



Climate-resilient and sustainable water management is crucial for water security and resilient livelihoods in rural India.

Photos: GIZ WASCA/ Travelling tripod films

Strengthening India's resilience to climate change through water security

India is among the countries most affected by climate change. Building on the concept of Integrated Water Resource Management, the Indo-German Development Cooperation Project “Water Security and Climate Adaptation in Rural India (WASCA)” aims at improving water conservation, management and productivity in high water stress areas of the country while improving rural livelihoods. For this purpose, the implementation of location-specific interventions is being linked with India’s public works programme MGNREGA.

By Caroline Ostendorf, Meekha Hannah Paul and Jagdish Purohit

Warming trends and increasing temperature extremes were observed in most parts of the Asian region over the past century. The majority of climate change risks come down to water, including floods, droughts and cyclones. As a result of increased water demand and lack of good management, water scarcity coupled with water quality concerns is expected to be a major challenge for most countries in the region in the near future.

This also applies to India, a country that comes up seventh in the Global Climate Risk Index (most affected countries in 2019). By 2050, 600 million people in India are expected to live in moderate and severe climate hotspots. About 82 per cent of rural households do not have individual piped water supply, and 163 million live without access to clean water close to their homes. More than 30 per cent of Indian lands are impacted by desertification and land degradation, and this outcome is strongly

linked to poor water management. Ground-water resources, which account for 62 per cent of irrigation water, are declining. Furthermore, 70 per cent of India’s surface water is contaminated. Heavy reliance on rainfall and lack of efficient irrigation systems are major problems in rural areas, where almost 70 per cent of the Indian population live.

Recognising the importance of water for climate resilience, the Government of India specially established a nodal ministry for all issues related to water in 2019: the Ministry of Jal Shakti. It brings all national agencies working on water, including the National Water Mission, the Central Water Commission, the Central Ground Water Board, the River Boards and the Department of Drinking Water and Sanitation, under one umbrella. In the same year, the Indo-German development cooperation project “Water Security and Climate Adaptation in Rural India (WASCA)” was

launched, supporting the Indian Ministry of Jal Shakti and the Ministry of Rural Development in enhancing water resource management. The project, implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (see upper Box), aims at improving planning and financing mechanisms for sustainable water management, demonstrating climate-resilient water management measures, and strengthening cooperation with the private sector. To move closer to the objective of sustainable water management and climate resilience, various measures have been combined, as described below.

A new approach for (rural) water management

The project approach centres on the Composite Water Resource Management Planning Framework (CWRM). The CWRM builds on the concept of Integrated Water Resource

Management (also see lower Box). It provides a step-by-step process to develop and implement sustainable water resource management plans at the lowest administrative and hydrological unit in a catchment area or river sub-basin. It involves systematically and scientifically characterising the landscape and assessing natural resources and local life support systems for effective planning, financing, and cooperation at local, regional, and national levels. Working within the framework of the watershed, the method is to begin at the top and come down the slope. It intends to conserve every drop of water starting at the ridge and reduce both the surface runoff volume and the velocity of water to a considerable extent. This, in turn, allows better management of water flowing from the ridge to the valley and ensures efficacy, economic stability and durability of soil and water conservation structures downstream. Here, a simplified planning approach using remote sensing, Geo-Information-Systems (GIS) and non-spatial information on land, water, soil, forest, climate, vegetation, and pastoral resources has been developed. The aim is to achieve a reduction in soil erosion and an increase in the conservation and harvesting of rainwater and productivity of lands, but also employment generation and social upliftment of local communities.

The CWRM planning process is aligned closely to India's MGNREGA – the world's largest public works programme – with an annual budget in excess of eight billion euros and a coverage of more than 155 million families. Through public works, MGNREGA creates rural infrastructure and community-level assets augmenting the natural resource base and contributing towards water conservation, land, and soil management. Each year, there is a community-level planning process driven by the local governments for assessing the demand for public works under MGNREGA, estimat-



Localisation of digital planning tools simplifies landscape characterisation and the assessment of natural resources under CWRM.

The WASCA Project in a nutshell

The Indo-German development cooperation project Water Security and Climate Adaptation in Rural India (WASCA), implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ), runs from April 2019 to March 2022 in the Indian States of Rajasthan, Madhya Pradesh, Uttar Pradesh, Tamil Nadu and Karnataka (in the latter State via a special Studies and Experts Fund project with the State Government). The lead executing agencies in India are the Ministry of Rural Development and the Ministry of Jal Shakti. The project contributes to Sustainable Development Goals

(SDGs) 1 (No Poverty), 2 (Zero Hunger), 6 (Clean Water and Sanitation) and 13 (Climate action).

In preparing the Composite Water Resource Management Planning Framework (CWRM) approach, experiences from different governmental programmes – including the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), the Prime Minister's Irrigation Programme PMKSY and the Jal Jeevan Mission aiming for ensuring piped water supply to all rural households – were drawn on, as was expertise from think tanks and preceding Indo-German development cooperation projects.

Integrated Water Resource Management and the CWRM Framework

The Global Water Partnership defines Integrated Water Resource Management (IWRM) as “a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems”. Key components that need to be addressed in the IWRM context to achieve sustainable water management include an enabling environment, institutional arrangements, and management instruments.

Based on these key elements, the Composite Water Resource Management Planning (CWRM) Framework contains several

themes and sub-themes under four components:

1. Interpretation of the area of interest (e.g. estimating water resources or assessing the water quality);
2. Capacity development and institutional mechanisms (e.g. stakeholder mapping, promoting the cadre of planners);
3. Preparation of the Composite Water Resource Management Plan – CWRMP (e.g. projections of emerging scenarios);
4. Implementation mechanisms (e.g. preparation of shelf of projects for proposed actions).

ing the types of work to be undertaken, prioritising the beneficiaries. The CWRM approach includes preparation and analysis of spatial and non-spatial datasets by the engineers and technical workforce, and then taking it to the community to help them make informed decisions during their planning process. CWRM planning builds on MGNREGA, leveraging its financial and technical resources, as well as converging with other government programmes, thus providing a holistic and sustainable solution for enhancing environmental benefits including water security in rural India.

Dialogue and capacity building are key to success

The WASCA project aims to build a knowledge network regarding integrated water resources management and to strengthen capacities of more than 5,000 employees of public

and private institutions, as well as of stakeholders at different levels, to plan and implement respective measures. This includes trainings for smallholder farmers in the efficient use of resources to better cope with the impacts of climate change as well as developing skills for the technical staff of the MGNREGA and other government programmes to implement water management measures and work with digital tools.

At the same time, collaboration between government departments and other stakeholders is promoted to develop strategies and activate platforms that concentrate technical and financial resources for planning and implementing climate-resilient water resource management and ensure the sustainability of project activities. To do so, holistic pilot measures at local or sub-catchment levels are taken up in selected districts. Some specific examples include the rejuvenation of traditional water bodies which

is being demonstrated in the Indian state of Uttar Pradesh, community nutrition gardens run by women collectives in Madhya Pradesh, and greening of barren hillocks and rejuvenation of traditional water bodies in the southern state of Tamil Nadu. Successful approaches are then to be scaled-up at the state and national levels. As the private sector footprint in water is high, dialogue and cooperation with companies is strengthened to leverage public-private financing and improve sustainable practices for local water security.

In the context of digital tools and technologies used in the field under the CWRM framework, including remote sensing and GIS data, an innovation hub on 'GIS-based planning and monitoring for public employment programmes' was rolled out in partnership with the Global Alliances for Social Protection II project, commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) under "International cooperation with regions for sustainable development [ICR]" in 2020 for knowledge transfer from India to Peru and Malawi via digital learning mechanisms.

An accepted approach

Initial achievements are visible. So far, 5,345 Gram Panchayats (GP; local governance institutions for rural areas), covering an area of 7.4 million hectares and a population of 22 million, have prepared CWRM plans and identified 700,000 water-related interventions. These interventions will be implemented over the next few years through MGNREGA and other government programmes. Across all project locations, this is expected to result in an additional 100 million cubic metres of

water resource conservation and constitutes significant adaptation, as well as measures to mitigate the impacts of climate change.

The CWRM approach has been accepted nationally and by state governments as a comprehensive and climate adapted planning approach for water security. The impact of the project interventions is expected to far exceed what can currently be measured, since WASCA has now been requested by the Indian Ministry of Rural Development to extend the capacity development support to scale up the GIS-based planning to all GPs in the project states.

Lessons learnt and way forward

Sustainable water management, including the maintenance of healthy ecosystems, is a critical tool for overall climate resilience. It is crucial to ensure that both natural and human systems are able to cope with future extreme events, adapt to changing conditions and transform in crisis situations. An integrated management of water resources is therefore required that balances the needs of ecosystems and people while taking into account future climate change-related impacts – not only in the immediate activities of the water sector such as storage, supply and sanitation, but also in other sectors that affect or depend on the availability and quality of water resources. This requires a coordinated approach between all sectors and across all scales (political, natural, and social), from local to national to transboundary. The WASCA project is an example of such an approach.

Given its success and the Indian Government's request, a second phase of the project is currently being prepared. It is planned to expand

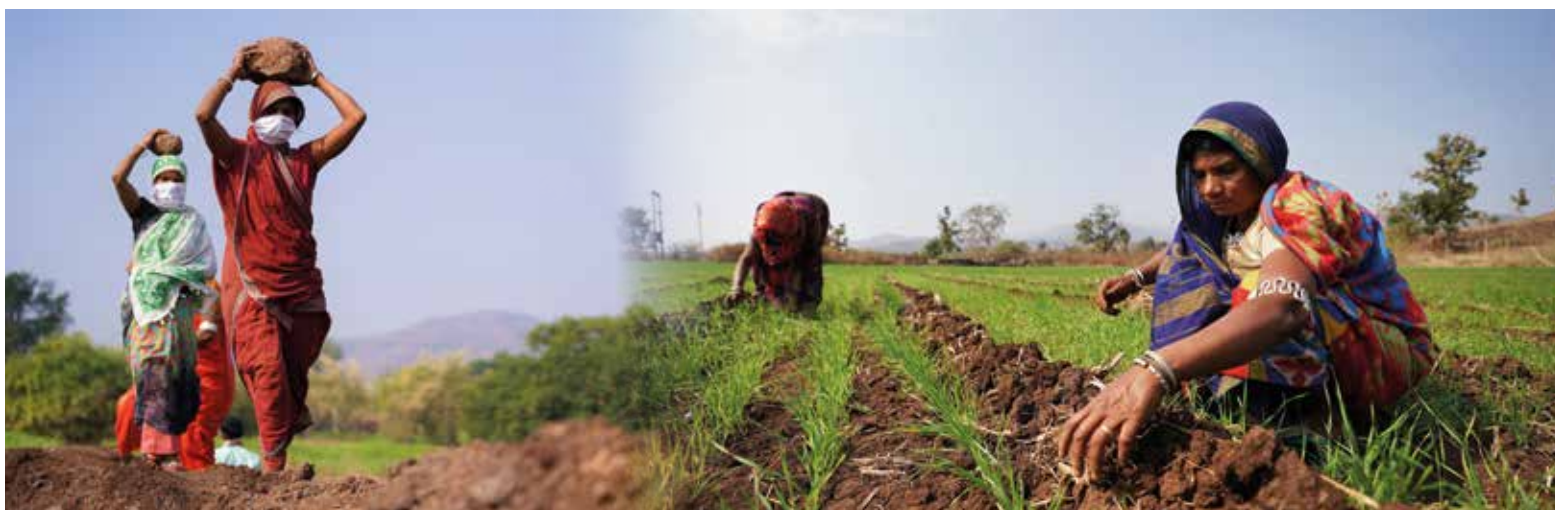
the CWRM approach, strengthen coherent implementation through further capacity building and achieve national scaling-up of mechanisms to promote water security: The pilot regions will be expanded from seven to fifteen agro-climatic zones to be able to demonstrate the applicability of the landscape-based CWRM planning approach for all agro-climatic zones in India. The project will focus on further integrating local climate change information, the development of an impact monitoring system and innovative approaches for holistic management of water, land, and vegetation. This can also draw on agro-ecological and similarly sustainable agricultural approaches, which are increasingly being recognised by the Indian Government.

As a climate adaptation project, WASCA is contributing towards slowing the effects of climate change in the water sector and making rural regions in India more climate-resilient. However, the climate crisis is a global one and requires greater convergent efforts worldwide to make way for a sustainable future!

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Women engaged in MGNREGA work for implementing CWRM plans, thus building infrastructure for strengthening rural water security (left). CWRM contributes towards sustainable farming practices among smallholder farmers (right).