate, can be further developed or extended

within the framework of new programmes. The project has also enabled the testing of several innovative approaches and the development of demonstration tools, particularly in the field of satellite hydrology, paving the way for future developments and wider-scale adoption in the monitoring and decision-support systems of river basin organisations. In some cases, these findings may also serve as a basis for extending or scaling up approaches tested within the project, particularly with regard to nature-based solutions.

Finally, DYNOBA forms part of a wider range of initiatives promoting transboundary water management in Africa. The synergies established with the Team Europe Initiative dedicated to African transboundary basins open up prospects for continuity and expansion for several actions undertaken as part of the project, notably through programmes currently being launched in the Senegal River basin and the Lake Chad basin. These developments offer opportunities to consolidate the project's achievements and continue efforts to strengthen basin organisations and promote the collaborative management of transboundary water resources in the context of climate change.

Appendix 1: Summary table of activities

SERVICES	PARTNERS	KEY RESULTS
COMPONENT 1. GOVERNANCE, INSTITUTIONAL ORGANISATION AND FINANCING OF TBO		
1.1 Support for institutional reorganisation of the relevant TBO		
Activity 1.1.1&2 Technical assistance and capacity building	**TBO: NBA / VBA** Implementation: *OiEau (TA)*	• Capacity-building workshops • *Updating of the Procedures Manual for Annex 2 to the NBA Water Charter* • *NBA participation in CPE-OMVS*
Activity 1.1.3 Strengthening of the Lake Chad Basin Observatory	**TBO: LCBC** Implementation: SCP / Rives & Eaux du Sud-Ouest / IRD	• *Institutional and technical assessment of the LCBC Observatory, including hydrological monitoring, processes and analytical outputs* • *Structured analysis of the Observatory's outputs: hydrological bulletin, basin status report, other summary documents* • *Framework of recommendations for refocusing the Observatory's remit on hydrological monitoring and associated outputs* • *Proposals for changes to the formats, content and links between the hydrological bulletin, strategic report, etc.* • *Guidance on the profiles and skills required for the Observatory's operations*
1.2 Consolidation of autonomous and sustainable funding for the relevant river basin organisations		
Activity 1.2.2 Consolidation of autonomous and sustainable funding mechanisms	**TBO: VBA / OMVG** Implementation: BRLi	• *Analysis of the existing funding mechanisms of the VBA and the OMVG* • *Roadmap for the diversification and structuring of VBA's financial resources* • *Financial modelling tool for the OMVG, based on scenarios for revenue, expenditure and prioritisation of spending* • *Consolidated financial guidance frameworks for the VBA and the OMVG, developed through technical discussions and validated with the relevant teams*
COMPONENT 2. INFORMATION SYSTEMS, TOOLS AND PRODUCTS		
2.1 In situ monitoring equipment and satellite hydrology		
Activity 2.1.1 Procurement and installation of hydrometric gauging stations	**TBO: NBA / OMVG** Implementation: ARTELIA / SHER	• *4 operational automatic hydrometric gauging stations (3 OMVG, 1 NBA)* • *User, operation and maintenance manual for automatic gauging stations*
Activity 2.1.2 Study on groundwater resources	**TBO: NBI-NELSAP** Implementation: BRLi / ANTEA	• *Delimitation and hydrogeological characterisation of the aquifers in the Western Rift Valley and Mgahinga* • *Georeferenced field data on boreholes and springs: water levels, uses, basic physico-chemical parameters* • *Harmonised database of water points and associated information at the study area scale* • *Regional maps of groundwater potential and constraints* • *Spatial analysis of groundwater occurrence, accessibility and quality*
Activity 2.1.3 Strengthening of satellite-based hydrological monitoring	**TBO: NBA / VBA / LCBC / OMVG** Implementation: IRD / Hydro Matters	• *Operational configurations of the distributed hydrological model for the Gambia, Volta, Niger and Lake Chad basins* • *Processed and validated satellite altimetry data series* • *Virtual hydrological station networks defined and documented across the four basins* • *Tools for visualising and accessing results (time series, model outputs)* • *Technical training sessions in satellite hydrology and MGB modelling*

SERVICES	PARTNERS	KEY RESULTS
2.2 Strengthening of the TBO WIS. Applications and services, tools		
Activities 2.2&3 Water Information Systems and decision support tools	**TBO: NBA / OMVG** Implementation: DHI	• Analysis of gaps, expectations and prioritised objectives for the NBA, based on technical workshops • Action plan and recommendations for the deployment of the decision support tool at the NBA • Hydrometric data visualisation platform set up for the NBA. Updated NBA WIS Procedures Manual • Comprehensive hydrological data structured and made available via the OMVG's WIS to feed the 'WEAP' model • Technical recommendations for adapting the WEAP model to the context of the OMVG basin
COMPONENT 3. STRATEGIC PLANNING AND MANAGEMENT OF INFRASTRUCTURE, INCLUDING NbS		
3.1 Strategic planning of measures, actions and infrastructure		
Activity 3.1.1 Development of the Climate Investment Programme for strengthening climate resilience in the Volta basin	**TBO: VBA** Implementation: BRLi	• Consolidated assessment of the Volta Basin: vulnerabilities, sectoral pressures, existing actions and projects • Methodological framework for the selection and prioritisation of actions at basin and national levels • Structured portfolio of actions organised into strategic priorities, strategic actions and specific actions • Standardised action sheets including geographical scope, proposed implementing bodies and financial estimates • Volta Basin Climate Investment Programme incorporating indicative programming and a monitoring and evaluation framework
Activity 3.1.2 Implementation of the CTP	**TBO: NBA** Implementation: OiEau (TA)	• *Workshop on the coordinated management of dams in the Upper Niger sub-basin* • Preparation of a future Upper Niger sub-basin commission
Activity 3.1.3 Valuation and update of the NELSAP Strategic Plan	**TBO: NBI-NELSAP** Implementation: BRLi	• Structured evaluation of the NELSAP Strategic Plan 2017–2022, including an analysis of objectives, strategic priorities and monitoring mechanisms • Summary of lessons learnt from the 2017–2022 period, incorporating documented achievements and identified gaps • Updated NELSAP Strategic Plan for the period 2023–2027, with a formalised strategic framework and priorities • Logical framework and monitoring mechanism associated with the 2023–2027 strategic plan
3.2 Studies and management of infrastructure delivering shared benefits		
Activity 3.2.1 Detailed pre-feasibility study for the Soono mini-hydroelectric power plant	**TBO: NBI-NELSAP** Implementation: ISL	• Detailed pre-feasibility study of the Soono hydroelectric site (Kenya/Uganda): run-of-river scheme; power and production estimates; environmental and social screening; institutional and regulatory framework; ToR for subsequent phases.
Activity 3.2.2 Coordinated water infrastructure management tool for the Volta Basin	**TBO: VBA** Implementation: ISL	• Hydrological runoff model for the Volta Basin, calibrated using satellite, hydrometric and infrastructure data • Harmonised analysis of the characteristics, uses and management rules of the eight major existing dams in the Volta Basin • Basin-wide performance indicators for the analysis of coordinated water infrastructure management strategies • Computer tool for simulating and analysing scenarios for coordinated water infrastructure management in the basin • Regional workshop to present and discuss the results and the tool
3.3 Implementation of pilot initiatives relating to biodiversity		
Activity 3.3.1 Pilot actions to protect the headwaters of the Fouta-Djalon massif	**TBO: NBA / OMVG / OMVS** Implementation: SCP / CNR / ACK / TROPIS / IRD	• Multi-site assessment of the headwaters of the Fouta-Djalon massif, including characterisation of environments, pressures and uses • Selection and justification of three representative pilot sites in the Niger, Senegal and Gambia basins • Pilot action programmes by site and implementation procedures • Methodological framework for the implementation and scaling up of pilot actions across the relevant basins

SERVICES	PARTNERS	KEY RESULTS
Activity 3.3.2 Protection of aquatic ecosystems (LCBC)	**TBO: LCBC** Implementation: BRLi	• Diagnosis and preliminary analysis of nature-based solutions in the Lake Chad basin • Spatial analysis of areas with hydrological and environmental challenges at the basin scale • Classification of potential nature-based solutions • Mapping of potential intervention areas and associated hydrological functions • Summary of existing projects and initiatives incorporating nature-based solutions in the basin • Analytical feasibility framework for identifying and prioritising nature-based solution options
Activity 3.3.3 Transboundary cooperation for the management of priority wetlands	**TBO: NBI-NELSAP** Implementation: BRLi	• Updated mapping of cross-border stakeholders (Sango Bay – Minziro site) • Structured identification of capacity-building needs at community and institutional levels • Key messages and awareness-raising content tailored to local and cross-border contexts • Multilingual IEC materials dedicated to transboundary wetlands • Formalised cross-border forums for dialogue between community and institutional stakeholders • Consolidated summary of the issues, expectations and recommendations expressed by stakeholders
COMPONENT 4. EXCHANGE OF EXPERIENCES AND DISCUSSIONS BETWEEN THE TBO AND ANBO		
Joint training sessions	**7 TBO: OMVS, OMVG, NBA, VBA, CICOS, LCBC and NELSAP** Implementation: ANBO / OiEau	• Regional training workshop on hydro-diplomacy and transboundary water governance in West and Central Africa • Organisation of the SADIEAU focal points workshop • Strengthening AMCOW/ANBO ties • Training workshop on two themes: Innovative financing, Joint water infrastructure and water infrastructure of common interest (followed by a visit to the DIAMA dam in Saint-Louis) • Training workshop on: the WIS of the 7 DYNOBA transboundary water bodies, SADIEAU/ANBO and WASSMO/AMCOW • Filming of a mini-documentary with TV5 Monde on the OMVS's Diama Dam • Redesign and monitoring of the SADIEau platform

Appendix 2: Summary of activities by TBO

The following points are taken in particular from the DYNOBA Technical Committee meeting held on 10 April 2026.

Organisation	REVIEW	AREAS FOR FURTHER INVESTIGATION
NBA	• Technical Assistance: Implementation of the Procedures Manual in Annex 2 to the Water Charter and a capacity-building workshop on the coordinated management of dams in the Upper Niger sub-basin (September 2025, Conakry); NBA participation in the OMVS Permanent Water Commission (CPE) in June 2025 in Conakry • In situ monitoring equipment (1 station in Nigeria) and satellite hydrology (joint training with OMVS and OMVG in October 2025 in Conakry) • Strengthening of Water Information Systems and decision support tools: development and deployment of the Decision Support Tool and applications (DSS-NBA) • Implementation of pilot initiatives relating to biodiversity – Measures to protect the Fouta-Djalon massif: Development of a pilot site (Tinkisso)	• Operationalisation of coordinated dam management • Convening of an Upper Niger Sub-Basin Commission • Holding of a Permanent Technical Committee of the NBA • Scaling up NbS activities in the Fouta-Djalon
VBA	• VBA Climate Investment Programme (PIC Volta) document drafted and approved; Proposed institutional and governance framework • Satellite hydrology: operational satellite hydrology in the Volta basin; Implementation of the MGB model; Online training • Coordinated water infrastructure management tool: Existing structures, management tool (management rules, uses, environmental issues, etc.); Client-server IT tool to facilitate information sharing between the VBA, dam operators and the main water users • Sustainable financing mechanism: Self-financing (‘user pays’ etc.); Practical implementation arrangements; Preparation of draft instruments and tools for practical implementation	• Support for the validation of the Volta PIC in VBA member countries • Support from a green fund accreditation body for project financing • Satellite hydrology: identification of areas for post-project research and development (e.g., improvement of SWOT algorithms, updating of calibration curves using bathymetry) • Coordinated water infrastructure management tool: extension to future planned structures (Noumbiel, etc.)
LCBC	• Support for the Lake Chad Basin Observatory: Recommendations for the institutional and technical strengthening of the Observatory; Proposal to refocus its remit on hydrological monitoring and related outputs; Proposals for changes to the formats, content and coordination between the hydrological bulletin, strategic report and other outputs • Flood resilience and improving water quantity and quality: Mapping of potential intervention areas for the implementation of nature-based solutions and associated hydrological functions; Analytical feasibility framework for identifying and prioritising nature-based solution options	• Support for strengthening the Observatory’s capacity, support for the regular production of hydrological bulletins, and support for the sharing and dissemination of information • Capitalisation on DYNOBA results by start-up projects (Project to support the restoration of the ecological and economic functions of the Lake Chad Basin – *PARFEBALT,* funded by the AfDB, and the Integrated Water Resources Management and Early Warning System for Climate Change Resilience in the Lake Chad Basin – *AF Project,* funded by the Adaptation Fund) • Implementation of nature-based solutions in areas facing hydrological and environmental challenges (synergy with the LACHAWAMA project funded by the European Union and led by AFD)

Organisation	REVIEW	AREAS FOR FURTHER INVESTIGATION
NBI-NELSAP	• Detailed pre-feasibility study for the Soono mini-hydroelectric power plant • An assessment of groundwater resources in the aquifers of the Western Rift Valley and Mgahinga • Structured evaluation of the NELSAP Strategic Plan 2017–2022, including an analysis of objectives, strategic priorities and monitoring mechanisms • Awareness-raising on wetland conservation at the Sango Bay transboundary site in the Equatorial Nile Basin	• *Design & Build* project for the Soono mini-hydroelectric power station (existing ToR) • Supplementary studies on groundwater resources and the implementation of solutions for aquifer recharge • Implementation and monitoring of the NELSAP Strategic Plan 2023–2027 • Continuation of communication and capacity-building activities for the management of the Sango Bay–Minziro transboundary wetlands • Support for NBI's accreditation with the Green Climate Fund
OMVG	• Consolidation of self-sustaining and long-term funding (Regional final validation workshop in December 2025) • In situ monitoring equipment and satellite hydrology for the acquisition and transmission of hydrological data: Adaptation of the OMVG's WEAP tool; Management of the OMVG's hydrometric data; Capacity building for the OMVG; Installation of 3 hydrometric gauging stations in 3 countries • Pilot actions to protect the headwaters of the Fouta-Djalon massif: Validation of the pilot site, assessment; Action plan and development works	• Consolidation of autonomous and sustainable financing: Structuring and supporting the operational implementation of the identified mechanisms (Institutional validation; operational action plan; ownership by Member States; establishment of a steering mechanism; pilot phase and phased implementation; monitoring, evaluation and knowledge capture) • In-situ monitoring equipment: Establishment of periodic maintenance protocols and training for national operators • Pilot actions to protect the headwaters of the Fouta-Djalon
ANBO	• Capacity building through support for seven key organisations (OMVS, OMVG, NBA, VBA, CICOS, LCBC, NBI) in the areas of IWRM • Training workshops on hydro-diplomacy, innovative financing, and joint water infrastructure projects and projects of common interest • Capacity-building workshop on Water Information Systems and the Common Geomatics Repository of African Transboundary Basin Organisations, the SADIEAU/ANBO and WASSMO/AMCOW systems • Other: The Network's participation in international meetings, strengthening communication and visibility, relaunch of the SADIEAU information platform, mini-documentary with TV5 Monde; Presentation of the project at the 9th ANBO Council in Dakar from 20 to 23 January 2026	• Continuation of activities and training under the Peer-to-Peer project funded by the EU and implemented by INBO and ANBO