

Tackling Climate Change

GIZ India

giz



Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

About GIZ

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (German Technical Cooperation) changed its name to Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on 1 January 2011. It also merged with among others, InWEnt – Capacity Building International, Germany.

It is owned by the German Government and works in the field of international cooperation for sustainable development. GIZ is also engaged in international education work around the globe and currently operates in more than 130 countries worldwide.

GIZ in India

Germany has been cooperating with India by providing expertise through the organisations now forming GIZ for more than 50 years. To address India's priority of sustainable and inclusive growth, GIZ's joint efforts with the partners in India currently focus on the following areas:

- Energy- Renewable energy and energy efficiency
- Sustainable Urban and Industrial Development
- Natural Resource Management
- Private Sector Development
- Social Protection
- Financial Systems Development
- HIV/AIDS-Blood Safety

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Preface



As climate change has become a global challenge, it is a rapidly expanding field of work for international cooperation. Germany too, is taking its responsibilities seriously. The Federal Ministry for Economic Cooperation and Development began funding numerous climate-change related mitigation and adaptation projects in its partner countries as early as 1993, and has substantially increased the international cooperation resources available for climate change related activities to a current contribution of over one billion Euros per year.

Additionally, Germany was the first country to earmark a share of the earnings from the auctioning of emission certificates to support climate projects in newly industrializing and developing countries. With these funds, the Federal Ministry of Environment, Nature Conservation and Nuclear Safety started the International Climate Protection Initiative.

India has taken on the challenge of climate change as a national priority. The country is a strong actor in the international climate negotiations, and in 2008 the Prime Minister released the National Action Plan on Climate Change with eight missions. The Ministry of Environment and Forests holds the overall mandate, while other ministries are responsible for the elaboration and implementation of some of the missions. All Indian states are currently developing State Action Plans on Climate Change, many supported by GIZ. India is well set up to deal with the multi-faceted nature of climate change due to its sophisticated institutional landscape. Various organisations have a good knowledge base to take up issues related to mitigation or adaptation.

Within the last decade, the Government of India and a number of institutions have started working explicitly to address climate change challenges, in some instances together with GIZ.

India and Germany have cooperated through development initiatives for over 50 years. Many of the areas of collaboration lie in sectors, which have the potential to mitigate greenhouse gas emissions such as energy, industry and forestry.

The same applies to thematic areas such as agriculture, water and biodiversity where the pressure to adapt to climate change is the greatest. As an external co-operation partner in the field of climate change, GIZ shares experiences from Germany and other countries and together with Indian partners develops solutions. GIZ works in strong alliances and can offer tried and tested approaches, as well as specific instruments developed to address climate change challenges such

as the GIZ Environment and Climate Assessment. GIZ participates in Indian assessments and studies on climate change issues such as vulnerability to the impacts of climate change and financial instruments for both mitigation and adaptation.

We can all learn from each other.

This brochure provides an overview of climate change work GIZ is involved in with its Indian partners, illustrated with numerous examples of joint initiatives.

Stefan Helming

Country Director
GIZ India



The Challenge of Climate Change

Climate change has become real and tangible, affecting people's lives worldwide. Over the past decade it has become warmer, rainfall is more erratic, polar ice caps and glaciers are melting, the sea level is rising and extreme weather events are becoming more frequent and more intense. Droughts and floods occur more often, and climatic zones are shifting. Development successes and the Millennium Development Goals are at risk. Greenhouse gas (GHG) emissions have been identified as the main cause for human induced climate change. Hence, decoupling of GHG emissions from economic growth to mitigate climate change, and adapting to its inevitable impacts have become global challenges.

India with its diverse agro-climatic zones is particularly affected by climate change. According to the country's initial national communication to the United Nations Framework on the Convention on Climate Change, the predicted impacts of climate change in India include a surface air temperature rise up to 4° Celsius by 2100, up to 30% decline in yield in rain-fed areas for some crops and an increase in incidences of extreme events, such as droughts, floods and cyclones. Since these impacts will strongly vary in its extent and form throughout the country, they require customised inter-ventions in different states and regions to cope with these risks and to enhance the resilience of India's most threatened population.

At the same time, steady economic growth linked with rapid industrialization and fast-paced urbanization has made the country one of the booming nations of the last decade, which has resulted in an increase of India's GHG emissions.

According to the Indian Network for Climate Change Assessment in 2010, 58 per cent of the total emissions in 2007 were caused by the energy sector, followed by the industrial sector at 22 per cent, agriculture at 17 per cent, waste at 3 per cent and land use, land use change and forestry at 1 per cent. Of the total carbon dioxide (CO₂) emissions 85% were contributed by activities of the energy sector. Of the total national methane (CH₄) and nitrous oxide (N₂O) emissions 78% were due to the agriculture sector.

In order to address the challenges of climate change, the Prime Minister released India's National Action Plan on Climate Change on June 30, 2008. It consists of eight missions and provides a multi-pronged, long-term and integrated framework for addressing climate change as a core development issue.

In this plan it is envisioned that sustainable development should increasingly guide India's development policy in the future.

- National Solar Mission
- National Mission for Enhanced Energy Efficiency
- National Mission on Sustainable Habitat
- National Water Mission
- National Mission for Sustaining the Himalayan Ecosystem
- National Mission for a Green India
- National Mission for Sustainable Agriculture
- National Mission on Strategic Knowledge for Climate Change

In line with this, GIZ is working in India following a multi-level approach: from policy advice at national and state level to pilot projects on mitigation and adaptation, as well as developing and testing new approaches and techniques in tackling climate change.



GIZ Approach to Tackling Climate Change

In the dynamic field of climate change GIZ advises on useful approaches and investments, highlighting in which context they are most promising. This is of particular importance given the multiplicity of emitting or vulnerable sectors, and the growing engagement of numerous actors in the field of climate change.

Applying a Climate Lens

To ensure sustainable development despite climate change impacts and assess potential reductions of greenhouse gas emissions, GIZ developed the Environment and Climate Assessment for projects and programmes, and carries out Climate Proofing

of strategies, investments, and policies. This ensures climate change is considered during project design and implementation and assists in defining where innovation is necessary and which field-tested and trusted approaches can be adjusted for mitigation and adaptation.

Tried and Trusted Techniques

Although the challenges posed by climate change are immense and some of the issues are new, elements of the solutions and most of the technologies needed to stabilize global warming are well known. Good examples of tried and trusted techniques in the field of mitigation are the promotion of renewable energies,

energy efficiency, and forest conservation. This is true also for adaptation to climate change: once climate risks and possible solutions have been identified and prioritised, it is often possible to use familiar techniques, such as efficient irrigation methods or the planting of mangrove forests to protect coastal zones. Hence, reinventing the wheel is not necessary in most instances. Therefore GIZ is stepping up its efforts to encourage the rapid dissemination of proven, efficient and locally appropriate solutions.

Building Alliances

To develop innovative solutions from conception to implementation and jointly work on their efficient dissemination, GIZ builds alliances with leading institutions from the governmental, scientific and business spheres within partner countries and at international level.

Policy Advice

Following its multi-level approach, GIZ provides support to national, regional and local level governments. GIZ policy advice includes climate strategies such as adjusting sectoral policies, capacity development and institution building. It helps to create an “enabling environment” for investments in adaptation, climate friendly technology and innovation for economic and private agents, necessary framework conditions to participate in the Clean Development Mechanism and upcoming avoided deforestation mechanisms (Reducing Emissions from Deforestation and Degradation, REDD and

REDD+). GIZ also transfers know-how and climate-friendly technology to partner countries and fosters political dialogue to exchange results of research and experiences with climate change strategies.

Capacity Development

Developing potentials and competencies is particularly needed in the context of climate change, and facilitating learning and change processes are some of the prime tasks to which GIZ is dedicated. Capacity Development strengthens the decision-making capacity of individuals, organizations and societies.



GIZ Principles for Climate Change Adaptation and Mitigation

Innovation where necessary, dissemination of tested techniques where possible, working hand-in-hand with strong alliance partners: these are core principles guiding GIZ’s efforts to make effective contributions to tackling the global challenge of climate change. To achieve this, GIZ builds on its strengths and successful approaches of policy advice and capacity development.



Mitigation – Reducing Emissions

Several paths are available to reduce greenhouse gas (GHG) emissions and hence GIZ cooperates with institutions and partner country governments in developing appropriate sectoral policies and measures. This can be achieved in all emitting sectors such as energy and industry, but also agriculture and forests, which act as carbon sinks and therefore need to be preserved and reforested to avoid further carbon emissions and to bind atmospheric carbon.

A concrete mechanism to reduce GHG emissions is available through the Kyoto Protocol: the Clean Development Mechanism (CDM). Developing countries that save GHG emissions, for example by using renewable energies for electricity generation or by improving their energy efficiency, can generate certified emission reductions and sell them on the world market. GIZ supports progressive CDM projects in India and in various other countries



and provides advice for the creation of favourable framework conditions for a participation in the carbon market.

In India, GIZ works with the government and the private sector in the field of climate change mitigation. A number of joint Indian and GIZ initiatives focus on mitigation of GHG and thus contribute to the Indian National Action Plan on Climate Change (NAPCC) with regard to five missions: the National Solar Mission, the National Mission for Enhanced Energy Efficiency, the National Mission on Sustainable Habitat, the National Mission for a Green India and the National Mission on Strategic Knowledge for Climate Change. In addition, contributions are made to ongoing Indian initiatives around mitigation, which the NAPCC also refers in the fields of power generation, renewable energies and energy efficiency under the Energy Conservation Act 2001.

The main areas in which GIZ works on finding ways to reduce greenhouse gas emissions with different ministries, businesses, and institutions in India are:

- Renewable energy
- Energy efficiency
- Industry
- Carbon markets
- Incentives for economic and private agents to invest in mitigation
- Demand-side management
- Urban habitat and waste management

Adaptation - Preparing for Change

Proactive measures to deal with climate variability and change can substantially reduce many of the adverse impacts of climate change on human beings and natural systems. Adaptation comprises a wide range of behavioural, structural and technological adjustments. GIZ works with its partners on adaptation at all levels, be it raising the awareness for climate change impacts and the need for adaptation, enhancing capacities to deal with the adverse impacts of climate change, or implementing technical adaptation measures. Examples of technical measures include diversifying livelihoods, building flood defences and altering farming practices (e.g. shifting to more heat- and drought-resistant crops). In addition to that, adaptation also means examining policies, programmes and investments with regard to climate change vulnerability and modifying them, if necessary.

GIZ collaborates with Indian national, state, and local governments, affected communities, scientific institutions, as well as the private sector at different levels to adjust to a changing climate. Through these activities a contribution is made to the National Water Mission, the National Mission for Sustaining the Himalayan Ecosystem, the National Mission for Sustainable Agriculture and the National Mission on Strategic Knowledge for Climate Change of the Indian National Action Plan on Climate Change.

GIZ is currently engaged in partnerships to address the impacts of climate change through the following initiatives:

- State Action Plans on Climate Change
- State-level vulnerability and risk assessments
- Piloting adaptation measures
- Financial instruments for adaptation for rural communities and small and medium enterprises
- Climate Proofing to assess climate risks and opportunities to increase adaptation benefits
- Human capacity building through orientation programmes, trainings and networks
- Information and Knowledge Management for adaptation

In addition to these directly climate-related activities, GIZ is also engaged in a variety of activities, which promote sustainable environmental management, such as watershed management and enhancing sustainable, natural resource-based livelihoods.





Renewable Energy

Biomass to Energy

Fifty-five per cent of all rural households in India have no access to electricity or receive only erratic power supply for not more than six hours a day.

Also, the distribution of energy to the fragmented villages in rural India causes high technical and even higher commercial loss. Biomass and biogas power plants are considered one of the best solutions to abate these problems, while at the same time the use of clean and renewable energies is creating new income sources for the rural population.

The biomass power potential in India is enormous. According to figures released by the Ministry of New

and Renewable Energy in 2010, an estimated 25,000 megawatt can be derived from available surplus biomass such as agricultural waste products alone.

Qualified rural biomass-based electrification and energy services is a public private partnership (PPP) between GIZ, supported by the German Federal Ministry for Economic Cooperation and Development, EnviTec Biogas AG, Germany's leading builder of biogas power plants based on agricultural produce and waste, and the Indian company Malavalli Power Plant Pvt. Ltd.

The partnership facilitates access to biomass-based electrification and energy services in rural India.

A supply chain for biomass-production is being developed and public awareness raised about the benefits of efficient biomass use and its potential for income generation for the rural population. For this PPP a set up of a Clean Development Mechanism (CDM) Programme of Activities (PoA) for modular biogas plants with a Pan Asian basis is being initiated. This will enable participation in the trade of certified emission reductions and

registration of upcoming projects as CDM project activities. GIZ Indo-German Energy programme and its private partners are working together on the needed steps to register the PoA following the United Nations Framework Convention on Climate Change guidelines at the CDM Executive Board. Due to its enormous potential for clean and climate friendly energy technologies the PPP is getting extended to the Philippines.

Renewable Energy Supply for Rural Areas

The Ministry of New and Renewable Energies is working with the GIZ Indo-German Energy programme, funded by the International Climate Initiative of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, to develop and test business and governance models for decentralised energy services.

Village Energy Committees are established and capacitated to own, operate and manage the energy production and distribution facilities in villages of the Korba region in Chhattisgarh and of the Kolwan region in Maharashtra. Local farmers are supported in efforts to augment and sustain biomass production for the reliable supply of feedstock for electricity generation. Generation units and distribution systems are set up according to the local availability of renewable energy sources including biomass and non-edible oilseeds.

They are optimised on the basis of demand for electricity for productive uses, such as irrigation, rural enterprises or community establishments. Learning from the initiative will be disseminated and the government assisted in replicating tested models of decentralised energy generation in rural areas.



Commercialisation of Solar Energy

As a part of the Indian National Action Plan on Climate Change, the National Solar Mission proposes that 20,000 megawatt of solar power systems should be installed by the end of the 13th Five Year Plan in 2022. But since solar energy has been promoted mainly in off-grid rural areas over the past decades, there are currently only few applications of solar power in urban and industrial areas and the number of grid-connected solar systems is markedly low.

The Ministry of New and Renewable Energy is partnering with the GIZ Indo-German Energy programme, with funding from the International Climate Initiative of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, to develop business models for the commercialisation of solar energy in urban and industrial areas and test them through pilot projects. A dissemination strategy is being developed and technology transfer facilitated through Public Private Partnerships. A regulatory framework is being



prepared to stimulate a market for grid connected solar systems, and to encourage manufacturers and service providers to recognise the business potential of solar energy applications in urban and industrial areas. Together with information campaigns and capacity building, this will contribute to the achievement of the ambitious targets of the National Solar Mission.

Solar Mapping

The Ministry of New and Renewable Energy (MNRE) in partnership with the GIZ Indo-German Energy programme is seeking to inform investment decisions in solar energy through the Solar Mapping and Monitoring project. Funding is provided through the International Climate Initiative of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. The MNRE and GIZ are establishing a countrywide system for the collection of relevant solar data, and create a monitoring and benchmarking system to optimise the outputs of solar systems. Data from measuring stations is correlated with satellite data, which provides a basis for industrial development of solar energy. The project thereby accelerates the planning and implementation of solar power plants and increases their current output.

Contributing to the National Solar Mission



Energy Efficiency

In order to respond to the growing demand for energy in a climate-friendly way, India passed the Energy Conservation Act in 2001. The Energy Efficiency component of the Indo-German Energy programme (IGEN), aims at enhancing the Energy Efficiency in India and thereby at supporting the country to implement the Energy Conservation Act. It is a joint initiative by the German Kreditanstalt für den Wiederaufbau (KfW) Banking Group and GIZ. The Indo-German Energy programme offers support at administrative levels and at all levels of society, such as energy-intensive large industries, manufacturers of household appliances and industrial equipment, residential households, as well as engineering

consultancy enterprises, and power stations. GIZ-IGEN is working with the Bureau of Energy Efficiency and the Central Electricity Authority, both part of the Indian Ministry of Power. The programme is financed by the German Federal Ministry for Economic Cooperation and Development.

Perform, Achieve & Trade Mechanism

The Perform, Achieve and Trade Mechanism (PAT) is an innovative and challenging initiative under the National Mission on Enhanced Energy Efficiency. It is a market-based mechanism that assigns energy efficiency improvement targets to India's most energy-intensive industrial units in nine sectors, namely

aluminium, cement, iron and steel, chloralkali, thermal power plants, fertilisers, pulp and paper, textiles and railways. According to the scheme, industrial units that achieve energy savings in excess of their target will be provided energy savings certificates (ESCerts). These ESCerts can be procured by the units that under-perform to meet their target compliance requirements.

Overall, the initiative provides the twin benefit of cost saving and mitigating climate change through a reduction in greenhouse gas emissions. The Bureau of Energy Efficiency and GIZ Indo-German Energy programme, financed by the German Federal Ministry for Economic Cooperation and Development, are enabling the set up of the PAT mechanism.

Technology Upgrade

Energy efficiency measures and technological up-grade at business level, especially in India's Micro and Small Medium Enterprises sector, remain a big challenge to be addressed at different levels. Several initiatives



have been started to find alternatives for the increasing energy demand of the Indian economy.

The initiative Energy Efficiency: Moving India's small and medium enterprises towards a sustainable future is a Public Private Partnership (PPP) between the KAEFER-Group, the world largest provider of complete insulation solutions and GIZ, supported by the German Federal Ministry for Economic Cooperation and Development. The PPP provides training, access to advisory services and financial products to industrial Small and Medium Enterprises (SMEs) in selected regions of India. These SMEs are thereby enabled to implement energy efficient insulation measures. Successes of energy efficient interventions are shared to raise the awareness of SMEs on competitive advantages of integrating sustainability measures into their operations.

To reach its aim, KAEFER, its local subsidiary KAEFER Punj Lloyd Ltd and GIZ are drawing on the combined knowledge of three Indo-German initiatives: While the Indo-German Energy programme is supporting technical aspects and the selection of SME clusters, the Corporate Social Responsibility project of the Sustainable Economic Development (SED) programme focuses on raising awareness around environmentally and socially responsible behaviour of small and medium enterprises to reduce the demand of energy. "The Micro, Small and Medium Enterprise Umbrella Project, also under the SED programme, in cooperation with the Small Industries Development Bank of India, supports the development of financial" services for identified SMEs to finance the initial cost

of insulation measures, implemented by the private partner KAEFER.

At the policy level, GIZ, supported by the German Federal Ministry for Economic Cooperation and Development, works with the Ministry of Micro, Small and Medium Enterprises on public support programmes for technology up-grading in the Indian business sector. An example is the Credit Linked Capital Subsidy Scheme, a federal government programme that provides a subsidy of up to 15% of the value of a loan taken by a micro or small enterprise from a government bank to purchase the latest plant and machinery. Its goal is to provide an incentive to such enterprises to upgrade their production technology.

Energy Efficiency Certification

In order to implement the Energy Conservation Act, the Bureau of Energy Efficiency (BEE), the Central Electricity Authority (CEA) and the Indo-German Energy Programme (IGEN), financed by the German Federal Ministry for Economic Cooperation and Development, are cooperating in several initiatives of Energy Efficiency Certification. The National Energy Labelling Programme was set-up by BEE with support from GIZ-IGEN to certify household appliances and energy-intensive industrial equipment with energy efficiency labels. These labels enable users to consciously choose energy-saving devices and equipment. Another joint initiative certifies energy managers and energy auditors so that they can conduct energy audits and provide technical advice on energy efficiency. The stricter



norms and standards for heavy industry, mapped out with help from the Indo-German Energy programme, create the preconditions for a transition to modern, energy-efficient technologies.

The Indo-German Energy programme and the Central Electricity Authority also extend the initiative to existing thermal power plants. Government efforts to improve power plant efficiency address one of the largest potentials for energy savings. Consequently this initiative has a high potential for the reduction of greenhouse gases.

Energy Efficiency Financing

The Indian Micro, Small and Medium Enterprises (MSME) sector consists of approximately 26 million enterprises, which contribute to more than 10% of the Gross Domestic Product, according to figures of the Ministry of Micro, Small and Medium Enterprises published in 2011. Due to the large number of MSME units, the energy demand of the sector is huge. However, financial services to assist MSME in implementing energy efficiency measures are still marginal.

The Micro, Small and Medium Enterprise Umbrella project of the GIZ Sustainable Economic Development programme, together with the Small Industries Development Bank of India are strengthening the capacity of Indian banks in the area of “green finance” and energy efficiency finance. Options for this are communicated through consultations and workshops on international best

practices in energy efficiency financing, and a special loan product for banks to finance energy efficiency measures in MSME is currently being developed. This provides MSME with incentives to invest in energy efficiency, and thereby contributing to a low carbon economy in India.

The German Federal Ministry for Economic Cooperation and Development supports the initiative. is demonstrated. Recommendations are drawn from there for the policy level and public institutions such as regulating bodies. Such activities contribute to creating framework conditions that make mitigation and adaptation measures economically viable for businesses.



Contributing to the National Mission on Enhanced Energy Efficiency



Industry

Cooling Without Warming

Many of the refrigerants and foam blowing agents used in refrigerators, freezers, air conditioning equipment and insulated “green” buildings still contribute to the depletion of the ozone layer and also harm the global climate. The hydro-chlorofluorocarbon (HCFC) number 22 for example, which is used as a refrigerant in most of the household air-conditioners in India, has a Global Warming Potential (GWP) of 1810.

Under the Montreal Protocol HCFCs will be phased out from 2013 onwards but many of the ozone friendly alternatives have an even higher GWP than the substances they will replace.

Through the Proklima programme, funded by the German Federal Ministry for Economic Cooperation and Development, and within the framework of the Montreal Protocol on Substances which Deplete the Ozone Layer, the Ozone Cell, Ministry of Environment and Forests and GIZ are providing policy advice and capacity development, training and qualification for service technicians.

This cooperation also includes pilot projects for industry partners to facilitate green technology transfer. Proklima strongly supports the introduction of technologies based on natural gases such as Propane

and Isobutane, which do not deplete the ozone layer and have zero or very low GWP compared to HCFCs and hydro-fluorocarbons (HFCs). For example, under the Ecofrig project and with support from the Multilateral Fund of the Montreal Protocol, one of India's major refrigerator manufacturers converted its entire manufacturing line to hydrocarbon based foam and refrigerant technology. Also more than 20,000 service technicians, most of them from the informal sector, have been trained all over India in better service practices and alternative technologies. In another project, Indian small and medium enterprises have been supported in the phase-out of carbon tetrachloride, which was used as a cleaning agent in textile and metal industries. Due to the high GWP of the substances that have been phased out under these projects, more than 4.4 Mio tonnes of carbon dioxide equivalent emission reductions have been achieved. Within the framework of the International Climate Initiative the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety Proklima works on the development and market introduction of energy efficient and climate friendly propane based household air-conditioners in



India. The estimated impact of this project is more than 1.3 Mio tonnes of carbon dioxide equivalent emission reductions. Future activities of Proklima will focus on supporting India in the phase-out of HCFCs in the entire refrigeration and air-conditioning sector.

Eco-Industrial Parks

Industrial emissions contribute substantially to climate change. With 332 industrial parks, Andhra Pradesh is one of the leading industrialised states of India. The preliminary estimates from four existing parks quantify emissions at approximately 2.1 to 3.5 million tonnes of carbon dioxide equivalents (CO₂ eq.) per year and for two new parks at about 5.3 to 12.3 million tonnes of CO₂eq. The Andhra Pradesh Industrial Infrastructure Corporation Ltd. and GIZ Advisory Services for Environment Management programme have initiated actions to convert existing industrial parks into eco-industrial parks with funding from the German Federal Ministry for Environment, Nature Conservation and Nuclear Safety.

For a new Special Economic Zone, environmental and climate issues were incorporated at planning stage in the site master plan, for existing industrial a number of measures were demonstrated for improved infrastructure and management, and at individual industry level, measures addressing environment and climate issues were demonstrated. The potential for greenhouse gas emission reductions is considerable in the industries and industrial parks, and if all the calculated potentials of various demonstrated activities are fully tapped, CO₂ equivalents of around 3,8

million tonnes per year can be reduced. The activities have the potential for replication in other parts of India, especially those that are rapidly industrialising such as Gujarat.

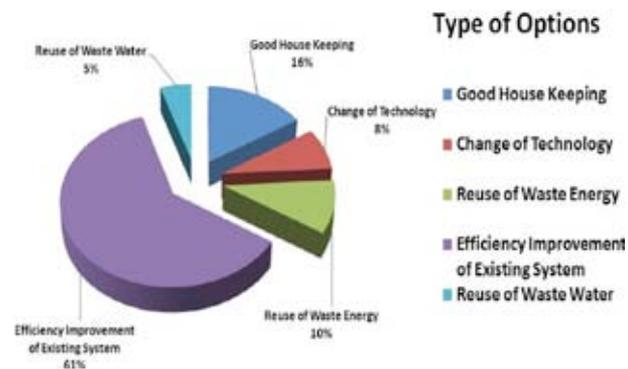
Ecoprofit Tool

At the individual industry level, activities with ecological and economical benefits were identified using the 'Ecoprofit' tool and taken up by 14 small and medium enterprises (SMEs) in the Hyderabad region and by several other SMEs in the National Capital Region of Delhi. STENUM Environmental Consulting and Research Company GmbH from Austria started 'Ecoprofit' in Europe in the early 1990s. In India, GIZ Advisory Services in Environmental Management programme started applying the Ecoprofit tool at individual industry level in the year 2006. The main focus has been to support micro, small and medium enterprises.

The Ecoprofit tool helps to identify measures that enhance the efficiency of industries, reduce the demand for raw materials and energy, and minimise associated environmental impacts for example through emission, effluent and waste control. Ecoprofit bundles proper training tools, interactive exercises, onsite assistance/consultation, and working out economic and environment savings. Within each participating industry, a competent team of three or four employees is established for identifying and implementing step-by-step process improvements. The industries' teams receive training on topics such as cleaner production and preventive environmental

approach. Through a project evaluation at the end of the programme in a given cluster of industries, it is checked if the participating companies make optimal use of their resources (including raw materials, production streams, energy, water, etc.), and that company representatives are able to use the Ecoprofit tools and continue to minimise emission, effluent and waste generation in all streams. So far, these activities have resulted, in the 14 SMEs in Hyderabad region alone, savings of over 25 million Rupees to the industries, which include savings of about 836,000 kilowatt hours/year of electricity, 2,804 tonnes/year of coal, 11,638 tonnes of furnace oil, 18,158 kl/year of water and 300 tonnes/year of materials (primarily tyre tubes).

The chart displayed below shows the categorisation of options suggested to 14 participating companies.



Sustainability Reporting

As the business sector is crucial for mitigating greenhouse gases, creating the right incentives to encourage economic agents to invest in such activities is the key. Investors are important stakeholders to encourage environmentally responsible business behaviour, since they can make the disclosure of relevant environmental and social performance criteria and reporting on environmental and climate-related aspects mandatory for their investments. It pays for firms to take into account social and environmental factors, not just financial ones. Companies listed on alternative stock indices, such as S&P's Environmental Social Governance India Index, have seen their shares perform consistently well.

The GIZ Sustainable Economic Development programme, supported by the German Federal Ministry for Economic Cooperation and Development, and the Global Reporting Initiative together with partners such as the National Stock

Exchange, the Institute of Chartered Accountants of India and several Indian banks (e.g. YES Bank, Small Industries Development Bank of India) promotes the movement towards sustainable reporting. Through hosting multi-stakeholder dialogues and consultations, the business case for disclosure and information on environmental, social and corporate governance aspects of business behaviour is demonstrated. Recommendations are drawn from there for the policy level and public institutions such as regulating bodies. Such activities contribute to creating framework conditions that make mitigation and adaptation measures economically viable for businesses.



Contributing to the National Mission on Enhanced Energy Efficiency



Carbon Markets

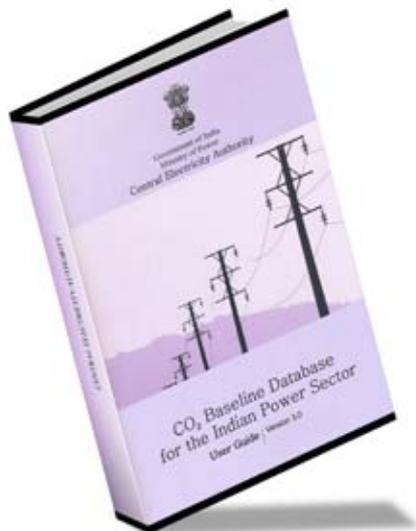
India is booming. Steady economic growth rates of around 8 per cent annually, rapid industrialization and fast-paced urbanization are clear indicators. Promotion of energy efficiency and the increased utilization of renewable energies rank high on the national agenda, making India a primary market for Clean Development Mechanism-projects. The Indian Carbon Market has evolved as a mature market due to established market participants and stakeholders, availability of skilled manpower resources, good legal framework, contracts honoured, and English as the business language. Consequently, the role of the Indian Carbon Market is likely to remain of high importance for trading of carbon emissions certificates.

Clean Development Mechanism - CDM

The Kyoto protocol is an international agreement between participating nations under the United Nations Framework Convention on Climate Change, signed in December 1997. Clean Development Mechanism allows a country with an emission-reduction or emission-limitation commitment under the Protocol (participating developed countries) to implement an emission-reduction project in developing countries. Such projects earn saleable Certified Emission Reduction credits, each equivalent to one tonne of carbon dioxide, which can be counted towards meeting Kyoto targets.

Developing CDM Instruments

The Ministry of Environment and Forests and GIZ Advisory Services in Environment Management programme, with support from the German Federal Ministry for Economic Cooperation and Development, started very early on to design and build up market instruments for the Clean Development Mechanism (CDM) in India. One of the activities was the establishment of a carbon dioxide (CO₂) baseline for the Indian power sector. Since 2006, yearly mapping of the CO₂ baseline of power plants is being conducted in India. The database consisting of 85 power plants benefits all prospective CDM project developers to estimate how many Certified Emission Reductions could be generated. The development of the baseline database encourages project developers to pose CDM projects in hydropower generation, renovation and



modernisation of power stations, and adoption of super critical technologies in power generation. Through another initiative, the website www.cdmindia.in has been established and made India become the first country in the world to have e-filing of CDM projects for a Host Country Approval process.

Capacity Building for CDM

The Bureau of Energy Efficiency, Ministry of Power and GIZ Indo-German Energy programme with support from the German Federal Ministry for Economic Cooperation and Development, established CDM-India in August 2003. This is a capacity building facility to assist project developers and reduce transaction costs in the early market development process. Its objective is to showcase high quality Clean Development Mechanism projects that are widely replicable. To date, 60 project proposals with the potential to generate over 40 million Certified Emission Reductions have been received by GIZ.

Identifying CDM Projects

GIZ Advisory Service in Environment Management in collaboration with the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety has launched an initiative with the prime focus of identifying and developing Clean Development Mechanism (CDM) projects. These should be in line with the Indian National Action Plan on Climate Change and lie within sectors that

are not well represented but offer great potential. The focus is mainly on the promotion of CDM among small and medium enterprises. This initiative explores opportunities of technology transfer and it can help in the development of Programmes of Activities whereby projects are bundled under CDM. Furthermore it establishes early contacts with buyers from Germany and can assess possibilities for investment from German industry.

Carbon Bazaar

The Ministry of Environment and Forests, the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and GIZ Advisory Services for Environment Management programme started organising Carbon Bazaars in 2009. As a facilitating platform, the Business to Business component of this yearly event enables the interaction between major national and international stakeholders in carbon markets, including carbon market developers, investors, buyers and sellers, public & private sector units' facilitators, Chambers of Commerce, state and central government policy makers, consultants, and technology providers. The conference component of the Carbon Bazaar addresses new, evolving and pertinent issues, such



as Nationally Appropriate Mitigation Actions (NAMAs), Programmes of Activity related to the CDM mechanism, Post Kyoto Protocol regulations of the carbon market, energy efficiency and Reducing Emissions from Deforestation and Degradation (REDD and REDD+).

Dissemination of Energy Saving Lamps

The Bachat Lamp Yojana programme is a voluntary scheme whereby the Government of India, State level electricity distribution companies and private sector investors in energy-saving compact fluorescent lamps (CFLs) work in partnership to save electricity through the dissemination of CFLs. GIZ Indo-German Energy programme with funding from the German Federal Ministry for Economic Cooperation and Development supported the Bureau of Energy Efficiency with the design, development and review of the scheme and business arrangements. Energy saving CFLs are



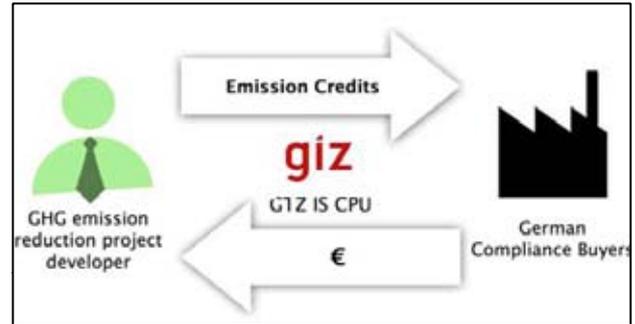
distributed to grid-connected residential households in exchange of an incandescent lamp and 15 Rupees. The scheme operates through a number of projects in different regions, and approximately 700,000 CFLs can be distributed within a single project resulting in greenhouse gas savings to the tune of 30,000 tonnes of carbon dioxide equivalent per annum and avoided installed capacity of 8-10 megawatt.

Carbon market mechanisms help in bridging the cost differential between the market price of the CFLs and the price at which they are distributed to households: Project costs are covered through the sale of certified emission reductions. The Bachat Lamp Yojana was registered under the United Nations Framework Convention on Climate Change (UNFCCC) in April 2010 and is by design the world's largest Programme of Activities. As of December 2010, around 20 investors expressed an interest in project development and around 100 projects under various stages of implementation are expected to be approved by the UNFCCC by mid-2011.

Linking up Buyers and Sellers

GIZ International Services has created the Carbon Procurement Unit (CPU) to link eligible Indian Clean Development Mechanism (CDM) projects with German compliance buyers wishing to procure emission certificates. One example is the CDM Composting Project at the Okhla Compost Plant in the National Capital Region. Through controlled aerobic decomposition of waste the project avoids methane emissions. For the whole ten-year duration of the project a total of 370,000 tonnes of carbon dioxide equivalents is being avoided, and thereby the project earns saleable Certified Emission Reductions (CERs). On the side of the German compliance buyers, companies such as RWE, one of the biggest power generators in Europe, are major greenhouse gas emitter and consequently interested in purchasing these certificates. GIZ CPU set-up the trade of CERs between the Okhla Compost Plant and RWE. In addition to RWE, CPU is cooperating with other power companies in Europe such as the German Energie Baden-Württemberg AG (EnBW) and the Dutch energy company ENECO.

Furthermore, the CPU provides carbon advisory services to CDM project implementers in India and



The Carbon Procurement Unit acts as an intermediary between German Compliance Buyers and GHG emission reduction project developers.

conducts technical feasibility studies. Currently, it is pursuing approximately 30 CDM projects of various sizes with a total volume of about 18 million Certified Emission Reductions stemming from power generation based on biogas, biomass, and other renewable energies, totalling some 130 megawatt installed capacities. CPU is exploring opportunities in the field of sustainable investments between German industries and Indian renewable energy companies.

In all its efforts, the CPU cooperates closely with Indian public and private companies, such as urban development companies, power generators, energy intensive industries, and non-governmental organisations.

**Contributing to the National Mission on Enhanced Energy Efficiency
Contributing to the National Mission on Sustainable Habitat**



Sustainable Consumption

The effect individual consumption has on the climate is substantial. Globally, the food we eat accounts for almost a third of our climate impact and household energy consumption produces another fourth of worldwide greenhouse gas (GHG) emissions. The transportation sector for local and international travel further produces a share of GHG from consumers. This is especially true in India, with the staggering number of more than one billion consumers and a financially solvent middle class of currently more than 250 million people.

The Greendex Survey 2010 initiated by the National Geographic Society and the international polling company GlobeScan states that India is the top-

scoring environmentally friendly consumer society. It was also noted that India's environmentally sustainable consumer behaviour had increased the most between 2008 and 2010. Nevertheless, a large part of India's population manages with less than a few hundred Rupees per day, which leaves them no other choice but to consume less, buy locally and travel by bike or on foot. While this of course needs to be taken into account, India's society still offers a great opportunity, as every single of the many consumers of the country has the potential to mitigate climate change by adjusting his or her consumption habits.

In partnership with the Ministry of Consumer Affairs, GIZ Advisory Services in Environment

Management programme (ASEM), funded by the German Federal Ministry for Economic Cooperation and Development, organises public awareness campaigns on sustainable consumption and a network of consumer advice centres has been established. The Sustainable Consumption and Consumer Protection project of GIZ-ASEM has developed a Sustainable Shopping Basket on how to reduce carbon footprints through more sustainable consumption patterns while at the same time saving money and improving health. This includes guidance on low carbon lifestyles as well as product specific information and labelling schemes.

The shopping guide covers information about products of daily consumption, such as (organic) food or textiles, offers information on local commuting and sustainable travel and indicates how to responsibly behave during one of India's many festivals. Moreover it gives advice on energy efficient electronic applications and thereby promotes the energy star label in a number of states, in partnership with the Bureau of Energy Efficiency.



Contributing to the National Mission on Enhanced Energy Efficiency



Urban Habitat

According to the census of 2001 half of India's population will live in cities by 2050 and as a hub of economic activities, urban areas drive the increase of energy consumption and greenhouse gas emissions. Moreover, great parts of the economic and social assets vulnerable to climate change are located in urban areas, where the poor are the most affected and least able to cope with the impacts. Local governments are challenged to develop and implement mitigation and adaptation actions, giving priority to measures with social, environmental, and economic co-benefits.

In order to raise awareness of challenges and opportunities in integrating climate change issues

into local policies, GIZ has developed a training course on Cities & Climate for decision makers from urban governments and consultants working in urban development.

Sustainable Urban Development

The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) of the Ministry of Urban Development and the Ministry of Housing and Urban Poverty Alleviation has the objective to improve the overall environmental situation in selected cities of India and thus offers an enormous potential for climate change adaptation and mitigation. GIZ Advisory Services in Environment Management programme,

funded by German Federal Ministry for Economic Cooperation and Development is supporting seven cities that were strategically selected considering their geographic, heritage and touristic significance. These cities are Shimla, Nainital, Varanasi, Raipur, Nashik, Tirupati and Cochin. Areas of intervention include

municipal solid waste management and resulting CDM opportunities, city sanitation plans and urban transportation. Each intervention includes planning, selection of appropriate technological solutions and financial sustainability with capacity building and climate change as crosscutting issues.

Waste to Energy in Nashik

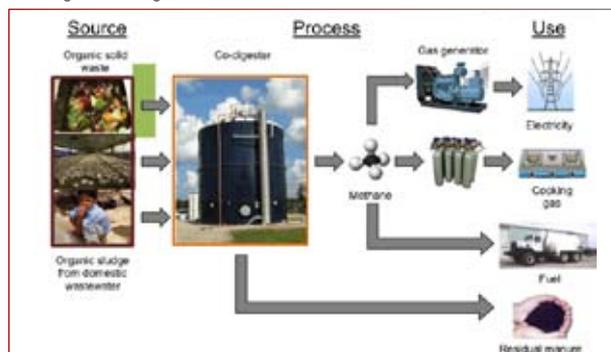
Within the International Climate Initiative of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, GIZ is supporting the city of Nashik in setting up an innovative waste to energy plant as a pilot. The idea is to demonstrate that the combined treatment of concentrated wastewater from community-toilet-complexes, so-called blackwater (septage), and organic waste from restaurants and hotels can generate a range of advantages. In addition to the energy production through co-fermentation and consequent biogas production, this treatment allows the pasteurisation and material recovery of urban material flows. An uncontrolled methane exposition as well as an energetically intensive treatment as is the case in conventional disposal systems can be avoided.

As a first step a feasibility study was carried out to demonstrate the technical and financial viability of the pilot plant. Based upon the study a pilot plant will be designed and its construction and operation tendered out to a private operator. GIZ Advisory Services in Environment Management will support the process and assure capacity building for the city of Nashik and the future operator.

The plant is designed for a daily input of 20 cubic metres blackwater and 10 tonnes of organic waste per day.

Converted to carbon dioxide savings, a total of about 4,700 tonnes per year can be avoided by the operation of the pilot plant. Particularly the electricity generation from the produced biogas and the avoided methane emissions due to the treatment contribute to this value, as it is assumed that in case of inadequate treatment 50% of the produced methane escapes into the atmosphere and thus contributes to global warming.

The process of generation of clean energy from household wet waste and organic sludge



Sustainable Urban Transportation in Cochin

The coastal city of Cochin in the South-Indian state of Kerala is a magnet for national and international tourism. But Cochin is also a rapidly growing city with already more than one million inhabitants and its setting on the mainland and several offshore islands pose additional challenges to city planners.

A pre-feasibility study by the Cities Development Initiative for Asia and GIZ Sustainable Habitat programme supported by the German Federal Ministry for Economic Cooperation and Development has assessed the impact of three investment packages contributing to sustainable urban transportation in Cochin, both for mitigation and adaptation. The assessment has been made for the ferry service, an enhanced bus service and pedestrian precincts. It has an accumulated foreseeable saving potential of more than 55,000 tonnes of carbon dioxide for a five-year period.

Using its Climate Proofing tool (see also section on Climate Proofing), GIZ assessed several climate change-related impacts and its effects on the urban transportation system. The Climate Proofing is followed by GIZ's situational recommendations on adaptation measures for designing a resilient infrastructure system, which will be considered during the next planning steps.



Contributing to the National Mission on Sustainable Habitat



State Action Plans on Climate Change

The Ministry of Environment and Forests developed a common framework for the preparation of State Action Plans on Climate Change (SAPCC) in consultation with various donor agencies and organisations including GIZ, and following the guidance provided by India's National Action Plan on Climate Change. Based on this framework, GIZ Natural Resource Management programme (NRM) through the Climate Change Adaptation in Rural Areas of India project, funded by German Federal Ministry for Economic Cooperation and Development, is supporting fourteen states in preparing State Action Plans on Climate

Change. In these plans, adaptation and mitigation options are identified and prioritised. The SAPCCs are being developed through a participatory planning process involving all major stakeholders including government officers from various line agencies, policy makers, institutions, academics, non-governmental organisations, scientists, the private sector, civil society and local communities. In seven states GIZ-NRM is also supporting adaptation activities, therefore contributing to the implementation of the SAPCC. These states are Meghalaya, Nagaland, Madhya Pradesh, Rajasthan, Sikkim, Tamil Nadu, and West Bengal.

Contributing to all the Missions of the National Action Plan on Climate Change



Vulnerability Assessment

Although there are various methodologies available to assess risks and the vulnerability to the impacts of climate change, there is a gap between global scenarios and local risk assessments. The Ministry of Environment and Forests and the GIZ Natural Resource Management programme with funding from the German Federal Ministry for Economic Cooperation and Development, therefore supported the development of a vulnerability assessment approach in cooperation with leading Indian and international institutions. The approach integrates and synthesises the outputs from various top-down climate models and

bottom-up vulnerability assessment methodologies. Following this approach, the state departments of Madhya Pradesh, Rajasthan, Tamil Nadu and West Bengal are conducting vulnerability assessments. Vulnerability assessment reports and maps provide key inputs to planning for adaptation at state level, Climate Proofing of rural development programmes and managing information to support mainstreaming climate change adaptation. After these applications, a practical and tested methodology to vulnerability and risk assessment at state-level will be available that can be used by other Indian states as well.

Contributing to the National Mission on Strategic Knowledge for Climate Change



Piloting Adaptation Measures

The rural poor whose livelihoods depend on natural resources such as agriculture, fisheries and forestry remain the most vulnerable section of Indian society. Natural resources in India are already under tremendous pressure due to various anthropogenic activities, and climate change poses additional challenges, increasing the vulnerability of rural communities.

GIZ Natural Resource Management (NRM) programme is addressing vulnerabilities in rural areas through different projects. Ministry of Environment and Forests and GIZ-NRM are jointly implementing the project Climate Change Adaptation in Rural Areas of India to enhance the resilience of vulnerable groups to deal with climate variability and change.

In four Indian states of various agro-climatic zones, technical adaptation projects are being piloted. These include sand dune stabilisation in Rajasthan, water management in Tamil Nadu, agro-forestry in Madhya Pradesh, and controlled flooding in the Sundarbans of West Bengal. The project Climate Change Adaptation in the North-Eastern Region in partnership with the Ministry of Development of North Eastern Region focuses on capacitating the government departments, private sector and rural communities in Sikkim, Meghalaya and Nagaland to plan and implement community based adaptation approaches.

Both projects are funded by German Federal Ministry for Economic Cooperation and Development.

Water Reservoir Proofing - CapCoast

Kadaikadu, a coastal town in Nagapattinam district of Tamil Nadu, is the home of 300 people and vulnerable to sudden climatic variables due to its close proximity to the sea and low-lying lands. Lately, the town's freshwater supply is becoming scarce due to flooding and changing rainfall patterns as ponds are turning saline or running dry. Thereby the livelihoods of the agriculture-based communities of Kadaikadu are threatened.



In order to address these challenges, GIZ Advisory Service in Environment Management initiated the CapCoast pilot project for Kadaikadu with funding from the German Federal Ministry for Economic Cooperation and Development. One of its aims is to climate proof a fresh water pond in the village. The intention is to increase the capacity of water reservoirs, to support the recharging of ground water and thus the well water sources. Through the construction of bunds the pond is protected from the intrusion of brackish water during cyclones and flooding.

The technological intervention of increasing the groundwater recharge is accompanied by capacity development and knowledge transfer in water resource management, and includes limiting the groundwater extraction to an amount that can be replenished. This prevents further salinisation of the water sources and the nearby fields that provide the main source of livelihood.

Contributing to the National Mission for a Green India
Contributing to the National Mission for Sustainable Agriculture
Contributing to the National Mission for Sustaining the Himalayan Ecosystem



Financial Instruments for Adaptation

Rural poor often have limited access to financial products that could help to reduce the impacts of climate change on their livelihood. The Ministry of Environment and Forests and the GIZ Natural Resource Management programme are assessing various available financial instruments according to their potential for promoting adaptation to climate change. The instruments can include insurance and credit-based products. Close links with national and international players from the public and private sector are being established for designing, field-testing and marketing affordable financial products in rural areas.

The expected output will be a range of tailor-made financial instruments for adaptation to climate change impacts, at the level of the target group and state investments. GIZ also targets adaptation at the business level through the Sustainable Economic Development programme, especially at the level of the micro, small and medium enterprises. Their access to financial services (e.g. special loan products) is facilitated, thus enabling enterprises to finance technical adaptation measures. Both initiatives are financed by the German Federal Ministry for Economic Cooperation and Development.



Climate Proofing

The sustainability of public programmes, investments, or agricultural value-chains may be at risk due to climate change. GIZ has developed the tool Climate Proofing for Development to analyse whether intended benefits of investments and government schemes or agricultural production levels are threatened by the impacts of climate change. Additionally, opportunities of reducing climate risks through investments and programmes, or of increasing the capacities of communities and institutions to deal with climate change are explored through Climate Proofing. GIZ has already applied this tool in other countries, for instance in Mali, Morocco, Niger, the Philippines and Vietnam,

showing the tool's value in developing concrete and feasible options to respond to climatic changes.

Climate Proofing Public Schemes

Policy planners need to gauge the sustainability of public sector programmes in the face of climate change and can make use of programmes for adaptation. Through the project Climate Change Adaptation in Rural Areas of India, implemented jointly by the Ministry of Environment and Forests and GIZ Natural Resource Management programme, and financed by German Federal Ministry for Economic Cooperation and Development, public investment schemes and rural development

programmes are being climate proofed in Madhya Pradesh, Rajasthan, Tamil Nadu, and West Bengal. Using the Climate Proofing tool policy makers analyse whether the objectives of government projects might be threatened by climate change, and how the planned measures can be adapted accordingly if deemed necessary. It is assessed how selected public schemes are already contributing to adaptation to climate change, followed by an elaboration of options for how the schemes could further prepare communities for climatic changes and build capacities to respond to and deal with variations in rainfall patterns, an increase in extreme events, etc. The project is the first of its kind to carry out Climate Proofing of public investments. The experiences gained here will be made available to other interested ministries and federal states.

Adjusting Agricultural Value Chains

In the North Eastern Region, GIZ Natural Resource Management programme with funding from German Federal Ministry for Economic Cooperation and Development, is partnering with the Ministry of Development of North Eastern Region to focus on Climate Proofing and adaptation of value chains that are important for local livelihoods. This involves the analysis of risks that climate change poses at different steps of value chains that are economically important.



Additionally, opportunities may arise through climatic changes, and these need to be identified and made use of. The main outcome will be that key stakeholders, such as non-governmental organisations, community based organisations, research institutes, micro-finance suppliers and government scheme holders have clarity on their roles to promote climate change resilient value chains in selected priority commodities.

Watershed Development

The sustainable development and management of watersheds in India significantly contributes to increasing adaptive capacities of rural communities. However, if climate change is not accounted for in the planning process of watershed development projects, the success and ultimately the investments in the watersheds may be at risk.

**Contributing to the National Mission for Sustainable Agriculture
Contributing to the National Mission for the Himalayan Ecosystem**

With the double objective of maximizing the climate change adaptation potential of watershed development as well as to make public investments in watershed more robust, the National Bank for Agriculture and Rural Development (NABARD), with the support of the GIZ Natural Resource Management programme and funding by German Federal Ministry for Economic Cooperation and Development, is piloting Climate Proofing in two NABARD watershed projects in the states of Rajasthan and Tamil Nadu.

The GIZ Climate Proofing tool has been customised for NABARD's needs based on their guidelines for watershed development programmes. Entry points for the application of the Climate Proofing tool in the planning cycle of the selected watershed projects have been identified and appropriate adaptation options will be implemented.



Analysing Potential Ecosystem Services of MGNREGA

The intention of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is to provide a basic employment guarantee in rural area. A significant part of works conducted under the Act are activities related to natural resources. These include soil and water conservation, drought proofing, flood control, and afforestation.

Given the sizeable resources annually allocated and channelised through MGNREGA, the potential of these works to safeguard and provide environmental services and reduce vulnerabilities of poor communities is likely to be immense. The Ministry of Rural Development and the GIZ Natural Resource Management programme are therefore conducting a study to analyse the potential of MGNREGA works to contribute to environmental services, especially in the context of climate change adaptation and mitigation. The main focus of the study lies on how ecosystem services benefit the primary beneficiaries of MGNREGA.



Learning About Adaptation

Human Capacity Development

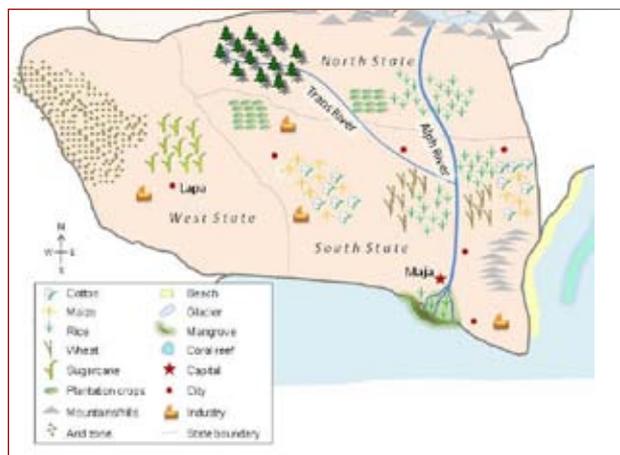
For an effective adaptation to climate change and to enhance people's adaptive capacities, the first step is to raise awareness on climate change, its impacts and its interlinkages with the management of natural resources. GIZ has been working in this direction through workshops and training programmes. A programme on Environmental Planning and Disaster Risk Management integrates climate change issue in the trainings for disaster management professionals. Under this programme and within an alumni network, workshops have been conducted on interlinkages between climate change and biodiversity. The project Climate

Change Adaptation in the North-Eastern Region in partnership with the Ministry of Development of North Eastern Region, supported by the German Federal Ministry for Economic Cooperation and Development, focuses on raising awareness on climate change issues among government departments, non-governmental organisations, the private sector and rural communities. Especially women in Sikkim, Meghalaya and Nagaland will be targeted, and training institutions will be supported in integrating climate change into different curricula. Policy makers in North-Eastern India have been trained on integrating adaptation to climate change into

development, following a course conceptualised by GIZ.

Information and Knowledge

Based on existing forms of communication and networking, an information and knowledge management system on adaptation to climate change is being set up by the Ministry of Environment and Forests and GIZ Natural Resource Management programme as part of the project Climate Change Adaptation in Rural Areas of India. A strong network of partners will be built relying on existing institutions from the public and private sector. This will also be linked to a regional knowledge management network to be established in the North-Eastern Region for generating and disseminating practical approaches and knowledge on climate



Map of Zanadu, fictitious country of the training course on Integrating Adaptation to Climate Change into Development.

change adaptation. Funding is being provided by German Federal Ministry for Economic Cooperation and Development.

Monitoring and Evaluation

Assessing the effectiveness and impacts of adaptation initiatives is still a relatively new field for development practitioners. A key role for monitoring and evaluation of adaptation is to identify and track the “adaptation difference”, i.e. what is done additionally or differently to reduce climate change risks, or build capacities to adapt? The Ministry of Environment and Forests and GIZ Natural Resource Management programme with funding by German Federal Ministry for Economic Cooperation and Development, are piloting ways of monitoring how the project Climate Change Adaptation in Rural Areas of India contributes to both, building adaptive capacities and supporting adaptive actions.

During operational planning, results chains with indicators were developed outlining the logic of how project components contribute and interact towards the project goal of enhancing the resilience of the rural poor to live with climate variability and change. This enables active learning about adaptation, techniques and processes, and tracks the effectiveness of the project itself.

Contributing to the National Mission on Strategic Knowledge for Climate Change





List of Involved GIZ Programmes

Advisory Service in Environment Management

- Carbon Markets
- Carbon Bazaar
- Clean Development Mechanism - CDM
- Developing CDM Instruments
- Industry
- Eco-Industrial Parks
- Ecoprofit
- Piloting Adaptation Measures
- Water Reservoir Proofing – CapCoast
- Sustainable Consumption
- Urban Habitat
- Sustainable Urban Development
- Sustainable Urban Transportation in Cochin
- Waste to Energy in Nashik

Indo German Energy Programme

- Carbon Markets
- Capacity Building for CDM
- Clean Development Mechanism – CDM
- Dissemination of Energy Saving Lamps
- Identifying high Potential CDM Projects
- Energy Efficiency
- Energy Efficiency Certification
- Technology Upgrade
- Perform, Achieve & Trade Mechanism
- Renewable Energy
- Commercialisation of Solar Energy
- Solar Mapping
- Renewable Energy Supply for Rural Areas
- Biomass to Energy

International Services

- Carbon Markets
- Linking up Buyers and Sellers

Natural Resource Management

- Climate Proofing
- Climate Proofing Public Investment Schemes
- Adjusting Agricultural Value Chains
- Watershed Development
- Financial Instruments for Adaptation
- Learning About Adaptation
- Human Capacity Development
- Information and Knowledge

- Monitoring and Evaluation
- Piloting Adaptation Measures
- State Action Plans on Climate Change
- Vulnerability Assessment

ProKlima

ProKlima is a transnational programme

- Industry
- Cooling Without Warming

Sustainable Economic Development

- Energy Efficiency
- Technology Upgrade
- Energy Efficiency Financing
- Financial Instruments for Adaptation
- Sustainability Reporting



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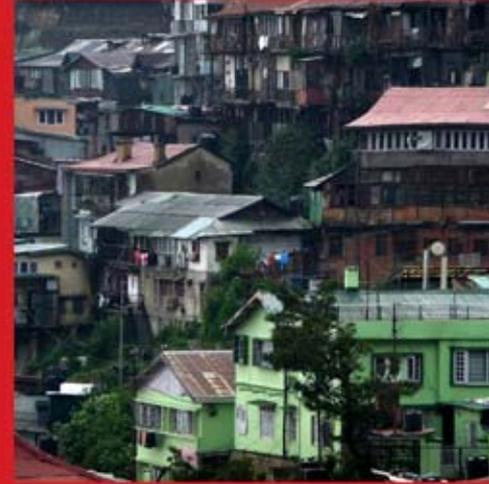
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