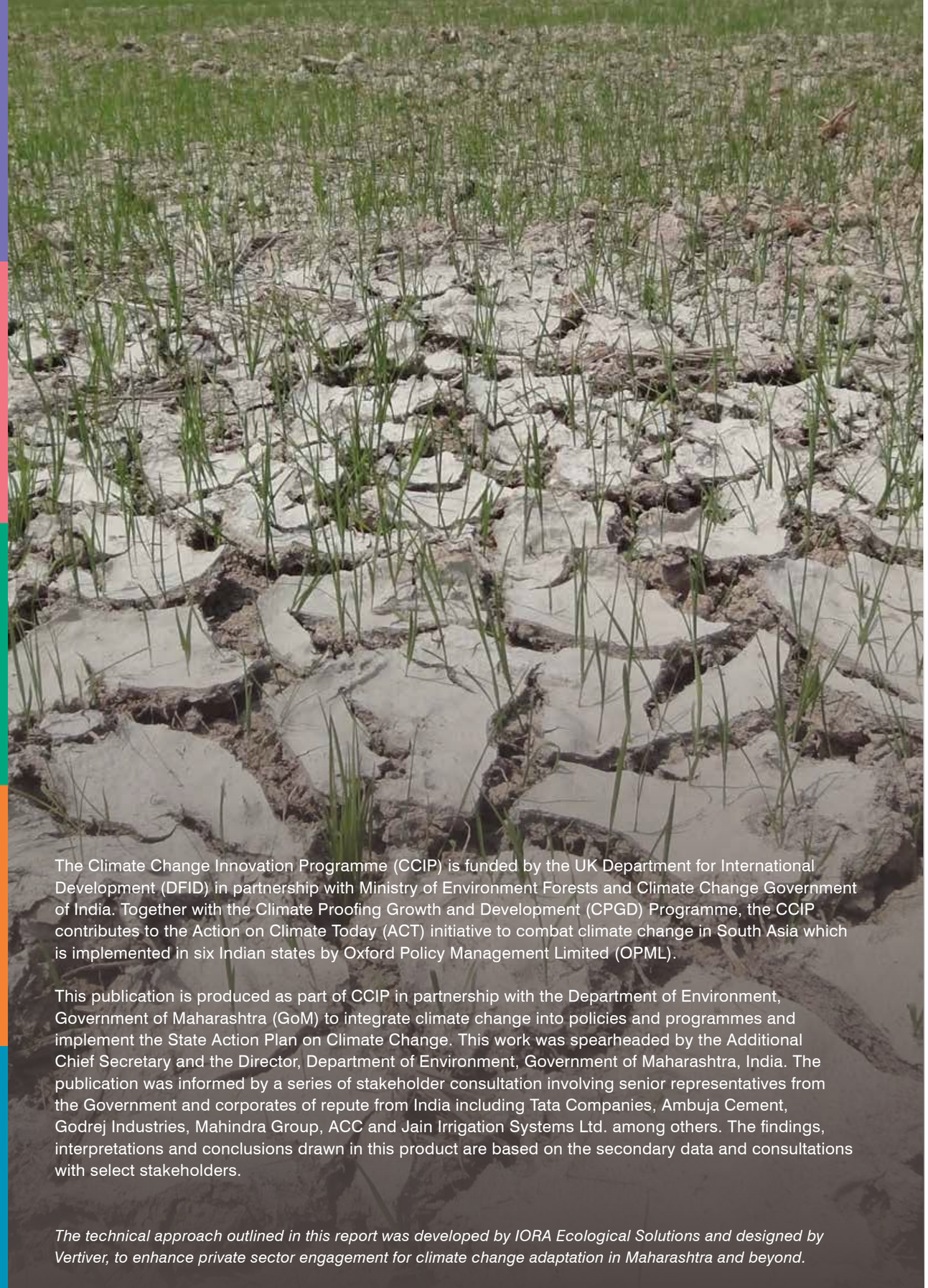
Private Sector Approaches for Climate Change Adaptation

October, 2017



The Climate Change Innovation Programme (CCIP) is funded by the UK Department for International Development (DFID) in partnership with Ministry of Environment Forests and Climate Change Government of India. Together with the Climate Proofing Growth and Development (CPGD) Programme, the CCIP contributes to the Action on Climate Today (ACT) initiative to combat climate change in South Asia which is implemented in six Indian states by Oxford Policy Management Limited (OPML).

This publication is produced as part of CCIP in partnership with the Department of Environment, Government of Maharashtra (GoM) to integrate climate change into policies and programmes and implement the State Action Plan on Climate Change. This work was spearheaded by the Additional Chief Secretary and the Director, Department of Environment, Government of Maharashtra, India. The publication was informed by a series of stakeholder consultation involving senior representatives from the Government and corporates of repute from India including Tata Companies, Ambuja Cement, Godrej Industries, Mahindra Group, ACC and Jain Irrigation Systems Ltd. among others. The findings, interpretations and conclusions drawn in this product are based on the secondary data and consultations with select stakeholders.

The technical approach outlined in this report was developed by IORA Ecological Solutions and designed by Vertiver, to enhance private sector engagement for climate change adaptation in Maharashtra and beyond.

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सत्यमेव जयते

Message

Human induced climate change is being increasingly recognized globally as one of the greatest threats to mankind in the 21st century. This changing climate can negatively impact and limit development.

Climate change is of significant relevance to the state of Maharashtra given its location and varying geophysical conditions, as well as its significant developmental needs given that it has an economy that is closely tied to climate sensitive sectors like agriculture.
To tackle the impacts of climate change, the State has taken several initiatives such as developing its 'Action Plan on Climate Change' and its 'Climate Change Policy'. Apart from these, flagship programmes of the government such as Jalyukta Shivar Abhiyan contribute positively in building resilience of the communities. A key player in Maharashtra's economy, is the private sector, which needs to have an active role in building the climate adaptive capacity of the state. I am happy that this publication can act as a guiding framework for businesses to build a climate-smart future for themselves and as well as for the people in Maharashtra. It is a much-needed step towards demystifying the concept of climate change adaptation to businesses by showcasing implementable approaches and global case studies to emulate.

I hope that the approaches presented here will be adopted and implemented in earnest by the private sector so that the possible adverse impacts of climate change are minimized and Maharashtra can head in the direction of sustainable development.

Devendra Fadnavis

Chief Minister, Maharashtra State, India

सत्यमेव जयते

Message

The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) affirms the current negative impacts of climate change and concludes that sea level rise, unpredictable weather patterns and extreme events such as floods, cyclones, droughts, declining agricultural productivity, changes in ecosystem composition etc. are likely to continue into the future unless concrete action is taken to control the drivers of climate change. These changes will make our socio-economic systems highly vulnerable.

The Government of Maharashtra is taking several measures to address the threat of climate change and reduce vulnerability of its people to its adverse impacts. To this end, the Maharashtra State Action Plan on Climate Change provides an overarching framework by identifying priority sectors and actions for building climate resilience in the state. The successful implementation of the action plan will require adequate and timely mobilization of support and investments for climate change adaptation measures that can prepare and equip our societies and economy. As a leading industrially developed Indian state, Maharashtra's corporate sector can play a key role in mobilizing the desired technological, financial and capacity building support towards climate change adaptation. The purpose of this publication is to showcase various approaches that can be undertake by businesses for climate change adaptation.

I wish that the approaches presented here will catalyse dialogue and action towards building climate resilience and inclusive growth in Maharashtra.

Ramdas Kadam

Environment Minister, Maharashtra State, India

सत्यमेव जयते

Message

Global models suggest that climate change could possibly warm the planet by 4°C or more above preindustrial levels till the end of this century. Maharashtra also one of the states in India which is experiences the effects of climate variability and changing patterns.

To avert these impacts, the State has developed its own State Action Plan on Climate Change, wherein the climate modelling assessments, show that temperature and rainfall are projected to increase all over the state in the near future. Further the state's long coastline, stretching nearly 720 km along the Arabian Sea, is also vulnerable to climate impacts as global mean sea level is projected to increase. These will have long-term impacts on sectors such as agriculture, manufacturing and services sector, which are the major contributors to the State's GDP, and consequently affect the livelihood of the people.

Private companies which majorly form the manufacturing, industrial and services sector, will need to support the initiatives of the public sector to strengthen the responses to climate change. This publication is a stepping stone in mobilizing private sector action and building public-private partnerships for making Maharashtra a 'Climate Resilient State'.

Pravin Pote Patil

State Environment Minister,
Maharashtra State, India

सत्यमेव जयते

Foreword

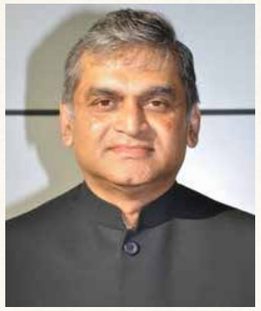
It gives me immense pleasure to present this publication on ‘Private Sector Approaches for Climate Change Adaptation’ prepared by the Department of Environment, Government of Maharashtra, India and Action on Climate Today (ACT), supported by the UK Department for International Development (DFID) and managed by Oxford Policy Management. This publication gives an insight into frameworks that private sector can adopt towards building adaptive capacity of their businesses as well as societies.

Climate change poses new and complex challenges for the private sector. It may affect companies’ fixed assets, i.e. property, plant and equipment, as well as their financial, social and environmental performance. With the right approaches and decision frameworks, these climate risks can be converted into significant opportunities. Globally, there is an increasing trend observed in the number of private sector initiatives that focus on climate change adaptation actions. This publication has synthesised these various actions into 15 models which are categorized under 5 key approaches for climate adaptation by private sector, relevant in the Indian context. Further, over 60 case studies by private sector companies from India and other countries are documented to illustrate the applicability of the approaches and models presented. I trust that this publication will provide a good basis for the private sector, government and non-government institutions to identify and partner in implementation of climate adaptation models in Maharashtra. It will also be a useful information source for academicians, civil society and experts.

I congratulate the Department of Environment and ACT for bringing out this useful publication at a time when climate adaptation has become essential to achievement of sustainable development. I am confident that this publication will be the cornerstone for enhancing private sector engagement in climate adaptation in Maharashtra and beyond.

Sumit Mullick

Chief Secretary, Maharashtra, India



सत्यमेव जयते

Message

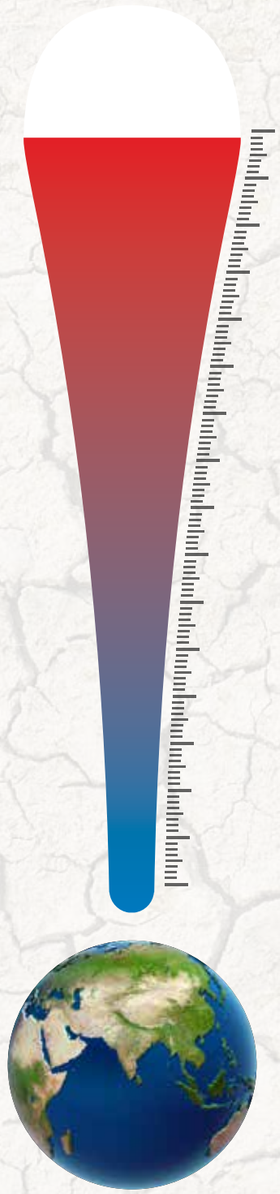
The impacts are climate change are well known globally as well as in the state. The Department of Environment has been leading in the State in taking initiatives to mitigate and adapt to the changes caused by climate change. It has support several departments within the State Government in tuning their existing policies and schemes to integrate the likely future climatic changes. To get a comprehensive view on the subject, the Department commissioned the study on climate change to develop the State’s Action Plan on Climate Change. The Plan adopted a cross sectoral approach while also covering the temporal scale, by conducting the climate modelling assessment. Understanding the recommendations provided in the plan, the Government has recently passed the resolution to establish an independent and dedicated ‘Climate Change Cell’. The newly formulated ‘Climate Change Policy’ will prove a guiding document in mainstreaming climate change issues in the developmental strategies of the state of Maharashtra.

Environment Department and the State Government is taking initiatives to bring together different stakeholders to increase the resilience of the communities towards climate change in the state. Private sector, in the state, has been having a large share in last few years in bringing a change on ground in terms of building adaptive capacity towards climate change. Their CSR activities have been bringing a positive change in communities. To convene these efforts, the Department with support from Action on Climate Today, the UK-India bilateral programme, has prepared this Toolkit on Private Sector Approaches This publication has screened and contextualized these global leading practices by private sector towards climate change adaptation to the Indian context.

I hope that this publication will serve as an important knowledge product for informing private sector actions towards climate change adaptation in Maharashtra.

Satish Gavai

Additional Chief Secretary, Environment,
Government of Maharashtra, India



Introduction

India is highly vulnerable to the impacts of climate change, as is being witnessed by rising temperatures, changes in rainfall patterns, and increasing frequency and intensity of extreme weather events.[1] Developing and implementing concrete and scientific strategies to adapt to climate change is paramount for the country and as a key stakeholder of India's economy, private sector must play a major role in enabling climate change adaptation. Indian businesses face internal climate risks such as sustaining production and supply chains, and externally to ensure market competitiveness and regulatory compliance in the future. Addressing these risks will be essential to sustaining viable and profitable businesses, while also contributing to building the adaptive capacity of the country. With the right approaches and models, these risks can be converted into significant opportunities.

This guide is designed to help build awareness among Indian businesses about various approaches that can be undertake for Climate Change Adaptation based on successfully implemented models that are applicable in the Indian context.

This guide can be used by:

- Private sector companies to promote corporate engagement and action on climate change adaptation.
- Central and state governments who wish to partner with private sector on designing and implementing models for climate change adaptation.
- Civil society interested in promoting corporate investments for community adaptation.

[1] India First Biennial Update Report to the United Nations Framework Convention on Climate Change

Business Life Cycle and Climate Risk

Internal Risk	
Production	**Supply Chain**
• Unavailability or high prices of raw materials • Low productivity of workforce • Poor access to finance • Physical risk to infrastructure	• Disruption in movement of material • Increasing cost variance • Uncertainty in inventory management
External Risk	
Market	**Regulatory Environment**
• Obsolescence of product mix • New competition • Social engagement/reputation	• New policies, programmes and regulations • Policy environment instability

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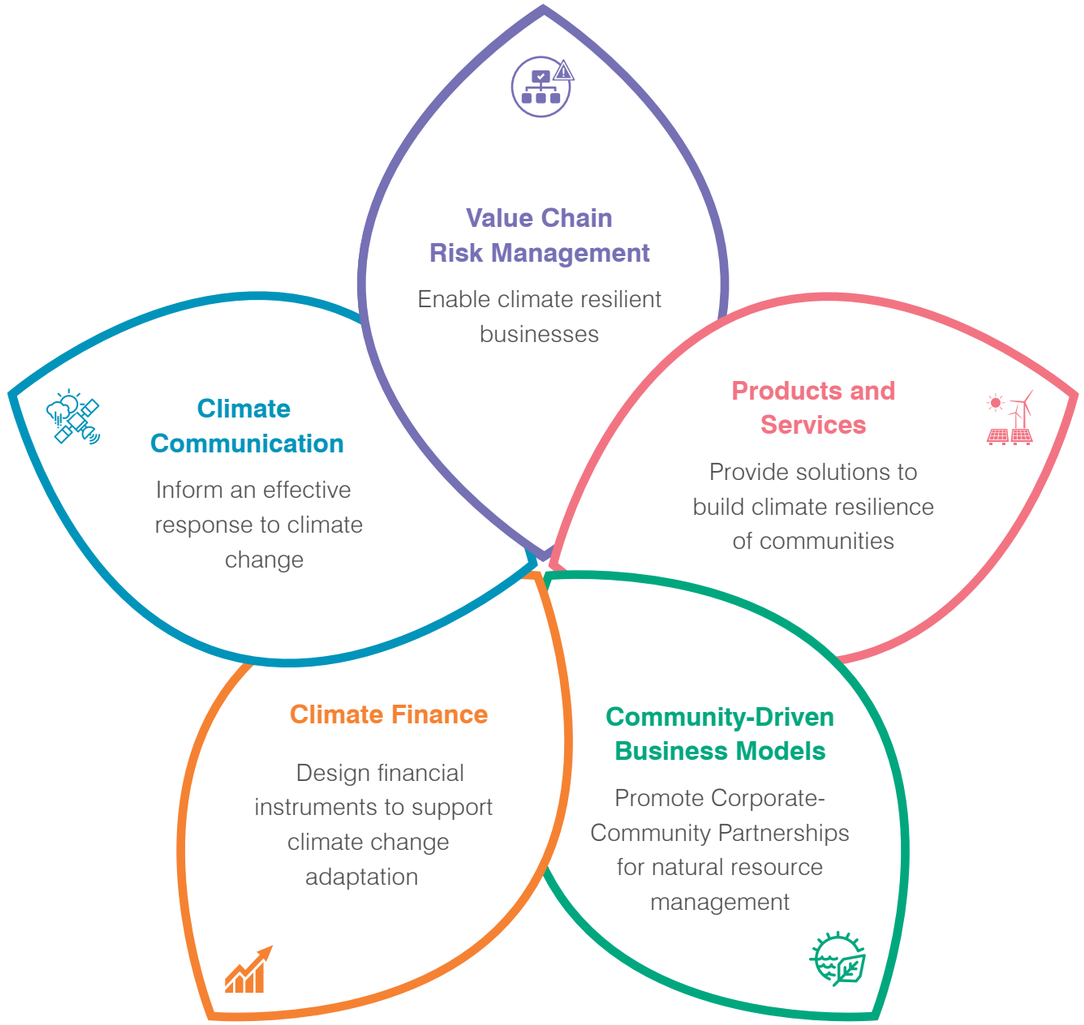
Adaptation Approaches



Private Sector Participation in Climate Change Adaptation: Five Approaches

Value Chain Risk Management

1. Climate Risk Assessment of Value Chain
2. Buy-Back Guarantee
3. Workforce Management
4. Climate Smart Agriculture
5. Water Resource Management

1. Climate Risk Assessment of Value Chain

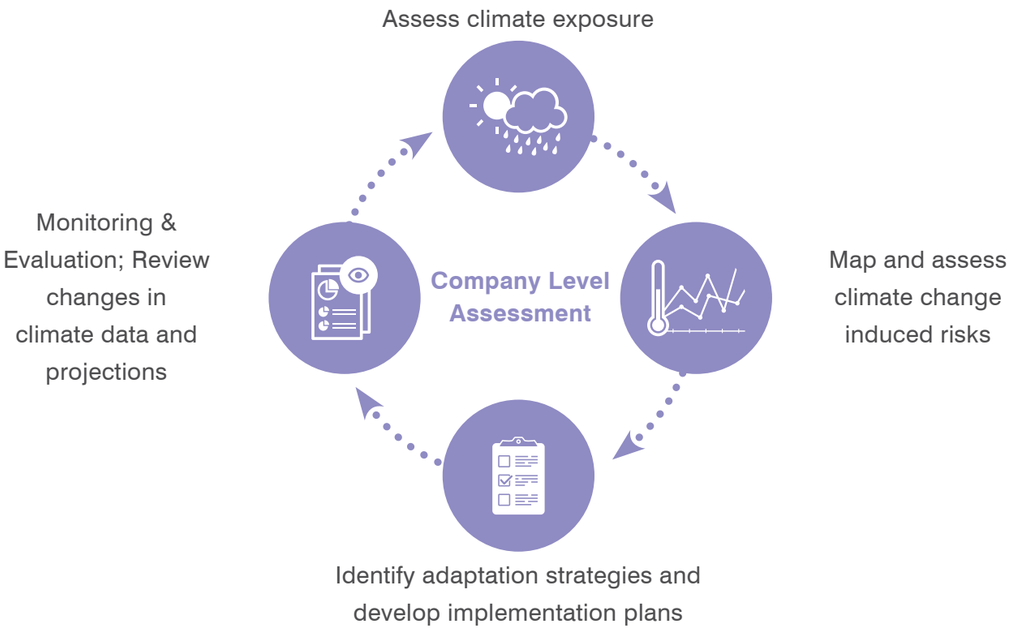
Overview

Climate change impacts business as well as the communities they depend upon.[2] Recognizing the problem, identifying the resulting risks, and responding with adaptation measures can help businesses build resilience to climate change. Companies need to undertake climate risk assessments to understand and assess the risks they face both internally, in sustaining their production and supply chain, and externally, in regulatory compliance and market competitiveness.

Means of Implementation
Corporate (Business)

Industry
All, especially those which have large infrastructure facilities/investments

Stakeholders Involved
Company



[2] Jean-Christophe Amado and Peter Adams (Acclimatise), Heather Coleman (Oxfam America) and Ryan Schuchard (BSR). Value Chain Climate Resilience - A Guide to Managing Climate Impacts in Companies and Communities.

Case Studies

National Grid plc

The company has undertaken climate risk modelling studies for its business in the UK and USA. Under these studies it - evaluated its business resiliency against a “worst case” scenario of climate changes through 2080 in UK; prioritized investments to reduce interruption losses and assessed flood risks in key U.S. geographies.

Entergy

Based on assessment of climate risks to its business, Entergy has strengthened its transmission and distribution lines in coastal areas to address the challenge of sea level rise. In addition, it has elevated substation control equipment in flood-prone areas and partnered with government, business, economic development and scientific research entities to approach environmental adaptation as a community-wide strategy.

SN Power

SN Power, a Norwegian hydropower company, has partnered with ICIMOD for assessing the climate change impacts on the hydrological regime of the Hindu Kush Himalayas.

Anglo American

Anglo American, a mining company commenced regional climate modelling exercises with UK Met Office, Imperial College of London and consultants to assess the long-term adaptation measures for its operations and projects in South Africa, Brazil and Peru.

2. Buy-Back Guarantee

Overview

Climate change will have adverse impacts on natural resources and correspondingly business value chains which are dependent on these.[3] Buy-back guarantee programmes and contract farming agreements with suppliers can secure long term supply of raw materials. These guarantees are mutually beneficial for both parties as the company secures its supply chain while the suppliers are backed by financial assurance for investing in adaptation mechanisms for their assets.

Means of Implementation

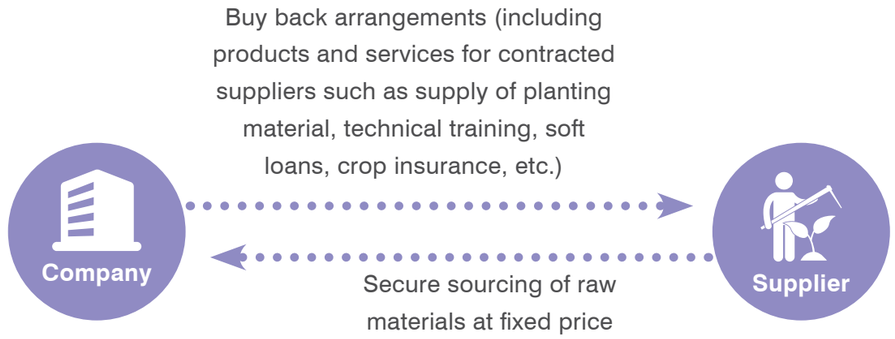
Corporate Entity Driven

Industry

Primary and Secondary Industries dependent on natural resources for sustaining their supply chains. For example, agri-businesses, FMCG companies

Stakeholders Involved

Company and Raw Material Suppliers (E.g. Farmer)



[3] IPCC, 1997 - R.T.Watson, M.C.Zinyowera, R.H.Moss. The Regional Impacts of Climate Change: An Assessment of Vulnerability.

Case Studies

Pepsico

Pepsico has introduced collaborative farming of process-grade potatoes in India. This included:

- **Assured buy-back of produce** at pre-agreed prices, which insulates farmers from open market price fluctuations.
- **Supply of high quality planting material**, including its proprietary advanced seed varieties.
- Offering advanced **plant protection programme** and technical know-how developed in collaboration with leading agri-input companies like DuPont, Bayer and BASF.
- **Soft loans** through a national level tie-up with State Bank of India.
- Facilitation of **crop/weather risk insurance** in partnership with leading insurance companies to protect farm incomes

Jain Irrigation Systems Ltd. (JISL)

Jain Irrigation Systems Ltd. (JISL), an integrated agribusiness, is the **third-largest processor of dehydrated onions in the world**. To secure regular supplies for its food processing business, **JISL has adopted a contract farming model**. It is a win-win situation for both the farmer & the company in which JISL gets assured, consistent and quality supply of white, high solid onion in large quantity and in turn, the grower benefits from a **unique pricing mechanism**, which is based on a minimum guaranteed price or the average of market price on the day of procurement, whichever is higher. Launched in year 2002, JISL's contract farming model is built on selecting progressive, receptive farmers and providing them with **high-quality seeds; access to Micro-Irrigation Systems (MIS), fertilizers, saplings**, and other inputs; supporting with agronomical training and guidance on all aspects of planting, input application, and other farm functions via JISL's more than 70 extension associates who reside in villages. There is no transaction fee, commission, quality certification charges payable by the farmer. Approximately **90% of JISL's onion contract farmers are small**, with an average farm size of less than two hectares. Further, in response to its major buyers' concerns about food safety and increased interest in farm-level practices and traceability, **JISL helps farmers meet international standards**. Based on the Global Good Agricultural Practice (GLOBALGAP) standards, JISL has developed the Jain GAP standard for Indian farmers and it uses the same for its farmer suppliers under the contract farming model. Farmers who comply with these standards are able to sell their higher-grade produce to markets outside India at substantial premiums.

Nimbus

Nimbus is the one of the largest animal health and nutrition companies in Nepal. It imports *soyabeans* and is **interested in supporting farmers to cultivate soyabeans in Nepal with a buy-back guarantee.** By growing *soyabeans* for Nimbus with direct market linkages, farmers in remote areas of western Nepal are ensured a fixed income for their harvest. Discussions and modalities for connecting Nimbus to local organizations and farmers are underway with the help of ICIMOD.

Dabur

In Bundelkhand region, Dabur has joined hands with 150 farmers who own marginal land. These **farmers are being offered an opportunity to augment their agricultural income by growing Bhumyamlaki** (a key ingredient in Chyawanprash), which is then bought back by the company.

Mahindra and Mahindra

The company **works closely with over 600 seed potato growers** through contract farming arrangements. Mahindra's agronomy interventions have helped farmers increase their productivity and quality of produce. **The company supplies farmers with high quality mini-tubers which are produced at their facility in Palampur (HP).** The seeds are bought back from the farmers at a minimum guaranteed price and are further distributed through a well spread out network to potato growers in Uttar Pradesh, Madhya Pradesh, Gujarat, Maharashtra and West Bengal.

3. Workforce Management

Overview

Climate change induced temperature increases, extreme weather events and related pressures will directly impact workforce productivity. Investing in initiatives that build adaptive capacity such as redesign of workforce spaces, training for extreme weather events, adjusting work schedules during extreme heat, will help businesses stay productive while become climate responsive.

Means of Implementation

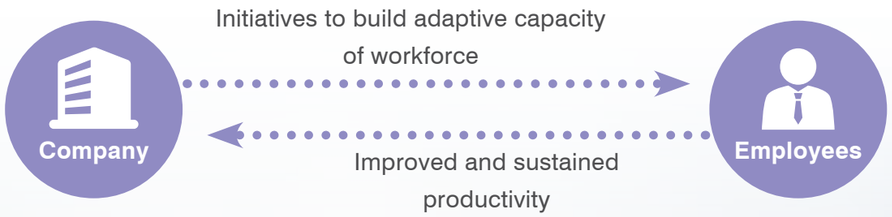
Corporate-Community Partnership or Corporate-Government-Donor-Community Partnership

Industry

All industries. Especially labour intensive industries such as mining and power sector companies

Stakeholders Involved

Company; Government Donors and Community



Case Studies

BHP Billiton

BHP Billiton joined the Lubombo Spatial Development Initiative (LSDI), a cross-border public-private sector partnership focused on reducing the malaria burden in Lubombo, an area spanning three adjoining countries: South Africa, Swaziland, and Mozambique. This has helped the company in ensuring productivity of their workforce.

Freeport-McMoRan Copper & Gold

The company supports malaria control programmes in Papua New Guinea, Indonesia and the Democratic Republic of the Congo (DRC). These programmes involve management of disease carriers through spraying and larvae control, diagnosis and treatment of malaria. The company closely monitors disease trends in both areas and modifies its programmes to respond accordingly. In the DRC, employee infection rates have dropped by 66 per cent and cases in children in the local community have decreased by 47 per cent since 2007.

Entergy

Entergy has recognized the broader implications of extreme events in developing its contingency plans. While the headquarters building (located next to the New Orleans Superdome) itself was relatively unaffected by Hurricane Katrina, the devastation in the surrounding area made it impossible for employees to get to work, highlighting for them the importance of adaptive planning.

4. Climate Smart Agriculture

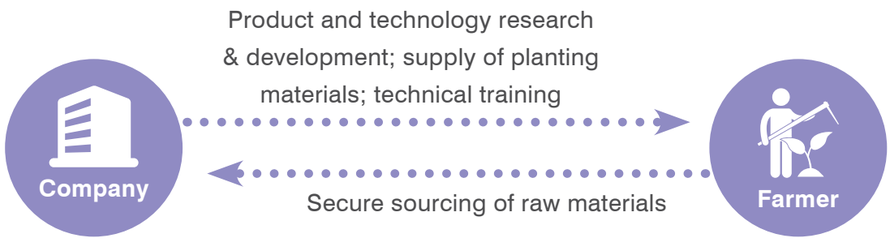
Overview

Climate change will have significant impact on agri-businesses, including both on farm and small holder supply chains.[4] Assessing the climate induced risks to their value chains and deploying appropriate measures to address the same can help build long-term sustainability of these business.

Means of Implementation
Corporate-Community

Industry
Primary and Secondary Industries involving agro-based businesses

Stakeholders Involved
Company and Farmers



[4] Business Innovation Facility. Project resource - Making Agribusiness Climate Smart.

Case Studies

Jain Irrigation Systems Ltd. (JISL)

The company has launched Project 'Maha Unnati', - a unique partnership with farmers to demonstrate and enable adoption of Ultra-High Density Plantation (UHDP) practice for mangoes. The project has an investment outlay of more than 50 crores, shared equally between Hindustan Coca Cola Beverages Pvt. Ltd. (HCCBPL) and Jain Irrigation. It will encourage sustainable, modern agricultural practices and help double mango yields. The project focuses on creating an ecosystem that delivers higher growth and income for farmers, thereby improving their livelihoods and building resilience to climate change, and the 'Grove to Glass' fruit supply chain, for optimising delivery.

DCM Shriram

The company is setting up Bio Control Labs in its sugar units in Uttar Pradesh which is assisting farmers in controlling pest attacks and helping in improving the ecological balance.

ITC

ITC's Social Forestry Programme aims to promote pulpwood plantations in Andhra Pradesh and energy plantations in Karnataka. The yields from pulpwood plantations are supplied to ITC's Paperboards and Specialty Papers Division (PSPD). Under the programme the company provides high-yielding, disease free clonal planting stock to farmers, developed through Tree Improvement research at its Bhadrachalam unit.

Nestle

In 2009, Nestle opened a R&D centre in Abidjan in Côte d'Ivoire with a focus on agriculture, raw materials and traditional African ingredients. Since 2012, this initiative has helped improve production of cocoa in extreme weather conditions, by providing farmers with 1 million high-potential cocoa trees each year.

5. Water Resource Management

Overview

Climate change induced water crisis is ranked as the third most impactful global risk by the World Economic Forum.[5] This calls for companies to assess the climate-induced water vulnerability of their business operations and deploy measures to address the risks identified.

Means of Implementation

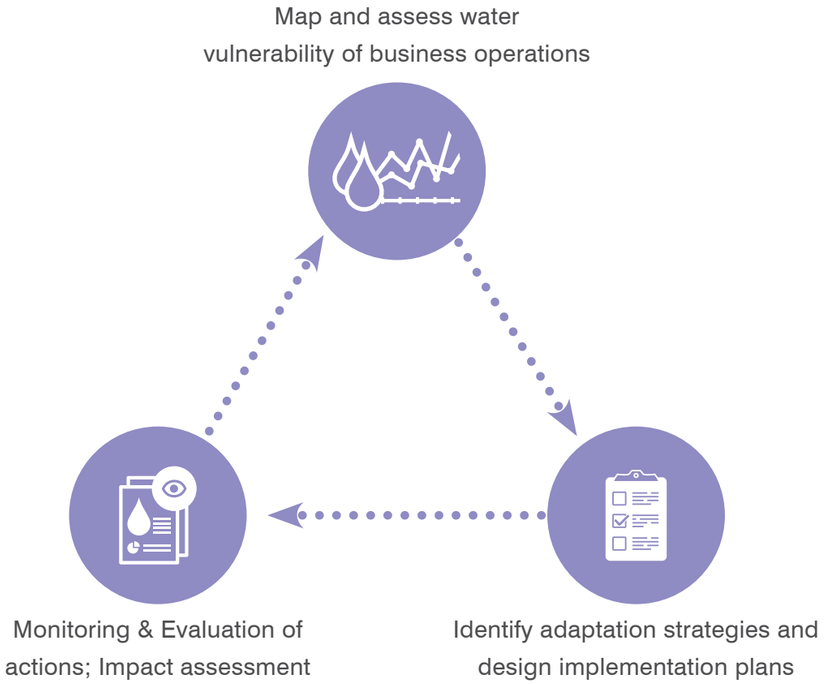
Corporate-Community Partnership

Industry

All industries, especially primary and secondary industries

Stakeholders Involved

Company



[5] World Economic Forum. The Global Risks Report 2016, 11th Edition.

Case Studies

Coca Cola

As a result of a system-wide requirement for its bottling plants to assess and address local water vulnerabilities through plant-level improvements and local partnerships, in India Coca-Cola has achieved full balance between the groundwater used in beverage production and the amount of water the company is replenishing to nature and communities.

Ambuja

Ambuja is declared as a water positive company; It has taken several initiatives including water harvesting and conservation efforts across its installations, recycling of waste water generated from plant and colony and reusing it in dust suppression, gardening, horticulture, and other activities within its facilities.

Hindustan Construction Company

Hindustan Construction Company is applying innovations in water treatment and rainwater harvesting to large-scale infrastructure projects in India that contribute to the company's goal of water neutrality. Examples include the wastewater treatment plant built for process requirements in the Visakhapatnam Cavern project and its model for harvesting rainwater runoff from the Delhi-Faridabad Elevated Expressway in order to manage stormwater and exceed its goal of water neutrality for the project.

Tata Chemicals

Rain water harvesting projects at all plant sites along with continued watershed development and management programmes at Mithapur.

ACC

ACC has adopted rain water harvesting in all its plants, mines, colonies and, community areas. This has helped its Kymore and Jamul plants to become self-sustainable without depending on natural resources like rivers, bore wells etc. Further, it has invested in treatment, recycling and reuse of waste water thus reducing fresh water intensity by reducing the demand for water in process and non-process needs. It has also installed water metering systems to track water usage and minimized leakage through modifications in industrial processes.

DCM Shriram

The company is addressing the dearth of water in arid terrains near Kota, Rajasthan, through the digging of bore wells and the installation of submersible pumps. Its man-made water harvesting based reservoir spread over 50 acres at Kota accommodates 4.5 lac cubic metres of water, enough to provide for 21 days of production.

Thames Water

A water utility company, it is embedding adaptation into its core operational strategy. The strategy is focused on water resources, sewer capacity and flood resilience. The company has also challenged their suppliers to consider its adaptation actions to ensure and maintain service levels in future.

Products and Services

1. Product Diversification
2. New Market Opportunities
3. Technology Solutions for Water Management
4. Technology Solutions for Climate Smart Agriculture

1. Product Diversification

Overview

Climate change may present new opportunities for businesses.[6] Companies can develop and deploy new products, technologies and services that support climate mitigation or which help improve the climate adaptive capacities of their target audience or markets.

Means of Implementation

Corporate (Business/ CSR)

Industry

Manufacturing and Service Industries

Stakeholders Involved

Company; Buyers/ Market; Donors; Government Agencies

[6] ICF International, 2008 - Frances G. Sussmanand J. Randall Freed. Adapting to Climate Change: A Business Approach.

Case Studies

BASF

BASF is a chemicals manufacturer which has developed products to help coastal settlements protect local dykes by absorbing the force of breaking waves and slowing down water masses.

BASF's researchers are also developing stress-tolerant plants that are more resistant to extreme weather conditions such as drought and superabsorbers are being trialed for a reforestation project in Brazil to increase water storage capacity.

GSK

GSK, a pharmaceutical company, has invested US $1.8 million in research to enable a critical liquid component used in their malaria vaccine candidate to remain stable in hotter climates, working with the Bill and Melinda Gates Foundation

Sanofi

Sanofi, a pharmaceutical company, has launched the first dengue vaccine. On December 9, 2015, Mexico was the first country to grant marketing authorization to Dengvaxia, Sanofi's tetravalent vaccine for the prevention of diseases caused by all four dengue virus serotypes in preadolescents, adolescents and adults (aged 9 to 45) living in endemic areas. The marketing authorization of Dengvaxia in Mexico was followed by approvals in the Philippines and Brazil in 2015 and El Salvador in 2016.

2. New Market Opportunities

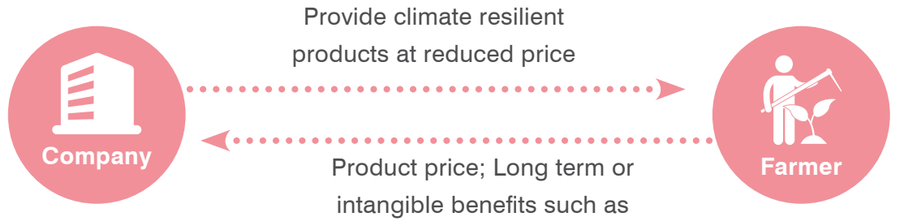
Overview

Early movers on opportunities arising due to climate change can gain significant advantage over their competition in expanding to new markets.[7]

Means of Implementation
Corporate-Government-Donor-Community

Industry
Manufacturing and Service Industries

Stakeholders Involved
Company; Buyers/ Market; Donors; Government Agencies



[7] Environment Agency, 2015 - Alastair Baglee, Anna Haworth and Richenda Connell, Acclimatise. Business Opportunities in a Changing Climate: Managing Impacts and Market Opportunities.

Case Studies

GSK

GSK has a tiered pricing approach for prescription medicines and vaccines, where countries pay different prices based on their ability to pay, as determined by Gross National Income (GNI) per capita. To maximise patient benefits and sustain their business in Least Developed Countries (LDCs), GSK has capped its prices at 25% of those for more developed countries. It has also committed to reinvest 20% of the profit it makes selling medicines in the LDCs in community healthcare projects.

Sanofi

The company promotes access to treatment at affordable prices in the areas most affected by malaria. In 2007, Sanofi developed Artesunate Amodiaquine Winthrop (ASAQ Winthrop), a malarial drug, under a public-private partnership with the Drugs for Neglected Diseases initiative (DNDi). This drug has been distributed at tiered prices in 34 countries, particularly in Africa, with over 400 million doses have been produced since 2007. Sanofi did not seek patent protection for that drug.

3. Technology Solutions for Water Management

Overview

Climate change increases water vulnerability by reducing the availability and accessibility of water resources. Its impacts on regional water availability and accessibility will lead to regional water crises, potentially resulting in economic destabilization and conflict, which affects poor and vulnerable people the most.[8] Companies can play a key role in mitigating this vulnerability by investing in and/or channelizing their philanthropic investments or Corporate Social Responsibility (CSR) investments towards deployment of technology solutions for water resource management amongst communities in water stressed regions.

Means of Implementation

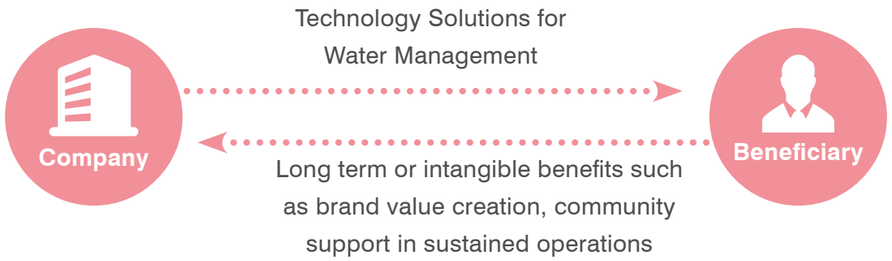
Corporate-Community Partnership

Industry

All

Stakeholders Involved

Company; Communities; Technology/Service Providers



[8] UNFCCC - Synopsis Series Nairobi Work Programme. Water Resources, Climate Change Impacts and Adaptation Planning Processes: Overview, Good Practices and Lessons Learned.

Case Studies

ITC

ITC's Integrated Watershed Development programme provides soil and moisture conservation to over 2,00,000 hectares; Reduction in specific water consumption and augmented rainwater harvesting activities both on site and off site at watershed catchment areas.

ACC

ACC has built rainwater harvesting structures in villages surrounding its business units.

Jain Irrigation Systems Ltd. (JISL)

In 2014, JISL undertook a major initiative of constructing the 'Kantai Bandhara' (or Kantai Dam), a weir built across the seasonal river Girna (a tributary of river Tapi), having a total water storage capacity of 2 million cubic metre (cum). The project was completed in a record time of 9 months by the company. A Memorandum of Understanding was signed between the Maharashtra Government and JISL for implementation of this project. The technical design, geological surveys and site selection was overseen by the Government while JISL covered the capital cost and construction of the dam. In addition, JISL is also responsible for operation and maintenance of the dam for 100 years and is entitled to use a maximum of half the water stored in the dam at a subsidized rate while the rest of the water is made available to local communities. This project has significantly improved water availability in the region which is drought-prone. Water stored in Kantai Dam is being used for irrigation and drinking purposes by 7 Gram Panchayats (villages) comprising of about 15,000 families. The dam also serves as a public transport bridge connecting two major villages with the district headquarter (Jalgaon), thereby reducing travel distance by 7 km.

Dabur

Dabur has buit rainwater harvesting structures in villages surrounding its plants.

Ambuja

Ambuja is fighting salinity in Gujarat through methods like establishment of roof rainwater harvesting structures, construction of check dams and pond recharge, water filling of its mined out pits. This has resulted in recharge of ground water and ponds in various locations in the state. In Rajasthan, the company has revived traditional water conservation systems like khadins. This, coupled with technical advances, has ensured the availability of good quality water for household & agricultural purposes. In Darlaghat, Himachal Pradesh, Ambuja is supporting a watershed dvelopment project in partnership with NABARD and it has constructed the Bhekeswar Dam on the river Shingoda

Rio Tinto India

Rio Tinto has worked with local government and communities to develop a network of earth ponds for rainwater harvesting in order to supply water to the communities during dry seasons.

4. Technology Solutions for Climate Smart Agriculture

Overview

Agriculture is deeply impacted by weather and climate, which are not only the main drivers of agricultural production but also the dominant factors in the overall variability of food production.[9] To address this challenge, farmers need to be equipped with technologies, knowledge and skills for climate smart agriculture. Companies can play a key role in meeting this requirement by investing in and/or channelizing their philanthropic or CSR investments towards deployment of technology solutions for improved farming in climate vulnerable agricultural regions.

Means of Implementation

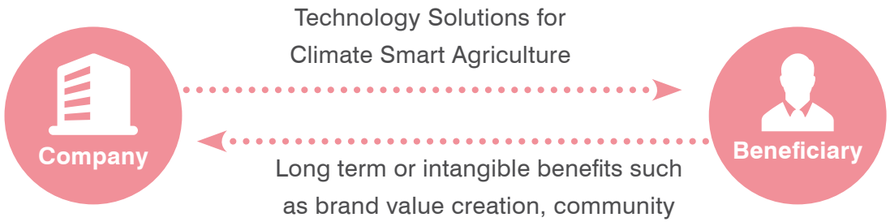
Corporate-Community Partnership

Industry

All

Stakeholders Involved

Company, Communities and Technology/Service providers



[9] Selvaraju, R, Gommes, R. &Bernardi, M. 2011. Climate science in support of sustainable agriculture and food security. Clim Res., 47: 95–110.

Case Studies

Jain Irrigation Systems Ltd. (JISL)

It has developed a range of irrigation products which reduce water wastage associated with agricultural crops. The company has placed sustainable agriculture at the core of its business offering products such as bio-fertilisers, drip and sprinkler irrigation and water filtration systems.

DCM Shriram

Drip Irrigation technology is promoted by the company in villages surrounding its sugar factories. The company has set up 74 Apna Sewa Kendras to promote farm mechanization among farmers through continuous training. In addition, the company has helped in financing more than 650 bore wells around its sugar mills.

Dabur

Dabur introduced drip irrigation for the cultivation of medicinal plants in Thar desert as a demonstration, which was a first in the desert region. In addition, it supports distribution of Seed Storage Tanks.

Ambuja

Ambuja, through the Better Cotton Initiative (BCI), has reached out to more than 26,000 farmers covering 40,000 hectares of land. Its System for Rice Intensification (SRI) project has covered 800 farmers. It also supports promotion of organic farming in the north. The company works in water-scarce areas of Rajasthan and Gujarat by promoting micro-irrigation to boost water conservation in agriculture. The drip irrigation method ensures optimal usage of water and a good yield.

TATA Steel

The company supported pilots of System of Rice Intensification (SRI) method for paddy cultivation in 125 acres of land in 10 villages which positively impacted 250 farmers. The yield of SRI cultivation in the demonstrated plots was more than two tonnes per acre.

BASF

The company has developed stress-tolerant plants that are more resistant to extreme weather conditions such as drought and super-absorbers. These are being trialed for a reforestation project in Brazil to increase water storage capacity.

Community-Driven Business Models

1. Ecotourism
2. Community Carbon Offset Scheme

1. Ecotourism

Overview

Ecotourism, one of the most rapidly growing tourism sectors globally, is defined as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education".[10]

Means of Implementation

Corporate-Community Partnership

Industry

Tourism and Hospitality Industries

Stakeholders Involved

Involved Company, Community (where the activity will take place) and tourists

[10] International Ecotourism Society.

Case Studies

Kailash Sacred Landscape

Representatives from tour companies in China, India, and Nepal operating in the **Kailash Sacred Landscape** have agreed to promote responsible tourism and work together to keep the landscape clean. For example, since July 2013 all lodges in the Kailash region are equipped with garbage bins, and lodge owners are working with tour companies to haul collected waste out of the landscape. Several tour companies have also organized annual cleaning campaigns.

Costa Rica

Boating and rafting companies operating in Costa Rica depend heavily on the maintenance of landscape beauty alongside the rivers. Recognising this, the National Forest Fund, initiated a process of negotiation with leading rafting companies to explore payments for forest protection to local landowners.

Ecuador

Indigenous communities living within **Ecuador's** Cuyabeno Wildlife Reserve are increasingly joining forces with ecotourism operators to market the natural beauty of their forests.

2. Community Carbon Offset Scheme

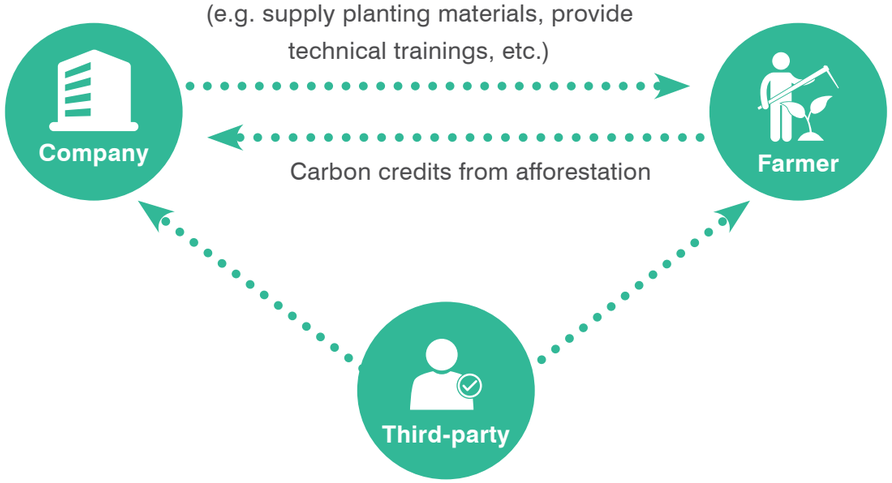
Overview

Community based afforestation programmes can result in livelihood generation for rural communities, build their adaptive capacities and generate carbon credits. Companies can invest in such programmes for their wide-ranging socio-economic benefits and utilize the resulting carbon credits to achieve their climate mitigation targets.

Means of Implementation
Corporate - Community Partnership

Industry
All

Stakeholders Involved
Company; Farmers; Third-party verification of carbon offsets



Verification/ Monitoring of the plantings - catalogued, including the species, a brief description, a serial number, geo-positioning coordinates, and a photograph

Adapted from the Trees for Global Benefit initiative

Case Studies

Uganda - Trees for Global Benefit

A self-sustaining financial model that buys carbon emission reduction units upfront from across multiple small-scale landholdings, and then sells them on the voluntary market. Once farmers sign emission reduction purchase agreements, the project then makes partial upfront payments to acquire the carbon assets. These initial payments enable the farmers to begin investing in sustainable land management. Each farmer is paid according to how much credit he or she contributed to the scheme. Through group certification, the project enables the farmers to afford the cost of registration, verification, and certificate issuance, establishing a market share. Tree-planting activities include mixed woodlots of native or naturalized tree species, and fruit orchards. Once farmers are registered, they enter into sale agreements which specify the amount of carbon, and the terms and conditions.

Climate Finance

1. Insurance-for-work
2. Financial Products and Services

1. Insurance-for-work

Overview

Climate change is projected to increase insured losses from extreme events in an average year by 37% within just a decade.[11] Emerging markets, including India, are especially vulnerable to climate change. Insurance can act as an important tool to help emerging markets adapt to climate change.[12] One key sectors that will be significantly impacted by climate change and therefore merits climate-specific insurance instruments is agriculture. However often farmers in these regions do not have the resources to pay for insurance services. To address this gap, insurance companies can design climate based insurance services for socio-economically disadvantaged farmers in return for their labour on community projects.

Means of Implementation

Corporate Entity Driven or Corporate-Government-Donor-Community

Industry

Financial Institutions

Stakeholders Involved

Financial Institution, Government, Donor, Farmers

[11] Lawrence Berkeley National Laboratory. Responding to Climate Change – The Insurance Industry Perspective.

[12] IFC - EMCompass. Insurance Options for Addressing Climate Change.

Case Studies

Horn of Africa Risk Transfer for Adaptation

Oxfam America, Swiss Re and other partners developed a three year pilot project in Ethiopia, where farmers were provided with access to microcredit and crop loss insurance coverage. An affordable drought insurance based on a weather index insurance model was developed, while farmers paid premiums through labour on community-identified projects to reduce risk and build climate resilience. In the event of a seasonal drought, insurance payouts are triggered automatically when rainfall drops below a pre-determined threshold, enabling farmers to afford the seeds and inputs necessary to plant in the following season and protecting them from having to sell off productive assets to survive. In partnership with local microfinance institutions, the model allows farmers the option to bundle insurance with credit and savings. More prosperous farmers will pay their insurance premiums in cash. Over time, as the poorest farmers become more prosperous, they can "graduate" from the need to pay through labour, and begin paying in cash, helping to ensure the project's commercial viability and long-term success. Starting with 200 households in 2009, by 2011 over 13,000 households had been enrolled and the first insurance payments made. Building on the success, Oxfam America and the WFP have launched the R4 Rural Resilience Initiative to expand the model in Ethiopia and abroad, with USAID contributing $8 million.

2. Financial Products & Services

Overview

Financial Institutions can design and implement new financial instruments that aim at mitigating the impacts of climate change and building the climate adaptive capacities for future.

Means of Implementation
Corporate Entity Driven

Industry
Financial Institutions

Stakeholders Involved
Financial Institutions, Target Group/Market

Case Studies

Sompo Japan Insurance

Sompo Japan Insurance has developed a Weather Index Insurance scheme for farmers in north-east Thailand who rely on rain-fed agriculture where compensation is linked to precipitation. The product was developed in collaboration with the Japan Bank for International Cooperation (JBIC) and offered through Thailand's Bank for Agriculture and Agricultural Cooperatives (BAAC), a state-owned enterprise, to its loan clients at an affordable commercial rate. Payments are made based on analysis of rainfall data for the policy period.

Allianz

Allianz offers micro-insurance products in six countries. With a highly established market in India, Allianz has extended its reach to Indonesia, Egypt, Cameroon, Senegal, and Colombia. Its first flood catastrophe bond is part of a USD 1 billion programme to mitigate the risk of severe, regional floods across a global fund. Allianz's schemes are typically managed in partnership with others.

Swiss Re

Swiss Re forges partnerships with local insurers, banks, micro-finance institutions, governmental and NGOs to design risk transfer solutions that help lift smallholder farmers out of the poverty trap through its Climate Adaptation Development Programme. The Programme comprises an umbrella of activities to help develop financial risk transfer markets to tackle the effects of adverse weather in non-OECD countries. Swiss Re has designed and implemented index-based weather risk transfer instruments in India, Kenya, Mali and Ethiopia, protecting farmers against drought risk.

Munich Re

Munich Re collaborated with the Munich Climate Change Initiative (MCII), the Caribbean Catastrophe Risk Insurance Facility (CCRIF), and MicroEnsure to implement the Climate Risk Adaptation and Insurance programme. Its aim was to design and implement products that combine risk reduction and insurance to protect the livelihoods of low income groups in the Caribbean. It has developed two parametric weather-index based risk insurance products aimed at low-income individuals and lending institutions exposed to climate stressors.

Crop Insurance Schemes in India

Several General Insurance Companies have been empanelled under Crop Insurance Schemes of India including Reliance General Insurance, Tata AIG General Insurance, Cholamandalam MS General Insurance, Bajaj Allianz General Insurance, ICICI Lombard General Insurance and SBI General Insurance among others.

Climate Communication

1. Educational Initiatives
2. Communication Products and Services

1. Educational Initiatives

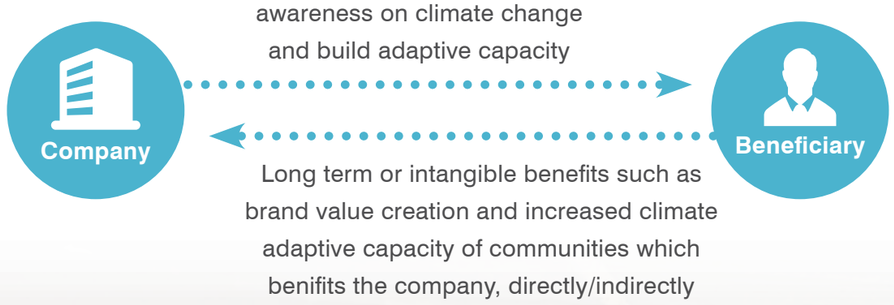
Overview

Companies can support educational and awareness building programmes to build the capacity of climate vulnerable communities.

Means of Implementation
Corporate-Donor-Community

Industry
All

Stakeholders Involved
Company, Donors, Communities, NGOs and Academic Institutions



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Case Studies

Dcm Shriram

Working for over ten years to support farmers, the Shriram Krishi Vikas Programme (SKVP) is an Integrated Rural Development programme by DCM Shriram covering over 500 villages annually. Under SKVP, education and training is provided to the farmers towards holistic development. The focus is to increase farm productivity, profitability and quality of produce.

Rio Tinto

Rio Tinto India raises public awareness about water resources management through film screenings.

Ambuja

Ambuja's Krishi Vigyan Kendra (KVK) at Ambujanagar, is a one stop shop for the latest and best agricultural technologies in the region. KVK has reached out to 265 villages through numerous training programmes; Local women are trained as para-veterinarians or Pashu Swasthya Sevikas (PSS), thus providing the much needed access to cattle care, improving the status of agriculture allied activities; Creation of community institutions like water user associations (WUAs) and pani samitis.

Cafédirect

Cafédirect, a fair trade agribusiness, along with Gesellschaft für Internationale Zusammenarbeit (GIZ) is engaged in a three year Public-Private-Partnership with the Kenya Tea Development Agency to strengthen smallholder capacity to cope with climate related risks. The programme helps farmers which supply the Michimikuru tea factory to reduce their vulnerability to climate change through sustainable management of natural resources, use of good quality seeds, and investment in a self-managed nursery.

Tata Power

Tata Power's Walvan garden is a stand out model for the promotion of organic farming, given that no pesticides or fertilizers go into its upkeep to learn about different types of medicinal plants and also, experiments are conducted on medicinal plants to help local farmers cultivate them.

Dabur

Dabur provides training programmes for farmers, villagers and tribal communities across the country to educate them on sustainable and environment-friendly cultivation processes.

2. Communication Products and Services

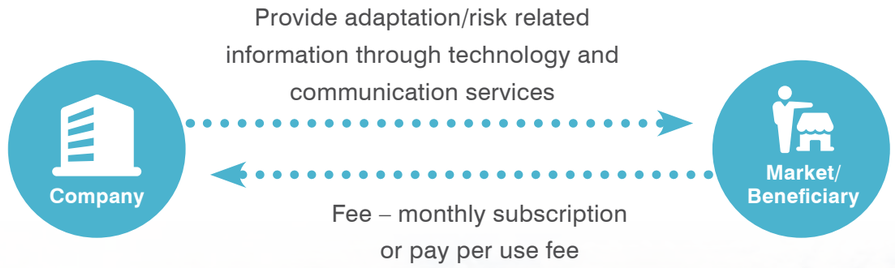
Overview

Companies can develop communication products and services to improve the quality and accessibility of data on climate change related risks and adaptation measures. For instance the increasing data and information requirements of agriculture sector includes climate data, cropping systems, knowledge on local environmental conditions and agricultural practices, costs of inputs and market price among others.[13]

Means of Implementation
Corporate Entity Driven

Industry
Service Industry, primarily Information and Communication Technology Industry

Stakeholders Involved
Company and Buyers/ Market



[13] FAO, Climate, Energy and Tenure Division - RamasamySelvaraju. Climate risk assessment and management in agriculture.

Case Studies

Nokia

Nokia refocused its CSR investment in promoting use of mobile technology for development. The company has developed two mobile applications - Nokia Life and Nokia Data Gathering – that are providing users in developing countries and emerging economies with tools and information to build climate change resilience in areas such as agriculture, health, and disaster risk management. Nokia claims that Nokia Life user feedback shows better market negotiation and 10%-15% increase in profits for farmers in India resulting from the service.

Vodafone

Vodafone offers a number of services which can support farmers in emerging economies, including standard voice communication (which gives them access to information to markets) and money transfer services (e.g. M-PESA in Kenya).

ITC

ITC's E-Choupal Initiative empowers farmers with relevant, up-to-date information on weather forecasts, best practices, and prices – knowledge that expands choice, enables them to make informed decisions and improves risk management. This information is available right at the village level, through ITC's custom-designed website accessible via computers placed in the homes of selected farmers. As of 2014, there were 6,500 such 'internet kiosks' – a digital network used by four million farmers across the country that is helping them to raise quality, productivity and incomes.

British Sugar

The company has developed an internet portal system, British Sugar Online, designed to provide growers, haulers and advisers with instant access to the latest technical information, self administration and support tools. The technical information includes agronomic updates, the impact on crop production and the actions needed to manage them.

Environment System Research Institute

The company provides Geographic Information System (GIS) software and information in South Asian countries. Satellite-based technologies can enhance understanding of glacier and forest cover changes and can assist in monitoring and detecting forest fires, planning disaster response strategies, and monitoring agriculture and food security.

Telvent

Telvent, an IT solutions and information services provider, designs technology and information management systems for national meteorological services to enable them to gather, analyze, and disseminate accurate weather information to help countries prepare for severe weather events and mitigate the impact on people, assets, and the economy.

ACT (Action on Climate Today) is an initiative funded with UK aid from the UK government and managed by Oxford Policy Management. ACT brings together two UK Department for International Development programmes: the Climate Proofing Growth and Development (CPGD) programme and the Climate Change Innovation Programme (CCIP). The views expressed in this leaflet do not necessarily reflect the UK government's official policies.

महाराष्ट्र शासन

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