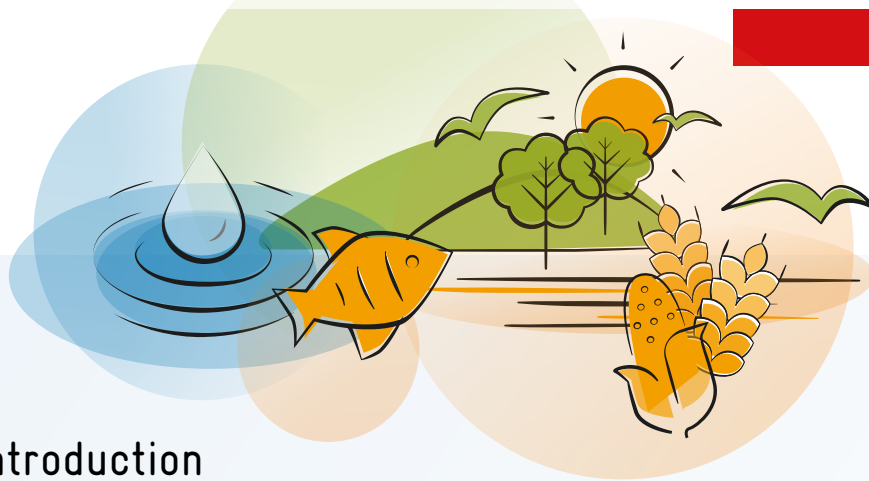


Best Practices Water, Land, Food – Integrated Approaches as Key to Strengthening Resilience in Rural Areas



Introduction

Only two of the 17 SDGs relate directly to water and life in water. But hardly any other SDG is achievable unless water is factored in – as a resource or commodity, as an ecosystem or ecosystem service, as an issue of conflict or reconciliation, as a matter of inequality or social justice.

Terrestrial assets are inextricably linked to aquatic assets. Land and life on land. Water will only be available if land is managed well. And vice versa. Together, they are the very basis of life. Together, they enable the provision of food for animals and humankind. Together, they provide resilience towards climate change. If managed well. And if managed together, considering interdependencies and impacts across scales and sectors.

Transforming food systems requires focusing on land, soil, water, ecosystems and human well-being as interconnected systems. A systemic and cross-sectoral approach to promoting resilience in rural areas is key.

But how does German Technical Cooperation put these ambitions into practice? How do projects working in the water sector address the water-land-food nexus, and how can resilience in the broader context of rural development be enhanced? What experiences have been made regarding the sustainable management and integrated governance of water and land for rural development, food security and climate resilience?

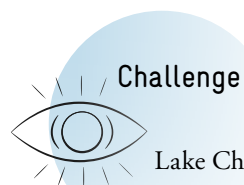
Together with the Sector Project Rural Development, five projects have volunteered to jointly reflect on these questions, share their approaches and derive learnings as an inspiration to those facing similar challenges.

Projects have been selected to reflect regional and thematic diversity, so the present compilation is by no means exhaustive. Project staff are greatly acknowledged for sharing their knowledge and enthusiasm.

-
- 1 | Chad: **Managing Shared Resources Amidst Multiple Crises in the Lake Chad Basin**
 - 2 | Lesotho: **Catching Water for All in Lesotho's Water Catchments**
 - 3 | India: **Mobilizing Multiple Funding for Water Security and Climate Resilience in India**
 - 4 | Bolivia: **Planning Together for Better Livelihoods and Climate Resilience in Bolivia**
 - 5 | Mexico: **Saving Groundwater for Foods and Beers in Mexico**



1 Managing Shared Resources Amidst Multiple Crises in the Lake Chad Basin



Challenge

Lake Chad gives name to one of the largest and most crisis-prone river basins in Africa. Home to more than 40 million people, the basin has been facing multiple crises, starting with the shrinking of the lake and the associated disruption of livelihoods, and ending with insurgencies threatening regional stability. Millions of people have been displaced, and conflicts over natural resources have intensified. The situation is exacerbated by climate change and weak governance. As a result, food insecurity has surged while trust in state institutions to bring about positive change has waned.



Approach

The **Applied Water Resource Management in the Lake Chad Basin II** project supports the Lake Chad Basin Commission (LCBC) to execute its mandated tasks related to the transboundary management of water and other natural resources. The support involves capacity development for improved advisory to member states and better implementation of management frameworks and processes such as the Water Charter and the Lake Chad Basin Management Cycles. Guidance on the Lake Chad Information System (LIS) aims to define rules for its use as an accessible knowledge and decision support tool.

A particular focus is placed on the management of sub-basins. Multi-stakeholder Partner Platforms identify challenges arising from opposing natural resource claims and develop fair and gender-sensitive solutions for managing shared resources. Stakeholders include farmers, pastoralists and fishers, as well as civil society actors and local administrations. Representatives of Partner Platforms will be delegated to the Partner Forum foreseen in the Water Charter to partake in central decision-making.

Local level measures such as climate-sensitive flood-recession farming or the joint management of agro-pastoral lands draw on good practices from other sub-basins and LCBC's Strategic Action Programme. Local stakeholders may opt to design own measures that better match their needs. Good practices are disseminated via Farmer Field Schools, radio broadcasts and farmer-to-farmer learning.



Nexus

Water and land constitute the baseline of the nexus approach. It is overlain by a nexus between climate and security which drives or multiplies conflicts over the use of water and land resources. LCBC acts as a trusted institutional intermediary. Sub-basin Partner Platforms and the central-level Partner Forum provide spaces to discuss natural resource allocation issues and agree on actionable solutions. They also connect with the gender-environment nexus which is an important layer in the project design. Synergies among the multifaceted nexus elements lead to positive outcomes for food security as well as social justice and gender equality.

Outcome

Partner Platforms are being established sequentially, starting with the Waza-Logone sub-basin in Cameroon and followed by the densely populated Logone sub-basin shared by Cameroon, Chad and the Central African Republic. At the same time, preparatory work for the Komadougou-Yobé sub-basin shared by Niger and Nigeria has begun. In Waza-Logone, the livelihoods of tens of thousands of people have improved thanks to climate-adaptive and conflict-mitigating good agricul-

tural and pastoral practices such as the cultivation of drought-resistant food and feed crops or sustainable land management. Many more people will benefit as the approach is rolled out to other sub-basins. Management decisions are increasingly better informed as the LIS becomes fully operational.

Learnings

- › **Supporting bottom-up natural resource management**
Accessible decision support tools such as LIS empower local stakeholders in natural resource management. Bottom-up approaches foster collaboration and leverage local knowledge.
- › **Changing perspective from best practice to best fit¹**
River basin organizations are criticized for imposing best practices top-down. Partner Platforms prove to the contrary by providing space for developing options fit to context.
- › **Aligning with the agroecological paradigm**
LCBC promotes good practices in agriculture, animal husbandry and fisheries. Agroecology offers an integrative framework for better outcomes and potential co-financing opportunities.

¹ ECDPM Discussion Paper No. 236



@GIZ/Water Resources Management in the Lake Chad Basin II



2 | Catching Water for All in Lesotho's Water Catchments

Challenge



Lesotho is one of the least water-stressed among the least developed countries. Hailed as regional water tower, the mountain Kingdom provides more than 45 % of the inflow to the Orange-Senqu Basin. Under a bilateral transfer scheme, huge volumes of water are diverted to South Africa's densely populated (15 million people) economic hub Gauteng (900 million m³ in 2021). However, Lesotho's water resources are diminishing, owing to land and wetland degradation and increasingly variable rainfall. Water stress is therefore likely to rise as populations grow and climate change intensifies, with implications for rural livelihoods and the distribution of water among riparian states.

Approach



The **Transboundary Water Management Programme in the Southern African Development Community (SADC)** supports Lesotho's Integrated Catchment Management (ICM) Programme ReNOKA ("We are a river!") as a lighthouse initiative. Co-financed by the European Union and the German Federal Ministry for Economic Cooperation and Development (BMZ), it supports ReNOKA in its endeavour to protect and restore the country's water resources, and to enhance food security and climate resilience through a sector-wide and

cross-sectoral approach centred on ICM. In partnership with the Ministry of Water, related policy and legal frameworks are improved, and institutional settings strengthened, building on outcomes from multi-stakeholder consultations.

ReNOKA is closely aligned with transboundary frameworks, namely the SADC Regional Strategic Action Plan and the Integrated Water Resources Management Plan of the Orange-Senqu River Commission (ORASECOM). Locally, ReNOKA supports communities to plan and implement ICM measures such as the construction of gabions intended to curb the degradation of watersheds, including nexus approaches and nature-based solutions.

Learnings and best practices are shared via SADC's and ORASECOM's knowledge networks. An extensive capacity development and education programme targets mandated authorities at multiple levels and educational institutions from primary school to university.



Nexus



ReNOKA applies nexus approaches to reduce negative interactions between uphill land use practices and basin-wide energy, water and food security. It promotes ICM as an instrument and platform for integrated problem solving. The water-land-food nexus is part of a more complex nexus including energy. Investments in renewable energy – from hydropower to solar – rely on healthy catchments to prevent erosion, siltation and flooding. Climate resilience and economic welfare are both desired outcomes and important ancillary nexus components.

Outcome



Community-based ICM has been piloted in six heavily degraded sub-catchments. ICM measures such as range management, removal of invasive species, or wetland restoration helped increase water availability, improve storm water management and decrease soil erosion. As a result, the livelihoods of tens of thousands of watershed residents have improved in the short term. Indirectly and in the longer term, millions more people, particularly those living downstream, benefit from reduced siltation of dams and undisrupted water transfer. Environmental outcomes are equally important. In supporting the rehabilitation of Lesotho's wetlands, significant co-benefits are generated in terms of carbon sequestration and biodiversity conservation. These contribute to Lesotho's Nationally Determined Contributions and the National Strategy on Biodiversity.

Learnings



› Sharing knowledge basin-wide

Knowledge networks of regional organizations such as SADC and ORASECOM provide fast-track opportunities to disseminate and scale-up successful ICM practices at regional level.

› Harnessing the momentum for ICM at local level

ICM promotes behaviour change among local communities. Communicating local ICM readiness to the national level may help to settle pending legal and institutional issues.

› Making a case for Payment for Ecosystem Services (PES)

Revenues from the transfer of water rely on highland ecosystem services. PES holds potential to incentivise communities to preserve these services and to co-finance ICM governance.





3 | Mobilising Multiple Funding for Water Security and Climate Resilience in India

Challenge

The Indian water crisis impedes the livelihoods of 600 million people in rural areas. Tried and tested water management and planning approaches to address this challenge and supporting funding schemes are available but not used efficiently, owing to incoherent, often siloed sectoral policies, and their equally siloed implementation. Insufficient absorption capacities and complicated administrative procedures add to the challenge.

Approach

To mobilise multiple funding at multiple levels, the **Water Security and Climate Change Adaptation in Rural India (WASCA) II project**, in partnership with the Ministry of Rural Development and the Ministry of Jal Shakti/Ministry of Water, places water at the centre of climate-resilient rural development. In addition to water-focused funds like the Prime Minister's Irrigation Programme or the National Water Mission's Catch the Rain Initiative, WASCA particularly targets the Mahatma Gandhi National Rural Employment Guarantee Act, one of the largest employment schemes worldwide.

To enable integrated and convergent planning, a Geographical Information System (GIS)-based Composite



Water Resource Management (CWRM) framework was jointly developed. At central and state level, strategies are designed to institutionalize and disseminate this framework. At watershed level, CWRM planning is extended to integrate and align with other spatial plannings, including land use, landscape, and rural development planning (CWRM+). This opens access to finance from missions and schemes not primarily targeting the water sector (e.g., National Food Security and National Horticulture Mission). Labour-intensive actions such as the construction of water harvesting structures or afforestation are implemented mainly through funding from the Mahatma Gandhi scheme. The approach encompasses comprehensive capacity building of administrations responsible for the implementation of missions and schemes and facilitation of cooperation among multiple stakeholders across sectors and scales.

Nexus

WASCA's water-land-food nexus unfolds from a water security perspective. As such, it primarily involves planning and implementing measures to reduce water use and increase water storage. By introducing the GIS-based CWRM framework, with watersheds – from ridge to valley in Indian terminology – as management units, the scope expands to integrate other thematic layers, namely land use and vegetation. Extended CWRM+ plans and associated actions such as afforestation or agroecological practices at farm and landscape level confer further benefits, e.g., in terms of higher water retention and groundwater recharge, leading to improved water as well as food security.

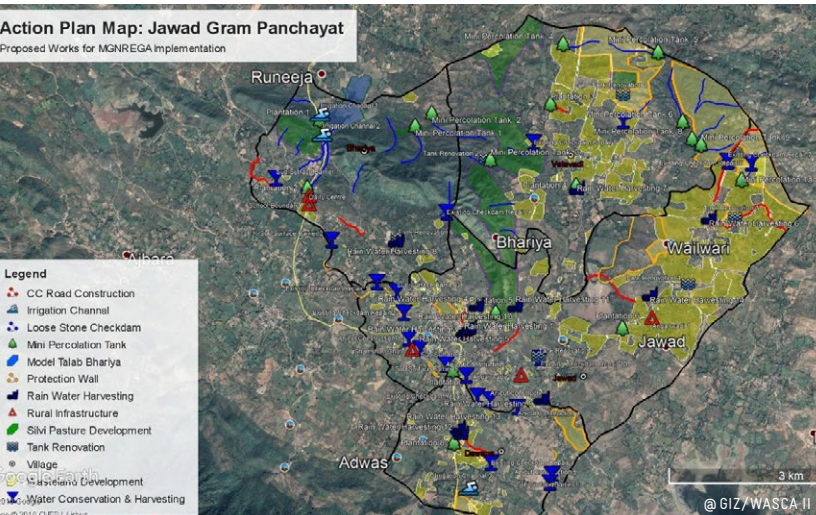
Outcome

More than 23,000 village councils in 17 states covering all agroclimatic zones used the CWRM framework to develop action plans encompassing hundreds of thousands water-related interventions, the bulk of them funded – or to be funded – through a range of national schemes, leveraging about 270 million EUR in total. These interventions help improve water and food security for, and climate resilience of nearly 10 million people. Figures for the area subjected to state-funded CWRM measures such as water-conserving irrigation, soil conservation, agroforestry or other agroecological practices will reach 5 million hectares. Furthermore, private sector readiness to co-finance measures is expected to increase as convergent planning improves.

Learnings

- › **Enhancing capacities from two ends**
Effective application for and awarding of funding requires capacity building for both scheme beneficiaries and administrators. Integrated planning helps identify fundable measures.
- › **Using top-down and bottom-up approaches in tandem**
India's pyramidal governance system enables top-down knowledge management and capacity building for CWRM. Bottom-up planning, in turn, ensures that CWRM learns from practice.
- › **Providing incentives for convergent planning**
Convergent planning enhances fund flow and performance of schemes, thereby incentivizing administrations and sector departments for up-take and dissemination.

Action Plan Map: Jawad Gram Panchayat
Proposed Works for MGNREGA Implementation





4 | Planning Together for Better Livelihoods and Climate Resilience in Bolivia

Challenge

Recent trends and future predictions indicate a changing climate with lower but more intense precipitation in Bolivia. Deforestation, wildfires, agro-industrial encroachment, and insecure land tenure add to increasingly precarious livelihoods of rural populations. In its updated Nationally Determined Contributions (NDC), Bolivia has set challenging targets to strengthen climate resilience, including Integrated Watershed Management (IWM) and wetland conservation on 12 and 16 million hectares, respectively. However, capacities to implement related actions across sectors and at scale are still insufficient.

Approach

The **Integrated Rural Development at River Basin Level Project (PROCUENCA)** seeks to improve water security and climate resilience. It supports actors to develop integrated, climate and gender-sensitive approaches to natural resources management.

At national level, PROCUENCA advises on the Pluri-national Water Resources Plan under the Vice-Ministry of Water and Irrigation and the NDC under the Plurinational Authority of Mother Earth. The NDC process is supported by a national roundtable on water. At watershed level, the project facilitates convergent river basin planning through integration of different planning layers, namely water resources, landscape, land use and climate risk. This is achieved by involving multiple stakeholders in inter-institutional platforms to develop Integrated Watershed Management Plans (IWMP), and to explore financing options, including NDC funding, for their implementation. Interventions at landscape level include ecosystem-based adaptation (EbA) such as wetland conservation and restoration, agroforestry or soil regeneration. These measures are aligned with Bolivia's NDC and have a water management focus. In Chiquitania, a dry forest region in eastern Bolivia, they are co-financed by the European Union, combining IWM with Integrated Landscape Management. Special focus there is placed on measures yielding short-term food safety and livelihood benefits.

PROCUENCA'S capacity development programme addresses both public and civil society actors. Its overall aim is to institutionalize multi-stakeholder planning and management processes.



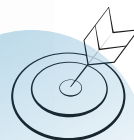
Nexus



PROCUENCA is embedded in a rural development and environment programme which aims to ensure food safety and economic welfare in times of climate change. Water, land and climate are key nexus components while food is an outcome of interactions among them. Direct interventions target the management of land and water for the purpose of climate resilience. By supporting NDC goals, PROCUENCA implicitly links to the components land tenure (target: 100 % land titling) and gender equality (target: 43 % tenure rights for women). Biodiversity is addressed by preserving wetlands as water reservoirs and habitats for fauna and flora.



Outcome



Thanks to wider stakeholder participation and better vertical and horizontal integration of planning processes, water security has improved for more than 400,000 residents of four watersheds. Examples for the convergence of plans are the integration of water-related NDC goals into the Sectoral Plan of Integrated Development, the Plurinational Plan of Water Resources and the Climate Change and Water Security Strategies of Santa Cruz (Chiquitania). At watershed level, IWMPs have been aligned with Territorial Integrated Development Plans and Municipal Water Security Laws. Climate resilience outcomes of EbA implemented on 40,000 hectares of land will materialize over longer periods of time but are expected to benefit a much larger area of about 200,000 hectares.

Learnings



› Enhancing funding opportunities

IWM comes at a cost rarely met by the public sector. Compliance with NDC opens access to climate funds, but more sustainable funding is needed, e.g. from trust funds or green credits.

› Committing to common stakes

Effective IWM requires the engagement of multiple stakeholders. Joint visions and agreed implementation strategies are necessary to commit to common stakes.

› Co-creating knowledge

IWM is a knowledge-based approach. Practice has shown that co-created knowledge is more rigorous, reliable and accountable than transferred knowledge.





5 | Saving Groundwater for Foods and Beers in Mexico

Challenge

Agriculture in Mexico's drylands relies on groundwater for irrigation. In Zacatecas, home to one of the largest and most water-efficient breweries in the world, about 80 % of the Calera aquifer is used for the irrigation of food crops and the remainder for drinking water and other industrial or urban uses. After decades of excessive use, groundwater depletion has reached critical levels. The situation of the Apan aquifer in Hidalgo, another brewery site, is turning from good to worse as well. In both basins, aquifer recharge is far from sufficient to cover the long-term needs of all user groups. Reduced water infiltration due to unsustainable land use and climate change also contributes to mounting groundwater deficiency.

Approach

Efforts to reduce groundwater deficits follow a dual strategy of lower extraction and higher recharge. Under the umbrella brand Partners in Transformation

(develoPPP) of the German Federal Ministry for Economic Cooperation and Development (BMZ), these efforts are pursued by *Aguas Firmes* – **Sustainable Water Management for the Calera and Apan Aquifers**, a development partnership with the Mexican brewery *Grupo Modelo*, part of AB InBev beverage company. The partnership is closely aligned with policies and programmes of Mexico's National Water Commission.

Farming communities are supported to adopt water-conserving irrigation and other sustainable agricultural practices. *Aguas Firmes* provides subsidies and advisory services to help farmers invest in and practice drip-irrigation and conservation agriculture (CA), i.e., minimum tillage, maximum cover and crop diversification. Nature-based solutions (NbS), such as reforestation, live barriers or ground cover enhancement are implemented by local communities to increase basin-wide water retention and infiltration. In the Apan basin, NbS are integrated into the Municipal Master Plan, following multi-stakeholder participation facilitated by *Aguas Firmes*.

The partnership's gender-sensitive capacity development programme is delivered in collaboration with the International Maize and Wheat Improvement Center, as well as local agricultural and agro-finance service providers. A particular focus is on increasing the traditionally low participation of women in decision-making.



Nexus



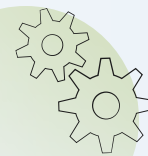
Agriculture in the Calera and Apan basins focuses on growing vegetables and cereals, including barley for making beer. It is limited by the availability of water. Water and food are therefore at the heart of *Aguas Firmes'* nexus. The land nexus represents both the cause of water scarcity and the lever to reduce it. The latter is achieved by adopting sustainable and water-saving land use practices at farm and watershed levels. Landscape-level management solutions are generated through participatory land use and municipal planning, creating governance benefits. Better practices, in turn, lead to improved climate resilience and biodiversity conservation.

Outcome



Sustainable agricultural practices have been or are being expanded to nearly 10,000 hectares of farmland, resulting in water savings of up to 15% and more stable yields. Through NbS alone, the aquifers are expected to be replenished by a further two million cubic meters of water annually, corresponding to about 40% of the extraction volume of the two breweries. *Aguas Firmes* has become a scalable model for development partnerships involving farming communities and the beverage industry. Despite initial scepticism, both sides realized that challenges of water scarcity can only be met through joint action. Follow-up initiatives in other catchments are in preparation.

Learnings



› Sharing development know-how

Resource extracting companies often lack expertise in sustainable resource management. Development partnerships are an opportunity to learn from development actors.

› Turning competitors into partners

Tensions among user groups are increasing as groundwater levels decline. Multi-stakeholder participation is a means to facilitate equitable resource-sharing arrangements.

› Providing access to finance

Small investments into water-saving practices and technologies have a big impact on groundwater recharge. Affordable public-private microfinance can help unlock this potential.



© grupo modelo / GIZ

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

Published by:
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn, Germany

Address
Friedrich-Ebert-Allee 32 + 36
T +49 228 44 60-0
F +49 228 44 60-17 66
E info@giz.de
I www.giz.de/en

Bonn, May 2024

Authors:
Ralf Peveling (University of Basel), Hannah Mosleh (GIZ),
Julia Davidson (GIZ)

Design/layout:
now [nau], Frankfurt/Main

The maps printed here are intended only for information purposes and in no way constitute recognition under international law of boundaries and territories. GIZ accepts no responsibility for these maps being entirely up to date, correct or complete. All liability for any damage, direct or indirect, resulting from their use is excluded.