

SEE FEEL CHANGE



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COPING WITH CHANGE

CLIMATE CHANGE ADAPTATION - NORTH EASTERN REGION OF INDIA



Coping With Change

Climate Change Adaptation - North Eastern Region of India

Germany and India have agreed to implement climate resilience measures in the North East through re-securing livelihoods, by helping people adapt to climate change through three partner states, Nagaland, Sikkim and Meghalaya



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P R E F A C E

Coping with Change

Climate Change in the North Eastern Region of India will only find entry in our hearts and minds, if

'WE SEE IT, WE FEEL IT, WE CHANGE IT'.

With this motto and framework in mind, a short illustrative, pictorial brochure and short movie (16 mins) has been developed about the 'Climate Change Adaptation in the North Eastern Region (CCA-NER)' program. CCA-NER is a bilateral program between the Government of India and the Federal Government of Germany, being implemented in the three states of Meghalaya, Nagaland and Sikkim in the North Eastern Region of India. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH was mandated in 2012 by the German Federal Ministry of Economic Cooperation and Development (BMZ) to implement a technical cooperation program in partnership with the Ministry for Development of the North Eastern Region (MoDONER), the lead executing agency for the North Eastern Region at the national level.

The nodal implementation partners in the three states are:

- Department for Planning and Economic Development (Govt. of Meghalaya)
- Nagaland Empowerment of People through Economic Development (Govt. of Nagaland)
- Department of Science, Technology, and Climate Change (Govt. of Sikkim).

GIZ aims through its program Climate Change

Adaptation in the North Eastern Region (CCA-NER), strengthening the adaptive capacities of people and various organizations and institutions, and thus enables them to cope better with the impacts of climate change. The program area represents the geographical and bioclimatic zones of the Eastern Himalayan biodiversity hotspot. From the high altitude cold deserts in Sikkim, over temperate regions characterized by oak and pine forests, and tropical belts up to the Brahmaputra flood plains, a wide range of agricultural practices and biodiversity conservation traditions are embraced. Results and lessons learnt to promote climate change adaptation in the program states are exemplary, replicable and relevant to the entire North Eastern Region.

Climate change adaptation is not an end in itself but rather becomes part of a broader sustainable development concept within the states and the North Eastern Region, integrating aspects of biodiversity and environmental protection, sustainable natural resource management and socially inclusive growth. Apart from the strategic regional heterogeneity, the CCA-NER has adapted a sectorial approach based on the state-specific prioritized adaptation strategies and respective missions in their State Action Plans on Climate Change.

The following focal areas thus emerged as key support areas for CCA-NER, also coherent with the priorities of GIZ in India:

- Policy Framework
- Forest, Water and Livelihood Management
- Human Capacity Development.



● Traditional weaver spinning silk, Meghalaya

CLIMATE CHANGE ADAPTATION

North Eastern Region of India

In many parts of the world, massive impacts of climate change on the environment and people's lives are already visible. Climate change affects livelihoods, food security, health and economic activities – to name but a few facets.

We see that the concentric circles formed between all these

factors are intricate, the fates of many components are entwined, such that an imbalance in one, will affect the other.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH program called 'Climate Change Adaptation in the North Eastern Region of India'

(CCA-NER) aims to strengthen the adaptive capacities of people and various organizations and institutions, so as to enable them to cope with the consequences of climate change. The program area covers the three North Eastern states of Meghalaya, Sikkim and Nagaland which together represent different geographical and bi-climatic zones of this eastern Himalayan Biodiversity hotspot.

GIZ's support to the State Action Plan on Climate Change (SAPCC) for each state have addressed varied issues and themes such as – water, urban and rural habitats, livelihoods, agriculture, horticulture, fisheries, biodiversity, forests, promotion of energy efficiency etc. The results and lessons learnt from GIZ interventions to promote climate change adaptation in the program states are relevant to the entire North Eastern region.

People living in rural areas and those dependent on nature for their livelihood face the

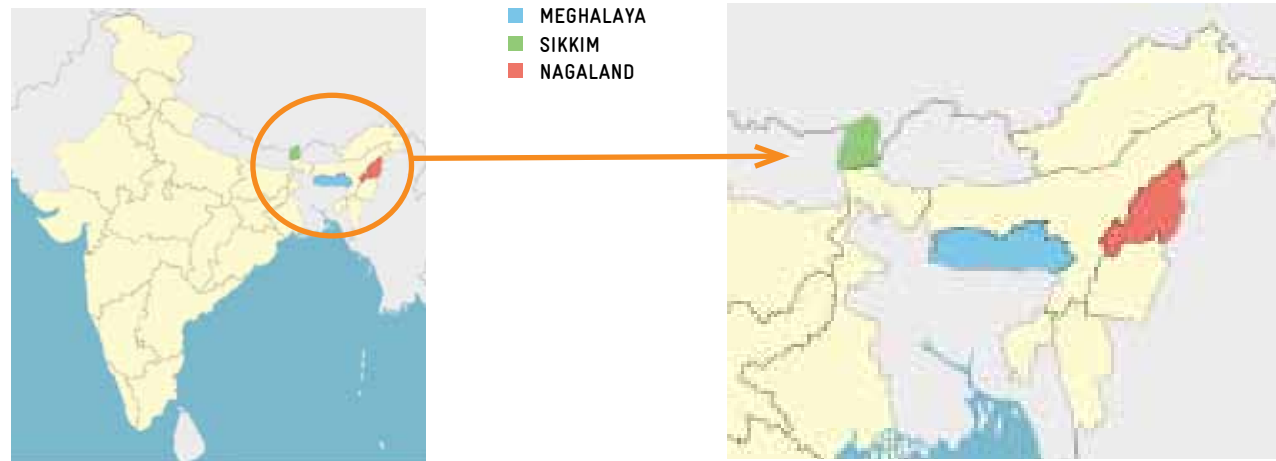
biggest challenges of all. This especially applies to the North Eastern Region (NER) of India, where most communities rely predominantly on natural resources for their livelihood. With the metamorphosis of the way things were, traditional knowledge is now faced with the challenge of adjusting to a new way of living, of understanding and reworking these relationships and incorporating the new vocabulary and language of climate change into their own practice.

We can't stop climate change, but we can identify the probable changes with which we would have to adapt. It is important to adapt livelihood patterns in such a way that the common man is not taken for a shock when the effects of climate change are being felt by the people. Though we may not be able to stop climate change, we can always be prepared to face it, increase capabilities of the people to know these effects and how best to cope with them.



● Burning of forests for cultivation in Nagaland

CCA-NER PROGRAM AREAS IN INDIA



MEGHALAYA



GIZ FOCUS AREAS

- Community Forest Management in Mawlyngbna
- Water Resource Management and Land Use Modeling at Uiam Lake
- Silk in Meghalaya

SIKKIM



GIZ FOCUS AREAS

- Mapping, Modeling and Management Guidelines for Oak Forests
- Disaster Preparedness Plan as a safeguard from possible GLOF in northern Sikkim
- Preparation of Village Water Security Plans in Tendong Hills

NAGALAND

GIZ FOCUS AREAS

- Promotion of local rice and seed sharing Tsiese Basa, Sakraba, Longkok and Yonglang
- Integrated Water Resource Management in Tsiese Basa and Kohima



The boundaries depicted in the maps are only indicative and not necessarily accurate.

POLICY FRAMEWORK

The State Action Plans on Climate Change (SAPCC)

The Government of India directed the Union Ministry of Environment and Forests (MoEF) to assist all Indian states to develop State Action Plans on Climate Change (SAPCC) in line with the objectives on various issues highlighted by the National Action Plan on Climate Change (NAPCC).

Since 2011, the organisation 'GIZ' GmbH has provided technical support to as many as 16 Indian state governments, including the eight states of the North Eastern Region, to design their respective State Action Plans on Climate Change.

These SAPCCs address state-

specific concerns of vulnerable sectors and communities in the context of climate change. In addition, CCA-NER provides technical support to implement the SAPCCs and to establish a monitoring and evaluation system to measure the implementation process of the respective SAPCCs.



● CCA-NER training program with silk weavers, Meghalaya

Strengthening of Meghalaya Draft Water Policy

CCA-NER, at the request of the Government of Meghalaya has been involved in reviewing the existing Meghalaya Water Policy. This is done by strengthening water resource management in close cooperation with relevant water institutions and the Planning Department of Meghalaya. The need to review the Water Policy stems from the fact that various factors such as unplanned management, unregulated waste water treatment in the areas of industries and mining, lack of regulation, multiple and competing uses of water etc are recognized as having a direct bearing on the water sector as a whole.

Recognition of the reality that water is scarce, calls for professional water management. Mechanisms that take into consideration the impact of climate change on water resource availability are equally important. The mandate of an Integrated Water Policy must be based on principles of integrated water resources management. This approach calls for sector strategies

for water resources management, reorganizing distribution of these sources into urban and rural target areas as a next step. An intervention by GIZ that reflects this approach, is the cleaning up of the Umiam Lake in an effort to secure water sources.



Disaster Preparedness Management Plan, Sikkim

Climate change has had a significant impact on the glaciers of the State of Sikkim. Climate change causes complex reactions in glaciers and its effects are being manifested in the form of increasing de-glaciations, changes in rainfall patterns and climate change ultimately contributes to the observable retreat of the Himalayan glaciers.

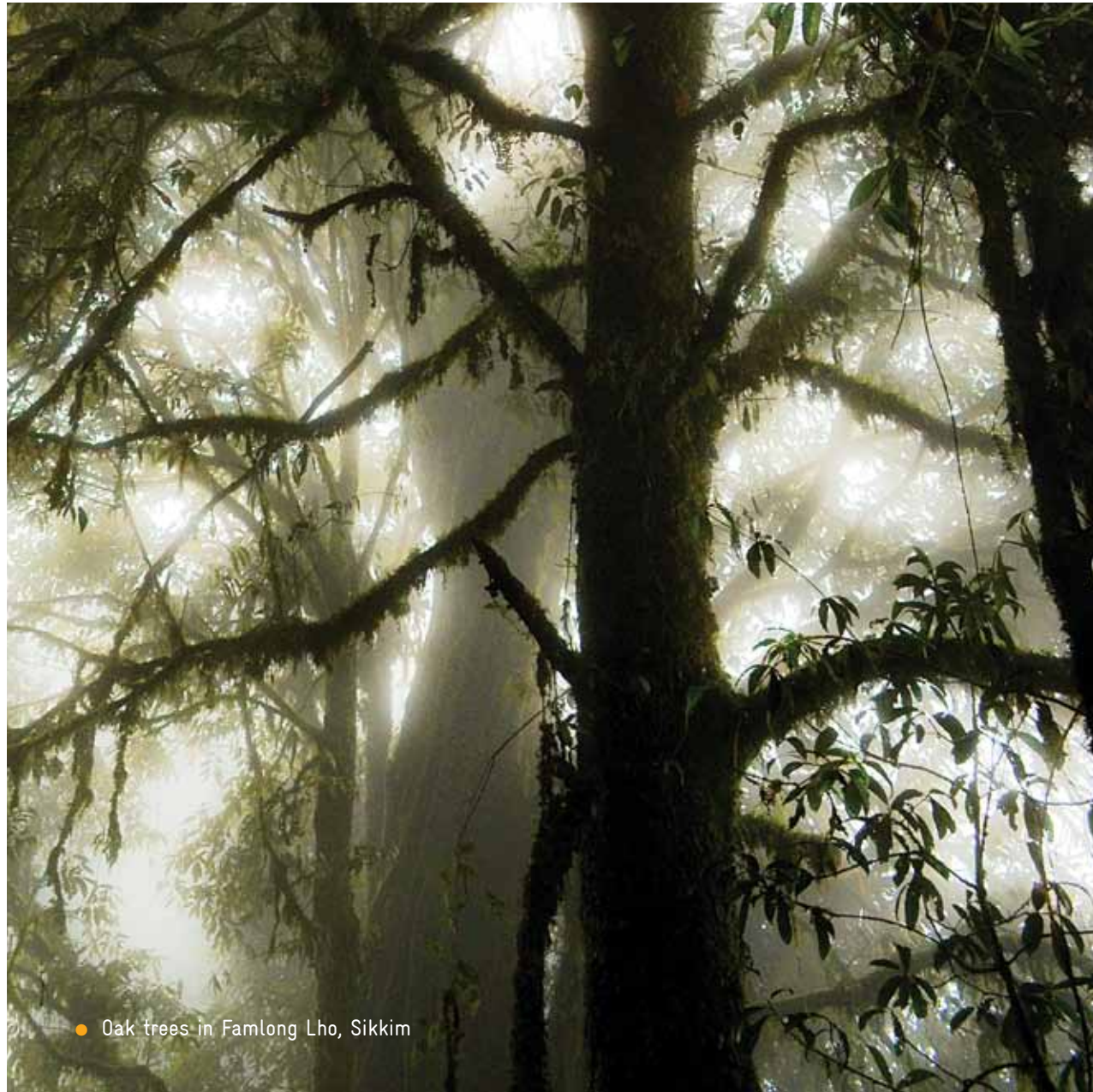
Recent studies show that the South Lhonak Lake has been growing tremendously in size for

the past 40 years and has a potential to form a Glacier Lake Outburst Flood (GLOF) in the near future. The GLOF in Thangu Valley Lake and South Lhonak Lake may be a cause of disaster for half of the population of Sikkim, as several towns and villages in Sikkim fall under the danger zones of these lakes including hydropower projects downstream on the Teesta river of Sikkim.

Therefore, the CCA-NER program has been requested with

high urgency, by the Department of Science and Technology in Sikkim, to support disaster preparedness management and mitigation plans and build-up of capacities at local and departmental levels.

The preparedness, management and mitigation plans shall act as safeguards from possible GLOF by classifying the vulnerability areas/groups in the downstream of the lakes and devising rescue and relief strategies in the event of flood.



● Oak trees in Famlong Lho, Sikkim

FOREST MANAGEMENT

Guidelines for Oak Forests, Sikkim

Each oak tree is an ecosystem, a microcosm of the forest in itself, with many different species in its immediate surroundings. Lichen, Moss, and Epiphytes cling on to the trunks, as squirrels, insects and birds dwell in the elevations of these old trees.

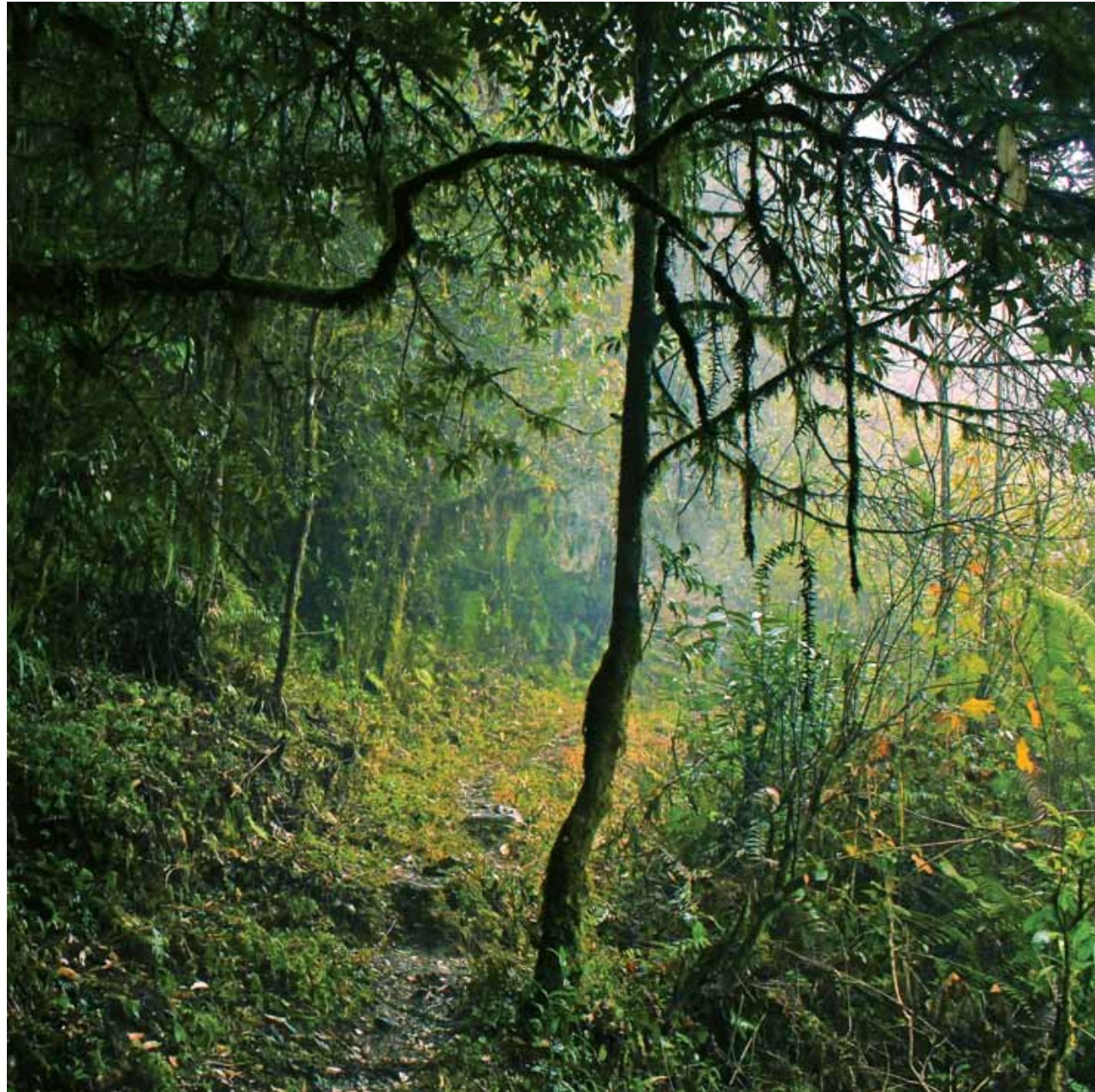
Oak forests are predominant in Sikkim and of high importance for ground water recharge, erosion prevention and for supply of local

people with forest products. However, large parts of the forests are in poor condition and are degraded due to poor natural regeneration. Reasons are multifold but climate change has a large part to play. Other factors such as overaged forests, poor canopy closure and dominating middle story thicket namely bamboo are the result of the degradation process.

In cooperation with the Forest Department of Sikkim, CCANER will facilitate sustainable oak forest management by facilitating a sound mapping of oak forests and their degradation status, models of the impact of climate change on oak species distribution under different scenarios and finally by developing guidelines on oak forest regeneration.



● Secondary growths are threats to old forests



Community Forest Management in Mawlyngbna, Meghalaya

In 2012 CCA-NER established a scientific network with leading research institutes in India and Germany. The Albert-Ludwigs University of Freiburg (Germany), TERI University (Delhi), and the North Eastern Hill University (Shillong) collaborated to bring three students to carry out research in Meghalaya's East Khasi Hills. Under the umbrella project 'Land-use related biodiversity in India', initiated by the German Academic Exchange Service (DAAD), the students seek to conduct case studies on the impact of institutional arrangements and the resulting forest-use schemes on biodiversity and medicinal plants in community forests. The selected village for the case study, Mawlyngbna, is approximately 75



kms from Shillong. It is situated on a south-facing slope just 15 kms from the Bangladesh border and is closely clustered with three other villages. Due to its patches of comparably well preserved

forests, and its number of unique natural features, Mawlyngbna was selected as a 'model village' with exemplary development efforts jointly implemented with the Government of Meghalaya.

The Student Study Aims

- to know the composition and structure in forests under two different management schemes
- to understand the link between the local institutional arrangements and forest degradation as well as forest preservation
- to link the abundance and population structure of species with medicinal purpose in forests.

Biodiversity and Cultural Significance at Kabi Lungchok Sacred Preserves

As a result of a GIZ initiated study on sacred forests in Sikkim and intensive consultations with Rural Management & Development Department (RMDD), Government of Sikkim, the forest of Kabi Lungchok was selected to be meliorated and re-evaluated.

Kabi Lungchok is a historic site of significance, which is located 17 kms north of the capital

city, Gangtok, on the Northern Highway of Sikkim. The historicity of the site is attributed to the fact that the Lepchas, the ethnic tribe of Sikkim and the Bhutias, ethnic Tibetans who immigrated from Tibet and settled down in Sikkim from the 14th century onwards, ceremonially signed a “Treaty of Blood Brotherhood” at Kabi Lungchok in 1268 AD and

the patch of forest was declared as “sacred”.

The essential idea is to upgrade the attractiveness of the forest by creating an Orchid Sanctuary or Orchid Shangrila. Accompanying measures such as participatory approach with nearby villages, mapping activities, renovation of footpaths etc. are in progress.



● A sacred site in the forests of Kabi Lungchok



WATER MANAGEMENT

Uiam Water Resource Management and Land-use Modeling, Meghalaya

Meghalaya in the past years has experienced a continuous economic growth which has not been supported by institutional governance of its state water resources. At present the water resources management implemented in Meghalaya is in its early stage within the Meghalaya Basin Development Authority.

It requires structured knowledge based enhancements to meet the objects of missions defined in the Government of India National Action Plan for Climate Change (NAPCC, 2008) and the Meghalaya SAPCC.

With the support of CCA-NER, the Government of Meghalaya with the Meghalaya

Basin Development Authority, line departments and the North Eastern Hill University (NEHU), Shillong started a partnership with the Friedrich Schiller University of Jena and various organizations from Germany. The major objective is to develop and implement a knowledge database management system and an integrated land

and water resources management system (ILWRMS) for the Uiam River Basin and its tributaries.

The project will support the development and implementation of a consolidated and innovative integrated land and water resources management of the Uiam River Basin and its tributaries in Meghalaya that accounts for

environmental concerns with respect to water resources related ecosystem functions, ecosystem services, and climate change. The project contributes also to the SAPCC and will be a core element for water management activities allowing to model available water quantities and demand. The Knowledge Management Centre

(KMC), to be established by the Government of Meghalaya in cooperation with CCA-NER, will provide and disseminate information on management of waste water and land-use management, reduction of erosion and water resources availability for planning hydropower management.



Preparation of Village Water Security Plans in Tendong Hills, Sikkim

A hydrological study to kick-start the process of development of Village Water Security Plans (VWSP) has been commissioned by CCA-NER. The VWSPs, are envisaged to be based on comprehensive hydrological potential analysis of the watersheds of the Tendong Hills and the base flow of perennial streams originating from

it. On the basis of the outcome of the study, the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) program now contributes towards the natural resource management measures using a spring-shed approach for increasing perennial flows in drought areas around Tendong. Alongside this baseline

study a vulnerability study in one of the most drought affected blocks had been done. The modeling highlights the past, present and future trends regarding this issue. The hydrological mapping, the vulnerability study and the preparation of the VWSPs are being conducted with the participation of the villagers of these areas.





LIVELIHOOD IMPROVEMENT

Promotion of Local Rice – Marketing and Seed Exchange Initiative, Nagaland

In Nagaland, CCA NER is in the process of introducing a Rice Seed Exchange Initiative among farmers from four districts of Nagaland. This initiative is collaboratively carried out between the CCA-NER program of GIZ and Nagaland Empowerment of People through Economic Development (NEPED).

The aim of this particular initiative is to distribute a larger number of rice varieties among the farmers. By bringing communities who may usually grow only two/three varieties as major crops together, farmers now have the choice to test an extra ten traditional varieties from other villages participating in the seed exchange test run. The emphasis on traditional rice varieties in this project is due to the fact that they are less water-intensive and provide better nutritional value thereby preferable in the process of achieving food security. The seed exchange will enable farmers to stabilize and increase their rice yields on the one hand – and to

particularly enhance their adaptive capacities in the context of higher climate variability on the other. The seed exchange support is safeguarded by the marketing of local rice varieties. Four villages, namely Yonglang village in Mon District, Longkok in Kiphre District, Sakraba in Phek District, and Tsiese Basa in Kohima District have been chosen to take part in the pilot. These villages have been selected on the basis of their distinctive geographical features,

dissimilar amounts of rainfall and their parallel cultivation of jhum and wet rice. As a start-off activity, rice varieties from all four villages have been collected during field visits. The field work is jointly carried out between NEPED, CCA-NER and extension workers from the line departments. Efforts to include technical expertise of the State Agricultural Research Station (SARS) to ensure sustainability of the initiative are being worked out.



● Individual granaries can be seed banks for the community

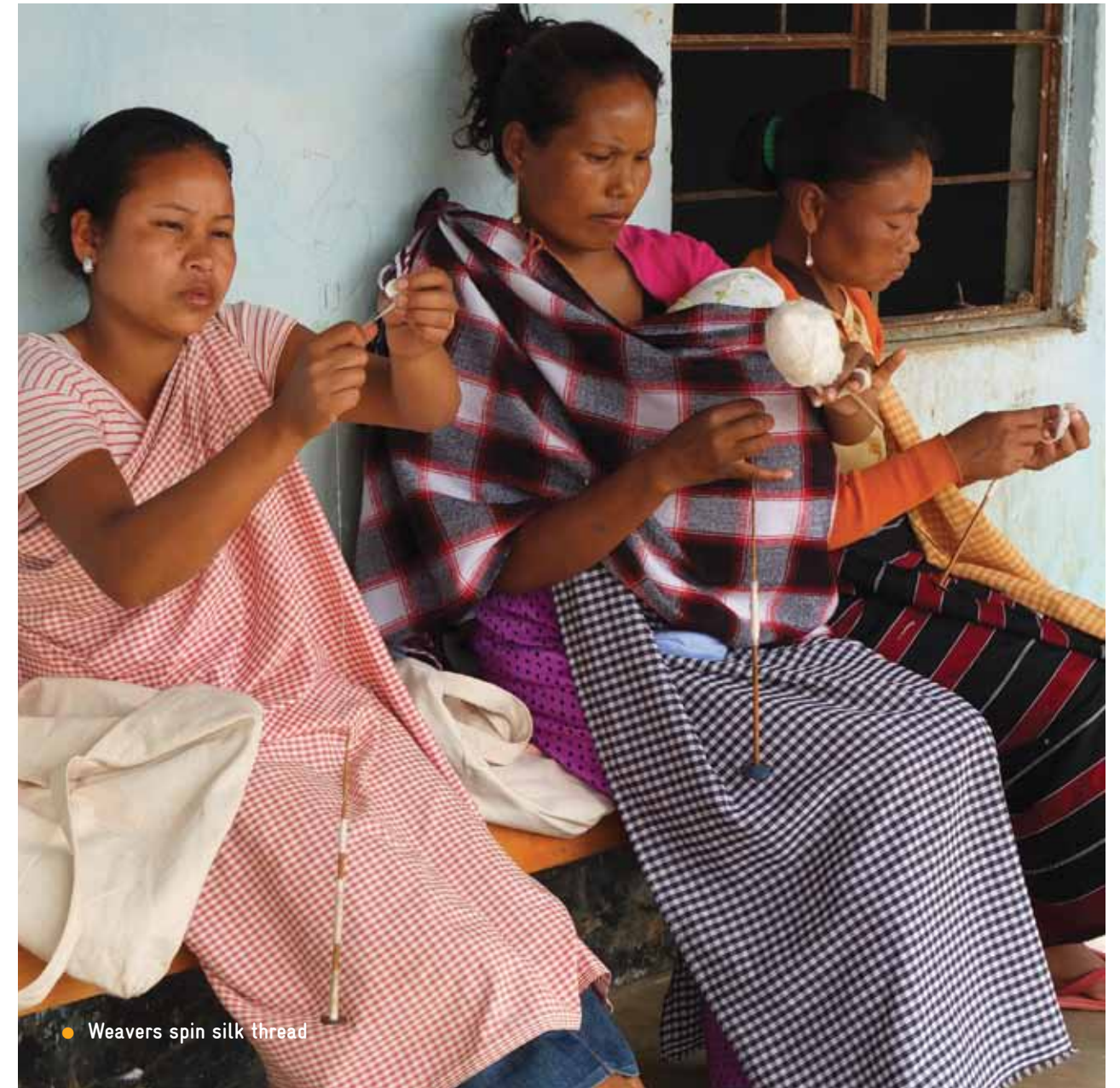


Silk in Meghalaya – Slow Fashion

Sericulture and weaving are important cottage-based industries in rural areas of Meghalaya, involving more than 30,000 families. Silk activity in Meghalaya is mainly based on traditional practices and is eco-friendly. Apart from very small proportions of Muga, Eri silk is the only silk fully processed within the state, from rearing to the finished product.

The objective of the Silk Project is to work along with the Government bodies of Meghalaya as key partners to enhance their strategies and plans towards climate change adaptation along the silk value chain. To be in line with the “slow fashion” way of thinking, the focus is on using both traditional and improved methods, thus preserving old eco-friendly techniques while encouraging use of improved equipment to make simple and timeless designs. In line with CCA-NER program objectives to create climate resilience in rural areas, protect natural resources and support inclusive social economic growth, the main objective is on securing livelihoods and providing economic security in the backdrop of climate change.

CCA-NER along with the Department of Sericulture and Weaving, Meghalaya conducted a ten-day training program in February 2013 to help enhance the traditional technique of spinning and weaving of Silk.



● Weavers spin silk thread

Trout Farming, Meghalaya

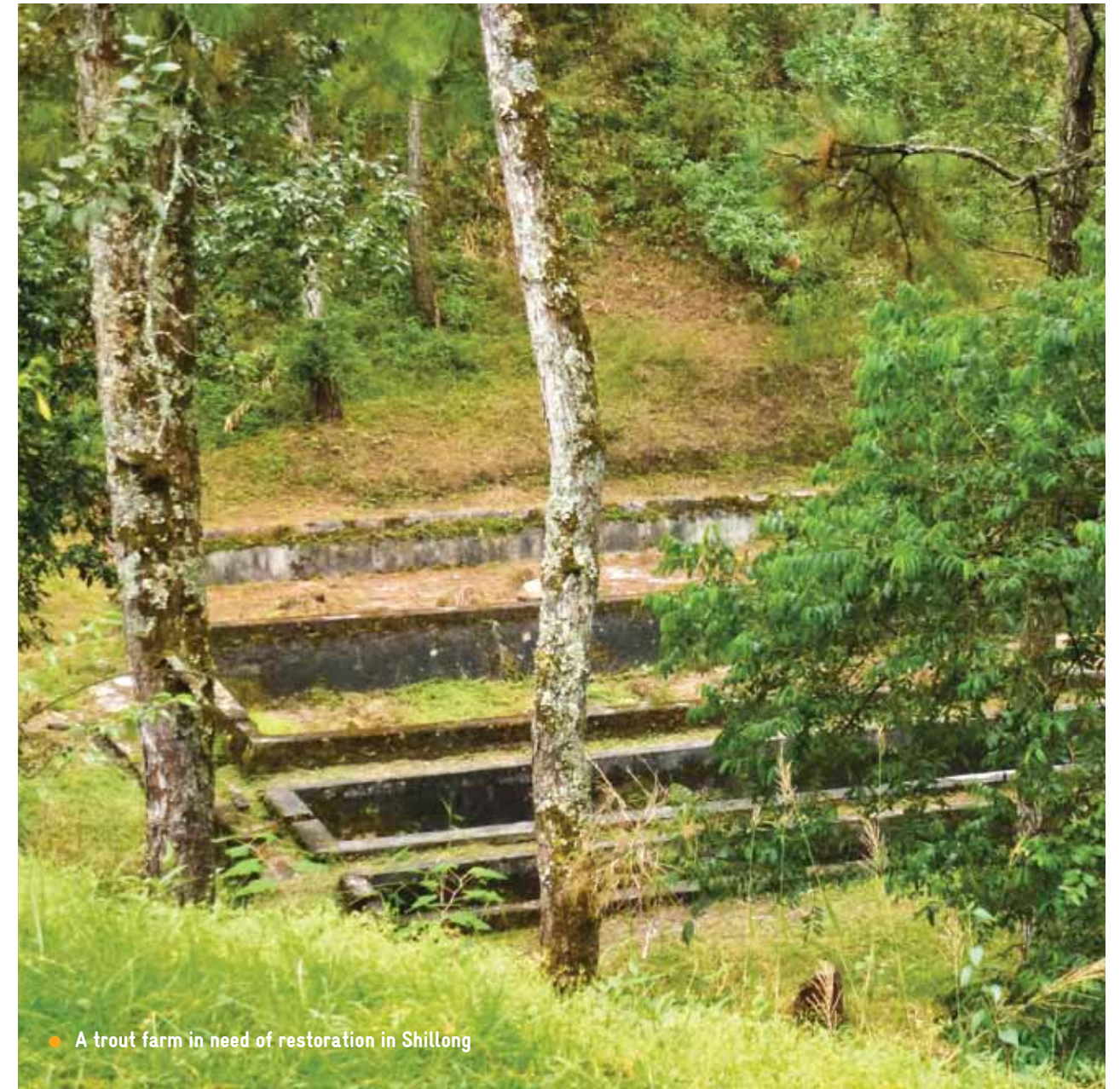
In the State of Meghalaya, it is estimated that about 30% of the total land area of 22,429 sq. kms lends itself for the development of fisheries. Against this backdrop, climate change has emerged as one of the most serious threats to the development of fisheries in the state. Changes in climate in recent years has resulted in heavy unprecedented rainfall during the monsoon which causes flash floods.

In the past, the Government of Meghalaya has taken steps to popularize trout farming in the State. However, due to the pollution of water sources along the stretch of streams and river bodies, this initiative has been rendered unsustainable.

Cooperation with the Department of Fisheries, Government of Meghalaya has been initiated to rehabilitate the trout farm with an attempt to showcase steps that are

required to address conservation of water sources and water catchment areas that feed into fish farms, resource use governance, and technological inputs required to translate trout farming into a viable green value chain.

A technically sound management plan with clearly defined interventions to ensure rehabilitation of water supply system to the fish farm, introduction of a sustainable hatchery system and marketing strategy to translate the farming into a value enterprise has been prepared. Efforts are presently underway to rehabilitate the water supply system and renovate the existing infrastructure within the fish farm, undertaken in close cooperation with experts from the Fisheries Department.



CAPACITY DEVELOPMENT

Center for Knowledge Management on Natural Resources & Climate Change

The State Action Plan on Climate Change of the Government of Meghalaya highlights the problem of the limited and /or fragmented knowledge related to climate change that is available at the state level as an important cross cutting issue. To improve the situation, the

creation of a database for baseline studies, modelling and monitoring is recommended. Moreover, the database can be used to share relevant information with target groups such as villagers, district councils, planning authorities, governmental institutions and

others. Generated information and knowledge could be made accessible via web portals and other communication channels.

A first stakeholder consultation workshop to outline a “Knowledge Centre for Natural Resource Management and Climate Change” was held in September 2012. With about 30 participants the workshop was well attended. Since then notable progress was made. A first project on the assessment of climate and land-use change impacts on land and water resources in the Uiam River Basin was kicked off in cooperation with University of Jena (Germany) and local research institutions. The newly founded Knowledge Centre will be a part of the State Institute for Natural Resources within the legal framework of the Basin Development Program. Once the Centre is operational and gaining experience, it is envisaged that it will be up-scaled to a Regional Centre for all states in North Eastern India.



● Traditional weavers interact with experts in Meghalaya

Coping With Change

Climate Change Adaptation in the North Eastern Region of India (CCA-NER) Program

Through the Climate Change Adaptation Program in the North Eastern Region of India [CCA-NER], GIZ collaborates with and supports the Governments of the states of Sikkim, Meghalaya and Nagaland to design strategies that address issues of climate change, create opportunities for knowledge management on natural resources and increase the adaptive capacities of people in the face of climate change.

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In Gratitude

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