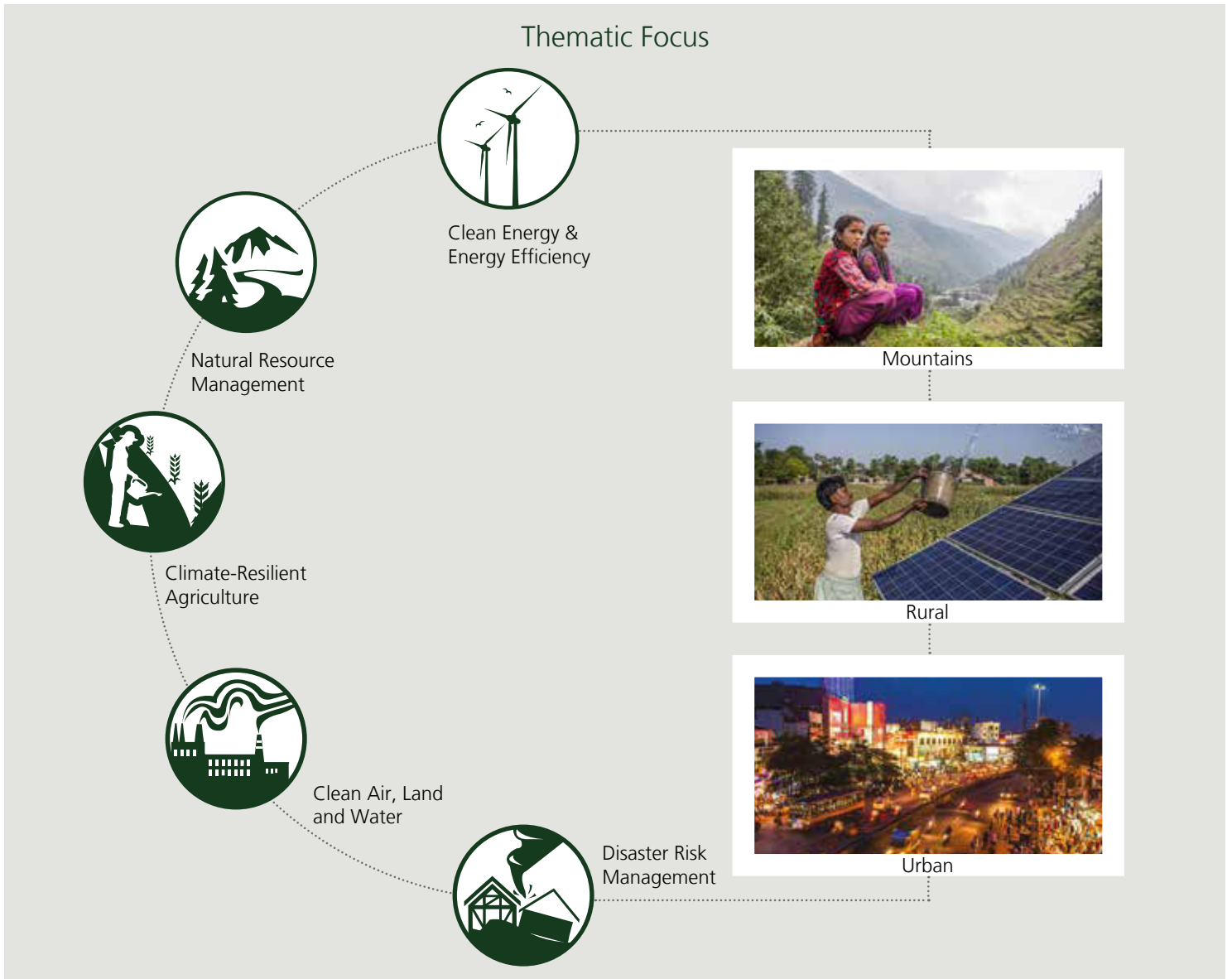


SDC in India

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Swiss expertise offered for:

- Innovative Actions**
 Develop and test innovative solutions to address the causes and effects of climate change.
- Policy**
 Contribute with evidence-based and practical experiences to policy processes at the local, national and global level.
- Knowledge**
 Generate and disseminate scientific and applied research-based knowledge for capacity building and awareness.

Our Partners



SDC in India: Project Portfolio on Climate Change & Environment



Strengthening Climate Change Adaptation in Himalayas (SCA-Himalayas)

Objective: To enhance resilience of mountain communities in the Indian Himalayan Region by integrating climate actions into national and sub-national planning and implementation

Implementation partners:

- Project Implementation Unit (PIU), SCO India
- Technical support through Swiss institutions and agencies

Website: <https://climalayas.in/>



Climate Responsive and Socially Inclusive Restoration of Shifting Cultivation Landscapes (ReStoRe)

Objective: To strengthen the enabling conditions for planning, implementation, and scaling up of forest landscape restoration

Implementation partners:

- United Nations Development Programme (UNDP)
- Ministry of Environment, Forest and Climate Change (MoEFCC)
- State Governments of Meghalaya and Nagaland
- District and Village Councils



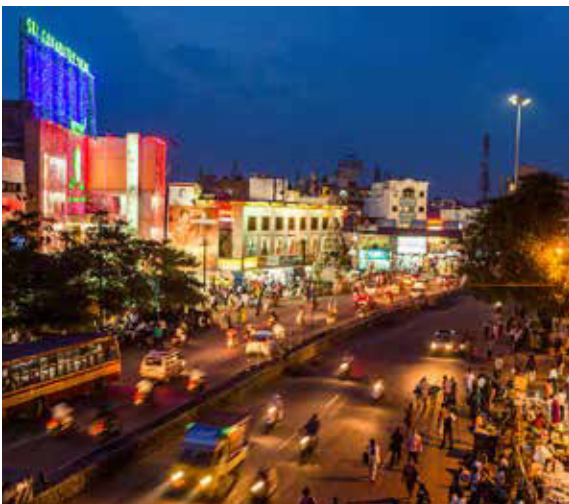
Solar irrigation for Agriculture Resilience (SoLAR)

Objective: To contribute to climate resilient, gender and socially inclusive agrarian livelihoods in Bangladesh, India, Nepal and Pakistan by supporting Government efforts to promote solar irrigation

Implementation partners:

- International Water Management Institute (IWMI)
- Partners in the four project countries
- International Solar Alliance (ISA)

Website: <https://solar.iwmi.org/>



Capacity Building for Low Carbon and Climate Resilient City Development in India (CapaCITIES)

Objective: To achieve a lower greenhouse gas emissions growth path and to increase the resilience of select Indian cities to climate change

Implementation partners:

- South Pole Carbon Management Ltd., Switzerland
- ICLEI South Asia
- Econcept AG, Switzerland

Website: <http://capacitiesindia.org/>





Building Energy Efficiency Project (BEEP)

Objective: To reduce energy consumption in new buildings through efficient design, construction, innovative technologies and capacity building

Implementation partners:

- Effin'Art, Switzerland
- Greentech Knowledge Solutions Ltd, India

Website: <http://www.beepindia.org/>



Integration of Renewable Energy in Buildings (BEEP RE)

Objective: To design and demonstrate building integrated renewable energy technologies for commercial and residential buildings suitable to the local conditions

Implementation partners:

- International Institute for Energy Conservation (IIEC), India
- Basel Agency for Sustainable Energy (BASE), Switzerland
- Environmental Design Solutions (EDS), India
- Meghraj Capital Advisors Private Limited (MCAPL), India



Low Carbon Cement Project (LCC)

Objective: To reduce global CO2 emissions by fast and sustainable uptake of LC3 by the construction sector, supported by a conducive regulatory environment.

Implementation partners:

- Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
- Indian Institute of Technology (IIT): Delhi and Madras
- Technology and Action for Rural Advancement (TARA)
- Centro de Investigación y Desarrollo de Estructuras y Materiales (CIDem), Cuba

Website: <https://www.lc3.ch/>



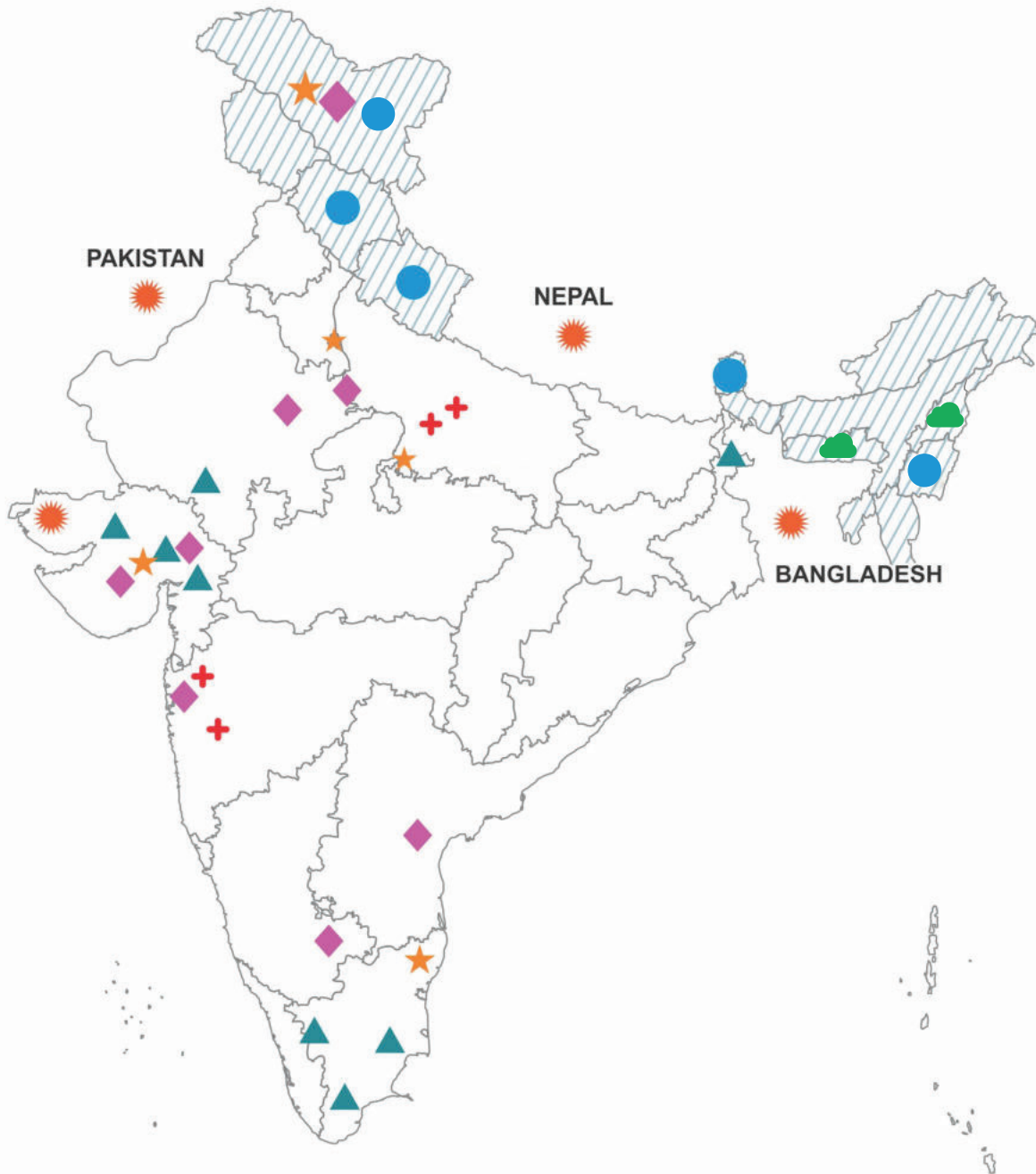
Clean Air Project in India (CAP India)

Objective: To support India's efforts to improve people's health and well-being through better air quality, while contributing to environment and climate change mitigation

Implementation partners:

- The Energy and Resources Institute (TERI), India
- Paul Scherrer Institute (PSI), Switzerland
- Other members of the consortium and research network









SDC's PROJECTS IN INDIA (Region South Asia)



Mitigation



Adaptation

-  Building Energy Efficiency Project (BEEP) Integration of Renewable Energy in Building (BEEP-RE)
-  Capacity Building for Low Carbon and Climate Resilient City Development Project (CapaCITIES)
-   Strengthening Climate Change Adaptation in Himalayas (SCA-Himalayas)
-  Clean Air Project in India (CAP India)
-  Solar Irrigation for Agriculture Resilience (SoLAR)
-  Climate Responsive and Socially Inclusive Restoration of Shifting Cultivation Landscapes (ReStoRe)
-  Low Carbon Cement Project (LCC)



Strengthening Climate Change Adaptation in Himalayas (SCA-Himalayas)

CONTEXT

The Global Climate Risk Index 2021 ranks India among one of the most vulnerable countries to climate change. The Government of India has encouraged all the states to develop action plans on climate change outlining the relevant climate strategies across key sectors for climate mitigation and adaptation. Although the Himalayas represent only 16% of the country, they shelter one of the most vulnerable ecosystems, requiring special attention. Responding to the Government of India's request for Swiss expertise, SDC supports the Indian Himalayan States to strengthen climate change adaptation.

During the first phase of the project (3SCA, 2016-19) SDC supported the States of Sikkim, Uttarakhand and Madhya Pradesh to assess sectoral vulnerabilities, to develop tools and to implement adaptation actions. The project's second phase (SCA-Himalayas) focuses on Disaster Risk Management (DRM) and Water Resource Management (WRM) in mountain ecosystems fostering resilience against climate change in the according sectors. The project supports pilots in the Himalaya states of Sikkim, Uttarakhand, Manipur and Himachal Pradesh. Through a close collaboration with relevant government institutions at local, state and national level the project builds capacities for replication of pilot interventions in the 13 Himalayan States and supports policy uptake.

OBJECTIVES

The project aims to enhance resilience of the mountain communities in the Indian Himalayan Region by integrating climate actions into national and sub-national planning and implementation.

Specific approaches and tools are developed, and shared through capacity building for replication and institutionalization. SDC brings on board Swiss, regional and Indian expertise through technical support for climate change adapted water resource management, science based springshed management and to pilot early warning systems for Glacial Lake Outburst Flooding (GLOFs), landslides and floods.



Natural Resource Management



Disaster Risk Management

PROJECT AT A GLANCE

Area: Adaptation and Risk Mitigation
Duration: February 2020 - December 2024 (Phase 2)

Budget: CHF 5'800'000

Implementation Partners:

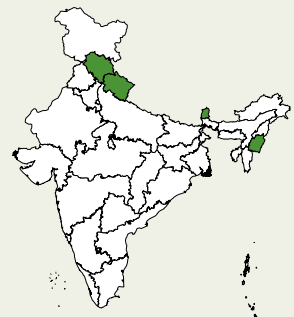
- Project Implementing Unit (PIU) managed by SDC in India
- Swiss experts from academia and private sector
- Other international, regional and national partners from academia, NGOs, intergovernmental institutions

Partners:

- Ministry of Environment, Forests and Climate Change (MoEFCC)
- National Disaster Management Authority (NDMA)
- NITI Aayog
- Department of Science and Technology (DST)
- Ministry of Jal Shakti
- State Governments from Uttarakhand, Sikkim, Manipur, Himachil Pradesh

Geographic Focus:

Uttarakhand, Sikkim, Manipur, Himachal Pradesh and other Himalayan States of India



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KEY ACHIEVEMENTS

- Publication of a resource book on springshed management in the Indian Himalayan Region in close collaboration with NITI Aayog, Government of India.
- Implementation of field pilots fostering springshed management based on a combination of science-based assessments, capacity building and community action.
- Development of guidelines and trainings for glacio-hydrological and water allocation modeling.
- Development of a Climate change Decision Support System (CC-DSS) for a reservoir in Madhya Pradesh and guidelines for its use and upscaling by the Government of MP.
- Analysis of remote sensing data using Synthetic Aperture Radar data (SAR-data) to identify surface deformations, namely landslides and instable areas.
- First-order assessment of GLOF risk for Sikkim and detailed hazard modelling for two critical glacial lakes in Sikkim.
- Development of a landslide susceptibility model and hazard mapping for Bhagirathi Valley in Uttarakhand.



INITIATIVES UNDER SCA-HIMALAYAS PROJECT

- Piloting an early warning system for GLOF in Sikkim.
- Development of a rainfall threshold-based landslide forecast model in Uttarakhand.
- Glacio-hydrological model, Integrated Water Resources Management (IWRM) plan and Decision Support System (DSS) for a selected sub-basin in Bhagirathi Basin in Uttarakhand.
- Documentation of best practices, guidance and field action to promote innovative science-based springshed management.
- Development of a numeric model and application for large scale hazard indication mapping of rock-ice avalanches in Uttarakhand.
- Capacity building for key institutions referring to officials, technicians and scientists etc. to design, implement and monitor climate change actions.
- Development of guidelines for upscaling of climate change actions in the (Indian) Himalayan Region and integration into policy frameworks.
- Documentation and experience sharing across the Himalayan region including in the international community.



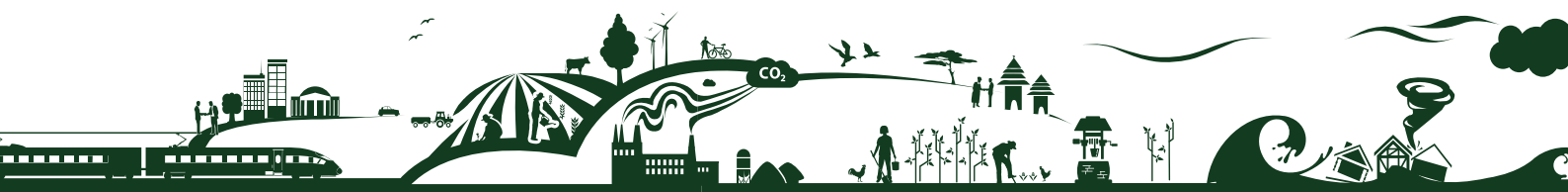
All pictures Parikshit Rao © SDC

ABOUT SDC IN INDIA

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Website: www.eda.admin.ch/countries/india/en/home.html

Email: newdelhi.ccd@eda.admin.ch





Climate Responsive and Socially Inclusive Restoration of Shifting Cultivation Landscapes (ReStoRe)

CONTEXT

North-East India (NEI) has 2 global biodiversity hotspots – Indo-Burma and the Himalayas. NEI accounts for 27% of India's forest cover and is the only region in India that continues to lose forest cover. 86% of the forest loss in NEI is from open/community owned forests. The region is also India's biggest carbon sink; accounting for 28% of India's total carbon stock.

The project aims to develop and test innovative community-led forest landscape management approaches. ReStoRe will demonstrate that such approaches, supported by policies, institutional and financial frameworks, can contribute to India's climate goals, while ensuring ecosystem benefits for local communities. The project hypothesis is that landscape restoration approaches developed in partnership with communities, while respecting their cultural and ecological rights, will reduce deforestation and conserve biodiversity. Furthermore, people will embrace sustainable management of forests when they derive direct and regular benefits.

OBJECTIVES

The overall goal of the project is to strengthen the enabling conditions for planning, implementation, and scaling up of forest landscape restoration.

Specific objectives are:

- Innovative incentive-based models of community led restoration of forest landscapes for carbon positive and climate resilient development of local communities are validated.
- Improved empirical evidence and technical capacities support strengthening of the forest and land management frameworks at the state level.
- Community-led forest landscape restoration models get mainstreamed to achieve climate and forest restoration goals.



Natural Resource Management

PROJECT AT A GLANCE

Area: Mitigation and Adaptation

Duration: 2023 - 2028 (Phase 1)
2028 – 2031 (Phase 2)

Budget: SDC CHF 8.3 million
GEF CHF 4.4 million;
Co-financing CHF 27 million

Partners:

- United Nations Development Programme (UNDP)
- Ministry of Environment, Forest and Climate Change (MoEFCC)
- State Governments of Meghalaya and Nagaland
- District and Village Councils

Geographic Focus:

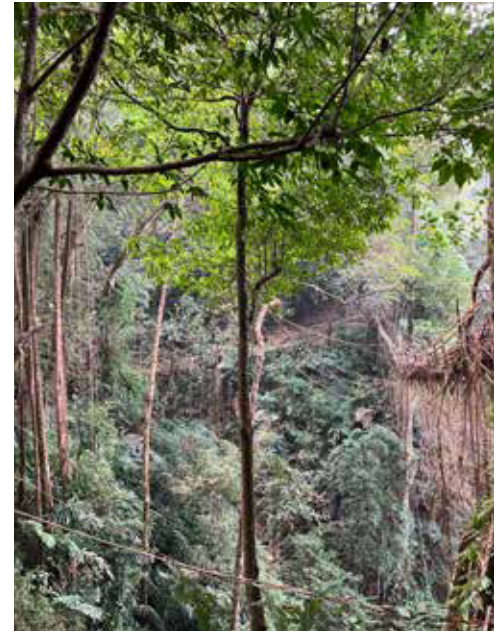


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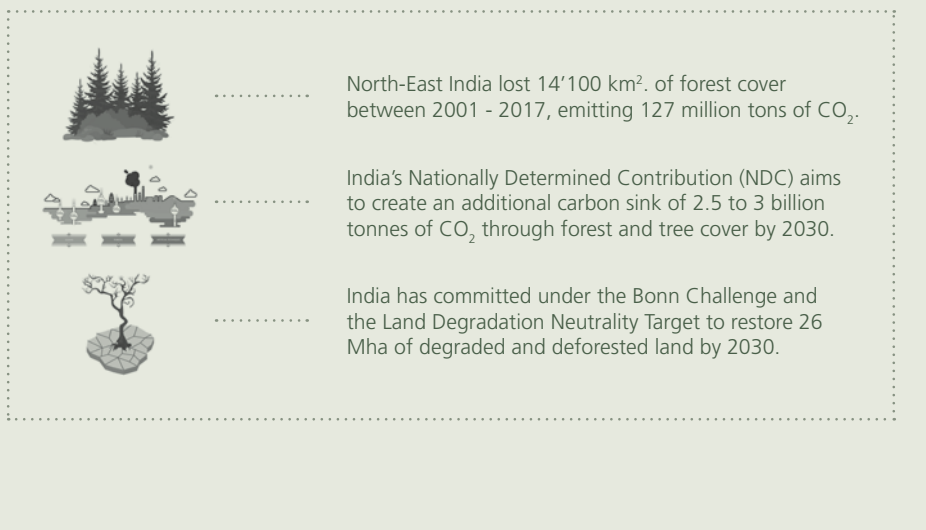
Swiss Agency for Development
and Cooperation SDC

PLANNED RESULTS

- The project will restore 10'000 hectares of forest fallows, benefitting 5000 shifting cultivation practicing households belonging to indigenous tribes in hilly tracts of NEI.
- Women will be a key target group as they perform 70% of the work related to shifting cultivation and water management.
- 150+ state and national level officials working with the forest, agriculture, rural development, land revenue and related departments will be trained as part of the project capacity building efforts.
- 4 innovative models for sustainable financing of forest landscape restoration will be tested.
- The scaling of the project approach through the state government using World Bank/other funds would in addition impact 20'000 households.



IN NUMBERS

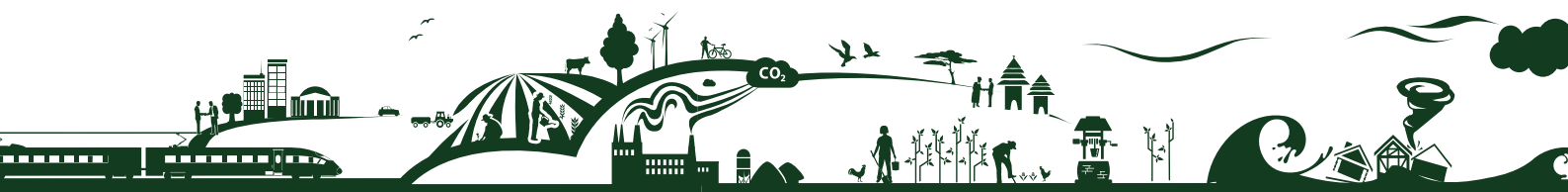


All pictures @ SDC

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Solar irrigation for Agriculture Resilience (SoLAR)

CONTEXT

Farmers increasingly rely on irrigation to counter rising temperature and rainfall variability, leading to growth in energy demand and depletion of groundwater resources. With 20.4 million pumps, the irrigation economy in Bangladesh, India, Nepal and Pakistan in South Asia is overwhelmingly dependent on groundwater. The intensity of groundwater extraction is influenced by access to subsidized electricity. Groundwater irrigation in the region accounts for up to 1/5th of total carbon emissions from agriculture.

The project rationale is to promote shift to solar irrigation pumps to reduce the carbon footprint of irrigation, coupled with incentives and policies for the sustainable management of groundwater and climate resilient agriculture in South Asia. The project while promoting solar irrigation, will focus on enhancing understanding of the impacts of the technology on groundwater, agriculture and equity in order to help the country partners identify the most appropriate approaches to promote Solar Irrigation Pumps while avoiding the negative outcomes.

Besides country efforts, the project will collaborate with the International Solar Alliance (ISA) which has identified solar water pumps as one of its priority technologies. Swiss innovation in groundwater monitoring through electricity use, efficient solar pumps and smart micro grids will be tested in the partner countries.

OBJECTIVES

The main goal of the project is to contribute to climate resilient, gender and socially inclusive agrarian livelihoods in Bangladesh, India, Nepal and Pakistan by supporting Government efforts to promote solar irrigation.

The specific objectives are:

- Improved empirical evidence supports development of climate resilient, gender and socially inclusive and groundwater responsive solar irrigation policies.
- Innovative actions and approaches for gender and socially inclusive and groundwater aware solar irrigation are validated.
- Increased national /global knowledge and capacity for gender and socially inclusive and groundwater responsive solar irrigation policies and practices.



Clean Energy & Energy Efficiency

PROJECT AT A GLANCE

Area: Adaptation and Mitigation

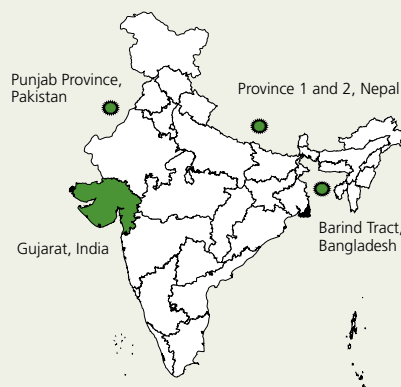
Duration: December 2019 - June 2024

Budget: CHF 5'300'000

Implementation Partners:

- International Water Management Institute (IWMI)
- Infrastructure Development Company Limited (IDCOL) in Bangladesh; Gujarat Urja Vikas Nigam Limited (GUVNL) and Gujarat Energy Research and Management Institute (GERMI) in India; Alternate Energy Promotion Centre (AEPC) and Nepal Electricity Authority (NEA) in Nepal and Federal Water Management Cell (FWMC) and Pakistan Agricultural Research Council (PARC) in Pakistan and International Solar Alliance (ISA)

Geographic Focus:



Schweizerische Eidgenossenschaft
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Swiss Agency for Development
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KEY ACHIEVEMENTS & ONGOING WORK

- In Bangladesh, the Country Project Management Committee has evolved into the only platform bringing all public sector agencies working with solar irrigation pumps (SIPs) together.
- Project research results have led to Nepal revising its SIP subsidy delivery policy to better target women and smallholder farmers.
- The project research results are being used by Nepal and Bangladesh for mapping emission reductions due to SIPs in order to mobilize climate finance.
- 2700 technicians were provided trainings on SIP operation and maintenance, benefits of grid integration, and water management with a view to enhance operational efficiencies and financial viability of public investments in SIP.
- The adoption of SIPs is leading to an increase of 10%-20% in farmer incomes due to switch to higher value crops, reduction in the cost of irrigation services, and receipt of payment for injection of surplus energy into grid.



EXPECTED RESULTS

- Documentation of the impact of solar pump adoption on livelihood, groundwater sustainability and climate resilience.
- Demonstration of gender responsive, pro-poor and groundwater aware solar irrigation models.
- Demonstration of technical and institutional modalities for grid connection of solar irrigation pumps in South Asian region.
- Multi-stakeholder forums support global and regional exchange of knowledge on best practices in gender and socially responsive and groundwater aware solar irrigation practices and policies.



IN NUMBERS



There are close to 11.8 million electric and 8.6 million diesel pumps in operation in Bangladesh, India, Nepal and Pakistan.



South Asia is the world's largest user of groundwater for agriculture, withdrawing 262 km³ of groundwater annually (50% of the global abstraction).



South Asia's agriculture a key source of greenhouse gases and short lived climate pollutants (SLCPs).



Bolstered by steep decline in panel prices solar irrigation pumps are increasingly becoming an important part of the renewable energy strategies and agriculture support programs of the Governments.



Despite availability of high subsidies in most countries, less than 10% of the solar irrigation pumps are owned by small and marginal farmers. In case of women farmers, this number is only 5%.



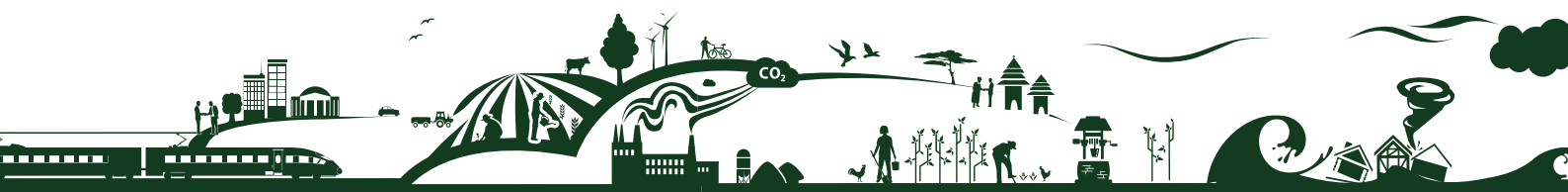
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Capacity Building for Low Carbon and Climate Resilient City Development project (CapaCITIES)

CONTEXT

Today, cities account for approximately two-thirds of global energy use and over 70 percent of energy-related greenhouse gas (GHG) emissions that drive global climate change. India is the fourth largest greenhouse gas emitter in the world and with the accompanying rapid urbanisation, there is an urgent need for climate action especially across its 4000 plus urban centres. Old and new cities across India are facing immense pressure due to ever-rising demand for energy, infrastructure and services. This will be further accentuated by the growing risks caused by climate variability, which are most likely to affect the poor and vulnerable segments of the urban populations. In view of this, the cities need to come up with integrated plans and solutions for dealing with the combined challenges of urban growth, poverty and climate change risks and move towards low emission, climate resilient and sustainable urban development.

Through the Capacity Building for Low Carbon and Climate Resilient City Development project (CapaCITIES), SDC responds to the Government of India's objective of developing "Climate-Smart Cities". After the successful implementation of the first phase, the CapaCITIES project in its second phase is focusing on enhancing the capacities of 8 cities and 2 states of Tamil Nadu and Gujarat. The project works on mainstreaming climate action in urban development through adoption of integrated climate-resilient planning, design of innovative finance mechanisms and development of climate-resilient infrastructure. The project brings together Indo-Swiss expertise in the sectors of water, waste and transport to demonstrate scalable solutions of urban climate action in India, with a global relevance.

OBJECTIVES

The overall goal of CapaCITIES project is to achieve lower greenhouse gas emissions growth path and to increase the resilience of select Indian cities and states against climate change impacts.

The primary objectives of the project in phase 2 are:

- City and state governments integrate climate change aspects (adaptation and mitigation) into urban planning and implementation.
- Enhanced capacities of city and state governments to access finance for scaled up urban climate action.
- Enhanced knowledge on accelerating city climate action at the national and global level.



Clean Energy & Energy Efficiency



Natural Resource Management

PROJECT AT A GLANCE

Area: Adaptation and Mitigation

Duration: September 2019 - June 2024 (Phase 2)

Budget: CHF 4'900'000

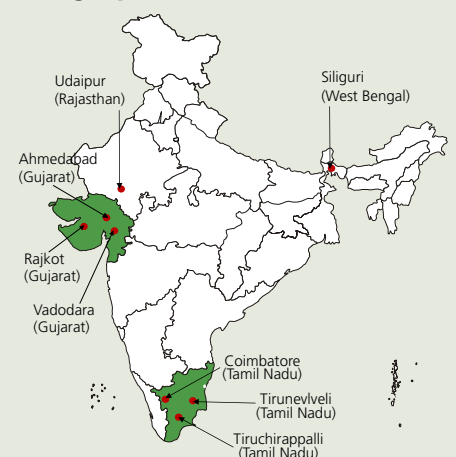
Implementation Partners:

- South Pole Carbon Management Ltd., Switzerland
- ICLEI South Asia
- Econcept AG, Switzerland

Public Sector Partners:

- National Institute of Urban Affairs
- Municipal Corporations and city level authorities
- Urban Development/Climate Change/ Municipal Affairs Department of Government of Gujarat and Tamil Nadu

Geographic Focus:



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
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Swiss Agency for Development
and Cooperation SDC

KEY ACHIEVEMENTS

- 8 Climate Resilient City Action Plans (CRCAP) ratified/approved by the Municipal Corporations.
- Highest 4 star ranking awarded to 3 partner cities (Ahmedabad, Vadodara and Rajkot) for their performance in the Climate Smart Cities Assessment Framework 2.0 by the Ministry of Housing and Urban Affairs (MoHUA).
- Specific allocations made in the municipal budgets to implement actions identified in the climate action plans (e.g. Rajkot municipal corporation allocated CHF 127 million in two years for climate actions).
- Cities implement innovative and scalable mitigation solutions (e.g. 124'900 t of CO₂e/year emissions avoided as a result of 20 TPD plants in Udaipur).
- Carbon credit concept for electric buses in Ahmedabad submitted to the state government by the CapaCITIES project. The 350 electric buses will lead to an annual average emission reduction of ~9100 tons CO₂e.
- Adaptation related interventions implemented in partner cities (e.g. ground water recharge systems to reduce short term urban flooding, provision of acoustic water leak detection systems, improvement in vegetative covers, dual plumbing, rainwater harvesting).
- Support to the MoHUA Smart City Mission in the preparation of the Climate Smart Cities Assessment Framework. CapaCITIES's city climate action plan methodology disseminated by the Ministry as an advisory and good practice to all 100 smart cities in India.



PLANNED RESULTS

- Simplified Climate Resilient Cities Process and assessment instruments (Basket of Solutions) are prepared, Climate Resilient City Action Plans (CRCAP) prepared, implemented and monitored in all 8 cities.
- Institutionalization of the urban climate action planning process at the state level in Tamil Nadu and Gujarat as well as at the national level through NIUA.
- Public private co-financing mobilised for financing city climate actions; knowledge products disseminated and reported at the national level; policy dialogues conducted at the national level for mainstreaming project results; project outcomes and knowledge products documented, disseminated and reported at the global level.
- Dissemination of best practices (approach and pilots) to other Indian cities and countries, improved access of the partner cities to participate in global city networks and coalitions.



IN NUMBERS



According to IPCC, urban infrastructure accounts for over 70% of global energy use and energy-related GHG emissions.



Over 64% of the world population is expected to live in cities by 2050.



According to UN DESA, India is projected to add more than 400 million urban dwellers by 2050.



India aims to reduce the emissions intensity of its GDP by 45% by 2030 from the 2005 level.

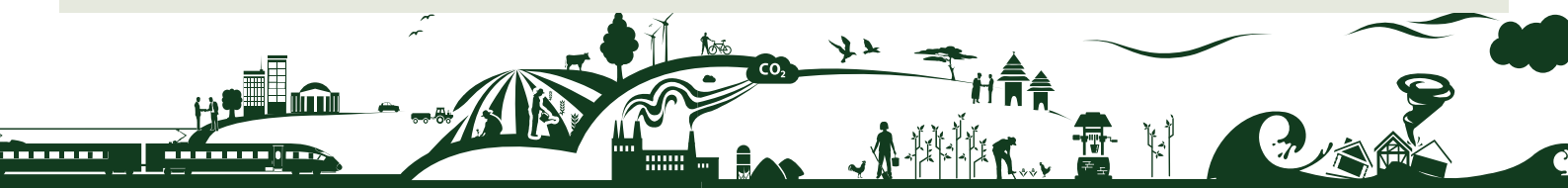


Lead photo Prashanth Vishwanathan © SDC; photo 1 Sundeep Bali © SDC, photo 2 Payal Kakkar © SDC, photo 3 Palani Kumar © SDC

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Building Energy Efficiency Project (BEEP)

CONTEXT

India's construction sector is experiencing unprecedented growth due to both a rising economy and population. Over the next decade, it is expected to grow at seven to eight percent annually. In fact, the total building floor area is expected to increase by four to five times between 2012 and 2047. From 2012 until 2047, the residential building area is expected to increase by four times, the commercial sector area by 13 times.

While growth is a positive indicator of India's development, it also poses considerable challenges in terms of energy demand and supply, as well as carbon dioxide emissions. At present, India's buildings account for 33 percent of the country's total electricity consumption. With the increasing building stock as well as the intensity of electricity consumption in urban buildings, mainly due to rapid growth of air conditioning, buildings will soon become the largest consumer of electricity in India.

In view of this, the Swiss Agency for Development and Cooperation (SDC) in partnership with the Ministry of Power, Government of India, is supporting a project to reduce energy consumption in new commercial, residential and public buildings.

OBJECTIVES

Energy consumption in new commercial, public and residential buildings in India is reduced through energy-efficient and thermally comfortable design and the application of renewable energy technologies. The project includes:

- **BUILDING DESIGN:** Energy-efficient and thermally comfortable building design adopted as standard practice by the Indian building sector.
- **BUILDING TECHNOLOGY:** External movable shading systems for windows and glazed areas in buildings developed and established in the Indian market.
- **POLICY:** Measures for energy-efficient and thermally comfortable buildings integrated in national, state and city-level policy.
- **OUTREACH:** Knowledge on energy-efficient and thermally comfortable buildings widely communicated.



Clean Energy & Energy Efficiency

PROJECT AT A GLANCE

Area: Mitigation

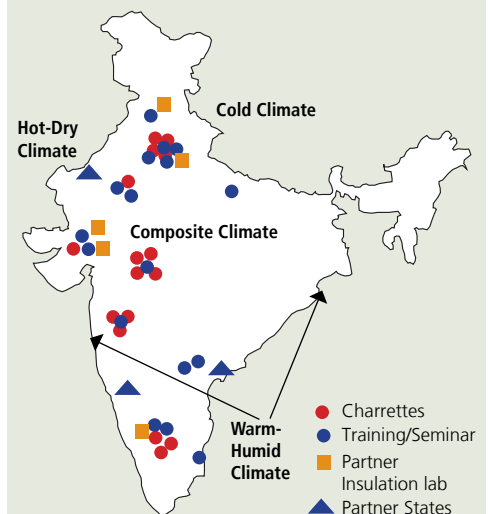
Duration: 2017 – 2023

Budget: CHF 7'000'000

Implementation Partners:

- Effin'Art, Switzerland
- Greentech Knowledge Solutions, India

Geographic Focus:



KEY ACHIEVEMENTS

- Energy conservation building code for the residential buildings (ECBC-R) launched at the national level by the Government of India.
- The ECBC-R is being applied in the construction of 3 million affordable housing units with the potential to impact more than 12 million housing units across India.
- 7000 people benefited from 445 better housing units due to energy efficient and thermally comfortable design measures in buildings.
- Guidelines for the design of energy-efficient multi-storey residential buildings for three climate zones in India released.
- Technical advice to 40 building projects showed 25-40 percent energy reduction potential through better building design with minimal cost additions, including, the first net-zero building in India.
- National award on energy-efficient and thermally comfortable building design established.
- Five new designs of external movable shading systems tested with the support of Swiss experts.
- 3000 building professionals and students introduced to energy-efficient building design processes and specific strategies for energy efficiency in buildings.
- 5 BEEP student camps on integrated building design implemented to train more than 250 young architects and engineers from about 50 Indian institutions.
- Over 160 media sector professionals, journalists and students are sensitized and trained to report on energy efficient and thermally comfortable buildings to the general public.



ECO-NIWAS SAMHITA 2018
(Energy Conservation Building Code for Residential Buildings)
PART I: BUILDING ENVELOPE



Lead photo © SDC; photo 1 Payal Kakkar © SDC; photo 2 Palani Kumar © SDC; photo 3 © LC3 website

PLANNED RESULTS

- Strategies and capacities for mainstreaming of energy-efficient and thermally comfortable buildings developed for selected states.
- Competencies of selected builders/developers for energy-efficient and thermally comfortable building design enhanced through trainings and workshops.
- Simple manuals and online tools for applying energy-efficient building design measures developed and disseminated for large-scale applications.

IN NUMBERS



Buildings in India account for 33% of India's electricity consumption.



India's construction sector is expected to grow at 7-8% each year over the next decade.



As per India Energy Security Scenario (IESS) estimates, Residential and Commercial buildings built-up area of ~14 billion m² in 2012 is going to increase to ~66 billion m² by 2047 i.e. ~5 times.



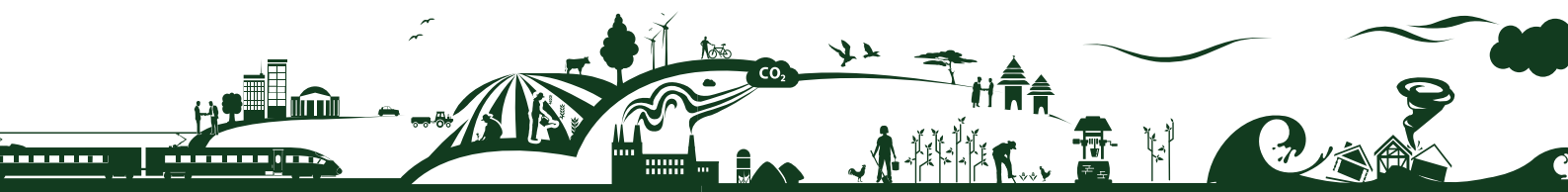
The Energy Security Scenarios of India identify the building sector as a sector with one of the largest energy and carbon mitigation potentials.

ABOUT SDC IN INDIA

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Integration of Renewable Energy in Buildings in India (BEEP RE)

CONTEXT

The residential and commercial buildings in India account for about 33 percent of the electricity consumption, which is rising at nearly 8-9 percent annually. Population growth combined with increasing electricity demand and affordability for thermal comforts (mainly by using air conditioners) is expected to exponentially increase the energy consumption in buildings. The projections of Niti Aayog, a premier think-tank of the Government of India, estimate 6-10 times increase in electricity demand in commercial buildings and 4-10 times increase in residential buildings during 2012 to 2047.

India aims to achieve a total of 500 GW of installed renewable energy capacity by 2030. For the building sector, there is a growing understanding to make buildings shift from energy consumers to become energy generators by integrating different renewable energy technologies.

In view of this, the Swiss Agency for Development and Cooperation (SDC) is supporting a project on the Integration of Renewable Energy in Buildings in India. This project works in coordination with SDC's other on-going project on building energy efficiency (www.beepindia.org).

OBJECTIVES

The broad objective of the project is to design and demonstrate building integrated renewable energy technologies for commercial and residential buildings suitable to the local conditions.

The specific objectives are:

- Building integrated renewable energy technologies are demonstrated for up-scaling in India.
- Research and monitoring methods to measure the performance of systems are adopted by the practitioners.
- Knowledge on performance monitoring methods is effectively delivered to targeted stakeholder groups.



Clean Energy & Energy Efficiency

PROJECT AT A GLANCE

Area: Mitigation

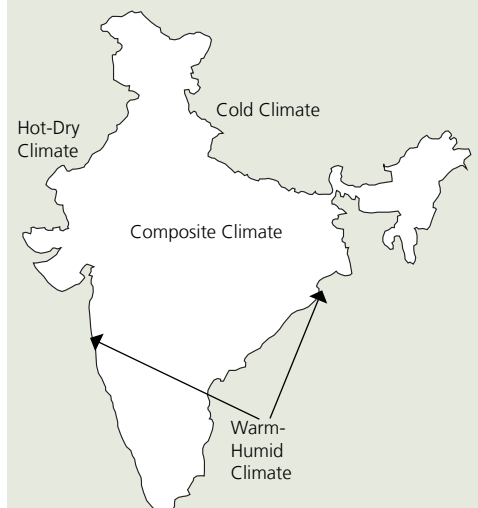
Duration: 2019 – 2023

Budget: CHF 950'000

Implementation Partners:

- International Institute for Energy Conservation (IIEC)
- Basel Agency for Sustainable Energy (BASE), Switzerland
- Environmental Design Solutions (EDS)
- Meghraj Capital Advisors Private Limited (MCAPL)

Geographic Focus:



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

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KEY ACHIEVEMENTS

- Technology factsheets for 9 commercially viable RE technologies developed and disseminated to sector practitioners.
- Selection tool developed to support building owners and developers in shortlisting appropriate RE technologies.
- Technical assistance for integration of RE provided to a prominent developer on small wind turbine and solar hybrid system for residential buildings.
- Business models developed to support the integration of RE technologies in buildings.
- Four MoUs signed with architectural colleges for the development of RE-specific courses and the creation of a Centre for Renewable Energy to support faculty training and capacity building at School of Planning and Architecture Delhi.
- Technical support provided to the Government of Ladakh to implement heat pumps in hospitals/public health clinics.



PLANNED RESULTS

- Development of a guidebook for the integration of RE in buildings for industry professionals and other stakeholders.
- Automation of technology selection tool for quick assessment of RE technologies suitable for buildings.
- Demonstration of pilot projects for the integration of renewable energy technologies in buildings.
- Research and monitoring methods to measure the performance of identified RE technologies are developed, released and distributed.
- Training modules and capacity building programmes developed for professionals and building sector practitioners for adoption of research and monitoring methods.



All pictures @SDC

IN NUMBERS



Buildings in India account for 33% of India's electricity consumption.



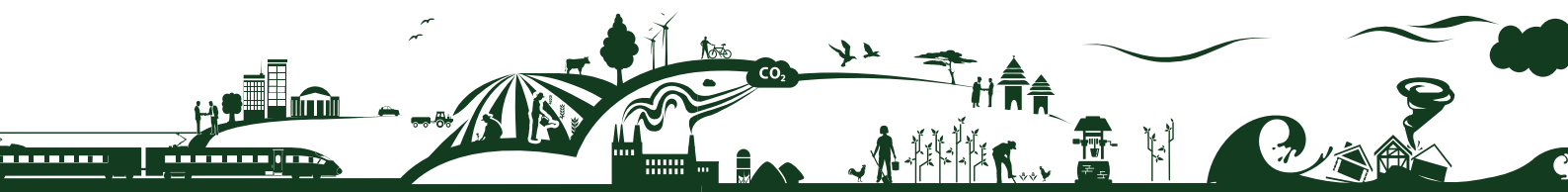
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Low Carbon Cement Project (LCC)

CONTEXT

India is the second-largest producer of cement in the world after China, accounting for eight percent of the total global production. With an increased focus on infrastructure development in India and an unprecedented growth in the housing sector due to rising population, the demand for cement is expected to rise even further. It is estimated that India's cement consumption will continue to grow at six to ten percent annually.

While an increase in demand for cement augurs well for the overall economic growth of the country, its production has a detrimental impact on the environment. Estimates suggest about five to eight percent of carbon dioxide in the atmosphere due to human activity originates from cement production.

Against this background, the Swiss Agency for Development and Cooperation (SDC) is supporting the development of a new type of low carbon cement, a blend of crushed limestone, calcined clay and clinker.

The new cement mix called Limestone Calcined Clay Cement (LC3) has the potential to reduce carbon dioxide emissions by up to 30 percent compared to standard cement while saving production costs at the same time.

OBJECTIVES

The phase 3 of the LCC project aims to reduce global CO₂ emissions by fast and sustainable uptake of LC3 by the construction sector, supported by a conducive regulatory environment. It has the following components:

- R&D has closed critical remaining knowledge gaps to support LC3 deployment.
- LC3 is included in Indian cement standards.
- Information on LC3 is broadly disseminated, realized construction projects and an enabling policy framework to de-risk investment and accelerate commercial deployment.



Clean Energy & Energy Efficiency

PROJECT AT A GLANCE

Area: Mitigation

Duration: 2020 - 2022

Budget: CHF 1'850'000

Implementation Partners:

- Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland (Project lead)
- Indian Institute of Technology (IIT): Delhi and Madras, India
- Centro de Investigación y Desarrollo de Estructuras y Materiales (CIDem), Cuba
- Technology and Action for Rural Advancement (TARA), India

Geographic Focus:



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development
and Cooperation SDC

KEY ACHIEVEMENTS

- Studies have confirmed that the production of LC3 with a clinker content of 50 percent results in about 30 percent less CO₂ emissions than standard cement and about 10 percent less than other blended cements.
- Draft standards in India to make LC3 a cement standard have been circulated for the public consultation. LC3 is approved as a cement standard in Cuba.
- Extensive tests in the lab and in the field have shown that LC3 has similar characteristics than standard cements.
- Resource mapping has shown that suitable clays are widely available in India, partly even as waste materials from current mining activities.
- While the actual cost of producing LC3 depends on the specific circumstances of each cement plant, case studies indicate that on average the production costs are similar or slightly lower.
- Trial production and applications of LC3 (e.g., pavements, small roads, LC3 based concrete platform) conducted in India and Cuba.
- Two Technology Resource Centers (TRCs) in India and Cuba are supporting the cement companies in Asia, Africa and the Latin American regions.
- Performance tests of LC3 have laid a foundation for its commercial production.

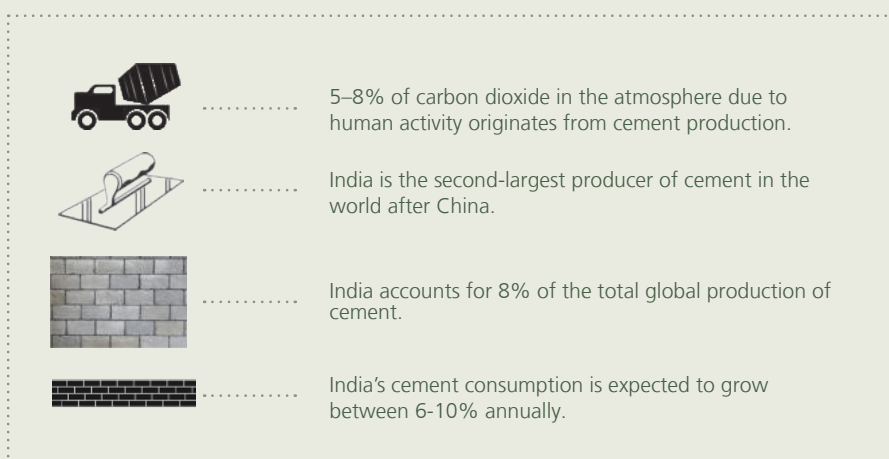


PLANNED RESULTS

- All relevant technical characteristics of LC3 are scientifically investigated and published.
- Remaining knowledge gaps related to cement and concrete are scientifically investigated and results published.
- Answers to anticipated technical questions during the standardization process generated and made available.
- Continued support is secured through active engagement in the standard approval committees, with cement companies and joint work with key stakeholders/experts.
- Dissemination of project results for up-scaling of the production and consumption of LC3 in the cement, concrete and construction industry.
- First-of-a-kind LC3 plants and construction project with LC3 cements help de-risk investment decisions and support commercial deployment.
- Policy makers are fully aware of the positive environmental and social impacts of the deployment of LC3 cements.



IN NUMBERS

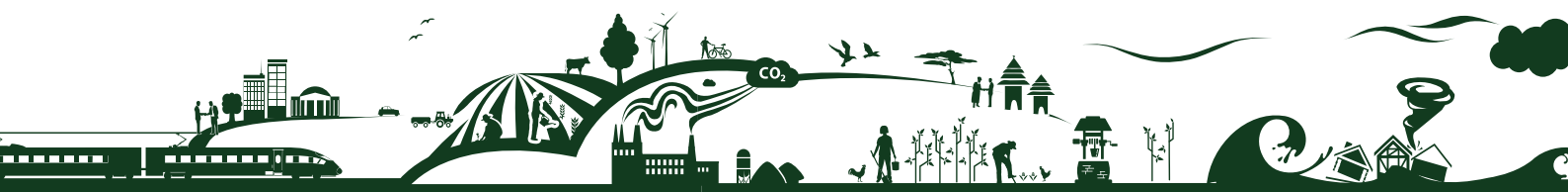


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ABOUT SDC IN INDIA

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Clean Air Project in India (CAP India)

CONTEXT

Air pollution is a global concern contributing to a wide range of health risks. According to the World Health Organisation data, around 7 million people die worldwide every year from exposure to the polluted air. More than 80 percent of people living in urban areas are exposed to concentrations higher than the level recommended by the WHO.

India is one of the countries that is severely affected by air pollution. As per the Global burden of disease report 2019, almost 100% of Indians were exposed to unhealthy concentration of PM2.5 in 2019. Around 78% of the Indian cities where air quality is being monitored violate the prescribed ambient air quality standards. Air pollution is among the top five health risks in India causing around 1.67 millions deaths in 2019 accounting for 17.8 % of the total deaths in the country. Sensing the urgency, the Government of India launched the National Clean Air Programme (NCAP) with the aim to reduce pollution levels in 132 non-attainment cities by 20 - 30% by 2024.

In view of this, the Global Programme Climate Change and Environment of the Swiss Agency for Development and Cooperation (SDC) is supporting the Clean Air Project in India (CAP-India) to strengthen Govt's efforts in controlling the air pollution. CAP-India is assisting four partner cities – Lucknow, Kanpur, Pune and Nashik – in strengthening their clean air action plans based on international techniques of the advanced source apportionment.

OBJECTIVES

The overall goal of the project is to support India's efforts to improve people's health and well-being through better air quality, while contributing to environment and climate change mitigation.

The primary objectives of the project area:

- Improved data measurement and analysis on clean air.
- Enhanced capacities of city and state authorities to implement clean air policies and action plans.
- Awareness for clean air action is raised.



Clean Air, Land
and Water

PROJECT AT A GLANCE

Area: Mitigation

Duration: 2019 - 2023

Budget: CHF 5'000'000

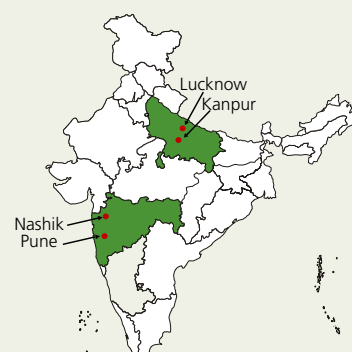
Implementation Partners:

- The Energy and Resources Institute (TERI), New Delhi, India (Lead)
- Automotive Research Association of India (ARAI), Pune, India
- International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria
- The Ecole polytechnique fédérale de Lausanne (EPFL) Lausanne, Switzerland

Research Partners:

- Paul Scherrer Institute (PSI), Switzerland (Lead)
- Indian Institute of Technology, Kanpur (IITK)
- National Environmental Engineering and Research Institute (NEERI)

Geographic Focus:



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

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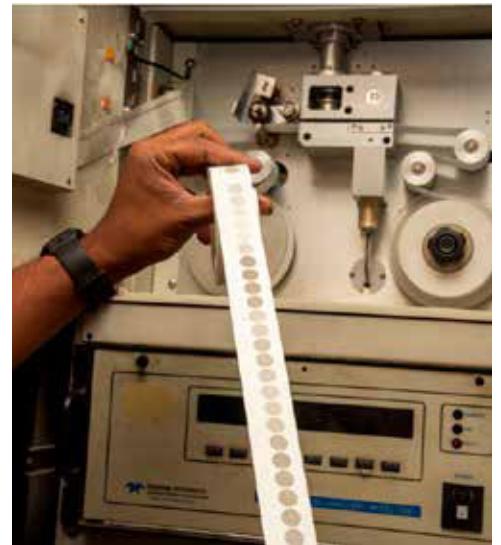
KEY ACHIEVEMENTS

- Emission inventory for four cities have been prepared.
- A comprehensive study to assess and optimize the existing air quality monitoring network in Pune has been conducted and has been submitted to MPCB.
- Priority sectors have been identified in the clean air action plan based on the initial study conducted in Pune and Nashik in consultation with relevant stakeholders using multi-criteria analysis.
- More than 250 government officials and local stakeholders were trained on air quality monitoring and management, traditional and advanced source apportionment studies and preparation of emission inventories.
- More than 3 million people representing the media professionals, general public and students, etc. has been aware about the air pollution through multiple awareness programs.

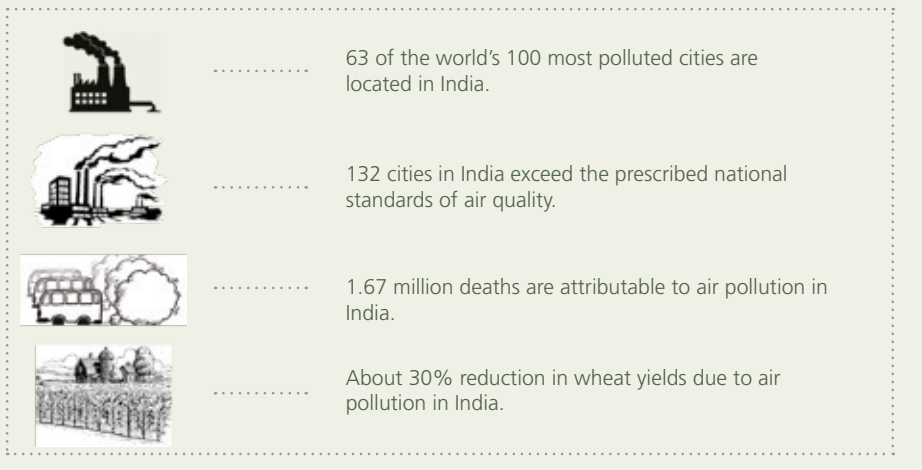


PLANNED RESULTS

- Scientifically proven source contributions of PM and other pollutants for four focus cities (Lucknow, Kanpur, Pune and Nashik) conducted.
- Clean air action plan of focus cities strengthened and accepted by pollution control board.
- Air quality monitoring, calibration methods and monitoring networks improved.
- Monitoring, review, and verification (MRV) systems developed for implementation of clean air action plans.
- Pilot demonstration based on approved city action plan conducted in selected sectors with high mitigation and replicative potential.
- Strengthened Technical capacities of the government officials in focus cities and other stakeholder strengthened on air quality measurement and management.
- Awareness campaign regularly organised by engaging with civil society, academic institutions and private sector actors.



IN NUMBERS



Lead photo, photos 1 and 3 Taha Ahmad © SDC, photo 2 Ranita Roy © SDC

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