



Sustainable Socio-Economic Development, Financing and Digitalization: Challenges and Opportunities for West African River Basin Development Organizations

Virtual Think Tank Roundtable with



September 29, 2022

Synthesis Report



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Acknowledgements

The virtual think tank roundtable with the Tennessee Valley Authority (TVA) is the sixth of a series co-led by the Geneva Water Hub (GWH) and the Pôle Eau Dakar (PED) to explore how new approaches in socio-economic development, financing and the digital transformation can support River Basin Development Organisations (RBDOs) as peacemakers and accelerators of sustainable development.

The organizers would like to thank Tennessee Valley Authority (TVA) senior staff for sharing their experience and expertise with the roundtable participants, including Erin Cardin (External Relations), Joshua Carlon (Director, Corporate Finance), James Everett (Senior Manager, River Forecast Center), Harry Schmidt (Manager, Field Operations), Heidi Smith (Director, Global Business) and Tiffany Smith (Senior Manager).

The series of six roundtables¹ was managed by Christophe Bösch (Lead Consultant, GWH/PED), with Hamidou Ba (PED), Niokhor Ndour (PED), Monica Nunez (GWH), Erik Schnetzler (GWH) and Jean Willemin (GWH).

Nearly 1,000 participants took part in the six round tables, which benefited from the support of the Swiss Agency for Development and Cooperation (SDC) as well as from several regional and global partners. These include the Gambia River Basin Development Organisation (OMVG), the Senegal River Basin Development Organisation (OMVS), the Regional Working Group for the Senegal-Mauritanian Aquifer Basin (SMAB), the Groundwater Management Institute of the Southern African Development Community (SADC-GMI), the Tennessee Valley Authority (TVA), the International Network of Basin Organisations (INBO), the International Office for Water (IOW), the World Meteorological Organisation (WMO), the United Nations Capital Development Fund (UNCDF), the UN International Groundwater Resources Assessment Centre (UN- IGRAC) and the Geneva-based Group of Friends on Water and Peace.

The Geneva Water Hub and the Pôle Eau Dakar gratefully acknowledge their support and significant contributions, particularly as these roundtables incubated three potentially transformative initiatives which were showcased at the 9th World Water Forum in Dakar in March 2022.

These include : (1) the creation by the Gambia (OMVG) and Senegal (OMVS) River Basin Development Organisations of interoperable [regional digital platforms](#) to share and valorize data, which could together support the [Senegal-Mauritanian Aquifer Basin initiative \(SMAB\)](#); (2) an initiative by the Senegal River Basin Development Organisation (OMVS) to create a [multi-stakeholder participatory digital platform](#) to promote local entrepreneurship, job creation and social cohesion, and (3) an initiative to explore how new approaches and technologies could transform the [monitoring and management of the water cycle from local to transboundary levels in West Africa](#), with support from the WMO, its SDC-supported Hydrohub and several other partners.

¹(1) <https://www.genevawaterhub.org/news/1st-virtual-think-tank-roundtable-digital-transformation-challenges-and-opportunities-west>
(2) <https://www.genevawaterhub.org/news/2nd-virtual-think-tank-roundtable-digitalisation-water-information-systems-governance-and>
(3) <https://public.wmo.int/en/events/meetings/water-and-cyber-security-protection-of-critical-water-related-infrastructure-online>
(4) <https://www.genevawaterhub.org/news/4th-virtual-roundtable-digitalisation-transboundary-river-basin-development-organisations>
(5) <https://www.genevawaterhub.org/news/5th-virtual-roundtable-digital-transformation-transboundary-river-basin-development>
(6) <https://www.genevawaterhub.org/news/virtual-think-tank-roundtable-tennessee-valley-authority>

Executive Summary

River Basin Organisations are peacemakers and accelerators of sustainable development. National or transboundary, they are, by construction, multi-stakeholder platforms connecting countries, water users and other local stakeholders. The core mission of the West African River Basin Development Organizations (RBDOs) is “to accelerate the economic development of Member States through the joint development of the opportunities offered by the Basin”. Their integrated development mandate allows them to act in a transboundary, territorial and intersectoral manner to catalyze sustainable and inclusive socio-economic development, to adapt to the effects of climate change, to prevent water-related conflicts, pollution and disasters, and to foster convergence between peace, humanitarian and sustainable development agendas.

The Dakar World Water Forum Declaration (March 2022) called upon the international community to reinforce river basin organizations, and the Global High-Level Panel on Water and Peace has underlined their vital role. To meet the current and future challenges in the Sahelian region, it is therefore necessary to value and strengthen the technical, human and financial capacities of River Basin Development Organizations.

The virtue of water as a vector of peace is already a historical reality in the Gambia (OMVG) and Senegal (OMVS) river basins, where major infrastructures have been or are being built in a collegial manner, benefiting each Member State. The challenge is therefore to enhance these infrastructures through sustainable and inclusive socio-economic development supporting social cohesion, through community and small private sector development to generate sustainable employment, especially for youth, women and marginalized populations.

Against this backdrop, the Geneva Water Hub and the Pole Eau Dakar (Dakar Water Hub) co-organized a roundtable to provide the space for an exchange between the West African RBDOs, the Tennessee Valley Authority (TVA) and other interested stakeholders. Back in the 1960s, TVA served as a model for the development of West African RBDOs. Half a century later, an exchange of experiences could help them chart an inclusive and sustainable course to prosperity and peace for the coming decades, learning from their challenges while valuing their successes. As the Vision Statement of the upcoming UN 2023 Water Conference in New York City indicates, the integrated river basin development model aimed at making water a catalyst for sustainable development and peace has never been more relevant and should inspire the world.

Accordingly, the objectives of the roundtable were to (i) share and discuss RBDOs’ experiences and lessons learned on economic development, financial services, and river management; (ii) initiate a trilateral dialogue on future initiatives and projects in relation to the above themes, and (iii) agree on the specific issues that could be explored at follow up meetings between the TVA Panel and the working groups at OMVG and OMVS.

The richness of the dialogues resulted in a fruitful and inspiring exchange, which was timely as participating RBDOs have recently undertaken strategic development actions and are exploring new participatory and community financing mechanisms as new ways to access the capital market to finance investments.

Roundtable participants agreed to keep this avenue of dialogue open and engage in further collaboration in the future. Topics of particular interest for the future were identified as the financing and economic development mechanisms of RBDOs and addressing the impacts of climate change on food security and natural disasters such as flooding. Proposals are being drafted for continuing and deepening this dialogue.

This report summarizes the brief presentations and discussions during the roundtable that helped to further foster good relations and exchanges among the three RBDOs and other relevant stakeholders.

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1. Introduction

This report, prepared by the Geneva Water Hub (GWH), documents the exchanges held during the event *“Challenges and Opportunities of Sustainable Socio-Economic Development and Financing for West African Integrated River Basin Development Organizations” - a Virtual Think Tank Roundtable with the Tennessee Valley Authority* and summarizes the brief [presentations](#) and key findings. This event took place online on Thursday, September 29th, 2022.

The roundtable brought together institutional actors of two West African River Basin Development Organisations (RBDOs), namely the Gambia River Development Organization (OMVG) and the Senegal River Development Organization (OMVS), and the Tennessee Valley Authority (TVA), a U.S. RBDO. More than 50 representatives from governments, INGOs, IGOs, as well as other technical and financial partners were present.

This exchange seemed timely because the two West African RBDOs have recently undertaken strategic development actions – notably the OMVG Integrated Development Master Plan as well as the first OMVS Senegal River Basin Economic Forum – and are exploring new participatory and community financing mechanisms such as an [OMVS Financing and Support Platform](#) to Promote Local Entrepreneurship and Job Creation as well as [innovative financing mechanisms for OMVG](#) to tap the international capital markets alongside traditional financing.

Objectives

Accordingly, the objectives of the roundtable were to:

- Share and discuss experiences and lessons learned on:
 - **Economic development**, including rural and community development programs; financial Incentives for enterprise development and job creation;
 - **Financial services**, including financing options, investor relations and investment opportunities;
 - **River management and integrated water resource planning**, including flood control, navigation and land management, environmental stewardship, resilience to climate change...
- More specifically, in relation to the above themes, initiate a trilateral dialogue on future and potential initiatives and projects at OMVG, OMVS and TVA
- Accordingly, agree on the specific issues that could be explored at follow up meetings between the TVA Panel and the working groups at OMVG and OMVS, and how best to sustain the dialogue and continue to collaborate and co-learn, including through a possible future in-person meeting.

The roundtable **Agenda** is in Annex 1.

An **Information Note** with details on TVA was provided to participants ahead of the roundtable and is attached as Annex 2.

Global and Regional Context

River Basin Organisations are [peacemakers and accelerators of sustainable development](#), as underlined in the Dakar Action Plan for Basins of Rivers, Lakes and Aquifers. National or transboundary, they are, by construction, multi-stakeholder platforms. They are places for dialogue, between countries on a transboundary scale, between users and water stakeholders on a local scale. They are relevant structures to ensure a joint and sustainable management of surface and groundwater resources and lead ambitious actions of adaptation to climate change.

The core [mission](#) of the West African Integrated River Basin Development Organizations OMVG (Gambia River Basin) and OMVS (Senegal River Basin) is “*to accelerate the economic development of Member States through the joint development of the opportunities offered by the Basin*”. Their integrated development mandate allows them to act in a transboundary, territorial and intersectoral manner to catalyze sustainable and inclusive socio-economic development, to adapt to the effects of climate change, to prevent water-related conflicts, pollution and disasters, and to foster convergence between peace, humanitarian and sustainable development agendas.

Indeed, the core mandate of integrated river basin development organizations like OMVS, OMVG and the Tennessee Valley Authority (TVA) matches the [three founding principles](#) of the upcoming Conference of the United Nations Water Decade 2023 in New York City: they are by design inclusive, action-oriented and cross-sectoral; they value water as an instrument of peace and as a catalyst for sustainable development because water connects all Sustainable Development Goals (SDGs).

[The Dakar Declaration](#) (March 2022) that concluded the first ever World Water Forum in Sub-Saharan Africa, called upon the international community to “reinforce basin organizations and support their efforts for inclusive, sustainable and integrated water resources management; to strengthen mutually beneficial cooperation and partnership in the management of transboundary basins, including aquifer basins, in particular by promoting the exchange of information, experience and best practices; and to make dialogue, coordination, and cooperation the core of dispute resolution, in the true spirit of hydro-diplomacy”.

The [Global High-Level Panel on Water and Peace](#) has underlined the vital role river basin organizations can play to foster people’s diplomacy, inter-sectoral water management and decision making provided financial and other incentives are in place to catalyze water cooperation from the local to the transboundary level. In fact, water cooperation should emerge at the grassroots level to generate the political will necessary to reach agreements at a higher level.

Both the [Mboumba Call of local actors of the Senegal river basin made to the Dakar 9th World Water Forum](#) and the [Ouagadougou Roundtable of local leaders of the Liptako-Gourma region](#) on Water as a Vector for Peace in the Sahel (June 2021) have underlined that to reverse the deterioration of security in the Sahel and prevent the emergence of new areas of fragility, the bond of trust between institutions, local authorities and local populations should be strengthened through the implementation of levers for local socio- economic development.

To meet the current and future challenges in the Sahelian region, it is therefore necessary to value and strengthen the technical, human and financial capacities of River Basin Development Organizations such as OMVG, OMVS and the Niger Basin Authority. The virtue of water as a vector of peace is already a historical reality in the OMVG and OMVS basins, where major infrastructures have been or are being built in a collegial

manner, benefiting each Member State. The challenge is therefore to enhance these infrastructures through sustainable and inclusive local socio-economic development supporting social cohesion, through community and small private sector development to generate sustainable employment, especially for youth, women and marginalized populations.

River Basin Development Organizations can and should take advantage of recent advances in integrative approaches especially between water and land, digital platforms and the network economy, innovative financing mechanisms, and best practices for representation and participation of local stakeholders in basin development. It is therefore necessary to build capacity and develop new economic and financial instruments so that River Basin Development Organizations can fully play their role as convener, facilitator and catalyst of local initiatives.

Back in the 1960s, TVA served as a model for the development of both the OMVS and the OMVG. Half a century later, an exchange of experiences could help them motivate each other, learning from their challenges while valuing their successes, to chart an inclusive and sustainable course to prosperity and peace for the coming decades. As the Vision Statement of the upcoming UN 2023 Water Conference in New York City indicates, the integrated river basin development model aimed at making water a catalyst for sustainable development and peace has never been more relevant and should inspire the world.

1.1. Welcoming Remarks

Ms. Caroline Pellaton, Corporate Operations Manager at GWH, opened the roundtable and welcomed the participants. In her introduction, she stated that we live in an increasingly complex world where global tensions are rising and numerous crises are occurring. Global pressures on water resources are increasing, with growing implications for security at local, regional and global levels. The effects of climate change and related ecosystem degradation are affecting the availability and quality of water, contributing to social and political instability that threatens human security in general. The GWH is convinced that it is of utmost importance to bring together those stakeholders who are committed to the sustainable and equitable use of water resources to ensure economic development, human well-being, and energy security, factors that ultimately contribute to strengthening peace.

Ms. Pellaton then turned the floor over to Niokhor Ndour, Coordinator of Pôle Eau Dakar, who in his opening remarks referred to the [Dakar Declaration](#) (March 2022), which concluded the first ever World Water Forum in Sub-Saharan Africa and called upon the international community to “reinforce basin organizations and support their efforts for inclusive, sustainable and integrated water resources management [...]”.

Mr. Adamou Lamine Ndiaye, Secretary General of OMVS, underlined the importance RBOs play in bringing people together, such as in the case of the OMVS, an organization grouping Guinea, Mali, Mauritania and Senegal for the purpose of jointly managing the Senegal River and its drainage basin. In recent years, OMVS has paid closer attention to the so-called nexus-approach, which highlights the interdependence of water, energy and food security. He emphasized that the cooperation between OMVS and the United States has existed for a long time, especially in the technical field, and that it had a positive effect on the development of the West African RBO.

Mr. Abdoulaye Kourou Diallo, Director of Regional Infrastructure Planning and Studies at OMVG, delivered a message on behalf of OMVG's Secretary General commending TVA for its remarkable achievements, which are also relevant to West African RBOs. OMVG is currently in the process of developing its [Integrated Development Master Plan](#) and is certain that it can learn from TVA's experience. With this in mind, OMVG has a particular interest in TVA's financing mechanisms and funding situation.

Next, Ms. Tiffany Smith, Senior Manager at TVA, emphasized that this roundtable is meant to be an open dialogue and that all relevant stakeholders at the table can learn and benefit from each other. She encouraged attendees to ask TVA's panelists many questions and stated that she looks forward to continuing this type of engagement in the future.

Finally, Ms. Dimka Stantchev, representative of the Swiss Agency for Development and Cooperation (SDC) in the Global Programme Water, said that Switzerland, through the Blue Peace Initiative, has for many years supported and continues to support partners of this initiative from around the world who have an interest in water as a means for peace and sustainable development. Since the publication of the Global High-Level Panel on Water and Peace's report "A Matter of Survival" in 2017, Switzerland has been working with its partners to put the report's recommendations into action. One example of this is the [Blue Peace Financing Initiative](#) [UNCDF OMVG](#).

2. Presentations & Discussions in Roundtable Format with TVA Panel Members

2.1. Economic Development

2.1.1. Heidi Smith - Director, Global Business

Ms. Smith opened her presentation with an overview of the Tennessee Valley Authority (TVA), a federally owned corporation in the United States created by congressional charter on May 18, 1933. The TVA was established to provide and promote the overall economic development to the Tennessee River Basin through power generation, flood control, navigation assistance and fertilizer manufacturing for agricultural production. Another goal was to eradicate malaria, which at the time of TVA's founding affected one-third of the population in the Tennessee basin. Ms. Smith pointed out that the TVA's service area is transboundary, spanning seven U.S. states, with an area of about 80,000 square miles (207,199 square km), home to approximately 10 million people (see Figure 1 below). As of September 2022, TVA provides electricity to residents and companies in the Tennessee River Basin, selling its power to 154 local power utilities, 5 direct industrial and institutional customers, and 12 area utilities.

TVA's Economic Development department consists of more than 50 employees whose primary goal is to prepare communities for economic growth opportunities, with a focus on job creation. To achieve its goals, the Economic Development department works in three areas: First, to *prepare* the communities that make up the seven-state region for economic growth. Second, to *attract* new business and investment throughout the service region. Finally, to *retain* businesses and organizations in the region.

The Economic Development department proactively seeks recruitment in the following target markets: aerospace and defense, industrial products, consumer products, transportation and related manufacturing and advanced manufacturing.

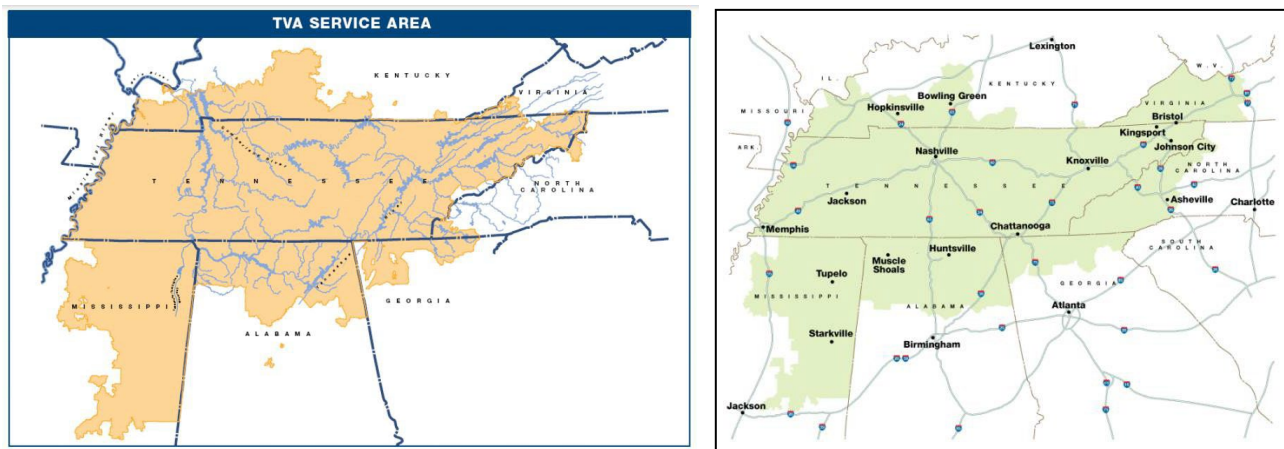


Figure 1: Maps showing TVA's service area

2.1.2. Harry Schmidt - Manager, Field Operations

Mr. Schmidt began his presentation by noting that TVA today serves as a catalyst for sustainable economic development in the region and notably its rural areas. Because the Tennessee Valley region is more rural, except for a few larger cities such as Nashville or Memphis, TVA counts on 15 so-called regional consultants embedded in local communities to facilitate work across the service area.

Mr. Schmidt then explained TVA's approach to industrial site development, one of the main focus areas of TVA's Economic Development department. In this regard, TVA works with state and local governments to develop industrial sites. However, it is important to note that TVA itself does not own any industrial sites. Rather, TVA provides a roadmap and partnership with local communities to develop these sites and make them ready for industrial customers. As this type of work requires significant marketing and communications efforts, TVA has created a website (TVASites.com) listing all available industrial sites throughout the Tennessee Valley.

In addition to developing industrial sites, another focus of TVA's Economic Development department lies in its economic incentive programs. The basic idea behind these programs is that TVA provides a discount on a company's electricity bill based on the company's investments, the number of jobs it creates, and the wages it pays its employees. In this regard, TVA follows a "pay for performance" policy, which means that TVA does not provide benefits up front, but only after a company has made the necessary efforts, i.e. locates its facility in the region, hires its employees, and begins operations.

Mr. Schmidt concluded his intervention by briefly outlining the rural and community development programs, which play a vital role in TVA's Economic Development department, including such programs as Rural Leadership Institute, Rural Certified Communities Program, Valley Workforce Institute, Young Talent Initiative, Community Livability and Valley Sustainable Communities. These programs broadly reflect TVA's commitment to working in a sustainable manner by being inclusive and focusing heavily on capacity building.

2.2. River Management

2.2.1. James Everett - Senior Manager, River Forecast Center

Mr. Everett began his presentation by emphasizing that TVA operates the Tennessee River system in an integrated manner. This means that TVA considers the impacts of its multiple dams on upstream and downstream users, the environment, etc. In this sense, TVA did not stray much from its original purpose when it was established by an act of Congress in 1933. At that time, the Tennessee Valley was experiencing many destructive floods. Thus, one of the primary functions of building and designing a river system and dams was flood control, controlling tributaries that flow into the Tennessee River, and providing relief to areas and communities that faced tremendous flooding.

Today, TVA still pursues the three original objectives enshrined in the TVA Act of 1933, namely navigation, flood damage reduction and power generation. However, TVA has expanded its operational goals and scope to include other areas such as water supply, recreation and water quality.

The area TVA covers in the Tennessee River system includes forty-nine dams, twenty-nine of which generate hydroelectric power, and another twenty dams that do not generate power. All dams are managed, staffed, and operated by TVA. There are very few dams in the area covered by the TVA that are not managed by the TVA.

Regarding TVA's reservoir operating policy, Mr. Everett stated that in 2004, TVA underwent a process to review the benefits of reservoir operations, including determining if there were areas where TVA could provide greater public benefit. The resulting "[Reservoir Operations Study - 2004](#)" was conducted by two groups of stakeholders, one interagency and one public. The Reservoir Operations Study continues to be the basis for TVA's current operational activities and is reviewed periodically on an approximately five to ten year cycle.

TVA also relies on a River Forecast Center that is staffed 24/7 throughout the year. It is TVA's central hub for making decisions about the river system, monitoring, and weather forecasts. The River Forecast Center makes use of the Flood Early Warning Systems (FEWS) tool, developed by Deltares (a Dutch knowledge institute for applied research in the field of water), which is used in over 40 countries. TVA leveraged partnerships with the U.S. National Weather Services (NWS) and others to develop and customize FEWS for TVA's own application over a 3-year development period.

The River Forecast Center also uses modeling data to determine what the economic losses from flooding would be if water were not held back by the system of dams. TVA estimates that it can save about USD 300 million annually that, without the system of dams, would be lost to the effects of flooding.

TVA also shares a large amount of these data through its website. In this context, TVA has developed a "TVA Lake Info App" that can be used, for example, by people who want to use a lake for recreational purposes such as fishing or canoeing, etc.

2.3. Financial Services

2.3.1. Joshua Carlon - Director, Corporate Finance

Mr. Carlon's presentation was about TVA's finances and its relationship with the U.S. Federal Government. As has been mentioned in previous presentations, TVA is a wholly owned government corporation and because of this as well as TVA's operating history, TVA securities are generally very highly rated (AA+ to AAA, highest credit rankings of any U.S. power provider). What helps TVA's credit ratings is the fact that the TVA Board (composed of nine members nominated by the US President) is essentially in charge of setting TVA's electricity prices. This is in contrast to many other utilities whose electric rates must be approved by a U.S. state or provincial jurisdiction. Even though TVA securities carry no explicit guarantee by the U.S. government, the TVA is owned by the government and its securities are therefore considered less risky.

TVA does not issue equity securities because the government is its only shareholder. Therefore, TVA does not issue stocks, but only bonds and notes or debt securities that are not guaranteed by taxpayers. Hence, TVA is the largest nonprofit government power provider in the United States. At the same time, TVA is completely self-funded and does not receive any funding from the U.S. government since 1999.

Legally, TVA cannot have more than US\$30 billion of debt outstanding at any one time, and it can only issue bonds to fund its power program or refinance existing debt. TVA is also legally required to set its power rates at a level sufficient to repay its debt.

Mr. Carlon continued to provide an overview of TVA's financial situation, highlighting that TVA over the last few years managed to reduce debt while also investing significant amounts of money in new power system assets. In addition, TVA has been able to reduce its carbon footprint by reducing about 60 percent of its coal fleet in 2021 and investing instead in nuclear energy and natural gas.

3. Summary of Q&A Sessions

| Themes | Questions | Responses from TVA Panelists |
|----------------------------------|--|---|
| Technical | <ul style="list-style-type: none"> Who owns the dams in the Tennessee Valley? | The area TVA covers in the Tennessee River system includes forty-nine dams, twenty- nine of which generate hydroelectric power, and another twenty dams that do not generate power. All dams are managed, staffed, and operated by TVA. There are very few dams in the area covered by the TVA that are not managed by the TVA. |
| | <ul style="list-style-type: none"> How does TVA estimate the cost of damage from natural disasters that would have occurred without a system of dams? | The costs that could have been caused by floods but were averted thanks to the dam system are calculated by modeling. The estimated USD 300 million per year spared in this way refers only to potential structural damage and does not take into account the additional economic impact resulting from disruption of services or other infrastructure due to flooding. |
| | <ul style="list-style-type: none"> Is it possible to couple tools such as Flood Early Warning Systems (FEWS) with other tools to obtain both short and long term forecasts? | TVA uses a number of tools for reservoir management, including reservoir simulations and hydraulic models to determine surface elevations. Further, TVA intends to standardize some of the data it receives as part of its climate change study project. The software for more short-term and long-term forecasts is the same. |
| | <ul style="list-style-type: none"> What role does TVA play in view of agriculture? | Agriculture and farming are an important aspect of livelihood for the people of the Tennessee Valley. TVA's primary focus to protect and enhance agricultural opportunities is flood control. |
| | <ul style="list-style-type: none"> Does TVA also work on groundwater? | Withdrawal of groundwater is regulated by the state, so this does not fall in TVA's scope of activities. However, since groundwater has an impact on watercourses, TVA attempts to capture this through monitoring and modeling. |
| Operations & Approach | <ul style="list-style-type: none"> How does TVA engage with companies? | TVA engages with companies in a variety of ways. Often, TVA receives a formal request for information/proposals (RFI) from a company. In this request, the company provides its growth plan and other relevant details as to why it would like to do business in the region. Based on this information and in collaboration with TVA's various partners, TVA then conducts further discussions with the company. In this way, TVA also builds relationships with the companies over time. |
| | <ul style="list-style-type: none"> How do different states cooperate on shared resources? | They are all in competition with each other. Mississippi, for example, competes with Tennessee for jobs and investment. So, we do a lot of confidential work. We are often asked by companies to sign a so-called nondisclosure agreement, ensuring that we will not leak information to other states. We try very hard to be transparent, but we also take confidentiality very seriously. So, since many states are in competition with each other, we have to be fair, equitable and transparent when we work with them. |

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| | <ul style="list-style-type: none"> • How does TVA prioritize operating benefits? | TVA priorities can change at any time due to weather conditions and competing demands. In general, however, it can be said that hydropower generation may take a back seat in favor of other operational benefits. |
| | <ul style="list-style-type: none"> • How does TVA work with customers on some of the local issues? | One challenge for TVA is energy efficiency. One of the best ways to avoid unnecessary investment is to encourage more efficient use of electricity at the local, individual level. However, because TVA does not want to control the end use customer, it has been more difficult for TVA to incentivize energy efficiency investments, whether through smart meters or rebate programs, etc. TVA's critics increasingly point to this challenge and claim that TVA is not doing enough, but this is largely structural. It is because TVA does not have direct control over these local customers. As a result, energy efficiency will be a major focus for TVA in the coming years, especially as demand for electricity continues to grow. TVA is committed to meeting the growing demand in an increasingly digitalized world without creating additional carbon emissions. |
| | <ul style="list-style-type: none"> • IPAR-Senegal focuses, among other things, on rural development and youth employment. In this context, it would be interesting for IPAR to know if TVA, for example through its think tank Young Talent Cabinet, has some sort of an “incubator approach” for young entrepreneurs. | TVA doesn't have its own incubator approach for young entrepreneurs. Instead, TVA relies on State Agencies for Economic Development, some of which have accelerator type programs. All are different with different requirements. For instance, LaunchTN.org is a “public-private partnership that empowers Tennessee's entrepreneur ecosystem to activate sustainable economic growth in Tennessee”. LaunchTN includes a blended (public-private) Impact Fund to promote financial opportunity and inclusion for all citizens, as well as a Mentor Networks program for early-stage companies. |
| Governance | <ul style="list-style-type: none"> • With regard to governance of TVA, is there a decision-making body that consist of a committee or something similar that addresses questions of water allocation in the Tennessee Valley? | TVA looks at its periodically reviewed Reservoir Operations Study to ensure that everyone gets their fair share of water. TVA's governance structure underwent major changes in 2006, including the creation of a CEO post and the assignment of a part-time advisory role to the nine politically appointed Board members. |
| | <ul style="list-style-type: none"> • Is TVA regulated and if so, by whom? | TVA is regulated. For example, TVA is the third largest operator of nuclear power plants in the United States. There is a U.S. government agency, the Nuclear Regulatory Commission (NRC), that has jurisdiction over all nuclear power plants, regardless of who owns them. TVA does not get a free pass because it is wholly owned by the U.S. government. For example, TVA must comply with all NRC requirements for the safe operation of nuclear power plants. In addition, there are a number of other agencies that provide some oversight to TVA. In addition, the TVA Board must set interest rates so that interest and principal can be recovered over time, providing a high degree of |

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| | | certainty to bondholders. |
| Financing | <ul style="list-style-type: none"> • What were TVA's investments in the first few years after its founding? | TVA's first investments were in the construction of dams to generate electricity. |
| | <ul style="list-style-type: none"> • Where do the resources for the Economic Development Department of TVA come from? | The work of the Economic Development Department, particularly its programs and incentives, is funded through electricity sales. |
| | <ul style="list-style-type: none"> • OMVG is currently developing a joint cross-border and multi-sectoral investment plan consisting of lucrative and less profitable projects. Through the Blue Peace Financing Initiative, OMVG plans to access capital markets to finance this investment plan. Therefore, the OMVG would certainly be very interested in hearing advice or suggestions from TVA, based on its experience, on how to better manage the risk and potential obstacles in this process. | Since TVA does not know the details of the plan, it is difficult to give an exact answer to this question. However, in TVA's experience, managing and minimizing risks in investments has proven successful thanks to regular exchanges with TVA's bond investors. Ultimately, the low financing rates are due not only to TVA being government-owned, but also to bond investors paying close attention to what TVA is investing in. |
| Risks and Weaknesses | <ul style="list-style-type: none"> • What are TVA's weaknesses and what are its development prospects in the future? | <p>Perhaps not a weakness, but certainly a challenge will be for TVA to fully reduce carbon emissions by 2035. To achieve this, TVA may need additional technologies that have not yet been developed. As for the future outlook, TVA remains committed to its sustainability plan and is currently spending about \$2-3 billion annually to reduce carbon emissions and invest in greener alternatives.</p> <p>What could also be construed as a weakness is the fact that several years ago, TVA was directly managed in its day-to-day operations by politically appointed members of the TVA Board. Thus, the TVA Board essentially acted as TVA's CEO. This was reformed in the early 2000s. Board members, nine in number, were given a part-time advisory role, while a separate position for a Chief Executive Officer was created. This was a very important and positive change for TVA. Today, TVA has a CEO who is an industry expert with knowledge of TVA's important assets, such as nuclear energy, and who manages the day-to-day operations of the company.</p> <p>However, a weakness of TVA remains that Board members, even if part-time and advisory, are appointed by politicians. Therefore, the U.S. government or the President may appoint someone to the Board who may have a political agenda. However, the fact</p> |

| | | |
|--|---|--|
| | | <p>that TVA has nine board members and staggered terms, as well as the political difficulties with the federal government in appointing members, have mitigated this to some degree. Finally, the fact that TVA does not have a monopoly could be interpreted as a weakness. After all, TVA's customers have a choice and can leave TVA. To mitigate this risk, TVA is now seeking longer-term contracts with its customers. TVA has gradually moved from average 5-year contracts to 20-year contracts. From a financial perspective, this mitigates a significant risk because when you make a large investment in a new power plant, you need to ensure that the revenues are there to service the debt over time and pay off the investment.</p> <p>Other new challenges lie in new and local technologies and in the behavior and preferences of local customers and end users. Local customers have many options today and can add rooftop solar to their homes, add their own storage system, and then go off the grid. But many of them still want to enjoy the security of being connected to the power grid.</p> |
| | <ul style="list-style-type: none"> • The Texas freeze of February 2021 left more than 4.5 million customers (more than 10 million people) without electricity at its peak, some for several days. The freeze had cascading effects on other services reliant upon electricity including drinking water treatment. Are there any lessons that TVA learned from the experience in Texas? | <p>TVA has also faced extreme weather events in the past, including heat waves, cold waves, tornado outbreaks, etc., which can damage transmission systems. So TVA has mechanisms in place to deal with these impacts and respond accordingly. Importantly, TVA relies on a mix of energy sources, from nuclear to hydroelectric, which makes the system more resilient in times of crisis because if one energy source fails, the other can bridge the gap or restart the transmission systems.</p> |

3.1. Key Messages based on TVA's Experience

The Q&A sessions that followed each presentation reflected the broad interest of roundtable participants in topics ranging from governance to technical cooperation and financing. The following is a list of key messages that emerged from the presentations and discussions:

On technical aspects:

- Data collection, management and sharing is crucial for adequate forecasts, agricultural development and disaster risk reduction.
- Almost all dams in the Tennessee Valley belong to TVA, however, the majority of electricity produced by TVA stems from other sources than hydropower.
- Since withdrawal of groundwater is regulated by the state, TVA does not directly work on groundwater related issues. However, since groundwater has an impact on watercourses, TVA attempts to capture this through monitoring and modeling.

On TVA's approach and operations:

- Fostering good and, when possible, long-term relations with private sector companies, based on a solid foundation of trust, is essential to successfully attracting and retaining businesses in the Tennessee Valley.
- Due to the cross-border nature of the Tennessee Valley, U.S. states sometimes compete with each other for jobs and investment. It is critical that a RBO like TVA remains neutral in these instances and operates with the necessary confidentiality with its customers while striving to maintain as much transparency as possible.
- TVA pursues six objectives, namely navigation, flood damage reduction, power generation, water supply, recreation and water quality. When it comes to prioritizing the various objectives, this is dependent on weather conditions and competing demands and consequently can change at any time. In general, however, hydropower generation may take a back seat in favor of other operational benefits.
- TVA looks at its periodically reviewed Reservoir Operations Study to ensure that everyone gets their fair share of water. It is important to note that this study was conducted by two groups of stakeholders, one interagency and one public.

On TVA's governance:

- TVA is a federally owned corporation in the United States created by congressional charter on May 18, 1933. TVA's governance structure underwent major changes in 2006, including the creation of a CEO post and the assignment of a part-time advisory role to the nine politically appointed Board members.
- TVA is regulated and needs to adhere to U.S. rules and regulations, such as those by the NRC.

On Financing:

- Since 1999, TVA is fully self-financed and finances its operations through the sale of energy and through the sale of TVA bonds.
- Since TVA is a wholly-owned government corporation it has excellent credit rankings (highest credit rankings of any U.S. power utility).
- In TVA's experience, managing and minimizing risks in investments has proven successful thanks to regular exchanges with TVA's bond investors. Ultimately, the low financing rates are due not only to TVA being government-owned, but also to bond investors paying close attention to what TVA is investing in (e.g. renewable energy).
- TVA is legally required to set its power rates at a level sufficient to repay its debt.
- TVA does not issue equity securities because the government is its only shareholder. Therefore, TVA does not issue stocks, but only bonds and notes or debt securities that are not guaranteed by taxpayers.

4. Closing Remarks and Next Steps

4.1. Closing Remarks

Mr. Jean Willemin, Senior Project Officer at GWH, who moderated the virtual roundtable, concluded the event by emphasizing that the Geneva Water Hub sees this roundtable as a first step towards a continued dialogue between stakeholders and wants to further promote exchange and collaboration between RBOs and partners. He gave the floor one last time to the representatives of OMVS and OMVG, as well as PED, for closing remarks and asked them if they wanted to highlight a specific area of interest based on the input from the event.

OMVG thanked the GWH for facilitating this virtual roundtable and expressed gratitude to participants from TVA for their presentations and availability to answer questions. One issue that will continue to be of utmost importance to OMVG in the future is **flood control**, as the risk of flooding will increase due to climate change and associated changes in the hydrological cycle. OMVG is committed to investing more in flood damage prevention and early warning systems. OMVG hopes to continue the dialogue with TVA.

OMVS also thanked the GWH and TVA and stated that they would like to further investigate, among other things, the **aspect of self-financing** of TVA and whether such a mechanism would be transferable to their context. OMVS also expressed willingness for further cooperation with TVA. The roundtable showed that there are many lessons to share and that the different RBOs can motivate each other to become more sustainable and efficient. There is indeed a lot that OMVS can learn from TVA, but TVA can certainly learn from the experiences of OMVG and OMVS as well. Therefore, maintaining this dialogue would certainly be a win-win situation for all stakeholders involved.

4.2. Next Steps

The richness of the dialogues during this roundtable resulted in a fruitful and inspiring exchange. This exchange was particularly timely as participating transboundary river basin development organizations have recently undertaken strategic development actions and are exploring new participatory and community financing mechanisms as well as new ways to tap the international capital markets alongside traditional financing.

Roundtable participants agreed to keep this avenue of dialogue open and to continue to collaborate and learn from each other in the future. This initial exchange will be followed by more focused meetings between the TVA Panel and the working groups at OMVG and OMVS.

Based on the exchanges at this roundtable three broad elements would be worth exploring further in future meeting(s): (i) *Financing and Economic Development Mechanisms*, (ii) *Disaster Risk Reduction*, (iii) *Coping with the Consequences of Climate Change*. It was also voiced that an in-person meeting would be desirable at some point in the future.

Proposals are being drafted for continuing and deepening this dialogue.

Annex 1: Agenda of the September 29, 2022 Virtual Roundtable



Challenges and Opportunities of Sustainable Socio-Economic Development and Financing for West African Integrated River Basin Development Organizations

Virtual Think Tank Roundtable with



Thursday, September 29, 2022

14:15-17:30 (Dakar/GMT), **16:15-19:30** (Geneva/CEST), **10:15 a.m.-1:30 p.m.** (Knoxville/EST)

Draft Agenda (v. 10/09/22)

14.15-14.30 **Welcome** by the River Basin Development Organisations (TVA, OMVG, OMVS) and their partners (SDC/Switzerland, Geneva Water Hub, Pôle Eau Dakar (Dakar Water Hub))

Presentations and Discussions in Roundtable Format with TVA Panel Members

14.30-15.30 **Economic Development** with Heidi Smith – Director, Global Business and Harry Schmidt – Manager, Field Operations

TVA Rural and Community Development Programs (Rural Leadership Institute, Rural Certified Communities, Valley Workforce Institute, Young Talent Initiative, Community Livability and Valley Sustainable Communities)

TVA Economic and Financial Incentives for Enterprise Development and Job Creation (Performance Grants, InvestPrep, Workforce+, Loan Funds and Investment Credits)

15.30-15.40 *Break*

15.40-16.30 **River Management** with James Everett – Senior Manager, River Forecast Center

River Management and Integrated Water Resource Planning: flood control, navigation and land management, environmental stewardship, resilience to climate change...

16.30-17.20 **Financial Services** with Joshua Carlon – Director, Corporate Finance

TVA Investor Relations and Investment Opportunities (TVA Long-Term Bonds and Short-Term Notes), TVA Sustainable Financing Framework (Green Bonds), ESG...

17.20-17.30 **Conclusions and Next Steps** by Pôle Eau Dakar (Dakar Water Hub) & Geneva Water Hub

The virtual exchange will take place by invitation by Zoom with simultaneous translation in French and English. Depending on mutual interest and available resources, this initial exchange could be followed by more focused meetings between the TVA Panel and the working groups at OMVG and OMVS. Resources permitting, a physical exchange could also be planned for the first half of 2023.

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Annex 2: Information Note Prepared for the Roundtable



Challenges and Opportunities of Sustainable Socio-Economic Development and Financing for West African Integrated River Basin Development Organizations

Virtual Think Tank Roundtable with



29 September 2022

Background Note and Draft List of Questions

Introduction

River basin organizations are peacemakers and accelerators of sustainable development. National or transboundary, they are by design multi-stakeholder platforms. They are places for dialogue, between countries on a transboundary scale, between users and direct or indirect water stakeholders on a sub-national scale. In a context of crisis of multilateralism, it is therefore fundamental to develop these two scales of sharing and solidarity so that water can fully play its role as an instrument of peace and prosperity, in order to accelerate the achievement of the Sustainable Development Goals (SDGs) as well as resilience to current and future climate challenges.

The mission of the West African Integrated River Basin Development Organizations OMVG (Gambia River Basin) and OMVS (Senegal River Basin) is to *accelerate the economic development of Member States through the joint development of the opportunities offered by the Basin*. Their integrated development mandate allows them to act in a transboundary, territorial and intersectoral manner to catalyze sustainable and inclusive socio-economic development, to adapt to the effects of climate change, to prevent water-related conflicts, pollution and disasters, and to foster convergence between peace, humanitarian and sustainable development agendas.

Indeed, the core mandate of integrated river basin development organizations like OMVS, OMVG and TVA matches the three founding principles of the upcoming Conference of the United Nations Water Decade 2023 in New York City: they are by design inclusive, action-oriented and cross-sectoral. As expressed in its Vision Statement, the UN 2023 Water Conference “will be the place where the water sector and especially other sectors will show water as the catalyst for sustainable development: water as dealmaker, because it connects all SDGs”.

The 2023 UN Water Conference Vision Statement² states further that “Water can drive the different partners apart – as a scarce resource or even a source of conflict – but water also brings them together, forging partnerships through inclusive collaborations. We need better water governance, finance, assessment and collaborative mechanisms to validate these cross-interest collaborations, ensuring a water secure world for all by all”. Switzerland³ also emphasized that the UN 2023 Water Conference must “step out of the water box” and “adopt a multi sectoral approach to water by reaching out to other relevant sectors, as water is intrinsically linked to current global challenges, such as health, global trade regulation, food and energy security, environmental sustainability and conflict resolution”.

The Dakar Declaration⁴ (March 2022) that concluded the first ever World Water Forum in Sub-Saharan Africa, called upon the international community to “reinforce basin organizations and support their efforts for inclusive, sustainable and integrated water resources management; to strengthen mutually beneficial cooperation and partnership in the management of transboundary basins, including aquifer basins, in particular by promoting the exchange of information, experience and best practices; and to make dialogue, coordination, and cooperation the core of dispute resolution, in the true spirit of hydro-diplomacy”. Further, the Dakar Action Plan⁵ for River, Lake and Aquifer Basins will help translate Dakar Declaration

Both the Mboumba Call⁶ at the Dakar World Water Forum and the Ouagadougou Roundtable⁷ on Water as a Vector for Peace in the Sahel (June 2021) have underlined that to reverse the deterioration of security in the Sahel and prevent the emergence of new areas of fragility, the bond of trust between institutions, local authorities and local populations should be strengthened through the implementation of levers for local socio-economic development.

In this regard, the Global High-Level Panel⁸ on Water and Peace has underlined the vital role river basin organizations can play to foster people’s diplomacy, inter-sectoral water management and decision making provided financial and other incentives are in place to catalyze water cooperation from the local

² https://sdgs.un.org/sites/default/files/2021-11/Vision_Statement_UN2023_Water_Conference.pdf

³ https://sdgs.un.org/sites/default/files/2022-03/Switzerland_proposals_thematic_dialogues_UN2023WC.pdf

⁴ <https://www.worldwaterforum.org/en/practical-information/dakar-declaration>

⁵ <https://www.riob.org/en/news/support-dakar-action-plan-lake-river-and-aquifer-basins>

⁶ https://www.ipar.sn/IMG/pdf/appel_de_mboumba_-_voix_du_fleuve_voie_de_la_paix.pdf

⁷ <https://genevawaterhub.org/resource/report-round-table-local-actors-water-vector-peace-sahel>

⁸ https://genevawaterhub.org/sites/default/files/atoms/files/a_matter_of_survival_www.pdf

to the transboundary level. In fact, water cooperation should emerge at the grassroots level to generate the political will necessary to reach agreements at a higher level.

To meet the current and future challenges in the Sahelian region, it is therefore necessary to strengthen the technical, human and financial capacities of River Basin Development Organizations such as OMVG, OMVS and the Niger Basin Authority. The virtue of water as a vector of peace is already a historical reality in the OMVG and OMVS basins, where major infrastructures have been or are being built in a collegial manner, benefiting each Member State. The challenge is therefore to enhance these infrastructures through sustainable and inclusive local socio-economic development supporting social cohesion, through community and small private sector development to generate sustainable employment, especially for youth, women and marginalized populations.

River Basin Development Organizations can and should take advantage of recent advances in integrative approaches especially between water and land⁹, digital platforms and the network economy, innovative financing mechanisms, and best practices for representation and participation of local stakeholders in basin development. It is therefore necessary to build capacity and develop new economic and financial instruments so that River Basin Development Organizations can fully play their role as convener, facilitator and catalyst of local initiatives.

Back in the 1960s, the Tennessee Valley Authority (TVA) served as a model for the development of the Niger, the Gambia as well as the Senegal River Basin Development Organizations (US National Academy of Sciences, 2003). Half a century later, an exchange of experiences could help them inspire each other, learning from their challenges while valuing their successes, to chart an inclusive and sustainable course to prosperity and peace for the coming decades. Indeed, as the Vision Statement of the upcoming UN 2023 Water Conference in New York City indicates, their integrated river basin development model aimed at making water a catalyst for sustainable development and peace has never been more relevant and should inspire the world.

This exchange would be particularly timely as these transboundary river basin development organizations have recently undertaken strategic development actions – notably the OMVG Integrated Development Master Plan¹⁰ (2022) as well as the first OMVS Senegal River Basin Economic Forum¹¹ (2021) – and are exploring new participatory and community financing mechanisms such as the OMVS Financing and Support Platform¹² to Promote Local Entrepreneurship and Job Creation as

⁹ https://cda-omvs.org/wp-content/uploads/2021/12/14904_charte_fonciere_-_bassin_du_fleuve_senegal_0.pdf

¹⁰ <https://www.uncdf.org/fr/article/6745/un-mcanisme-de-financement-innovant-pour-la-gestion-des-ressources-naturelles-transfrontalieres-et-la-mise-en-uvre-du-pddi-de-lomvg>

¹¹ <https://www.omvs.org/evenement/forum-dechange-economique-sur-le-bassin-du-fleuve-senegal/> and <https://bassindefleuveforum.com/>

¹² https://www.voixdufleuve-voiedelapaix.org/_files/ugd/0d06bc_e0f79a4bfbbb47aa8c4b54217fa12fe3.pdf

well as new ways¹³ for OMVG to access the bond market to finance capital investments (Blue Peace Financing Initiative).

The Integrated Functions of the Tennessee Valley Authority (TVA)

The Tennessee Valley Authority (TVA) is a federally owned corporation in the United States created by congressional charter on May 18, 1933, to provide general economic development to the Tennessee River Basin through power generation, flood control, navigation assistance, fertilizer manufacturing, agricultural development, and to eradicate malaria that affected at that time a third of the population in the Tennessee basin. The TVA was one of the most successful and ambitious of President Franklin Roosevelt's New Deal programs, who envisioned TVA as "a corporation clothed with the power of government but possessed of the flexibility and initiative of a private enterprise."

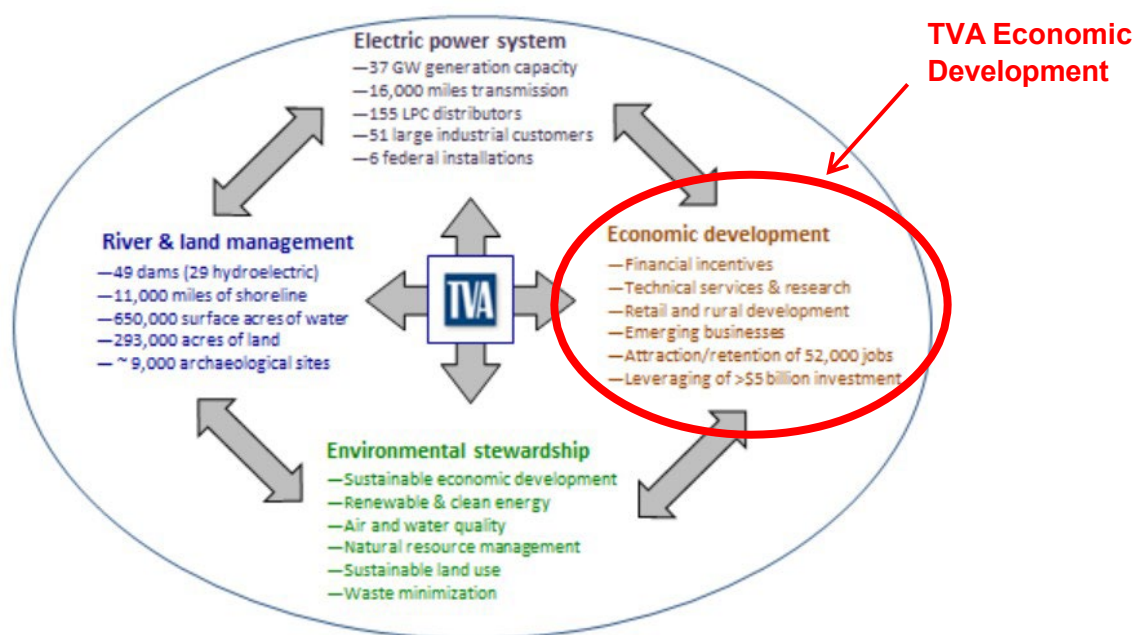
TVA's service area is transboundary and covers 7 American States (see map below). Despite its shares being owned by the federal government, TVA operates exactly like a private corporation and receives **no taxpayer funding**. Instead, it finances its operations through the sale of energy and through the sale of TVA bonds (more than US\$1 billion of TVA bonds issued every year without any explicit sovereign guarantee, but with a legal cap fixed at US\$30 billion). Its overall goal is to remain profit-neutral and to offer inexpensive energy to the area, which in turn attracts industry and jobs to the region.



¹³ <https://www.uncdf.org/article/7635/9th-world-water-forum-successful-launch-of-the-blue-peace-financing-initiative-through-a-high-level-panel>

Since the Great Depression years, TVA has developed primarily into a power utility, contributing to major economic development in the region through electrification and provision of cheap energy enabling private sector development. TVA now provides electricity to approximately ten million people, selling its power to 154 local power utilities, 5 direct industrial and institutional customers, and 12 area utilities. In addition to power generation, TVA provides flood control with 29 hydroelectric dams. Resulting lakes and other areas also allow for recreational activities. The TVA provides navigation and land management along rivers within its region of operation. As the diagram below indicates, environmental stewardship is a central mandate of TVA, as well as energy, economic development, water and land management.

TVA's integrated power and nonpower functions



Economic Policy Institute

Local Economic Development and Private Sector Development

Globally, it is a challenge for many River Basin Organizations to connect more with local communities, the private sector, local and international investors/financiers in order to create a virtuous cycle of local investments and job creation to support sustainable development of the river basin. **In this respect, past and ongoing experiences of TVA with regional economic development, electrification, community development, and investor engagement notably through its digital platforms could be particularly inspiring.**

Through its Economic Development department (tva.com/economic-development) and its more than 50 staff members, the TVA provides economic development assistance to local governments, rural communities and private companies. In FY 2021¹⁴, working with local power companies and other agencies, TVA helped create or retain nearly 81,000 jobs – a single year record for TVA’s economic development team – and attract more than US\$8.8 billion in capital investment to the Tennessee River Basin. These totals do not include the recent Ford Motor Company announcement of a major electric vehicle and battery manufacturing complex in western Tennessee near Memphis – the single largest economic development investment in Tennessee history. In the past 5 years, TVA Economic Development has contributed to the creation of 341,000 jobs and US\$45.4 billion in private sector investment in the Tennessee River basin.

The TVA serves as a catalyst for sustainable economic development in the region and notably its rural areas, consistent with its environmental stewardship mission, and benefiting directly from access to competitively priced, reliable electricity. It works with strategic partners to recruit new companies and investments, providing a variety of incentives and services to attract and retain companies and help communities benefit from economic growth opportunities. A basin-wide digital investment platform (www.tvasites.com) offers a suite of services that can be accessed at any point in a business or community's development plan.

Rural and Community Development Programs

Community development programs play a vital role in TVA Economic Development, including such programs as Rural Leadership Institute, Rural Certified Communities Program, Valley Workforce Institute, Young Talent Initiative, Community Livability and Valley Sustainable Communities:

- ***The TVA Rural Leadership Institute*** provides professional leadership training to rural community economic development professionals in the Tennessee River basin, including focused skills development in areas such as leadership, organizational effectiveness and communication.
- ***The TVA Rural Certified Communities program*** helps rural communities to develop economic development strategies and budgets, to enhance retention programs, recruiting efforts, and community livability initiatives. Organizations who complete this program are recognized as being prepared to compete for job creation and investment, based on third-party evaluation of their organizational strategic planning efforts, operational effectiveness (workforce, sites and buildings) and other criteria.
- ***The TVA Valley Workforce Institute*** is designed to assist economic developers in understanding and selling their workforce assets and address talent pipeline challenges in today’s economy. This includes focused skills development in areas such as workforce data analysis and application,

¹⁴ https://s25.q4cdn.com/191816265/files/doc_news/2021/11/TVA-Board-Recognizes-Performance-Looks-to-Future-FINAL-111021.pdf

identifying and addressing labor force challenges and opportunities and developing creative labor force solutions.

- **The TVA Young Talent Cabinet** is a working think tank that provides ongoing input and guidance to TVA Economic Development regarding opportunities to strengthen the success of the *Young Professionals in Economic Development Network*. The Young Talent Cabinet assists in recommending, developing and implementing ideas and initiatives.
- **The TVA Community Livability Initiative** is designed to map and showcase livability assets in an effort to attract economic growth in the TVA river basin and highlight talent attraction assets. It helps local leaders being prepared, having product available and understanding their workforce story and livability assets in order to compete, gain jobs and attract economic investments.
- The **TVA Valley Sustainable Communities Program** is designed to assist communities in evaluating existing sustainable programs, cataloging sustainable assets and increasing future commitments to sustainability. Grants reward community-wide sustainability initiatives, to attract jobs and investment. For instance, many companies have selected the Tennessee River basin to do business because of TVA's low-cost, reliable and clean energy. For example, in April 2022, Envision AESC, a world-leading electric vehicle battery technology company, announced a 2,000 job, US\$2 billion investment to build a new factory because of TVA's renewable energy programs.

Economic and Financial Incentives for Entrepreneurship and Job Creation

Through the Valley Investment Program (VIP), TVA offers a range of economic and financial incentives for enterprise development and job creation. They include a Performance Grant program where TVA invests directly in company projects, TVA Loan funds to reduce interest costs or fill a funding gap in a project, Investment Credits, Security deposit coverage, as well as grants to communities and territorial actors to develop small infrastructures (water, energy, roads, sites) in order to attract businesses and create jobs (agriculture, industries, services).

- TVA Performance Grants. Through the Performance Grant Program, TVA makes an investment in competitive economic development projects in the TVA region. Award amounts are paid directly to the company and are flexible for approved purposes. Funding amounts are based upon the five-year economic impact of the project. Capital investment during a five-year period after the incentive is awarded must equal 25 percent of the company's book value or \$2.5 million for a new facility. Companies are measured on capital investment, jobs added or retained, average wages, energy usage and "smart energy" commitment. Incentives are paid in credits over five years. TVA has put in place processes and procedures for awarding Economic Development grants and has established performance metrics to determine if grant program objectives are met.

- **Workforce+** is a Performance Grant option that allows TVA to make an investment in competitive economic development projects, which are focused on building a highly skilled and qualified workforce. Award amounts are paid directly to the company and are contingent on companies meeting the minimum requirements of the Performance Grant Program. Funding amounts are based upon approval of the company's talent pipeline development plan.
 - Through the ***InvestPrep Program***, the VAT provides grants to local actors to develop sites for future economic activities (SMEs, agriculture etc.). This includes local infrastructure such as access to water, sanitation and energy, access roads, environmental measures etc. TVA subsidizes 60% of the costs with a maximum of US\$ 750,000, the community or local government being responsible for co-financing 40% of the costs.
 - Through the ***Special Opportunities Counties (SOC) Performance Grant Program***, TVA assists smaller economic development projects that will be impactful for vulnerable or distressed communities with greater economic needs, notably youth.
- **TVA Loan Funds.** Financing is available for companies from TVA Loan Funds to stimulate job growth and leverage capital investment. TVA seeks to fill a funding gap or lower interest costs of project funding, thereby enhancing the opportunity for success. The maximum loan amount is \$3 million and is determined primarily by jobs and capital investment. Loan terms may be from five to 20 years based on collateral.
 - **TVA Investment Credit.** The Investment Credit is an economic development incentive program jointly offered by TVA and participating local power companies. This performance-based program rewards companies for the five or ten-year economic and energy benefits associated with their new/expanded operations. Awards are applied as a credit to monthly power bills. Most companies can expect a 15-30 percent savings annually over a five or ten-year period.
 - **TVA Security Deposit Coverage.** The Security Deposit Coverage program gives qualifying businesses an alternative to tying up valuable capital as they locate or expand in the TVA region. It is available to new or expanding commercial and industrial electric customers through a partnership between TVA and participating local power companies. The program allows the waiver of electric utility deposits to qualifying customers for up to five years, and the application process is simple and quick.

Energy Systems, Electrification, Innovative Technologies and Cybersecurity

TVA champions promoted the vision that economic development depended on the provision of low- cost, accessible power. Thus they worked both on the demand (by providing cheap appliances and easy access to credit) and supply (with the concept of centralized power generation by TVA and decentralized distribution through locally owned municipal electric systems and rural electric cooperatives). They constructed an extensive transmission system to ensure rural access to electricity. With electricity,

farms could be provided with lights and modern home appliances, making the lives of residents easier and farms more productive. The available electricity attracted new industries to the region, providing desperately needed jobs. TVA's successful experience was then rolled out across the USA through country-wide rural electrification programs.

Nowadays, TVA is working to meet future demand for cleaner, leaner power by developing innovative technologies, including digitalization. It comprises electric transportation, renewables including solar, storage technologies to notably unlock the full potential of solar energy, microgrids and energy efficiency measures. **In the face of ever-increasing cybersecurity threats worldwide, TVA recently established a Cybersecurity Operations Center especially for its power operations.**

In June 2021, TVA joined forces with the University of Tennessee, Oak Ridge National Laboratory and Techstars to create the **Industries of the Future Accelerator** to attract high-quality startups focused on solving the world's most pressing environmental and economic challenges. The accelerator will work with 30 startups over the next three years that use clean energy, AI, big data, cybersecurity, digital currency, 5G and other innovations to transform society.

Mobilizing Finance, Increasing Creditworthiness & Non-Sovereign Borrowing through TVA Bonds and Green Bonds

TVA has been able over time to improve its creditworthiness by increasing stable revenues and cash flows directly from its energy operations, and indirectly through its local economic development program. Presently, TVA is probably the only river basin development organization in the world able to access directly the capital markets, with more than US\$20 billion of bonds outstanding. The TVA sells four kinds of bonds which are issued domestically and internationally and carry a wide variety of maturities (from less than a year up to 50 years), terms, returns and currency denominations. These bonds and notes are available to investors through banks, brokers and investment dealers.

A digital financial information platform (www.tva.com/investors) enables stakeholders to easily access information and various news and events for investors including company filings, credit ratings, financial statements, investment opportunities such as bonds and other innovative financial instruments, ESG (Environmental, Social and Governance) sustainability reports etc.

Legally, the TVA cannot have more than US\$30 billion of debt outstanding at any one time, and it can only issue bonds to fund its power program or refinance existing debt. The TVA is also legally required to set its power rates at a level sufficient to repay its debt. Because of the TVA's operating history and its status as a government-sponsored enterprise, TVA securities are generally very highly rated (AA+ to AAA).

Even though TVA securities carry no explicit guarantee by the U.S. government, the TVA is owned by the government and its securities are therefore considered less risky. As a result, TVA bond yields are typically higher than Treasuries but lower than corporate bonds. For instance, in 2017 TVA priced US\$1billion of 10-year global power bonds carrying an interest rate of 2.875%.

Green Bonds

In September 2021, TVA launched an inaugural \$500 million Green Bond offering, setting a record for the lowest interest rate ever achieved by TVA. Proceeds from the sale will fund TVA’s capital investment in renewable energy projects, energy storage, development of advanced clean energy technologies, and transmission system enhancements. A potential TVA solar project in northern Alabama and a potential TVA energy storage project in eastern Tennessee – both still undergoing detailed environmental reviews – are two possible uses of the funding. Similar financial instruments developed under TVA’s Sustainable Financing Framework will support the implementation of TVA’s aspirational goal of net-zero carbon emissions by 2050.

The bonds carry a **coupon interest rate of 1.500%**, which sets a record for the lowest rate ever achieved by TVA on a 10-year financing. TVA’s previous record on a 10-year maturity was set in 2012, with a rate of 1.875%. The record low rate on the bonds will save TVA over \$15 million in annual interest expense compared to bonds that matured earlier in 2021.

TVA’s green bond offering drew over \$2 billion in initial orders from a variety of investors, including money managers, state governments, insurance companies, and others. Bank of America Securities served as Green Structuring Agent for the transaction, and joint book-running manager. Barclays, Morgan Stanley, RBC Capital Markets, and TD Securities, also served as joint book-running managers for the transaction.

Cross-Subsidization Mechanisms

TVA’s threefold mission entails inherent cross-subsidies. Its main mission profit-wise is to provide clean, reliable energy at the lowest possible cost, but generate enough profit to cross-subsidy its second mission to maintain environmental sustainability in the Tennessee River basin. Its third mission -- diligently support economic development activities that draw new jobs and investment to the region, or help companies stay here and grow – supports the cross-subsidization scheme by generating more wealth, part of which can be reinvested in TVA loss-making activities (notably through the sale of energy to the private sector).

Sustainable Environmental Stewardship and Public Participation

Sustainable environmental management is a core mandate of TVA, together with energy and economic development (the three Es). According to the recently released TVA Sustainability Report¹⁵ 2020, the utility reduced its carbon output by nearly 60% in the past 15 years by boosting power generation from carbon-free nuclear, hydro and solar sources. This year, TVA is on track to have over 60% of its electricity come from carbon-free generation. **TVA's Environmental stewardship mission is carried out through the adoption of policies, strategies and programs, which all make extensive use of digital technologies including:**

- **Environmental Policy** for environmental stewardship and compliance, technology innovation and a growing renewable energy portfolio.
- **Natural Resource Plan** addressing TVA's management of biological, cultural and water resources; recreational reservoir land planning; and public engagement.
- **Climate Change Adaptation Action Plan** to identify possible impacts, to assess potential consequences and ability to mitigate climate change and develop adaptation planning action.
- **Integrated Resource Plan** to provide a roadmap for making decisions about how TVA can meet future demand for power in new and innovative ways, considering costs, environmental factors, reliability, regulations and energy efficiency.
- In 2018, TVA published its first **Environmental, Social, and Governance (ESG) report**

Solar energy. As West African RBDOs seek to expand and diversify their renewable energy sources, lessons can be learned from TVA recent expansion into solar energy production, procuring more than 1.3 GW of energy through recent agreements with private developers to develop 484MW in 2019, and in 2018 the largest solar installations in Tennessee (150MW) and Alabama (227MW) at the time, to help support Facebook's data center with 100% renewable energy sources.

Water quality and groundwater monitoring. TVA has a long history of monitoring water quality conditions in reservoirs, as well as the streams and rivers that flow into them, to understand the health of aquatic resources and maintain updated information on current and trending reservoir conditions. TVA has monitored groundwater quality for decades. However, in relation to a major contamination incident at a TVA coal-fired power plant, a new 2015 federal rule sets forth a specific process for monitoring, investigating, and addressing any groundwater issues. The process requires groundwater monitoring through multiple phases: baseline sampling, detection monitoring, and assessment monitoring.

Flood control. TVA flood control operations (through the TVA's River Forecast Center) are estimated to save every year in the basin about \$300 million in estimated flood damages. In 2019, the Tennessee

¹⁵ www.tva.com/environment/environmental-stewardship/sustainability/sustainability-report

River swelled due to the wettest February in recorded history; TVA's 49 dams stored enough water **to avoid an estimated \$1.6 billion in flood damages**. In fiscal year 2021, TVA managed another above-normal rainfall year along the Tennessee River system, helping **prevent about \$170 million in flood damage**.

Questions for the TVA Expert Panel (to be completed)

Questions on TVA Economic Development Activities

- What are the 3 or 5 most important lessons learned from TVA Economic Development experience to catalyze entrepreneurship and jobs in the Tennessee River basin? What could be their relevance to West African River Basin Development Organizations, and notably for the OMVS Incentive and Proximity Financing Platform under development?
- How are TVA Economic Development's activities financed, including grants to communities and the private sector, and operating costs of the TVA Economic Development team (over 50 employees)?
- How to take into account local interests in the sustainable development of local communities and the private sector?
- How to create a digital platform bringing together investors, project promoters and local actors? What are the lessons learned from the TVASites digital platform?
- Based on the experience of TVA Economic Development, how can rural development programs coupled with economic and financial incentives strengthen the core mission of integrated development of West African River Basin Development Organizations such as the OMVG and OMVS?
- How can these incentives be structured so that rural development programs support social and environmental sustainability, inclusion and climate resilience?

Questions on TVA Investment Financing

- What success factors have enabled TVA to issue bonds to finance its investments? What lessons can be learned for West African River Basin Development Organizations?
- More specifically, how did TVA secure legal rights to issue bonds? How does TVA secure debt securities?
- The Gambia River Basin Development Organization (OMVG) is developing a joint cross-border and multi-sectoral Investment Plan composed of lucrative and less profitable projects. Through the Blue Peace financing initiative, OMVG plans to access capital markets to finance this investment plan.

Based on your experience, what advice or suggestions would you give to OMVG to better manage risks and potential obstacles?

- OMVG observes that the TVA enjoys 2 major advantages for its financing: (i) The TVA holds assets as an agent of the U.S. Government, (ii) The TVA holds the authority to set the rates at which it sells electricity to its customers, and the TVA's electricity revenues must cover its debt service. Without these 2 elements, could the TVA have directly accessed and issued bonds in the financial markets?
- We understand (unless we are mistaken) that TVA's debt securities are not guaranteed by the U.S. government, yet the TVA has U.S. Agency status. What role as "lender/guarantor of last resort" does the U.S. Government play in the financing mechanism (bond issuance) of the TVA?
- In the current context, OMVG's assets are held by OMVG Member States, not by the OMVG High Commission. In your opinion, what are the limitations, advantages and disadvantages of this governance model for a river basin development organization?

Questions on Integrated Resource Planning and Management in the TVA River Basin

- Exchanges with TVA could be useful for the elaboration of the OMVG Integrated Basin Development Master Plan and capacity building especially by sharing experiences and ideas on critical issues related to the analysis of the water-energy-agriculture-environment nexus, as well as to the process of modeling the management of the resources of the three OMVG river basins:
 - How does TVA sustain water resources data collection?
 - How does TVA ensure the decision making process' robustness regarding water resources allocation to different water demands?
 - Does Tennessee Valley watershed share groundwater resources with neighboring watersheds? If yes, how does TVA approach their common stewardship?
 - How does TVA assess/improve hydraulic infrastructure resilience to climate hazard?

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Annex 3: List of Acronyms

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| FEWS | Flood Early Warning Systems (tool, developed by Deltares, a Dutch knowledge institute for applied research in the field of water), |
| GWH | Geneva Water Hub |
| IPAR | Agricultural and Rural Prospective Initiative |
| NRC | U.S. Nuclear Regulatory Commission |
| NWS | U.S. National Weather Services |
| OMVG | Gambia River Development Organization |
| OMVS | Senegal River Development Organization |
| PED | Pôle Eau Dakar |
| RBO | River Basin Organization |
| RFI | Request For Information |
| SDC | Swiss Agency for Development and Cooperation |
| TVA | Tennessee Valley Authority |