



Up-scaling Community Based Approaches to Climate Change Adaptation

Almora

Background

Adaptation to climate change requires community-based, integrated and innovative solutions that simultaneously address climate impacts, livelihood improvements and environmental sustainability. Proactive measures focusing on preparedness for climate variability and climate change related disasters will enhance proofing of coastal communities and communities in hilly regions and thus contribute to livelihood security and poverty alleviation. The project therefore builds knowledge and strengthens the capacities of local authorities to assess, plan and respond to climate change related threats.

“Up-scaling Community Based Approaches to Climate Change Adaptation” is a project implemented by GIZ-ASEM and financed with Fast Track funds from the German Ministry for Economic Cooperation and Development (BMZ).

The objective of the project is to reduce the vulnerabilities of coastal communities, communities in hilly regions and industrial zones to climate change risk through adaptation by establishing processes and structures that strengthen the local capacities to assess, plan and respond to climate-related challenges, assess the climate change adaptation initiatives in urban and peri-urban areas and to build capacities to integrate climate change adaptation into city planning.

The project follows a holistic and integrated approach, developing and implementing local technology-based pilot projects, thus increasing the skill level of the local workforce. The integration of pilots into local action plans is supported, resulting in the promotion of climate change adaptation and disaster risk reduction measures for coastal communities. The up-scaling of successful technological and institutional adaptation approaches at local, regional and state levels is promoted.

Climate Change Impacts on Almora, Uttarakhand

Almora is located at 29.62°N 79.67°E on a ridge at the southern edge of the Kumaon Hills of the Himalaya range in the state of Uttarakhand. A great variety of animals, plants and herbs could be found in the unique Himalayan ecosystem here. The region is facing serious threats caused by climate change.



In the shape of a horse saddle shaped hillock, Almora is surrounded by thick forests of pine and fir trees. It has an average elevation of 1,651 metres (5,417 feet) and is home to around 30,600 people. Flowing alongside the city are the rivers Koshi (Kaushiki) and Suyal (Salmale).

The main source of income for the people living in the District of Almora is agriculture and forestry. A large number of the male population is working in big cities outside the state of Uttarakhand since employment opportunities are very scarce.

The impacts of climate change in the Himalayan regions seem dire in the future. The mean annual temperatures are projected to increase by 0.9°C to 2.6°C by 2030 with respect to 1970 and the projected annual rainfall are expected to increase to the effect of 60 - 206 mm, an increase of 5% - 13%, in 2030's with respect to the 1970's. These climatic conditions will severely impact the availability of water for irrigation and livestock, drinking, house-

hold use, manufacturing, etc.; lead to frequent droughts; change species composition, productivity and biodiversity; adversely affect human health. Thus the impacts of climate change are bound to be severe and it becomes pertinent to take actions that help communities adapt (and/or prepare to adapt) to such impacts.

Climate Change Impacts on communities in Almora

In the fragile ecological zone in the hilly areas of Uttarakhand, human activities, including agriculture, cause extensive land degradation which in turn adversely affects water retention and recharge. The problem of water shortage, exacerbated by extreme weather events such as erratic rainfall, cloudbursts, unpredictable temperatures, etc. leads to detrimental effects on agriculture, forestry and even industry. Increased urbanization is putting additional pressure on limited fertile lands in the lowlands and wetlands. CapCoast II helped the communities adopt measures that address environmental, social and economic sustainability in rural areas with the view of creating linkages between urban and rural settlements. It helped communities by creating a right balance.

Measures on Climate Change Adaptation

The Cap Coast II aimed to scale up the concepts and approaches for climate change adaptation and disaster risk reduction in vulnerable communities in Almora. This was done through developing and carrying out pilot initiatives for adaptation through development of climate resilient infrastructure and strengthening of alternative livelihoods; improving capacities and decision making skills vulnerable communities on climate change adaptation, providing advisory services on disaster risk reduction; enhancing capacities of key stakeholders to assess climate change threats and opportunities and incorporating climate adaptation measures into planning process to reduce vulnerability. The project also created awareness through workshops, and is now disseminating the experiences gained and lessons learned to stakeholders in other States of India. 6 small scale pilot measures have been implemented in the following communities as given in the Table 1.



Area, District	Name of village	Number of Beneficiaries (Total population)	Main sources of livelihoods	Pilot measures	Impacts
Pati, Cham-pawat	Toli, Goom, Chaurakhet	149	Labour, agriculture, government or private jobs	Fish tank poly-house, and revival of traditional water harvesting structures viz. "Naula" & "Chal-Khal nirman"	Alternative source of livelihood, increased nutritional source, decreased migration, decreased evaporation losses, increased soil moisture; revival of traditional water sources increases drinking water availability
Seraghat, Pithoragarh	Bhanolisera	191	Agriculture (rainfed)	Check dam (Plum concrete)	Prevent loss of agricultural farm, increased crop production, reduced migration
Danya, Dhauladevi development block, Almora	Dasheli, Malliragne, Nampauli, Tallidanya, Rautaliya silingdhar	7 families (Dasheli - 35) and 5 family per each village (100) Total 135	Agriculture (rainfed)	Rooftop Rainwater harvesting system	Increased availability of water especially during summer for vegetable farming and animal rearing, increased livelihoods
Ganai Gangoi, Pithoragarh	Dhigarkoli & Rugadi	34 families (182); 17 families (Rugadi) & 34 families of Dhigarkoli as the pilot is in between both villages	Agriculture, cattle rearing, labour, government & private jobs	Rejuvenation of springs & cleaning of catchment area	Increased availability of drinking water, increased soil moisture, reduced health impacts
Karnprayag, Chamoli	Pundiyani	187	Agriculture, cattle rearing, government & private jobs	Construction of storage tank near a spring "Bhagwan dhara"	Increased water availability, increased livelihoods as water is available for animal rearing
Gopeshwar, Chamoli	Tangsa	206	Agriculture, milk production, labour & government job	Construction of chamber at spring (drinking water source) and repairing main tank	Increased water availability, increased livelihoods as water is available for animal rearing

Impacts

The intervention objective is reached by the participatory development and implementation of community action plans for improving livelihoods and community resilience towards vulnerabilities associated with climate change.

- **Improved Planning:** 10 Local Adaptation guides (LAG) were generated by collecting the community's analysis of their own vulnerability towards climate change and suggested measures/pilots for climate proofing and adaptation. The pilots suggested in the local adaptation guides/ plans focused on improving the adaptive capacity by enhancing awareness as soft measures coupled with hard measures.
- **Improved infrastructural facilities and climate proofing of communities** through the 6 small scale pilot interventions. The pilot measures increase the adaptive capacities of communities in response to climatic changes by improving security, health, living and environmental conditions.
- **Reduced migration** due to improved adaptive capacities of communities to the impacts of climate change leading to better livelihoods.

- **Enhanced awareness and capacities** of communities, CBOs and local bodies on climate change adaptation and climate change issues.

Case Study – Check Dam, Bhanolisera, Pithoragarh, Almora

Bhanolisera is a small community (29 42; 14.62" N, 79 53' 22.97" E elev 704 m) located in the Seraghat area of Pithoragarh district in Almora. This area is the most productive and fertile region in Almora. Bhanolisera is home to 191 inhabitants approximately from about 45 families. The nearest river is Saryu (30m) and nearest pucca road is about 100m. People residing in the village belong to General and SC category with agriculture being their main source of income. Wheat, gram, pulses, rice, spices, vegetables and fruits are grown in this region. Bhanolisera has experienced a wide variety of climate-related impacts that have severely affected the livelihood of the community, such as changes in rainfall, extreme weather events (e.g. floods). Since last 5 years, during the rainy season the water flow has increased and eroded 5 hectares of agricultural farms. Also the 3 hectares of agricultural fields is silted making it non-usable and non-cultivable.

Due to climatic variability, the community has reduced rice and wheat cultivation but are also cultivating vegetables and fruits. As agriculture is only source of livelihood, the community has been severely impacted due to loss of crops, loss of agricultural farms, flooding leading to vector borne diseases and increased debts. Due to loss of agricultural farms, the migration rates have increased and community members are also taking labour as for employment.

To address the challenges of climate change and support adaptation, a pilot project was taken up to build a “Plum Concrete” check dam to prevent the erosion and siltation of agricultural

farms. The concrete blocks of 3x1.5 x1.5 metres were laid down to prevent flow of water and erosion of land. The community has contributed in-kind towards the pilot measure in the form of “Shramdanam”.

This pilot measure reduces the risk of climate related impacts (such as changes in rainfall patterns, increasing intensity and frequency of extreme weather events) and improves the adaptive capacity of the village by addressing erosion and siltation of agricultural farms, increased soil fertility and crop yield accompanied by awareness raising and capacity building activities.



Case Study – Fish Tank Polyhouse Pati Champawat, Almora

Toli is a small rural community located in the Pati village of Champawat district in Almora. The distance above sea level is 1600m and nearest city is Lohaghat. Pati is home to approximately 367 people from 62 families. The major source of livelihood is agriculture, cattle rearing and milk production and fish rearing. Nearly 50 years ago, the village had very less population and was having dense forest. With increasing population, the forests were cut down which is also leading to reduced water springs. Water pipeline was laid 6-7 years ago but people have been residing since past 35 years. So the community majorly depends on traditional water source for drinking water supply.

Wheat, turmeric, ginger and soyabean are the major crops cultivated. As irrigation is rain-fed the agriculture is impacted due to climatic changes like rainfall variability, high temperature, extreme weather events leading to landslides etc. The major issues

in the community are erratic rainfall, extreme temperature and no snowfall during season which leads to extensive crop damage. The people have stopped agriculture to some extent, due to unpredictable climatic pattern. There are around 10 water springs but they are spread far from the village. During summer season, the water in the spring is reduced and there is no water in the piped supply also.

As the uncertainty in agriculture was increasing, the community thought of diversifying their income sources. They learnt a technique of tapping water from springs and collecting it in farm ponds. These farm ponds provide increased supply of water for irrigation and increased soil moisture. They also introduced fish seedlings in the pond and started fish rearing in the ponds. This fish tank/ pond served as an additional source of income, increased protein source and usage of water for growing vegetables. But during winters, the fish yield is reduced as the fishes don't feed. Also as the intensity of temperature is variable, the fish production gets affected.



To reduce climate change impacts, the pilot project taken up was to develop a fish tank polyhouse to maintain the water temperature during winters. This measure will increase the fish yield, increase income levels, reduce migration and increased water availability for vegetable production. The regular maintenance will be taken up by the Mahila Mangal Dal (Women group) and project implementation committee (PIC).

This pilot measure is innovative and replicated in several other districts of Almora, as fish rearing is uncommon in hilly regions. This measure reduces the risks due to climatic changes in terms of temperature patterns and extreme weather events and improves the overall adaptive capacity of Toli by increasing income diversification and ensuring supply of water for irrigation, which reduces migration and unemployment. The accompanying aware-

ness raising and capacity building activities further enhances the adaptive capacity of the community.

Local Project Development

The pilot project was developed in cooperation with the Uttarakhand Seva Nidhi Paryavaran Shiksha Sansthan (USNPSS). USNPSS provided access to local networks, enhanced local knowledge and supported the implementation of pilots. It also supported the awareness generation by providing information on climate change and by sharing the approach for adaptation in local context. In regular exchange with the partner, the CapCoast II through various workshops, trainings and site visits supports the sustainability of the project.

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