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DEUTSCHE ZUSAMMENARBEIT

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2030 AGENDA

GIZ WE WORK TO SHAPE A FUTURE WORTH LIVING AROUND THE WORLD

Environment, Climate Change and Biodiversity

Supporting Indian Partners in Achieving the SDG's

The UN Summit held on 25th September 2015 in New York adopted the 2030 Agenda for sustainable development that replaced eight Millennium Development Goals (MDGs) with seventeen Sustainable Development Goals (SDGs), including 169 specific targets. The 2030 Agenda broadens the MDG based development cooperation into international cooperation, and provides national and international policy guidance for sustainable development.

The German Government considers the 2030 Agenda as an overarching framework for sustainable development that is to be implemented at three levels:

(1) in Germany

(2) in partner countries and

(3) globally

^ *Source: United Nations Sustainable Development Goals*

by shaping international processes. As a provider of international cooperation services for sustainable development and international education work, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is actively supporting the German Government in the implementation of the 2030 Agenda in developing countries, emerging economies and industrialised nations. GIZ is an enterprise of the government of the Federal Republic of Germany, and has over 50 years of experience in a wide range of areas, including economic development, employment generation, environmental protection, gender, energy, peace building and governance. Its diverse expertise is in demand around the globe – from the German Government, institutions of the European Union and the United Nations, the private sector and governments of other countries – all benefiting from its services.

In India, GIZ has been working jointly with partners for sustainable economic, ecological and social development over the last 50 years. The German Federal Ministry for Economic Cooperation and Development (BMZ), the German Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety (BMUB) as well as the German Federal Ministry for Economic Affairs and Energy (BMWi) are the main commissioning parties of GIZ in India. Other clients include the Indian public and private sector, the European Union and charitable foundations.

GIZ has been working jointly with partners for sustainable economic, ecological and social development over the last 50 years

One of the priority areas of the Indo-German cooperation is the environment. It has been established to respond to various development challenges through innovative projects. On behalf of the German Federal Government, the priority area environment assists its partners to implement projects in four areas:

(1) climate change mitigation and adaptation

(2) agricultural development

(3) natural resource management and

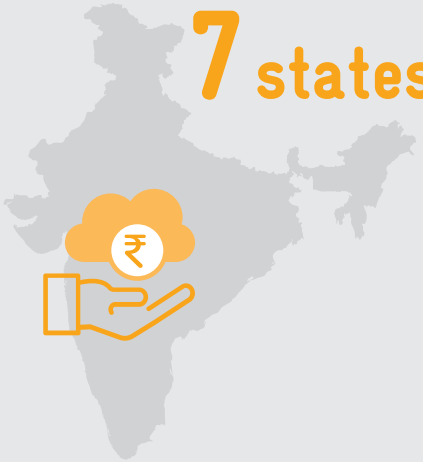
(4) biodiversity

The priority area environment consists of 13 ongoing projects, which are supporting India's commitment in achieving 12 out of 17 SDGs and 46 out of 169 targets.

1. Climate Change Adaptation and Mitigation

India's vulnerability to climate change is profound: The rural population, consisting of around 700 million people is directly dependent on climate-sensitive sectors such as agriculture, forests, fisheries and natural resources like water, mangroves and grasslands. Indian scientists are increasingly reporting on erratic monsoon rains, with more frequent and intense extreme events such as drought, cyclones and floods. In 2015, fifteen states in India were affected by droughts and floods, causing an estimated economic loss of EUR 2.8 billion (approx. 21,000 crores INR). In 2017, 235 districts were facing drought, with a monsoon shortfall of at least 20%, while cities such as Bengaluru and Mumbai were flooded by up to 30% of their annual rainfall average in a single day.

In India, GIZ supports national and state governments to increase their adaptation capacities and implement mitigation actions to tackle climate change. By adopting a multi-level approach, the priority area environment provides policy advice to the Ministry of Environment, Forests and Climate Change (MoEFCC) in implementing India's Nationally Determined Contributions (NDC) and supports mainstreaming climate change adaptation at the national, state and local level. GIZ supports policy makers and the private sector to enhance their capacities to use existing and emerging carbon markets and climate finance instruments for climate change mitigation.



7 states with support of GIZ implement projects worth

EUR 19.6 MILLION
(approx. 147 crores INR)

Funded by National Adaptation Fund for Climate Change (NAFCC)

The projects target approx.

45,000
beneficiaries

Projected emission reductions for 2018–2030 are approx.

183.5 m. tCO_2e
(Nationally Appropriate Mitigation Actions (NAMA) waste)
and between

5 and 27 m. tCO_2e
(Nationally Appropriate Mitigation Actions (NAMA) forest)

Capacity development of more than **10,000** project developers in Global Carbon Market

1,000
projects supported in accessing carbon market finance and approval

2. Natural Resource Management

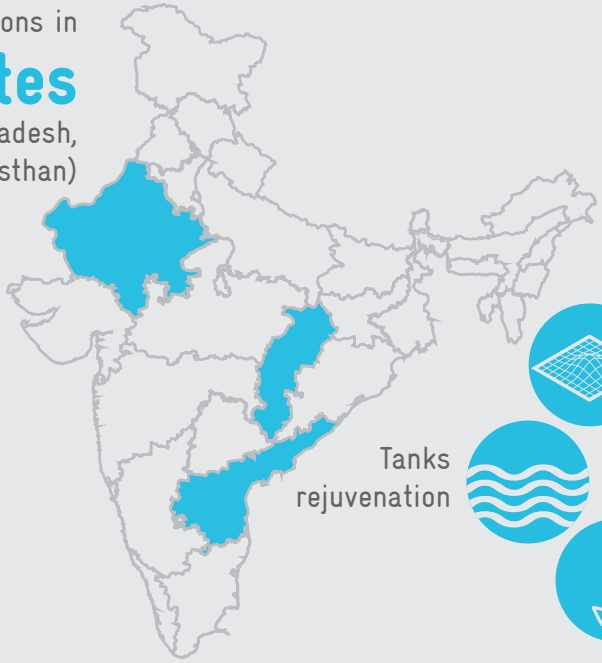
India's economy is still intrinsically linked to its vast natural resource base, which makes the country vulnerable to climate change. 700 million Indians (53% of total population) living in rural areas, are dependent on forestry, fishery and agriculture. This adversely led to degradation of natural resources in over 44% of India's land area. Groundwater resources are at a critical level and about 15% of the country's groundwater tables are overexploited with 54% wells showing heavy decline in level.

To facilitate sustainable climate-resilient management of natural resources, GIZ supports one of the largest employment generation programmes – the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). It does so through innovative Natural Resource Management approaches such as Geographical Information System (GIS) assisted planning, rejuvenation of irrigation tanks or afforestation of hillocks. GIZ supports the National Bank for Agriculture and Rural Development (NABARD) to expand its Green and Climate Finance Portfolio, and shift from the traditional approach of implementing development projects by means of grants and subsidies to innovative blended financing of loan and grant.

Interventions in

3 states

(Andhra Pradesh, Chhattisgarh, Rajasthan)



Geographical Information System (GIS) assisted planning

Tanks rejuvenation

Hills afforestation

330

projects

worth

EUR 80 MILLION

(600 crores INR)

3,30,000

BENEFICIARIES

(40% women)

in 22 states average income increase up to

30%

3. Agriculture

Half of the Indian workforce depends on agriculture for their livelihoods and food security. One third of land (96.4 million ha) is hit by desertification or degradation, including 36.1 million ha affected by water erosion and 18.23 million ha by wind erosion. Agriculture is becoming less lucrative for young people due to its low wage rate, decreasing productivity and increasing input costs leading to low profits. It results in rural-urban migration and ageing of the agricultural labour force.

GIZ supports NABARD and the Ministry of Agriculture (MoA) to double farmers' income by mobilising smallholders in Farmer Producer Organisations (FPOs) and introducing agricultural innovations along with value chains for tomatoes and potatoes. GIZ contributes to India's crop insurance scheme Pradhan Mantri Fasal Bima Yojana with innovative digital solutions for crop monitoring. By improving farmers' land management practices, it supports the National Mission for Sustainable Agriculture.

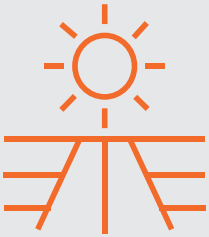
15 FARMER PRODUCER COMPANIES registered

Training of **25,954** smallholder farmers on sustainable agriculture practices

11 INNOVATION FARMS founded

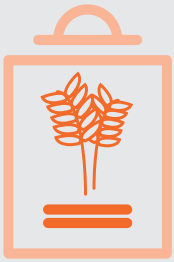
SOIL REHABILITATION of **35,000 ha**

GENERAL YIELD INCREASE of **34%** on average



Total area monitored **8 m. ha** (size of Austria)

Total rice area covered **1 m. ha** (size of Cyprus)



22,547 farmers received CROP INSURANCE PAYOUT in 2016

4. Biodiversity

India is one of 17 mega diverse countries. With just 2.4% of the world's land area, India's biological richness includes a vast range of habitats and ecosystems supporting 7% of all globally recorded species, including over 45,000 species of plants and 91,000 species of animals. Protecting biodiversity is a national priority as it is linked to water, food and livelihood security of hundreds of millions of people. It is in recognition of the relevance of biodiversity and its inter-linkages with the livelihood of people, that the Government of India has been working towards mainstreaming biodiversity into development.

GIZ supports public and private actors in applying economic approaches for the conservation and sustainable use of biological diversity to support livelihoods for future generations. It works in the fields of Forest Ecosystem Services, Business and Biodiversity, Access and Benefit Sharing, Coastal and Marine Protection and Human-Wildlife Conflict Mitigation.

26 INDIAN COMPANIES

with an annual turnover of

EUR 80 billion

joined the **India Business and Biodiversity Initiative (IBBI)**

The "National Policy on Marine Fisheries 2017 " has set **"mainstreaming biodiversity conservation in production processes"** at the core of the new policy

Wetlands (Conservation and Management) Rules 2017 will impact

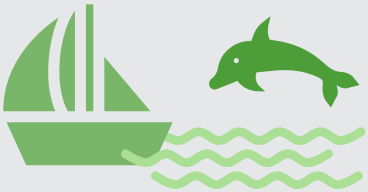
2,00,000

WETLANDS

across India

EUR 4 million

allocated to Chilika Lake Development Authority by the Odisha Government



Thane Creek Flamingo Sanctuary and

1,436 ha of

mangroves as reserved forests notified by Maharashtra Government

Umbrella Programme for Natural Resource Management (UPNRM)

1 NO POVERTY

With its 330 projects, UPNRM created livelihood opportunities for more than 3,00,000 beneficiaries and increased their incomes by 30%

Transforming Lives of Sugarcane Farmers

The Sustainable Sugarcane Initiative and drip irrigation system for cultivation

Even though sugarcane plays a major role in the state economies of Uttar Pradesh, Maharashtra and Tamil Nadu, its cultivation has been facing serious challenges such as inadequate irrigation facilities, non-availability of easy credit access and high labour costs. The lack of proper water management has led to both scarcity and wastage of water during irrigation.

With support of the UPNRM project, farmers in Kolhapur, Maharashtra were introduced to the Sustainable Sugarcane Initiative (SSI) under the supervision of Shree Datta Sugar Cooperative. The initiative provided farmers with a method of sugarcane production that involves improved cultivation practices, optimum utilisation of land, intercropping and drip irrigation. Farmer Dayanand Patil cultivated sugarcane in a conventional way using flood irrigation. However, the training on SSI by the sugar factory, along with financial assistance for drip irrigation has completely changed his perspective,

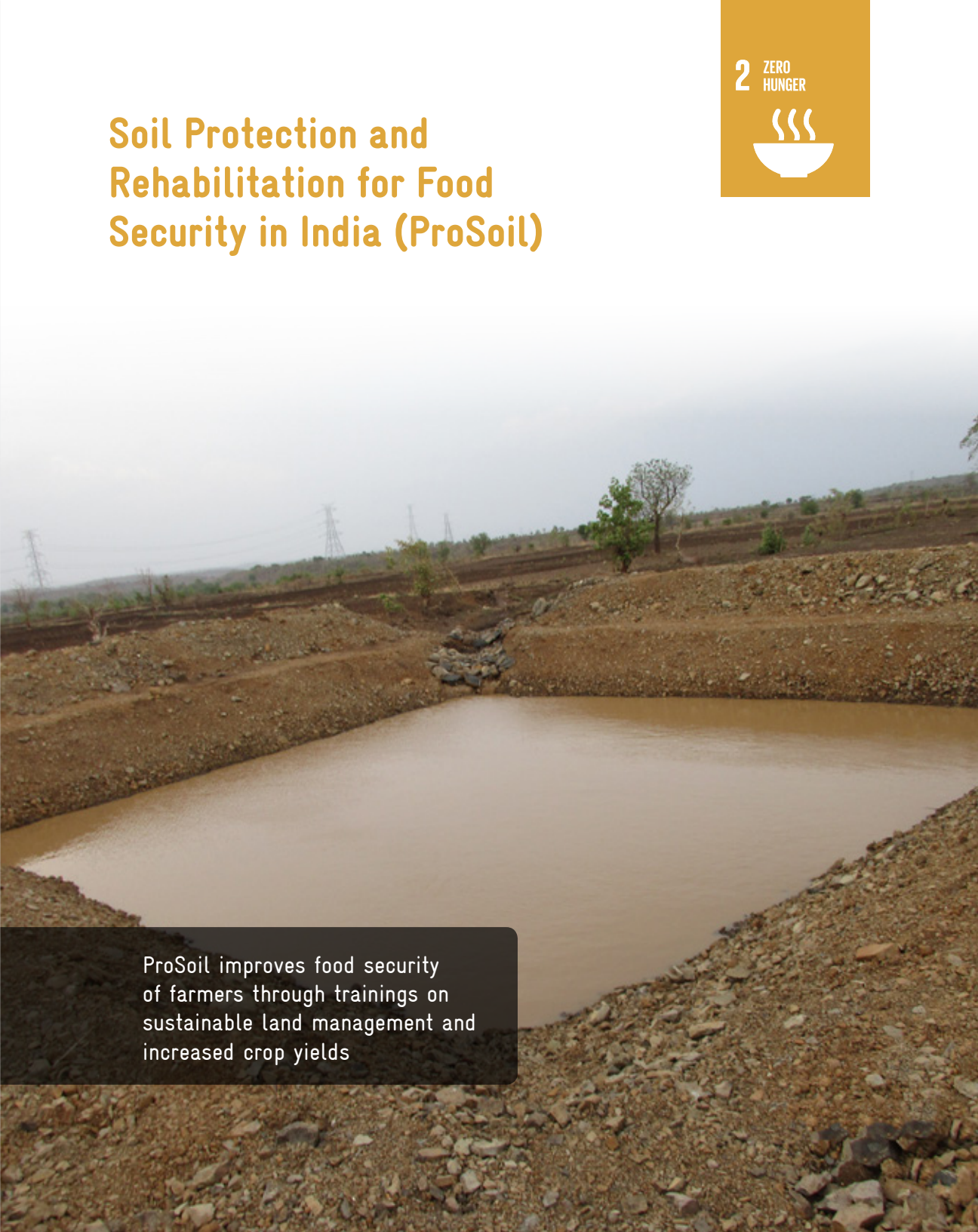
> **"Although I was aware of the efficacy of drip irrigation, I did not have the financial resources for it. I am now getting the needed support for my two acres farmland and technical guidance for practicing sustainable sugarcane cultivation."**

SSI farmers have been able to reduce water usage by 40% and seed quantity by 77%, along with an increase in profit.

UPNRM addresses the livelihood necessities of the rural population through innovative blended financing of loan and grant. The programme is implemented by the National Bank for Agriculture and Rural Development (NABARD) in collaboration with KfW Development Bank and GIZ. UPNRM marks a paradigm shift from the traditional approach of implementing development projects, primarily by means of grants and subsidies to credit. Core sectors of the programme are soil and water conservation, plantation and horticulture, forestry and farming. 57% of UPNRM's beneficiaries live below the poverty line. 40% of the project's target group are women.

Soil Protection and Rehabilitation for Food Security in India (ProSoil)

2 ZERO HUNGER



ProSoil improves food security of farmers through trainings on sustainable land management and increased crop yields

Increasing Food Security through Improved Water Management

A farm pond to empower women

Parvatabai Bhoja Rathod, a resident of Dadpapur village in Ralegaon block of Maharashtra, lost her husband a few years ago. All the responsibilities fell on her shoulders, and she had no choice but to take up the role of a farmer. Scanty rains and lack of irrigation facilities added to her woes. Parvatabai said,

> "I have to make the best of my situation and my resources. I have to figure out a way, I told myself."

The widow then decided to participate in the village committee meetings where joint measures for improved farming were discussed.

In Parvatabai's case, the Village Watershed Committee decided that a pond on her farm would help her and other famers in irrigation and recharge of the wells downstream. Cotton is the main Kharif (monsoon season) crop of the region but production is usually sub-optimal due to scarce rainfall. With the secure irrigation farm pond provided, the widow was able to produce six quintals of cotton compared to four quintals in the previous Kharif season. In Rabi (winter) season, she is now able to sow wheat and eggplant in her farm of one acre, which was otherwise barren due to unavailability of water.

> "With the water from my farm pond, I am now able to grow three crops a year instead of one, and have enough food for my family,"

says Parvatabai. Together with 129 village committees in Maharashtra and Madhya Pradesh, ProSoil promotes resilient agricultural practices. To improve the capacities of smallholder farmers for sustainable land management, the project trains them on vermicomposting, organic fertilisers, importance of soil testing and soil health. Through the pilot project's interventions such as efficient water management as well as improved nutrient and disease management, crop yield potential of rice, soybean, wheat and pigeon pea has increased on an average by 34% in the project area in 2016.

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

5 GENDER EQUALITY

Climate Change Adaptation in the North Eastern Region (CCA-NER) empowers women to increase their income and improve their social status

Weaving to Empower

Technology and skill upgradation in the handloom sector in Meghalaya

Cultivation of silkworms to produce silk (sericulture) and weaving are important cottage based industries in rural areas of Meghalaya. Sericulture and weaving, particularly the eri silk production, are effective tools for women to generate additional household income.

CCA-NER supports the development of handwoven silk products by enhancing traditional methods of production at all steps of processing and employs new technology such as the Flying8 Loom. As a result, substantial improvement in the quality of hand-spun yarn and fabric was achieved, which in turn has helped increase the sales and provided additional income. To increase the capacity of yarn production, women weavers belonging to a group called 'Seng Kynthei Pahamsyiem' in Ri Bhoi District, Meghalaya have modified and replicated some of the functions from the existing electric spinning machines and built them into a manual wooden hand spinning machine. By doing so, the weavers have ensured that they are able to spin even when electricity is not available in the village.

Mrs. Thrandar Tmung, a weaver from Ri Bhoi District, used a conventional Fly-Shuttle Loom. After completion of her training on the production process of silk and the Flying8 Loom, she says,

> "I have learned the skills of silk production from my mother and I have been practising this craft from a very young age. However, my sales were low, and it would mainly depend on key occasions and festivals. Once I got trained, I managed to improve the quality of the yarn and fabrics, expanded my production to shawls, scarves, bedsheets and bags, and enhanced my marketing skills too. My sales have now increased from 1-2 pieces to 3-7 per month and I don't even have to depend on key occasions or festivals anymore."

Earlier, women were dependent on male members of the family for financial needs. They are now becoming more self-reliant through silk handloom products. Women are able to generate an extra income of EUR 65 - 80 (INR 5,000 - 6,000) per month and contribute to the family expenses. This has given them a new sense of vigour and empowerment in the village. CCA-NER has provided training to 233 women weavers and have transformed them into master trainers.

Mahatma Gandhi National Rural Employment Guarantee Act - Environmental Benefits (MGNREGA-EB)

6 CLEAN WATER AND SANITATION

MGNREGA-EB contributes to water harvesting, conservation and management for sustainable livelihood development through MGNREGA works

Making Way for Climate-Smart Agriculture

Rejuvenation of traditional tank cascades as a means for sustainable water management

Over the last 30 years, Vizianagaram District has experienced multiple floods, cyclones and droughts. This has affected the livelihoods of communities heavily dependent on agriculture. To find a solution, the MGNREGA-EB project supported the Government of Andhra Pradesh in participatory appraisals with district communities. Appraisals, complemented by irrigation, ground water, rainfall and climate data, suggested the renovation of traditional tank cascades as the best way for water harvesting, its conservation and management.

As a result of cascade rejuvenation in the Garida and Tettangi micro sub-basins during 2015-2016, the storage capacity of both the basins improved, directly impacting agriculture of 300 farmer families. They now use the stored water for irrigation and could increase the crop productivity during 2016-2017. Reddy Venkata Laxmi Naidu, a farmer from Tettangi village, who has benefitted from the renovation of the tanks, says,

> "I own 4.5 ha of land and cultivate paddy once a year. My crop failed repeatedly, either due to lack of water for irrigation, or sometimes due to heavy rains flooding my fields. The development of tank cascades in Tettangi micro sub-basin has improved its storage capacity. The surplus water is channelled to other tanks, restricting the overflow. Now I cultivate two crops per year."

With enhanced water availability, communities are now able to diversify their activities including horticulture plantations, development of fish cultivation tanks within the renovated cascades, etc.

The model was well-received by the State Government and the Ministry of Rural Development (MoRD), and is currently being scaled up and replicated in other states. With technical support of the MGNREGA-EB project 124 tank cascades, covering the entire Champavati river basin, are being renovated. It is estimated that this measure will provide 6,500 farmer families with irrigation facilities.

7 AFFORDABLE AND CLEAN ENERGY

Development and Management of Nationally Appropriate Mitigation Actions (NAMA) in India

The Forest NAMA increases access to clean, affordable and sustainable energy for women in Assam

Better Forests, Better Lives

Community involvement in reducing deforestation and forest degradation

Annually, 200 million people collect fuelwood from India's forests. This makes fuelwood extraction a key driver of deforestation and forest degradation in the country. 4.6 million households in Assam (72%) are dependent on fuelwood for meeting their cooking energy requirements. This dependence leads to negative impacts on human well-being and natural ecosystems in the state.

To address unsustainable fuelwood extraction in Assam, the very first Nationally Appropriate Mitigation Action (NAMA) in India titled "Reducing Forest Degradation and Deforestation in Assam through Sustainable Fuelwood Management" was developed by the German Development Cooperation in collaboration with the Ministry of Environment, Forest and Climate Change (MoEFCC). The action will raise fuelwood plantations and ensure adoption of fuelwood saving technologies in a minimum of 1 million households across tea estate tribes and rural villages. Mr. Sanjay Kumar Bohra, Secretary, Tezpur Zone, Assam Branch Indian Tea Association, has high expectations,

> "Tea estate management has to provide 228 cubic feet of fuelwood to every household of the permanent tea estate worker every year. However, this is not being met due to lack of fuelwood availability. As a result, the tea gardens and the adjoining forest areas are denuding. A Forest NAMA will contribute immensely to the sustainable development of the communities that depend on fuelwood for cooking."

The adoption of fuelwood saving technologies will lead to lower indoor air pollution and reduced drudgery for fuelwood collection. One of the most significant social co-benefits of the Forest NAMA is improved health, especially of women and children in the targeted households, who are currently at risk due to inefficient and polluting cooking stoves. In addition, it will also increase productivity and quality of life owing to more time available, as compared to the long hours spent earlier on collection of fuelwood.

8 DECENT WORK AND ECONOMIC GROWTH

Green Innovation Centres for the Agriculture and Food Sector – India

The Green Innovation Centre India improves potato and tomato value chains through innovative technologies, increases agricultural productivity and incomes of smallholders, and creates new jobs

Entrepreneur Out of Passion

Akshaya Agro Engineering improving lives through innovative technologies

Soldering, welding, hammering, knocking – it is extremely noisy in the Akshaya Agro Engineering workshop; you can barely hear yourself. In the midst of all this, is junior manager Akshaya Shindhe, giving instructions and answering queries. In the workshop, potato planters are assembled and parts that cannot be bought elsewhere are produced.

Akshaya Agro Engineering is a small medium-sized agricultural machinery manufacturer in Chakan, Pune. The company designs and manufactures a semi-automatic potato planter, which is robust and easy to handle for the heavy clay soils of the region. The company currently has 11 employees and is a participant in the feasibility assessment being undertaken by the Green Innovation Centre India project. On demonstration plots, these planters compete with other manufacturers, aiming to showcase its potential and capacity. The results of these tests aid the program experts to advise farmers on the suitability of specific machines. The company also benefits from the tests and their results. Akshaya is satisfied,

> **"We expect a lot from this cooperation and plan to buy the property next door to enlarge our workshop."**

The company has sold 138 machines. The founder of Akshaya Agro Engineering has also been improving the model through adding new details such as a container for the fertiliser that includes a dosing device. With this, planting and fertilising can be done simultaneously. The new version also has a cutting device for halving large potatoes, a practice that is very common in Pune.

The Green Innovation Centre India project uses technological innovations to support small holder farmers and small medium-sized enterprises along the potato and tomato value chains to increase their annual turnover. It aims to boost incomes by 25% for 75,000 smallholders, increase productivity by 30% and create up to 1,000 new jobs.

Global Carbon Markets (GCM)

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

The Global Carbon Markets project supports policy makers and private sector to use carbon market mechanisms for more investments in green infrastructure and environmentally sound technologies

Green Infrastructure and Innovative Industrial Development

Climate change mitigation through Global Carbon Markets

Nitrous Oxide (N_2O) is a greenhouse gas with a global warming potential of 310. It is released as a by-product gas into the atmosphere during nitric acid production. Once emitted, it remains in the atmosphere for more than 100 years on an average. To reduce N_2O emissions, Gujarat Narmada Valley Fertilizers & Chemicals Ltd. (GNFC) decided to install a secondary catalyst in its ammonia oxidation reactor. This investment in an environmentally sound technology was mobilised by GNFC based on registration of the project under the Clean Development Mechanism (CDM). The training programs conducted as part of the Global Carbon Markets (GCM) project enabled GNFC to apply for CDM registration. Once the project is registered under CDM, the enterprise can sell their carbon credits or Certified Emission Reductions (CERs) to buyers worldwide. In addition to financing the installation of the reactor catalyst along with the revenue from carbon credits, GNFC allocated 2% of the revenue for development and improvement of educational facilities in Gujarat as well as development of agricultural services such as water and soil analysis, veterinary facilities, etc.

GCM provides trainings and technical support to several thousand public and private sector actors, to access carbon market opportunities. The support contributed to the development of several registered CDM projects in India. The revenue from carbon credits is used to upgrade infrastructure like green electricity generation, waste management facilities, green transport and retrofit of industries to achieve energy and resource efficiency. It creates employment opportunities in the renewable energy, energy efficiency, waste management, clean cooking and green transport sector. A Carbon Bazar, organised by the project, brings sellers and buyers of carbon credits together, which leads to further financing of green and innovative industrial development. The project is organising trainings for green start-ups so that they can benefit from the Voluntary Carbon Markets.

Alag Karo – Har Din Teen Bin

11 SUSTAINABLE CITIES AND COMMUNITIES

Alag Karo – Har Din Teen Bin supports source segregation of waste, improves working conditions in the informal sector and enhances recycling in Gurugram, Haryana

Clean Cities and Dignified Livelihoods

Source segregation of waste in Gurugram, India

Gurugram city, also known as the financial and technological hub of India's national capital region, generates 1,000 tons of municipal solid waste per day. Most of the waste is collected, mixed and dumped at various open spaces and landfill sites. The burning of waste and the greenhouse gas emissions result in serious health and environmental hazards. Waste workers, many of whom are suffering from serious health issues, live in extremely unhygienic conditions, close to the landfill areas, and make a living by collecting valuable recyclable material from waste and selling it.

As recommended by the revised Solid Waste Management Rules 2016, the 'Alag Karo' program sensitises and trains waste generators to segregate waste into three categories – wet, dry and domestic hazardous waste. The recycling and processing of waste ensures maximum resource recovery.

Waste workers' welfare is another important focus area of the project. The workers are equipped to handle segregated waste, sensitised about their plight and informed about their valuable contribution towards resource recovery and maintaining cleanliness. Prasenjeet, a waste worker in Gurugram is satisfied with the new developments in the city,

> "The Alag Karo project helps us in giving message about benefits of source segregation to waste generators. Segregated waste is good for us as it reduces our work burden, improves resource recycling and enhances our revenues."

The project is contributing towards the Indian flagship programme of Swachh Bharat Mission (Clean India Mission), which aims to clean up the streets, roads and infrastructure of Indian cities, smaller towns, and rural areas. The project is supported through the German Government's innovative Partnership Programme with the private sector (Coca-Cola India and Tetra Pak India), and is implemented by Saahas NGO. With the support of the Municipal Corporation of Gurugram, at least 20,000 households, 50 schools and 50 commercial establishments will be impacted. The project has already reached out to 200 waste workers and aims to train 500 waste workers.

Climate Change Adaptation in Rural Areas (CCA-RAI) of India

13 CLIMATE ACTION

CCA-RAI enhances the capacities of key actors at national and state levels as well as vulnerable rural communities to cope with and adapt to climate change

Up to My Neck in Water on Dried Up Fields

Ecosystem based climate proofing of watershed in Tiruvannamalai District, Tamil Nadu

Looking at the clear blue sky and his dried up fields, Mr. P. Chinnapaiyan, 65, from Tiruvannamalai District in Tamil Nadu says,

> **"The delayed onset of the Monsoon reduced my options of rain-fed farming. When the Monsoon finally arrived the intensity of the rainfall heavily eroded the top soil. We were left at the mercy of nature, resulting in decreased food production, unemployment and increased migration in our village."**

In Tamil Nadu, climate change contributes to an increased variability of rainfall, causing drought and flooding, and making extreme weather events the new 'normal'. Sudden heavy rains make it impossible for the often dried up fields to absorb the high amounts of water. It leads to high top soil erosion and siltation of ground water resources, thus decreasing ground water levels. The common practice of preparing agricultural land without erosion control contributes to further soil erosion and leaves farmers at risk.

CCA-RAI addresses this situation by providing trainings to farmers and introducing crop cultivation practices like optimal seed rate, mixed cropping and promotion of the cultivation of hardy crops such as millets. Adopting a watershed based approach further helps to enhance soil quality as well as soil moisture holding capacity. Water harvesting and construction of percolation and farm ponds increase water availability, and land fertility. Check dams aim to save the crops, and conjunctive water use helps to reduce soil salinity and hardening. Tree plantations on the slopes of field boundaries and in the ridge areas stabilise soil erosion and increase water recharge. This integrated multi-angle approach is expected to secure communities' agricultural produce and the survival of their livestock under changing climatic conditions.

Coastal and Marine Protected Area Management (CMPA)

14 LIFE BELOW WATER

CMPA supports the Indian partners to sustainably manage and protect marine and coastal ecosystems while taking into account the economic well-being of the local population

When Turtles Call for a Festival

A marine eco-tourism case from Maharashtra

The nesting of the Olive Ridley turtles on the coasts of India is a countrywide annual spectacle. Over the recent years, the audience for this event has increased manifold around these coastal belts. To protect marine ecosystems and promote local livelihoods, two small villages Velas and Anjarle in Ratnagiri District, Maharashtra are setting an example of successful marine eco-tourism in India. During the hatching season, enthusiastic villagers surround the beach with nets and baskets to dodge hungry dogs and sea gulls to protect turtle eggs. Since 2016, Anjarle village organises a turtle festival and in 2017 the festival witnessed an exemplary participation of more than 3,000 tourists boosting the local economy by about EUR 32,000 (INR 2.5 million).

To ensure sustainable marine tourism in this area, CMPA in collaboration with the local NGO Sahyadri Nisarga Mitra, supported both the villages to raise awareness on marine biodiversity conservation. Together with villagers, guidelines were developed on how to conduct the turtle festival as a designated environment day in the local language. For the village council, an outreach material on solid waste management was produced to deal with the increasing resource demand from the visitors. Nature guide trainings were also conducted to professionalise tourist guides and interactive events were organised in schools to sensitise students on marine biodiversity. However, the greatest achievement – for turtles and villagers – was the declaration of Velas and Anjarle as Biodiversity Heritage Sites.

Access and Benefit Sharing (ABS) Partnership Project

15 LIFE ON LAND

The Access and Benefit Sharing (ABS) Partnership Project ensures conservation and sustainable use of biodiversity through securing fair and equitable access and benefit sharing of biological resources

Lemongrass - More than Just a Plant

Incentivising bio-resource producers in Uttarakhand

Lemongrass (Cymbopogon citratus) is one of the important tradable bio-resources in Uttarakhand. It is a well-known cure for common cold, digestive disorders and is also used as mild astringent. Due to surging demands by the pharmaceutical industries for its essential oils, many companies have established contract farming and land lease agreements with local farmers and cultivators. In addition to the cultivation, there is a substantial wild collection of Cymbopogon citratus from the forests of Uttarakhand.

As per India's Biodiversity Act, companies that are using bio-resources for commercial purposes have the obligation to share a part of their profits with the local communities who are stewarding bio-resources. Obtaining resources for commercial purposes and sharing benefits arising from the use of biological resources is called "Access and Benefit Sharing (ABS)". Legal frameworks under the Act not only support conservation and encourage sustainable utilisation of bio-resources, but also prevent over-exploitation by the companies.

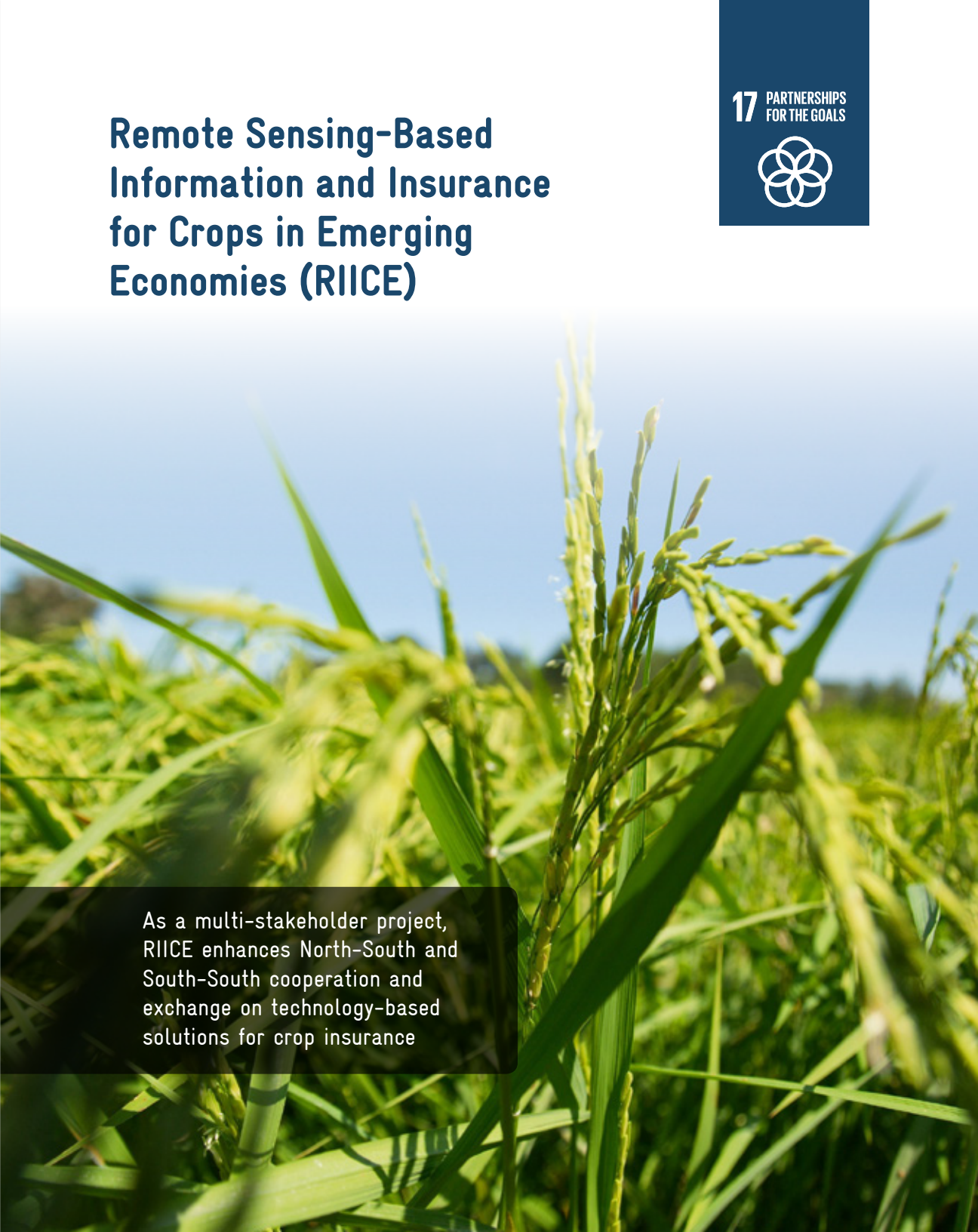
Uttarakhand Biodiversity Board is a state-level statutory institution established to implement ABS. Similarly, at the local-level, Biodiversity Management Committees (BMC) are being constituted under the Act. Dudhai BMC in Uttarakhand assisted by the State Biodiversity Board, negotiated benefit-sharing with local traders and companies accessing lemongrass and other important bio-resources, and received an amount of EUR 1,300 (INR 1,00,000) as benefit-sharing obligation from the companies. This amount is being used to develop a Navratna garden for conservation of medicinal plants in the region. Besides, they also actively participate in the forest fire mitigation and control of mining activities in the village. Mr. Rajesh Mall, President of Dudhai BMC, says,

> "The ABS paybacks from Industries and traders have improved our livelihoods. The forest fires in surrounding areas have reduced and resources collected from wild are also getting fair value. In future, we hope to be able to participate in the negotiation process with the industries as well."

Until December 2016, Uttarakhand Biodiversity Board has received more than EUR 1,30,000 (INR 10 million) as benefit sharing obligation by 15 companies. 95% of this amount will be shared with BMCs from the locations where the resources are collected from.

Remote Sensing-Based Information and Insurance for Crops in Emerging Economies (RIICE)

17 PARTNERSHIPS FOR THE GOALS



As a multi-stakeholder project, RIICE enhances North-South and South-South cooperation and exchange on technology-based solutions for crop insurance

One Small Step for the Farmer, One Giant Leap for Agriculture

Supporting rice farmers by applying remote sensing technology in crop insurance

Rice is one of the most important food crops for millions of small and marginal farmers in India. The availability of rice is equated with food security. Agriculture insurance as a means to achieve food security has shown considerable promise. However, it is beset with challenges that mostly revolve around the availability of transparent and timely information such as cultivation area and yield.

In 2017, Tamil Nadu saw the worst drought in 140 years in the Rabi (winter) season in India. RIICE measured 1 million ha sown rice area covering close to 8,00,000 farmers.

> **"This was particularly useful during the last cropping season to identify villages that had been hit by drought, and farmers benefitted from the technology by getting claims in a record time,"**

says Mr Gagandeep Singh Bedi, Agricultural Production Commissioner and Principal Secretary, Department of Agriculture, Government of Tamil Nadu. Eligible farmers started to receive claims due to prevented and/or failed sowing within three months of the harvest period (in comparison to the usual one year). Crop insurance payouts were facilitated to more than 22,000 farmers from the cluster of villages assigned to the project partner – Agriculture Insurance Company of India in Tamil Nadu.

RIICE is a Public Private Partnership between European and Asian agencies in Cambodia, India, Indonesia, Thailand, and Vietnam. It aims to reduce the vulnerability of smallholder farmers engaged in rice production by using crop insurance. RIICE technology uses satellite data to generate information like rice area statistics, mid-season rice yield forecasts and end-of season yield estimates down to the village level. This helps government decision makers, insurers, and relief organisations to better manage domestic rice production during normal growing conditions and compensations after natural catastrophes. When it comes to the application of remote sensing technology in crop insurance, the success of the ongoing pilot in Tamil Nadu has established India as a leading RIICE country. RIICE India will act as a knowledge hub in the current phase of the project, allowing other RIICE countries to replicate the successful use of technology.

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Registered offices:
Bonn and Eschborn

Friedrich-Ebert-Allee 36 + 40
53113 Bonn
Telefon: +49 228 44 60-0
Fax: +49 228 4460-17 66

Dag-Hammarskjöld-Weg 1-5
65760 Eschborn
Telefon: +49 6196 79-0
Fax: +49 6196 79-11 15

Environment, Climate Change and Biodiversity

GIZ Office New Delhi
A2/18, Safdarjung Enclave
New Delhi 110 029 India
T: +91 11 4949 5353
F : + 91 11 4949 5391
E: info@giz.de
I: www.giz.de

As at
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Responsible
Mrs. Sabine Preuss
E: nrm@giz.de

Dr. Konrad Uebelhor
E: biodiv.india@giz.de

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Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

A2/18, Safdarjung Enclave
New Delhi 110 029 India
T: +91 11 4949 5353
F : + 91 11 4949 5391
E: info@giz.de
I: www.giz.de