

Strengthening livelihood capacities to disaster risk reduction [Nepal updates]

The Project: *Mainstreaming livelihood centred approaches to disaster risk reduction* project has been implemented by Practical Action in Peru, Zimbabwe, Sri Lanka, Bangladesh and Nepal. In Nepal, Practical Action has been implementing the project in partnership with Sahamati in Nawalparasi and Multidimensional Agriculture and Development Nepal (MADE Nepal) in Chitwan districts. The project intends to build on the resilience capacities of the local communities to reduce the risks of disasters through preventive measures and preparedness, reduce the losses from disasters by effective rescue and relief measures and mitigate the impacts of disasters by increasing the livelihood capacities of the households. Through multi-stakeholder partnership and integrated approaches of community based planning and implementation, project aims to build on the capacities of local communities and political bodies, village development committees (VDCs) and District Development Committees in particular, to disaster risk reduction to achieve the goal to contribute to national poverty reduction. The project started in January 2007. The activities are still ongoing and will last in December 2010.

Hazards and vulnerabilities: Project feasibility studies, PVAs, community interactions and stakeholder consultation at village, VDC and district level carried before and at the beginning of the project provided information on hazards, stresses, contributing factors to different vulnerabilities and priority options for interventions.

Flood, landslide, drought (shortages of water for irrigation and, in some years when more severe drought occurs particularly for upstream community of Baulaha Khola in between March and May, for drinking), wildlife intrusion, winter fog, invasive weeds, new pests and diseases in agriculture crops and forests are major hazards that affect livelihood assets individually and collectively. Many hazards are linked to impacts of climate change directly or indirectly and entirely or partially. The impacts spread through different channels; sometimes resulting cumulative effects into different assets of livelihoods.

While wildlife intrusion is associated largely with proximity of the communities to the national park, increase in intrusion despite decrease in wildlife population is linked to invasion of inedible exotic weeds inside the park and community forests. Wildlife is badly affected due to the shortage of food and water due invasive species and the drought. This forced them to intrude community area more frequently where both wildlife and community and their assets are at risk of casualties. Furthermore, droughts enhance likelihood of fire in the forests and settlements.

Seasonality of stresses: Different hazards impact at different times of the year. Flash floods occur during the monsoon between June and October, dry spells usually occur between November and May which has become more frequent, longer, intense and severe in the recent decade. Lately the rainfall pattern has been changing creating water shortage for growing crops even during monsoon period. Winter fog covers in the mornings during December and January and in recent years it is more frequent, dense and lasts for longer (whole day) and expands up to second week of February. New disease and pests attack crops of different seasons, but lately winter crops are more prone to viruses. Usually wildlife intruded year round but between November and May, when food is scarce in the Park, growing crops were more prone to invasion. But now intrusion is anytime else due to invasive weeds inside the parks.

Sensitivity: Different families are differently and uniformly exposed to different hazards. Landslides and flood affect in two ways i.e. cutting down of agriculture land and damaging crop at the bank of rivers and sometimes inundating whole village in the downstream particularly in Chitwan. Cutting of land is almost annual event while inundation has taken place in 8 to 10 years interval. Upstream hill slopes are prone to landslides. Weather pattern has been experienced changed that disturbs usual crop calendar. Winter fog (known as *sheet lahar*) often affects winter crops such as mustard and lentils. Invasive weeds have invaded grasslands, under storey and ground cover in the park and community forests decreasing availability of fodder for both wildlife and livestock. Wildlife damages crops, homes and cattle sheds, attacks livestock, sometimes claiming human life. Winter fog, increased wildlife intrusion, obnoxious weeds and shortage of water for irrigation have discouraged farmers in recent years sowing winter crops. Drought affects agricultural crops and forests for their growth and production. It stimulates forest fire particularly between February and May. It is more probable to catch fire by houses and cattle sheds in this season.

Impacts: While different hazards have specific effects, the ultimate impact of each hazard on livelihood outcomes is similar: each reduces livelihood assets, the access to the remaining assets, peoples' capacities and their rights. Indigenous knowledge and coping mechanisms have not been sufficient to deal with the compounded impacts of multiple hazards. Prevailing poverty and low level of awareness, limited skills and thus options for livelihoods (and the preparedness) are major constraint to build on the resilience.

In future vulnerability to these hazards can be predicted to be exacerbated by increasing human population, unsustainable agricultural practices in catchments of rivers, changing vegetation composition (inside the park), limited options for livelihoods, slow development processes and the adverse impacts of climate change. Communities on the ground are more aware on the events that appear suddenly, are physically visible and damage assets faster. Precaution on the slow onset and creeping hazards such as drought, invasive species and loss of habitat for wildlife is less although loss from these hazard was higher to sudden onset hazards.

Contributing factors: Different contributing factors are interlinked to geophysical setting, socio-economic activities in the catchments, governance and weather pattern. Therefore, integrated approaches are only viable for sustainable coping of multiple stresses. That needed linking different sectors and stakeholders addressing development priorities and DRR together.

Project strategies: Project has devised and adopted community based practical strategies to reduce the stresses and impacts of different hazards and their contributing factors. These strategies include both structural measures such as defending wildlife by erecting electric wire fence around villages, improving resources and access to existing water resources such as by building shallow tube wells and water collection wetlands and improvement of irrigation channels, improving spillways and strengthening embankments along the river, and non-structural measures such as raising awareness and improving breeds and rearing practices in livestock and varieties and farming skills on agriculture, introducing on-farm and off-farm income generating options such as vegetable growing, bee keeping, house wiring training, and candle preparation. Disaster risk reduction initiatives have been introduced through flood warning mechanisms, formation of disaster management committee and encouragement of emergency fund within local governments, preparedness for seasonal hazards and promotion of watershed conservation. Both strategies include short-term and long-term activities along with accessory institutions and functional

mechanisms such as DMCs, community groups, cooperatives and their inter-linkages within and outside the community for their sustainability.

Implementation modality: Local communities, their organizations and governments have taken the role of hub in the process of identification, prioritization and implementation of initiatives and specific agencies take lead in the respective ground. For example, community identified shallow tube well boring site for the needy group of farmers, users to each tube well, project provided financial support to purchase pipes and pumping machines and technical support to bore shallow tube-wells, benefiting households contributed labour, VDC recommended to provide access to electricity and electricity authority provided tariff-subsidized electricity. Management of such tube wells has been taken by the user groups who decide on the levy considering electricity tariff, maintenance and replacement of pumping machine. The multilateral benefits of better access to water resources include timely seeding and transplantation, opportunity for additional crop, reduced cost of irrigation for those who used to rent pump and buy diesel, increased choice of crops and social harmony.

Similarly, national park provided resources and permissions to erect electric fencing around the villages to prevent wildlife intrusion inside the community territory. Forest user groups provided timber for poles, and project provided financial support to purchase wire and materials not available to the locality. Community raised fund by collecting levies from each benefiting family and contributed labour. The overall environment was enabled by the respective VDCs and buffer zone council creating the environment of trust among stakeholders. As the result, intrusion of the wild animals into the community territory was prevented which saved up to 75% of crop alone. The process also provided opportunity to raise awareness among villagers on the DRR and earn support to biodiversity conservation.

The skills and capacities on agriculture, livestock rearing, group management, planning and implementation are enhanced through field based practical trainings and demonstrations such as farmers' field schools, livestock health camps, training village agriculture and animal health worker. Alternative means of employment and livelihoods such as vegetable growing, candle preparation, bee keeping and skill based entrepreneurships like house wiring, mobile repairing have been promoted such that pressure on the natural resources is reduced and sensitivities to shocks and stresses are minimized.

Three years intensive work with flexible mechanism of partnerships and cooperation has produced some tangible and intangible outputs. Improvement of 3 irrigation channels have improved irrigation services to over 273 households in Nawalparasi while 14 shallow tube wells and a dig well connected irrigation scheme provide opportunities for timely irrigation and an additional batch of crop to 289 households in both districts. The wetland with raised and strengthened dam provides home for certain wildlife, longer water availability for around 28 families and potential for tourist destination in addition to environmental services. However, community capacities need further strengthening for the sustainable management without external supports and their self-reliance in future. Irrigation channels are exposed to landslides and floods which need preventive measures.

Vulnerability to wildlife intrusion has been reduced by supporting local initiatives on electric fencing. Project support in fencing directly benefits to 1235 households in Chitwan and 1238 in Nawalparasi, larger population than expected in the early stages of project implementation. The total number of beneficiaries through different services has been depicted in table I at the end of this document.

Activities and outputs: Improved varieties, practices on land preparation, planting, inter-cultural operations and harvesting practise for existing crops (rice, maize, zinger, wheat, potato and mustard) and new crops through field based orientations and demonstrations have enhanced skills and capacities of the farmers and increased production for over 266 households and replicated by their neighbours and relatives. Seasonal and off-seasonal vegetables are new and additional for almost farmers. Over 450 households have initiated vegetable growing at different scales. Some of them are increasing their production and income by selling in the local markets. From the second year some farmers have emerged as leaders to commercial production and sale of vegetables and the number is increasing.

Livestock rearing practices have supported to improve breeding and rearing practices particularly for goat and pig, and organizing livestock health camps. Fifty seven households improved pig sheds and 26 goat sheds in the upstream. Open roaring of pigs has fully controlled. Sanitation has been improved for both livestock and villagers. Earlier, people from outside feared to visit these villages due to the dirt and open roaring of pigs. Seasonally, livestock experts visit villages door to door and provide orientations.

The flood risk has been tried to minimize through different strategies; improving embankments and spill ways in the down stream and watershed health particularly in the upper reaches. A range of structural and non-structural strategies have been adopted; stall feeding, SALT, fruits, community forestry and off-farm income options such as bee keeping and sitting tool fabrication are some examples. Preparedness to the flood has been promoted through up and downstream linkages in communication. It would be too early to see the results although there are some good indicators. However, some activities need more investments and maintenance to make them strong enough to defend upcoming stresses.

Institutions and linkages are established at local, VDC and district level to manage emergencies and continuation of initiatives after phase out of the project. They are at their early stages and a lot needs to be done to make them effective and functioning. Each project working VDC has disaster management committee and disaster management plan for at least three hazards in top priority (similar plans have been developed for 59 VDCs and a municipality in two districts), communities are grouped in different groups such as irrigation user group, saving credit group, mother group, bee keeping group etc. based on their livelihood practices.

As of end of February 2010, 20 farmers groups have been registered to respective district agriculture development office (DADO) while other 3 are in the process, expected to be registered within March this year. Two water source user groups (irrigation purpose) have been registered to division irrigation office and a group is in the process. A bee keepers' group is in the process of registration to DADO and two community forest user groups are in the process of registration at district forest office. A cooperative has been established and registered to division cooperative office which is providing banking service to over 100 families. These institutions and linkages provide legal basis, better and ensured access to resources and technical inputs from these government line agencies. Project has supported with technical inputs and financial resources to establish office, stationeries etc. The institutional development supports will continue.

Practical approaches based on the project learning and experience have been shared through publications, presentation, meetings, visits and training events to the stakeholders outside the project areas benefiting government officials, organizations and communities.

Project assisted DDCs to publish DRR plans in two project districts. Practical approaches for CBDM planning has been published and shared with national and international audience in both printed and e-copies. A booklet with brief information on installation of shallow tube well has been published and shared. Some good practices have been published in national and international publications while a few others are selected for and being published. A book on CBDM is under process of manuscript finalization and some documents on CBDM training are being tested by pilot trainings to clubs, government officials and other stakeholders.

Initial results: Results so far can be viewed through food security situation of 30% vulnerable households in the project area has increased by 6 to 9 months (they are year round food secure) and about 30% families increased food security between 3 to 6 months. More than 70% families are now food secure for whole year, while over 50 families have earned beyond food security level. Quality of food has been improved remarkably with additional menu of green vegetables as reported by the beneficiaries. Growth of livestock has been observed faster and more vigour due to improved breeds, feeding practices, healthier sheds and regular veterinary services.

Sensitivity to the wildlife intrusion and drought has been reduced remarkably as loss due to wildlife has been reduced to negligible and farmers have utilized opportunities of irrigation to grow more crops and increase usual crop production. Raised income could be attributed to contribute to improve their resilience capacity.

Local and district level governments have initiated disaster planning and implementation processes, and incorporated disaster risk reduction into their development planning. Some local bodies have allocated emergency funds; organize preparedness meetings and allocated resources though not sufficient for DRR in their annual budgets. Political parties have become more sensitive to the issue and their youth wings are engaged in rescue. Some people trained by the project have started providing services to others in and outside districts.

Lessons: Early lessons of the project can be summarized as; recurring hazards though less striking in single event weaken the capacity of the community to sustain their livelihoods. Traditional focus of the government and other organizations were only to rescue and relief operations with respect to larger onset disasters. But the loss and impact is more severe and wide ranging posed by the stresses particularly brought about by the creeping hazards in association with mal (socio-economic) practices which are often neglected, if not, overlooked. Long term cooperative actions are necessary in an integrated way to safeguard livelihoods of vulnerable people thereby reducing the risk of disasters and improving the resilience capacity. Most severe hazard and most affected asset of livelihood can be the starting point.

A challenge and also opportunity for the project was to create common understanding among different political ideologies in viewing the disaster in different context. Disaster was not viewed from the perspective of victims and failed to incorporate the needs of vulnerable communities on the ground. However, a range of discussions, trainings, workshops and exposures between vulnerable communities, government line agencies, development organizations and political party representatives helped to establish common understanding on hazards, vulnerabilities and their consequences. This has helped to create synergy to integrated and cooperative actions from different stakeholders in DRR though slow in pace. Communities need to be more aware on new disease and pest risks and impacts of climate change which is likely to raise the risk in future beyond past experiences.

These initiatives can be replicated in other hazard prone areas widely. Awareness and understanding of policy makers and stakeholders on hazards, contributing factors and constraints that hinder local communities to their resilience is important and prerequisite for success. Working in the multi-stakeholder environment is not easy though, for coordination and establishing common understanding. Political situation and frequent strikes have hampered project activities. Governance environment affects to expand impacts at policy.

Future tasks: The final year activities will focus on strengthening initiatives institutionally, financially, technically and socially; internal and external assessments of outputs and impacts will be carried out and lessons will be shared through different means possible.

Table I Status of Beneficiaries

Activities	Direct (HH)+	Indirect (HH)+	Total (HH)+	Male+	Female+	Total+
STWs and irrigation channels	562	0	562	~1400	~1400	~2815
Electric fencing	2473	NA	2473	~6182	~6200	~12365
Agricultural inputs & trainings	266	184	450	1125	1125	~2250
Embankments	131	NA	>131	~330	~340	~670
Off-farm income activities	50	30	80	~200	~200	~400
Goat and pig sheds	83	147	230	~575	~575	~1150
Breed improvement and animal health camps	555	163	718	~1800	~1800	~3600
DRR Planning trainings	>750 ®	*	*	*	*	*
Farmers groups, saving and credit	536	0	536	~1340	~1340	~2680
Institutions (groups, cooperative, DMCs)	~1000	NA	~1000	NA	NA	
Publications and awareness raising**	718 + stakeholders	>40,000	> 45000	NA	NA	NA

NB: ® Individuals

* Trainings on DRR planning together have produced VDC level DRR plans for 60 VDCs and a municipality. 11 VDC level DMCs have been formed That benefits large segment of vulnerable population in the district and actual data is not available.

** Includes hoarding boards, training materials, exposure visits to and outside project area, preparedness meeting, early warning mechanisms, disaster rescue trainings, provision of emergency funds in the VDCs, publications, influencing etc (output 2 and 3)

+ Number of beneficiaries is inclusive in different activities. For example, 292 HH benefited by electric fencing are also benefited by the irrigation schemes and included in both activities.