

## **Integrated Conservation and Development Program (ICDP) could be a coping strategy to impacts of climate change in mountain regions**

*By Gehendra Bahadur Gurung*

Ten kilometers north from Narayanghat in Chitwan district of Nepal, on Narayanghat - Mugling highway, there is a stream called Jugedi Khola. Jugedi Khola originates from lower Mahabharata with a watershed area of 12.2 sq km. Geologically Lower Mahabharata region is fragile and the hill slopes are steep whereas the valley bottoms are good for agriculture. The Jugedi watershed provides home to 190 households of 12 different ethnic communities spreading over 10 settlements. The main living of the people is subsistence agriculture. Because of the sub-tropical climate, local people can grow crops throughout the year. However agriculture is nature based - the climate and the weather determine the success and failure of the crops. The major crops grown are rice, maize, finger millet, beans and pulses in summer, and wheat and mustard in winter. The villagers also grow seasonal vegetables. Goat, cattle and buffaloes are the major livestock of the area. The average landholding is 0.43 ha by a family of 6.

Practical Action Nepal has implemented a project on "Increasing the Resilience of Poor Communities to Cope with Impacts of Climate Change" in the Jugedi watershed. Impacts of climate change are being perceived by the communities. One of the perceptions is the unpredictability of rains including monsoon. In the past, people could predict the rain, based on which they prepared the fields, nurseries and transplanted crops. But in recent years the rain does not match with their predictions. The main rice transplanting month, July, is not getting sufficient rain. The rain occurs late when the seedlings are too old. Late transplanting of old seedlings reduces the yield and affects the following winter crops. As the communities relied on seasonal rain for rice transplanting, they were not prepared for planting alternative crops like finger millet. So some farmers leave the lands fallow for continuous years.

The local people have also observed that there are extended monsoon rains which are not good for the crops. The rice crop requires minimal irrigation at maturation stage. But the continuous rain delays the maturation ultimately affecting the production and the succeeding winter crops.

The rains in other seasons, winter and spring, are also not sufficient for enough soil moisture. Spring, the maize growing season, (March - May) has become hot and dry. Farmers have observed that hot and dry days at the cob development stage affects the pollination, resulting in poor maize production. At the early stage, it results in wilting of young plants.

The nature of the rainfall has also become intense, causing soil erosion on slash and burn cultivation fields, creating gullies and landslides on the slopes, and resulting flashfloods in the valley bottoms. All types of agricultural lands, on the slopes and in the valleys, are affected pushing the people towards landlessness. The landslides and flashfloods not only destroy the lands, but also destroy local infrastructures like irrigation canals, foot-trails and houses.



*House damaged by a flashflood (Practical Action Nepal)*

Occurrence of fog in winter in the plains and valleys was common. But now people experience it at higher altitudes above its usual upper limits. Such fog is affecting the production of winter crops such as mustard.

In the case of livestock, the liver-fluke was common in the lowlands, but now it is affecting buffaloes at higher elevations. As a result many households have abandoned keeping buffaloes.

### **The problem**

All the problems highlighted above were not new to local people. They have encountered these problems before but have managed and coped with them. What is new, is that these problems are increasing and people face difficulties to manage and cope with them. During the interaction with the community, they were unaware of the notion of “climate change” - the cause behind the unpredictability of rainfall and extreme, hot and dry days.

People are responding to the impacts of climate change, without taking account of climate change as the cause to their problems, which makes the existing technologies, skills and resources inadequate to address the growing problems. The existing skills and technologies were developed under climatic conditions that prevailed for long time until the recent human induced climate changes have started to occur.

At the participatory planning meeting held with the communities in order to help them strengthen their capacity, they identified such activities which help re-enforce their ongoing activities. All of these activities were also not new, including such things as protection of lands from landslides, floods and soil erosion; rebuilding and developing old or new irrigation canals and infrastructure, suitable crop species and varieties under the changed rainfall conditions, protecting the forest and planting trees on degraded lands, training on alternative income generation skills etc.

## Strategies to cope and adapt to impacts of climate change

Based on community participation, a whole range of activities was developed which finally looked like an Integrated Conservation and Development Program. The major programs comprised the following:

1. Institutional development
2. Disaster risk reduction
3. Alternative income generation
4. Alternative agriculture
5. Natural resources management
6. Infrastructure rehabilitation
7. Awareness on climate change

The community realized the need of an organization that represents all communities within the watershed. They formed a Community Based Organisation (CBO) and registered at the office of the district authority. Now the CBO identifies problems and actions through consensus and mobilizes the members in implementing the actions that help strengthen their capacity to cope with the impacts of climate change. The CBO coordinates with the village development committee (VDC), district development committee (DDC) and other government and non-government institutions in the district to get technical, financial and intuitional support.



*Participatory action planning meeting (Practical Action Nepal)*

Disasters due to landslides and flashfloods because of intensive rainfall are also major problems. The communities identified soil conservation, control of gully formation and landslides, and putting gabion wire check-dams for protecting lands from flashflood as major activities.

The climate induced disasters have led to some of the households being deserted, whereas many have lost their lands and many have been left with degraded land. This has forced people to look for alternative income sources. Therefore one of their identified needs was to create alternative income sources, but priority was given to farm based activities such as vegetable farming, goat keeping and dairy. These activities were built on their farming knowledge which helped for more

productive use of the limited land resource. Some farmers having only 2 - 3 *katthas* (1 *kattha* = 333 sq. m.) of land were able to increase the production by more than ten folds in terms of financial value.

Slash and burn and shifting cultivation on the slopes in the Jugedi watershed area are traditional practices. But these practices are not compatible with the changed rain pattern now. The intensive rain in the monsoon erodes the slopes and the dry and hot season reduce the soil moisture significantly. However, the people have to cultivate these slopes because these are the only lands available for some households. The local people were trained and supported on Slope Agriculture Land Technique (SALT) which helps to increase the land productivity and reduce erosion and landslides.

Some farmers changed the cropping system from rice - wheat - maize to fruits. They have found that annual crops were very sensitive to climate change compared to perennial crops. When rainfall deviates by even some days, rice, maize and wheat are significantly affected. But perennial crops like banana are impacted less under such circumstances. The farmers who decided to change the crops were supported through training and inputs. (because they were supported for banana suckers and fruit seedlings as well).



*Rice farm converted into a banana farm (Practical Action Nepal)*

The local people also decided to effectively manage their forest resources. In their understanding, forest degradation might impact local climate. Also they were aware that protection of the forest will help protect the land from erosion, landslides and flashfloods. They registered two forest users' groups at the District Forest Office for legal recognition. They decided to have a multipurpose forest nursery and plant trees on naked slopes. The priority for plantation was in up-stream micro-catchments and gullies where erosion and landslides start. The species chosen are multipurpose-species.

Rehabilitation of irrigation canals was another priority activity. The existing canals were destroyed by frequent landslides and floods and the requirement for them was increasingly high because of a lack of rain at the time of need. So the communities implemented rehabilitation and repairs of irrigation canals and foot trails at strategic points.

Awareness raising activities included home visits and educational visits for village people and school children, including slide talks at schools on climate change and its impacts. Slide talks were also organized for district level stakeholders to raise their awareness on climate change, its impacts and to help (the sentence also intends to influence them) influence them to mainstream this issue into their regular actions.

## **Conclusion**

Climate change is affecting poor communities. But impacts are not completely new. The impact mainly intensifies and increases the frequency of existing problems, taking them outside the coping capacity of communities within the existing system. The approach to strengthen the coping capacity of the communities does not require completely new actions or programs, but it requires an integrated approach as the impacts are multifaceted. The experience from Practical Action Nepal shows that an Integrated Conservation and Development Program can be one approach to help increase the resilience of communities.

It should be community-based as the impacts are localized and the best solutions depend on the local vulnerability context to climate change. The communities and the local stakeholders require awareness on climate change and its impacts to help them mainstream this issue into their regular plans and programs.

Currently development of a national policy on climate change is in progress in Nepal. A policy is urgently needed which helps recognize this issue at a national level and to incorporate it into an overall national development process.

**Gehendra Bahadur Gurung** is a Team Leader working on the Reducing Vulnerability Program at Practical Action Nepal. He has an MSc in Crops and Horticultural Science from the University of London. He has worked in agricultural research and development with CARE Nepal and the Lumle Agriculture Centre, Nepal for over eight years. He worked for Annapurna Conservation Area Project of National Trust for Nature Conservation for over 12 years including 5 years as director of the project. Since May 2005 he has been working with Practical Action Nepal as Team Leader for the Reducing Vulnerability Program which is one of 4 programs of the organisation. The program focuses its activities on food security, disaster risk reduction and adaptation to climate change for poor and marginalised communities.



**Practical Action** is a UK-based development organisation established in 1969. Its vision is "a world free of poverty and injustice". Practical Action is working in Asia, Africa and Latin America. In Nepal, this organization started working in 1979 on micro-hydro electricity and established the country office in 1998. Currently Practical Action Nepal is working on 7 broad program areas in Nepal including food security, disaster risk reduction, adaptation to climate change, markets and livelihoods, renewable energy, clean air and improving access for the poor. It is focusing its activities in 17 districts from Mid, Western, Mid-western and Far-western development regions of the country.