



Resilience in Practice

Programme Briefing Paper



RESILIENCE IN PRACTICE

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Repairing flood defences, Mainstreaming Livelihood Centred Disaster Risk Reduction Project, Practical Action, Nepal.

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Executive Summary

Promoting resilience is a growing area of interest in development. The United Kingdom Government's Humanitarian Policy Paper (2011) *Saving lives, preventing suffering and building resilience*, puts resilience at the heart of their approach. Building on this, the Department for International Development (DFID) have committed to embedding resilience-building in all of its country programmes by 2015 and integrating resilience into all of their work on climate change and conflict prevention. In response, members of Bond (the British Overseas NGOs for Development) Disaster Risk Reduction and Resilience Group are working on identifying common characteristics and principles of resilience.

This briefing paper provides case studies of building resilience into programmes. It offers case studies derived from local level experiences of the communities that Practical Action works with.

Practical Action sees resilience as the ability of a system, community or society to resist, absorb, cope with and recover from shocks and stresses (Pasteur, 2011). A resilient community is one in which people can manage risk and recover from shocks such as floods, droughts and violent conflict. It also

means people have the ability to adapt to long term trends such as climate change in a timely and efficient manner without undermining their wellbeing.

How to operationalize concepts of resilience is a challenge for many organisations. Practical Action has developed an approach called From Vulnerability to Resilience (V2R). This is a framework that analyses the causes of vulnerability and how disaster risk reduction, climate change impacts, governance and livelihoods interact and affect resilient outcomes.

The case studies offer lessons and recommendations from six Practical Action projects. They each work across the V2R Framework. The case studies illustrate key principles of building resilience in practice. A summary of the six case studies can be found in Table 1 below and a more detailed table can be found in Annex 1. Many of these projects have different entry points; some are focused on disaster risk reduction, others on sustainable livelihoods. They have been selected to illustrate the different entry points, country contexts and range of eco-systems that Practical Action has been working in.

Whilst short term immediate needs are a priority, the aim is for long term sustainable development. Current challenges whether

Table 1: Summary of the Six Case Studies

Case Study	Project Name	Country	Main Sector
1	Mainstreaming Livelihoods Centred Disaster Risk Reduction (DRR) in Peru	Peru (Ancash and Ica)	DRR Livelihoods
2	Mainstreaming Livelihood Centred DRR in Nepal	Nepal (Chitwan and Nawalparasi)	DRR Livelihoods
3	Drought Mitigation Initiative	Kenya (Turkana)	DRR Natural Resource Management Livelihoods
4	Greening Darfur	Sudan (North Darfur)	Food Security Natural Resource Management Conflict Prevention
5	Practical Solutions for Indigenous and Migrant Communities	Peru (San Martin)	Governance Natural Resource Management Livelihoods
6	From Vulnerability to Resilience: Household preparedness	Bangladesh (Sirajganj)	DRR Livelihoods Natural Resource Management

they be floods, droughts or marginalised livelihoods, offer entry points for actions that build the capacity of the people we work with to adapt to future changes. Therefore the central objective of programmes is to support the ability of communities and the people within them to deal with future uncertainties.

Key Lessons:

1. An integrated approach promotes effective interventions

Livelihoods, hazards, governance and changing trends are all interconnected in reality. Development practitioners must understand the links between them. Each of the four sections of the V2R shape and depend on one another. Understanding these dimensions of people's lives and designing interventions to enhance each component can contribute to more effective outcomes.

2. Building technical capacities can help to cope with future uncertainty

By building on local knowledge to strengthen existing technologies and helping farmers to access and adapt introduced technologies, small scale farmers and livestock keepers can take more control of their future and will be in a better position to make informed decisions for the long term. Building capacities and expanding people's choices has resulted in increased experimentation and innovation.

3. Long term partnerships can build adaptive capacity

Working in partnership with local civil society can help build adaptive capacity as these groups can strengthen institutions and local agency, access to information, increase knowledge and contribute to reaching sections of communities that programmes may not cover.

4. Building on past experience is essential

Building on past experience can help to understand the local level socio-economic, livelihood and governance context. This is essential because vulnerability to the impacts of climate change and hazards will often be mediated through these contextual factors.

5. Consensus building approaches bring tangible benefits, especially in conflict situations

Consensus building approaches involve participation of a wide range of stakeholders which has been essential in working with opposing groups and in mobilising capacity for social learning, negotiation and collective action. In Sudan they resulted in the project being able to continue in times of conflict.

6. Empowerment and agency are vital

Empowerment has been essential in building capacities of local people to make informed decisions about their future.

7. Scaling up is possible through partnerships and working with local and district officials

It is not enough to work only at village or local levels. Through working in partnership with local civil society organisations and linking up with local, district and national levels of government Practical Action projects have achieved greater impact.

8. Flexibility is needed to work with uncertainty

When working with future uncertainty, projects have had to be flexible and consider future scenarios. Consideration of how local people will be able to adapt into the future needs to be built into all programmes.

Recommendations for Policy & Programmes

1. Using a comprehensive framework such as the V2R can increase programme effectiveness. All programmers and planners need to take into account the interactions between livelihoods, hazards, governance and future uncertainty and not concentrate on only one dimension in isolation.

2. Local needs must be prioritised and addressed for local communities to be the drivers of change.

3. Link up with and influence meso-level governance systems in order for impact, and scaling up.

4. Best use of climate data will enable farmers to make informed decisions about their future agricultural practices.

Further Research

The case studies also highlight the need for further research, including more thorough evaluations and cost benefit analysis. Robust indicators of resilience must also be agreed upon. These indicators must be researched to ensure they are holistic and account for adequate time frames to measure longer term outcomes. Key areas for further research:

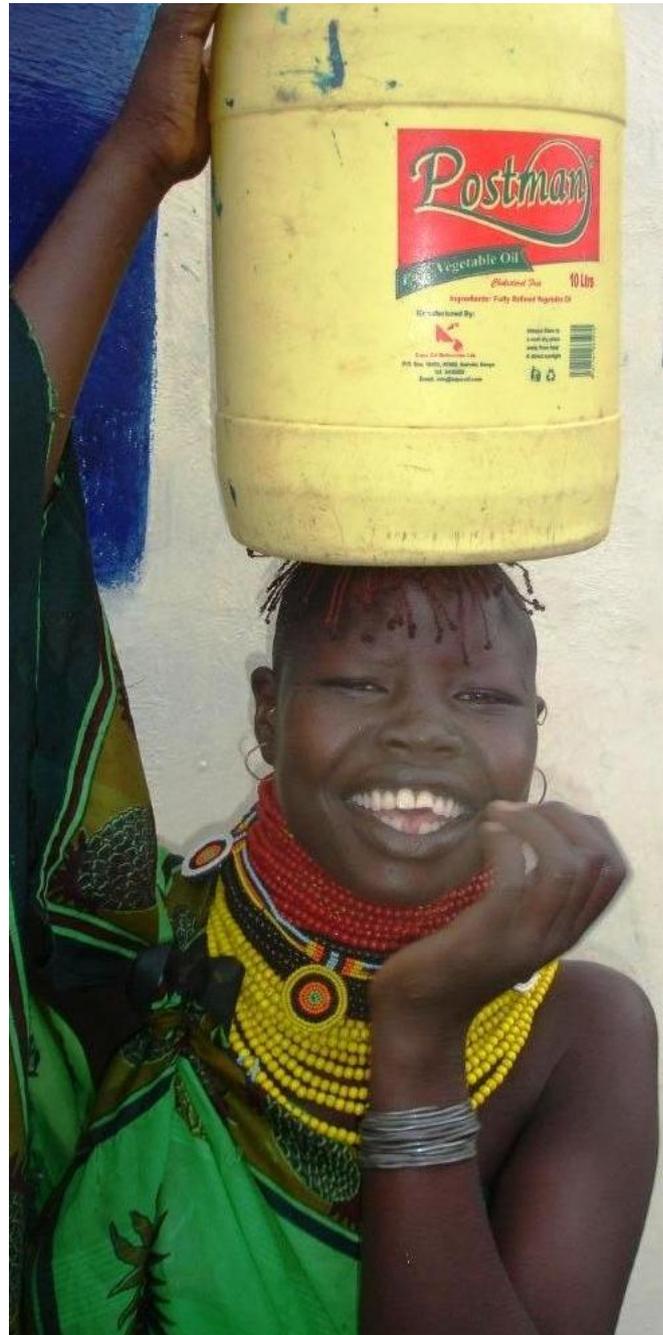
1. Indicators of resilience to measure impact
2. Introduce resilience approaches in urban programmes
3. How to understand and use climate data effectively.

Introduction: The V2R in Practice

This briefing paper looks at how Practical Action has gone about building resilience into its programmes. It uses the 'From Vulnerability to Resilience' (V2R) framework that Practical Action has developed to better understand the interactions between the four components of the framework: livelihoods, hazards, governance and future uncertainty.

Each case study starts with the particular development challenge in the country context. The case studies then go onto describe how each of the components of the V2R have been operationalized: Hazards and Stresses, Livelihoods, Governance and Future Uncertainty. Many of these projects have different entry points; some are focused on disaster risk reduction, others on sustainable livelihoods. They have been selected to illustrate the different entry points, country contexts and range of eco-systems that Practical Action has been working in. The paper finds that the six case study projects cover all four aspects of the V2R to differing degrees with positive results.

At the heart of Practical Action's projects outlined in this study is the belief that people we work with are the drivers of change. Communities do not view disasters, development and climate change as separate issues to be analysed and addressed through different processes at different times. They are all integral to their ability to make a livelihood and improve their wellbeing, and need to be tackled in an integrated way. The approaches outlined in this paper are not new, however the integrated nature of programming across livelihoods, hazards, governance and future uncertainty is innovative.



Strengthening the resilience of pastoralists in Turkana, Practical Action, 2009.

Photo: Access to portable water is an important local need in Turkana, Northern Kenya

The Development Challenge

Living with few assets and little access to skills and technologies is the reality for many throughout the globe. Vulnerable people live in circumstances where they are liable to, or live in fear of, a sudden, traumatic loss of their means of livelihoods and of their social or physical environment. This loss may be caused by a range of hazards including natural disasters or civil conflicts, or shocks such as sickness or injury which may affect individual households. The impacts of drought and floods are often exacerbated by unsustainable development such as deforestation or a combination of increasing population pressure, political tensions and economic changes that lead to practices that cause environmental degradation. Conflict is often a problem, fuelled by increasing competition over scarce resources such as pasture and water. Many vulnerable people live in fragile environments such as arid or mountainous areas often at long distances from markets and other services. They have few resources (physical, financial, natural, human and social) on which to base their livelihood strategies. They are vulnerable to food insecurity and destitution because they have little to fall back on if any shock suddenly reduces one or more of these resources still further. They also have inadequate access to skills and technologies that could help them to make the best use of the few resources they do have. Their ability to adapt to changed circumstances and adopt different livelihood strategies is limited. They also tend to have little access to and influence over the institutions and policies that govern their entitlements to resources. Services such as schooling, health, agricultural extension, transport and markets are often inadequate or unavailable to people living in more remote or challenging areas.

Growing uncertainty is another characteristic of the lives of vulnerable people. Climate change is causing many hazards and stresses to increase in frequency and intensity as well as creating uncertainty in weather patterns. This contributes to crop failure and livestock losses which have devastating consequences for farmers and pastoralists. Together this is affecting productive resources as well as governance structures which mediate access to needed resources. Fluctuating financial markets is another uncertainty that affects the poorest the hardest. Financial markets affect the prices of staple crops in developing countries, causing fluctuation in income for farmers and food shortages. Policy shifts, for example towards bio-fuels, can contribute to

rising grain prices that poor farmers cannot afford and urban food shortages.

Common characteristics of poverty is a lack of control and sense of powerlessness over the threats. To address this in a sustainable way, requires tackling the causes of their powerlessness and strengthening their resilience. The multiple factors of a lack of resources, fragile livelihoods, exposure to hazards, climate change and weak institutional support mechanisms must be understood in a more holistic way in order to address them in an effective manner. This means adopting an integrated approach that realises the interdependent nature of multiple factors contributing to vulnerability.



Photo: Deforestation in Moyobamba, Peru is a threat to the livelihoods of indigenous communities. It causes landslides, water pollution and land degradation as well as destroy local bio-diversity.

What is resilience?

The term ‘resilience’ has become a buzz word in international development. It is increasingly being applied in areas of climate change, humanitarian relief, and disaster risk reduction (DRR). Practical Action has been working towards the integration of these areas with the sustainable livelihoods approach (Chambers and Conway 1999) for more effective and sustained poverty reduction for the past seven years. We see integrating uncertainty (i.e. future trends such as climate change and increasing financial instabilities), livelihoods, hazards and governance into programme design, interventions and project reviews as promoting resilient outcomes for communities that we work with. Resilience refers to the ability of a system, community or society to resist, absorb, cope with, and recover from the effects of hazards, and to adapt to longer term changes in a timely and efficient manner without undermining food security or wellbeing (Pasteur, 2011, p13).

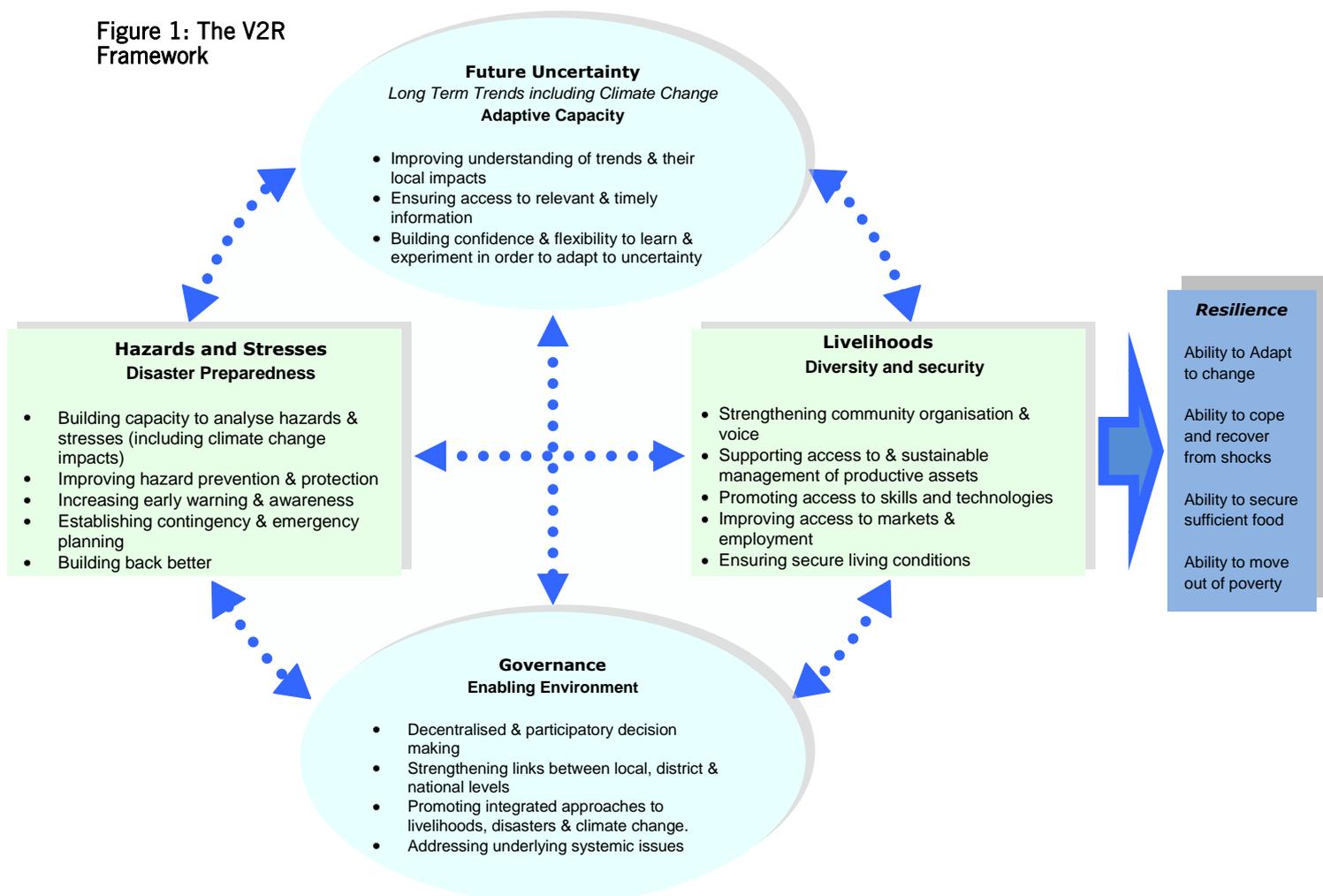
Resilience is an outcome which can take on different forms. In our programmes, resilient outcomes include: the ability to manage risks and reduce the occurrence of hazards; to adapt

to change over the long term; to secure sufficient food and to move out of poverty. Practical Action has developed the V2R framework, which draws on existing approaches (sustainable livelihoods, DRR and climate change adaptation) to help practitioners and policy makers to understand, analyse and address the multiple factors that communities need to build resilience. The V2R Framework (Figure 1 below) which has four interrelated elements has been developed out of an iterative process based on learning from field experience. Each of the four elements is interrelated and how they interrelate and promote resilience will be discussed below.

Livelihoods

A livelihood comprises the resources (including skills, technologies and social networks) and activities required to make a living and have a good quality of life. Understanding livelihoods does not just mean looking at people’s main sources of employment or income. It means looking at all the different activities and choices within the household and community which provide food, health, income, shelter and other tangible benefits, such as comfort, safety, respect and fulfilment. The livelihood options available to individuals and households depend

Figure 1: The V2R Framework



on the diversity of resources, skills and technologies they are able to access.

People with poor livelihood options are more likely to be forced into living or working in areas more exposed to hazards and stresses. They also have less alternative strategies to fall back on when shocks and hazards do occur. Building livelihood resilience means improving the diversity and security of people's livelihoods so that people have more options available to them. This includes strengthening community organisations and forging links with service providers to build capacity and voice, and support access to assets, skills, technologies and markets for enhanced production, income and security (Ensor, 2011). It also involves supporting access to and management of natural resources and ensuring secure living conditions.

Hazards and Stresses

Hazards and stresses come in many forms; they can be natural or manmade and are usually a complex mix of both. Hazards are sudden and unexpected events such as earthquakes, flash floods or cyclones. They can also be slower onset events such as droughts. Stresses refer to smaller, low impact events and seasonal factors, including seasonal unemployment, price fluctuations, local conflicts and gradual changes in climate, which can undermine livelihoods. People with few resources are disproportionately affected by hazards and stresses. A livelihoods approach looks in detail at hazards and stresses but takes care to understand how and why people and their livelihood are exposed to and affected by such events. The resource poor are often more exposed to hazards and stresses, due to a lack of knowledge about prevention and little choice over where they live. They are usually worst affected by hazards because they do not have the capacities or resources to cope and recover quickly. Building resilience to hazards and stresses involves building capacity to analyse hazards and stresses; improving hazard prevention and protection; increasing early warning and awareness; establishing contingency and emergency planning and building back better.

Governance

Governance embraces a whole range of public and private, formal and informal institutions, policies and processes, operating at local, district, national and international levels. It is vital in building

resilience because it determines: how people can access resources, skills, technologies and markets to strengthen and diversify their livelihoods; how they protect themselves from hazards; and how they access support to help them recover when they are affected. Addressing governance issues at various levels is necessary to create an enabling environment in which people are able to access and influence decision making processes, services and resources. Work to effectively address the governance context and the responsiveness of institutions and policy includes: advocating for decentralised and participatory decision making; strengthening links between local, district and national levels; promoting integrated approaches to livelihoods, disasters and climate change; and addressing underlying systemic issues causing vulnerability (Pasteur, 2011, p55).

Future Uncertainty

Long term trends can have unpredictable effects on the natural, physical, social, technological and economic environment. This in turn contributes to uncertainty about the future viability of livelihoods under new conditions, and around the probability of changing risks. Dealing with increasing uncertainty, including that which climate change brings, has led Practical Action to prioritise adaptive capacity. Adaptive capacity refers to the combination of skills, assets, networks and institutions and policies that enable communities to continually assess their own situations against the current and emerging context and make appropriate changes to their lives and livelihoods (also see Levine *et al* 2011).

Learning and experimenting with new technologies and methodologies in local contexts is necessary for communities to adapt to change and to be able to make active choices for their livelihoods strategies. Communities will need to expand their knowledge and access to information if they are to understand the challenges of an uncertain future and develop responses to the emerging impacts of climate (and other trends such as urbanisation, increased food prices, fluctuating financial markets) (Ensor. p43, 2011). To build resilience over time involves: raising awareness and recognition of trends and their local impacts; access to relevant and timely information relating to impacts and how to adapt to them; confidence and flexibility to learn and experiment in order to adapt (Pasteur, 2011, p.45).

How Practical Action operationalizes resilience

Working across the four different elements of the V2R (Hazards and Stresses, Livelihoods, Governance and Future Uncertainty) Practical Action has aimed to promote integration and interconnection between the elements to achieve resilient outcomes. The next section analyses six case studies and assesses how Practical Action is working towards the integration of all four dimensions of the V2R. This is an exercise to better understand the usefulness of the V2R framework and how it can benefit projects and programmes. From this we can then draw out useful lessons.

The first two case studies are from the 'Mainstreaming Livelihoods Centred Disaster Risk Reduction' projects in Nepal and Peru. Both illustrate the usefulness of integrating disaster risk reduction (DRR) and Livelihoods sectors and linking these up with local district and national level government. Other case studies include: the 'Drought Mitigation Initiative' in Kenya; 'Greening Darfur' in Sudan; the 'Vulnerability to Resilience' project in Bangladesh and the 'Practical Solutions for Indigenous and migrant Communities' in Peru.



Women play an important role in establishing community seedling nurseries in North Darfur. Greening Darfur Project, Practical Action Sudan.

CASE STUDY ONE:

Mainstreaming
Livelihood Centred
Disaster Risk
Reduction in Peru



Mainstreaming Livelihood Centred Disaster Risk Reduction in Peru

Overview

The Mainstreaming Livelihood Centred DRR (LCDRR) was a 5 year project funded by the Conflict and Humanitarian Fund through the UK Department for International Development (DFID). It was implemented by Practical Action's country offices in Peru, Bangladesh, Kenya, Sri Lanka, Nepal, and Zimbabwe. The Livelihood Centred approach to disaster risk reduction programme has gained widespread acceptance by local, district and provincial governments in the areas in which we have worked. The programme's main purpose was to help achieve secure and sustainable livelihoods, decrease exposure to disaster risks, contribute to poverty reduction and increase a community's ability to adapt to the impacts of climate change.

Practical Action's work in Peru illustrates well this interconnection between disasters, livelihoods and climate change.

The Development Challenge

The Mainstreaming Livelihood Centred Disaster Risk Reduction project in Peru was based in three areas: Ancash, Ica and Huancavelica. Ancash is exposed to climatic events from melting glaciers and frosts to droughts, landslides, floods and strong rains. Ica was the centre of the 2007 earthquake in Peru where over 600 people died; and Huancavelica suffers from frost, drought, landslides, and earthquakes and is the poorest region of the country. Communities in Peru are therefore exposed to landslides, periodic droughts and are increasingly suffering from unpredictable meteorological events – the impacts of climate change. Unseasonal frosts, extended periods of drought, extreme rainfall and the occurrence of new pests and diseases are all increasing vulnerability.

Disaster risk management in Peru was characterized by state-funded infrastructure development (prevention activities such as the construction of flood defences) and emergency response. These focused on large-scale disasters. There were, however, regular smaller events, which often passed unreported, but which had a major impact on vulnerable communities and which are one of the main causes of increasing poverty. Such events disrupt the means of production; the livelihoods of poor rural people. Major livelihood strategies such as potato cultivation, alpaca herding and guinea pig breeding were all under stress from increasing levels of frost combined with a

lack of knowledge of disease prevention and animal health care. A lack of secure livelihoods had meant that these communities were more vulnerable to shocks and hazards when they occurred as they had few resources to fall back on in times of need.

In addition to these hazards, farmers in these areas were cut off from agricultural extension services in Peru and had little access to information, services or decision making. There was a lack of voice and influence over disaster risk reduction at both local and national level due to the communities limited knowledge and skills to influence the decision making process.



Photo: Training children in an emergency simulation drill in a school in Ancash, Peru. Practical Action, Peru.

Hazards and Stresses

Local level, participatory vulnerability and capacity assessments (VCAs) were used to identify hazards by local communities the project worked with. Training was given to community leaders to conduct assessment of threats, vulnerabilities and capacities. As a result of this, communities developed detailed development plans which included disaster risk reduction strategies. This allowed communities to create action plans and understand their options based on changing hazards. The disaster preparedness and emergency response plans that were prepared in each community were led by Community Civil Defence Committees. Three hundred members of these committees were trained in disaster preparedness and emergency response. Disaster preparedness activities included designating risk areas, safe areas and evacuation routes in each community. They also carried out simulation drills for earthquakes and avalanches each year.

Safe living conditions are very important to human health and ability to work effectively, and therefore earthquake resistant housing was part of a strategy to 'build back better' used by Practical Action. In total, the project trained 400 families in Ica in the construction of earthquake resistant housing. This training involved demonstrations of making traditional '*quincha*' buildings better so that villagers could gain the necessary skills to build their own homes. The modern *quincha* buildings were more flexible in structure so that they would be resistant to future earthquakes which are a major disaster in this area of Peru.

Beyond the community level, the provincial civil defence committees of Yungay (Ancash) and Chincha (Ica) were strengthened. The project also supported the Civil Defence Institute of the Ancash Region in disaster preparedness.

Livelihoods

The communities Practical Action worked with are mostly marginalised small farming households who faced a range of hazards with little access to agricultural extension services or other inputs. Their livelihoods have been strengthened by improving the diversity and security of resources, skills and technologies that are available to households and communities.



Photo: Group discussing the impacts of climate change,

To do this, the project initiated a 'Resilient Farmer Leaders School'. This school successfully trained 31 farmer leaders from 4 project communities in 10 modules of agricultural and livestock production with a focus on risk reduction and climate change adaptation. Once lead farmers were trained they went back to their communities to teach others. This has resulted in increased capacity, productivity and ability to adapt by more than 800 families. This was the main initiative to strengthen livelihoods through teaching and developing technical skills and knowledge and has been successful in building confidence and flexibility to learn and experiment with crops and technologies. For example, communities are now experimenting using a combination of indigenous and new varieties of vegetable and conducting field trials to breed strains of potatoes, maize and alfalfa that have been successful in nearby areas.

As a result of the resilient farmer leaders school, farmer leaders who graduated have since found jobs in public and private institutions as farming technicians, furthering the impact of the project.

In addition, the school installed technical irrigation demonstration plots to encourage farmers to build their own as well as encourage public-private institutions to allocate funds to these activities. Better irrigation has meant that farmers are now less dependent on rain-fed agriculture. The reward has been an increase in crop productivity. Many families' incomes have risen over 100% compared to the traditional rain fed system they were using before the project. As a result of learning and experimenting with technology, a group of families have now installed drip irrigation systems in avocado crops with the financial support of municipalities in Yungay province (in Ancash) on their own initiative.

In order to expand the knowledge from the resilient farmer leaders school in Ancash, four revolving fund committees were set up to allow other farmers to invest in the same technologies. In 2009-2010 over 400 families participated in these revolving funds. The revolving funds have distributed guinea pigs to community members and have introduced new elements in the management of guinea pigs including crossbreeding with local breeds, incorporation of local and external knowledge on animal sanitation, feeding techniques, and installation of protective infrastructure. As a result, guinea-pig offspring are now more resistant to a colder climate and the health of guinea pigs have improved due to better maintenance. These better quality guinea pigs can therefore be sold in the market for a higher price. Households now own between 60-100 guinea pigs each. As a result of these activities, there was an increase of more than 100% in family income for guinea pig breeders.

As well as better guinea pig varieties, the revolving funds have expanded and diversified the stock of seeds and have helped to recover native varieties of potato, maize, forage, barley and wheat, which are more resistant to plagues, drought and freezing weather. Native varieties are favoured by farmers for their taste over foreign varieties. This is complemented with inputs for the production of organic fertilizers and equipment for their application. The Revolving Fund Committees have been officially recognized and negotiate projects with municipal governments and the regional government. The Revolving Fund Committees can access central government or private sector grant funds. As a result of their success, this model has been replicated by other development organizations as it is an exemplary way of ensuring farmer's own innovation and technologies are strengthened and linked to service providers.



Photo: Rosa Maque (pictured above) has been trained in better guinea pig breeding, feeding and cleaning.

Governance

Community-based training and capacity building has been conducted to better link communities with district officials. Peru has undergone a process of decentralisation and a component of this is the participatory budget process whereby organisations compete for funding from municipal authorities. In the past rural communities have been effectively excluded from the process both by their lack of capacity to submit proposals in the required format and by the inability of municipalities to process these proposals. The project facilitated communities to develop funding proposals and in 2011 four communities participated in the formulation of participatory budgets in local governments of Huaraz, Yungay, Shupluy and Matacoto. This reduced their exposure to disaster risks, while increasing their livelihood options. At the same time it developed the capacity of municipal authorities to process rural community proposals. Eight community projects which reduce disaster risks while increasing livelihood options have been approved for funding in the last three financial years and community plans have been

incorporated into the development plans of three Municipalities.

Building the capacity of district and regional officials was part of the project strategy to effectively promote the integration of livelihoods based disaster risk reduction into district and regional development plans. In total, three hundred municipal and regional officials in the three locations were trained in disaster risk management and protection of livelihoods. Six hundred civil society leaders were trained in disaster risk management, climate change adaptation and protection of livelihoods.

Local level experiences have also been incorporated into several sub-national plans such as the Ancash Food Security Strategy, the Environmental Education Plan and the Climate Change Strategy. Following the Ica earthquake, the project has been active with the Network for the promotion of disaster risk management and climate change adaptation (GRIDES) in influencing the civil defence network for the improvement of response and reconstruction at regional and local levels. Joint lobbying has resulted in the Ministry of Economy including a budget for disaster management and emergency response in the Ministries of Agriculture, Education, Health, Housing and Transport.

The Ministry of Education has endorsed the qualification given by the 'Resilient Farmer Leaders School' and recognised the potential of the school as a model for adult education in a number of subjects and is seeking to replicate the model. During the project, 31 leaders of 4 communities in the Ancash region were trained as highland agriculture technicians with official certificates issued by the Ministry of Education. Therefore the project achieved impact on governance and strengthened links between communities, district and national level officials.

In addition two of the graduates of the school have gone on to become authorities in their communities: one of them was appointed Mayor and the other was appointed president of the *campesino* community group '*Unidos Venceremos*' (Together we shall win) which is a group of more than 600 farmers from Yungay.

Future Uncertainty

Climate change is having a significant effect on the local environment in Peru. There are more frequent and severe frosts which have happened out of season and have killed off potato crops. This is particularly devastating for potato farmers as it not only destroys a staple harvest but also ruins the seed for the next harvest. Heavy rains have also increased in intensity, causing landslides and destroying crops. Farming communities have found that weather patterns were changing and that traditional indicators of weather patterns (such as bird migrations, plant flowering etc.) were no longer accurate.

Recognising that farmers must be able to adapt their farming practices over time to cope with these changes, the project sort to ensure knowledge and information were accessible for farmers. The project facilitated access to climate information at the local level in collaboration with a local university. Rainfall and temperature are also monitored by a number of households at different elevations in the community areas. This information is shared with the university and then fed back to the communities.

In order to build confidence and flexibility to learn and experiment, a revolving system of learning was set up through the 'Resilient Farmer Leaders School'. This involved each lead farmer returning and sharing their newly gained knowledge with their own community. This has resulted in increased capacity to manage agricultural calendars according to local climate conditions, an increase in productivity and the ability to adapt to changing climates by more than 800 families.

In addition, 200 families have adapted their production systems to the new local climate conditions by investing in new animal breeds, new varieties of seeds, hydroponics during the dry season, production of homemade fertilizers, storing seeds and the recovery of good agricultural practices (crop rotation, soil conservation, and optimization of water use). The project also initiated the recovery and distribution of 10 potato varieties and 6 maize varieties, and a selection of seeds, barley and wheat that are more resistant to adverse climatic conditions and diseases. These technologies ensure farmers are now more confident in dealing with the effects of future climate change and uncertainty.



Photo: Graduates of the Resilient Farmer Leaders School.

Conclusion

Whilst disaster risk reduction has conventionally focused on mitigating immediate disaster risks, the LCDRR project by Practical Action integrates this approach with a more holistic focus on development activities that build the livelihoods and resilience of communities.

DRR has had great success as an approach in systematically assessing the chances of a disastrous event happening, and identifying means for reducing the risks of harmful impact. The LCDRR Project in Peru has therefore included disaster preparedness to reduce exposure to hazards, early warning systems and emergency plans to respond to a hazard during and after its onset, and reconstruction and recovery of housing and animal shelters.

However, with the insight that strong, sustainable and diversified livelihoods can help households and individuals to cope better with hazards, LCDRR combines the above disaster management activities, with initiatives to understand and strengthen broader livelihood strategies. The LCDRR project in Peru therefore also addressed the underlying causes of vulnerability, namely poverty, lack of access to information and resources, and underdevelopment through a participatory approach. Investing in strengthening and diversifying the livelihood options of people at risk from disasters and thereby increasing their resilience is an effective strategy for both long-term

sustainable disaster risk and poverty reduction.

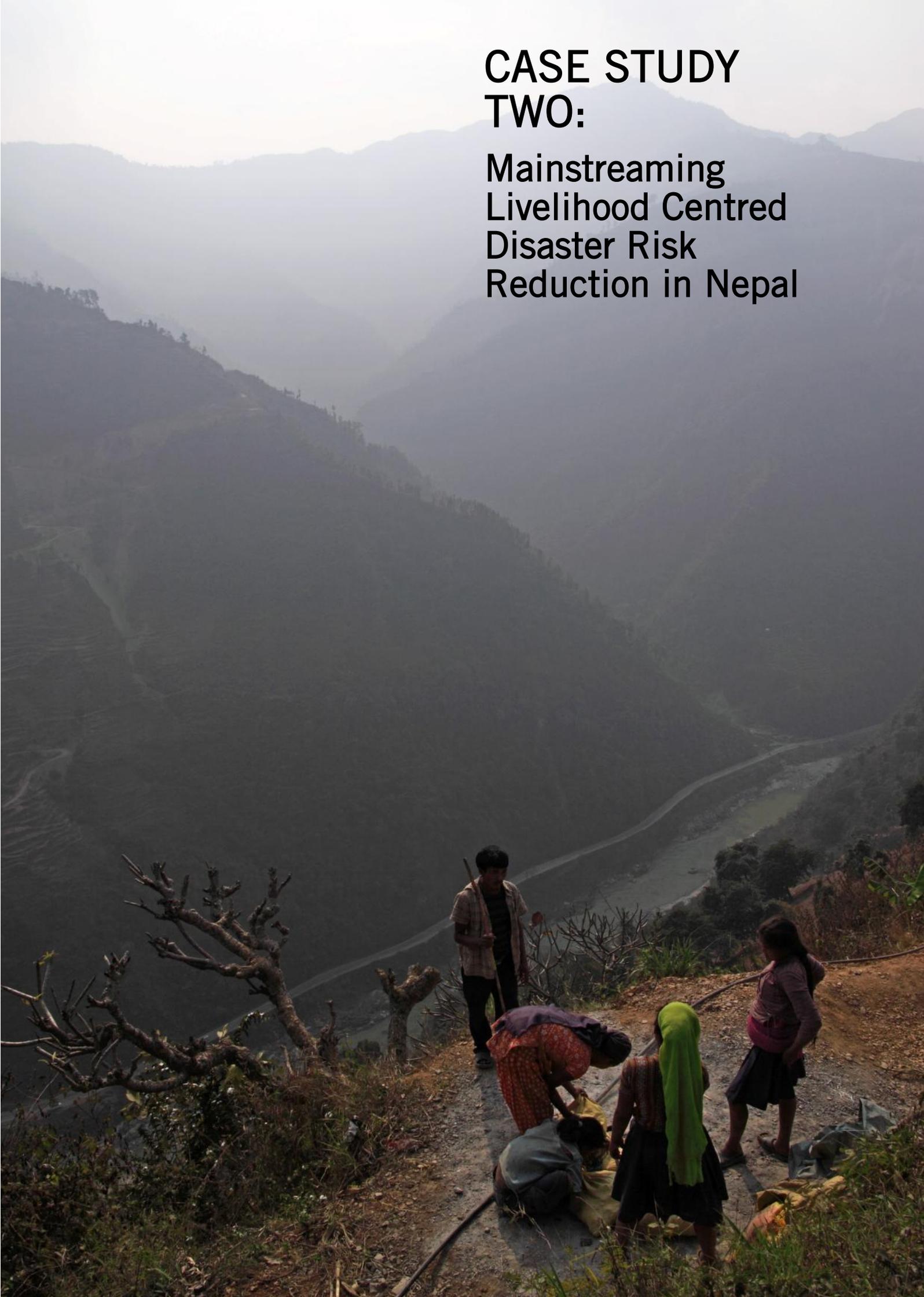
In this case study agriculture and risk have been addressed together. The LCDRR project in Peru has been successful in linking communities and local weather information which then allows them to access weather information and plan their agricultural activities accordingly.

Other wider elements, including governance and the enabling environment play important roles in building resilience. The LCDRR Project in Peru therefore strengthened links between local, district and national levels of government as well as build the capacities of communities to analyse hazards and plan accordingly.

The V2R Framework was developed and refined as part of the international Mainstreaming Livelihood Centred Disaster Risk Reduction Project. Through an integrated approach of DRR, Livelihoods, Future Uncertainty and Governance, the project has been able to benefit from the complimentary linkages between these areas. Disaster risk has been lessened due to livelihood strengthening and in turn, strengthened links between communities and local and national government and service providers has strengthened livelihoods. These interventions have in turn ensured that communities are better prepared and able to cope with future uncertainty.

CASE STUDY TWO:

Mainstreaming
Livelihood Centred
Disaster Risk
Reduction in Nepal



Mainstreaming Livelihood Centred Disaster Risk Reduction in Nepal

Overview

The Mainstreaming Livelihood Centred DRR (LCDRR) was a 5 year project funded by the Conflict and Humanitarian Fund through the UK Department for International Development (DFID). It was implemented by Practical Action's country offices in Peru, Bangladesh, Kenya, Sri Lanka, Nepal, and Zimbabwe. The objectives of the project in Nepal were to (1) improve the socio-economic status of vulnerable communities to disasters, and (2) to enhance the capacity of stakeholders at different levels to adopt a livelihood centred approach to disaster risk reduction.

The project was implemented in partnership with local NGOs SAHAMATI in Nawalparasi and Multidimensional Agriculture and Development (MADE Nepal) in Chitwan District from 2007 until 2010.

The Development Challenge

People in Nepal are being exposed to more frequent and severe hazards. There is a high risk of floods in the plains and landslides in the hills. While hazards are increasing in frequency and severity, their impacts are exacerbated by a series of dynamic processes including population growth, increasing poverty and marginalisation, environmental degradation, poor planning and preparedness, and the impacts of climate change. Low awareness levels in terms of disaster preparedness and management, lack of efficient mechanisms and capacity to deal with these natural disasters has had severe impacts on the lives of the people, property and economy at large.

Communities in Districts of Chitwan and Nawalparasi that Practical Action have worked with to reduce disaster risk face multiple hazards –specifically landslides, droughts and floods. Communities bordering the National Park also face wildlife intrusion from antelope, rhinos and other animals. Hazards such as floods destroy crops, homes and livelihood assets, undermine health and food security. Different hazards impact at different time of the year. Flash floods occur during the monsoon season between June and October and dry spells usually occur between November and May. Periods of drought have become more frequent, longer and severe in the past decade. Wildlife can intrude at any time of

year, but between November and May, when forage is scarce in the National Park, crops are more prone to invasion. There is also an invasion of inedible invasive weeds, which drives animals to alternative sources of food such as the communities' crops.

Landslides and floods are particularly detrimental as they both erode land as well as destroy crops. In Chitwan, severe flood inundation results in crop damage every 8 to 10 years. The villages Practical Action worked with in Chitwan are all downstream at the large watersheds of Narayani and Rapti Rivers where flooding is a result of various factors happening upstream. Factors include deforestation, slash and burn agriculture and erratic patterns of rainfall. Many of these factors are uncontrollable to the communities downstream.

Unseasonably severe weather conditions in Nepal are increasing the vulnerability of poor communities. Lately winter crops such as potato have been prone to virus due to gradual changes in weather patterns.

The communities are not well represented in decision making structures and are marginalised. Weak government institutions, especially District Disaster Management Committees, is a problem.

Whilst national and international policies recognised the need for decentralised measures to prevent, prepare for, respond to and recover from disasters, this was yet to be reflected in practice due to a lack of skills and resources. There was a gap between national policy, local authorities responsible for DRR and the project communities. The District Disaster Management Committees (DDMC) and the local Village Development Committees and municipalities were mandated to manage local disasters, but they lacked the institutional set up and plans that could link vulnerable communities to higher authorities. DDMCs and VDCs lacked the systematic categorisation of risks and were therefore unable to set priorities to take systematic action to minimise disaster risks.

Due to the multiple hazards, vulnerable livelihoods and weak governance structures and the need to address these at local, district and national levels meant that an integrated systems approach was used to tackle vulnerability.

Hazards and Stresses

Through vulnerability and capacity assessments communities highlight, rank and decide on action plans with the village development committee to reduce risks. In Nepal, community-level assessments identified droughts as a common recurring hazard for farmers. It was a particularly severe hazard for small scale farmers with less than one third of a hectare of land, as they cannot afford irrigation. Therefore farmers were helped to improve tube well and irrigation facilities which have improved their water supply. This has reduced the impact of drought, reduced crop losses and has increased productivity. Irrigation has also meant that additional crops such as maize and vegetables can now be cultivated in the winter and spring when rainfall is scarce. These initiatives have helped communities to cope with small scale but frequent stresses of drought. They have, in turn, improved food security, reduced drudgery and increased the income available for households. Due to the extra crops that can now be cultivated, many are now food secure all year round, while some are generating a surplus to sell for extra income.

Participatory vulnerability and capacity assessment also identified

wildlife as a high-frequency hazard for communities living near the Chitwan National Park. Wild animals were intruding into the community to feed and presented a hazard by destroying crops, attacking livestock and causing occasional injury to humans. Traditional methods of prevention, which involved farmers keeping watch over their farms for 24 hours throughout the crop cycle, were time consuming and discouraged farmers from investing in new crops. In order to stop wildlife intrusion, the project installed low voltage electric fencing to discourage wildlife from trying to penetrate the barrier. This electric fencing has reduced crop losses by more than 90%. Prior to the fencing, annual crop losses due to wildlife intrusion were 40% to 50% for farmers close to the park border (Willenbockel, 2011). This increased security has encouraged farmers to diversify their crops and this has resulted in increased yields and income. It has also changed local attitudes towards wildlife, from conflict between humans and wildlife, towards conservation. This has resulted in opportunities for the promotion of nature based eco-tourism.

Flood risks were also highlighted as a serious hazard and there have been various strategies to prepare for and prevent flood damage. The construction of gabions, embankments, new plantations and watershed conservation initiatives (including less shifting cultivation) have reduced exposure and decreased the loss of assets due to flooding. Preparedness for floods has also been promoted through up and downstream linkages in communication for early warning systems. These early warning systems, preparedness and contingency plans have all contributed to a reduced loss of assets and have saved lives.



Photo: Building a gabion in Nawalparasi District, Nepal after traditional irrigation channels were flooded.

Livelihoods

Livelihoods in both Chitwan and Nawalparasi depend on small scale agriculture and livestock farming. Low levels of awareness, limited skills and thus options for livelihoods are major constraints for these communities. Practical Action therefore worked to ensure livelihoods were strengthened and diversified in order to recover quickly from shocks and to prepare for future uncertainty. Strengthening livelihoods was achieved mainly through: increased incomes; increased food security; increased asset bases - both physical and intellectual; access to alternative income earning opportunities; reduced losses of lives and property/assets; savings; improved nutrition and health; improved community cohesion; greater confidence and ability to access support; and better access to knowledge and services.

The project provided training in the form of workshops, field based orientations and demonstrations to improve farming skills and knowledge with an emphasis on the introduction of new crop varieties to diversify existing cropping patterns. Improved agricultural skills, the adoption of improved practices together with improved seed varieties has reduced crop losses. The project improved crop varieties as well as practices on land preparation for existing crops (rice, maize, ginger, wheat, potato and mustard), planting and harvesting practice and introducing new crops through field based orientations and demonstrations. Therefore the project has been successful in enhancing skills and capacities of farmers. In turn this has increased production for over 266 households and has been replicated by their neighbours and relatives.

In addition, off-seasonal vegetables are now grown by many farmers and they are able to sell them in local markets for a good price. The ability to grow off-seasonal vegetables has increased household food security and has supplemented their incomes considerably. Over 450 households have initiated vegetable growing on their farms. After the second year of the project, some farmers used their own initiative to expand their vegetable production for commercial purposes and their businesses are expanding.

In Nawalparasi District alone, a total of 140 farmers attended 'farmer field schools' in 3 locations. During these courses, farmers learnt about vegetable farming whilst practicing in groups and on their own personal farms. As a result, farmers have scaled up their farming area as well as their

variety of crops and now more than 70% of families are food secure for the whole year and nutrition has improved.

Livelihoods have also been strengthened by the project through the promotion of livestock keeping. The project facilitated improved husbandry techniques, particularly for goats and pigs, through livestock health camps. Shed improvements in combination with other measures have also made a significant improvement in the health and growth of livestock. Farmers have reported that the live weight gains of pigs and goats have increased by up to 50% (Willenbockel, 2011). These benefits have in turn increased farmers' incomes significantly, and with this, the ability to cope with existing and future hazards, shocks and stresses.

Bee-keeping has been a successful strategy for agricultural diversification. Traditionally bee-keeping was treated as another form of hunting. When honey was removed from the hives, they were severely damaged. The project therefore raised awareness on bee hives and the importance of proper bee keeping skills. The introduction of better hives has reduced losses of bee colonies and increased productivity. Bee-keeping is now a reliable source of income. Bee-keeping businesses have been particularly successful and have been scaled up by farmers using their own funds and resources. Bee-keeping has also had other benefits, such as reducing land degradation. This is because surrounding environmental conservation is important if bees are to be productive. Therefore bee-keepers are particularly concerned with forest conservation and increasing local bio-diversity.

Livelihood diversification has been promoted because it is a proven strategy for reducing exposure to disaster risks while increasing resilience. Off farm activities were explored and selected based on available opportunities and the interests of community members. Candidates were selected through a consultation process with the communities. Off farm skills based enterprises are generally less sensitive to existing hazards, particularly weather related hazards. Off-farm activities initiated by the project included training in candle making, light engineering, tool making, thatching, animal health work and carpentry.



Photo: Learning about new crop production, Farmer Field School, Nepal

Governance

Practical Action has scaled up livelihoods centred DRR approaches in Nepal so that small, location specific interventions are integrated into wider district and national initiatives to create an enabling environment and achieve greater impact. To achieve this kind of change an integrated approach to disasters, livelihoods and development was taken. Practical Action has worked to enhance the capacity of stakeholders at different levels to adopt livelihood centred approaches to risk reduction. This was mainly achieved through building the capacity of local institutions such as Village Development Committees (VDCs). VDCs are now able to analyse and manage risks more effectively. In addition, these local institutions are now linked with District Development Management Committees and National disaster reduction processes and institutions, such as the Ministry of Home Affairs and Ministry of Local Development to promote better integration and access for local communities.

In total, 28 VDCs in Nawalparasi and 31 VDCs in Chitwan have incorporated community based disaster management into their development plans. In Nawalparasi all 28 VDCs have formed Disaster Management Committees (DMCs) to implement their plans

while in Chitwan 16 VDCs have formed DMCs. There has also been improved integration of these village level institutions into District and National level plans. VDC plans have been included into the District Development Plans of both Chitwan and Nawalparasi.

At the National level, the Ministry of Local Development has recognised the role of local communities, and is developing national guidelines on VDC planning based on project experiences. It is also producing guidelines for Village Development Committee disaster management planning based on project approaches. The Ministry of Home Affairs, has also recognised the benefits of incorporating livelihood approaches in DRR, and has incorporated Practical Action's VDC planning guidelines into the Hyogo Framework for Action¹ mid-term report for Nepal.

At the international level, through involvement with the project, officials from Chitwan district government went on to enter the UNISDR 'Resilient Cities' campaign. They were the first rural based authority to get involved with the campaign and have used an integrated livelihoods approach in their DRR strategy. There have also been exchanges between Nepal and Bangladesh District level officials through country field visits.

¹ The Hyogo Framework for Action (HFA) is a 10 year plan to make the world safer from natural hazards. Adopted at the World Disaster Reduction Conference in 2005 by 168 member states of the United Nations.

Future Uncertainty

The Mainstreaming Livelihood Centred DRR Project in Nepal has built adaptive capacity of community, VDCs and DDC members through improving local understanding of trends and their impacts. Hazard analysis took into account current risks and changing hazards so that communities can prepare themselves in the short term. Seasonal calendars, hazard timelines and other participatory tools helped community members to uncover changing hazards and weather patterns. However, community perception of the changing weather patterns and hazards was not cross-checked with meteorological information. Practical Action is working towards including meteorological data in programmes to help decision making through forward-looking scenario building.

Livelihoods have also been strengthened and built on to increase farmers' confidence to learn and experiment. New technologies have also been introduced to strengthen communities' capacity to adapt to change. This has mainly been in the form of new and diversified crop varieties which can be grown off season and in different weather conditions. To do this, farmer field schools have been used to build capacity, confidence and flexibility to learn and experiment. Learning about different techniques and inputs has also increased the adaptive capacities of farmers. An example of the success in this has been farmers using their own initiatives to start extending their businesses such as bee-keeping and off seasonal vegetable production beyond the scope of the project.

Conclusion

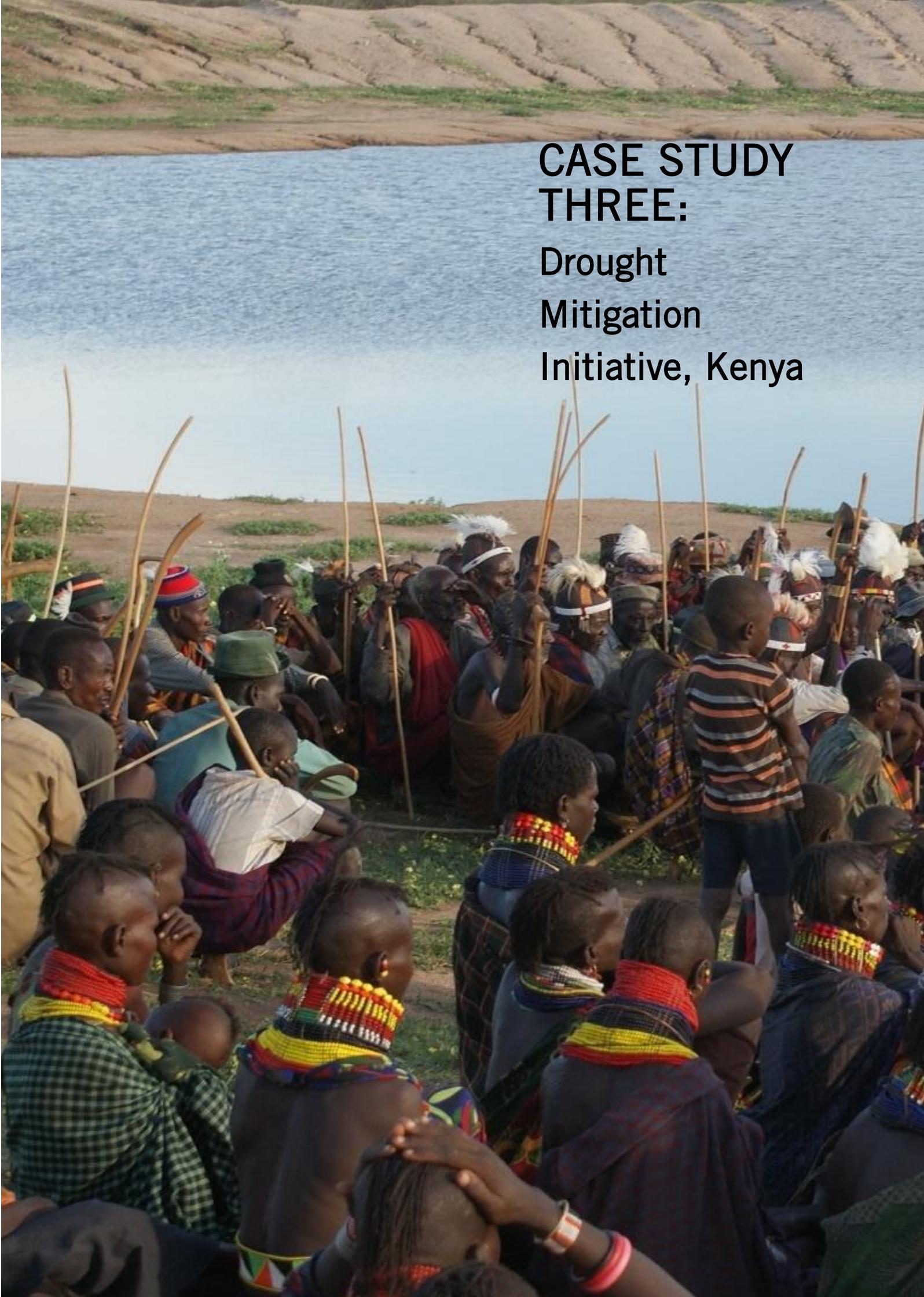
Livelihood diversification, disaster preparedness, gathering community perceptions of changing hazards and risks and strengthening community organisation have all been used in an integrated and holistic way. Each strategy works to reinforce one another, and has resulted in outcomes of increased food security, and better access to governance systems, decision making and resources.

Relevant institutions, including government departments, need to understand the integrated nature of vulnerability and work together to strengthen resilience and adaptive capacity. An important lesson of this project is that, if included in project design and delivery, these small scale community interventions can have an impact upon

district and national level development policies and processes. For example, before the project the focus of government, district and village development committee level institutions, was on rescue and relief operations in regards to large scale disaster events, such as earthquakes. A major impact has been that these institutions now realise the havoc of small scale stresses and shocks to people's livelihoods. These are corrosive and gradually erode people's ability to cope and recover. They are also exacerbated by deforestation of hillsides leading to flash floods, erosion, and landslides. The project therefore increased knowledge and access to information on the causes of many of these smaller stresses, mostly resulting from mal-practices such as deforestation and lack of natural resource management. People are now more aware and have access to appropriate knowledge and skills.

In addition, government authorities have widened their perceptions of disasters. A range of discussions, training and workshops has helped to establish a common understanding of hazards and their consequences. Not all hazards are natural and most can be prevented or at least prepared for. In addition, a new hazard such as wildlife intrusion, which was never on the DRR agenda before, has now been included.

Adaptive capacity has also been built through power-sharing in decision making. Village Development Committees (VDCs) which are the lowest level of government in Nepal are now able to influence District level plans to embed DRR. This has helped policies and practices tackling disaster risk to be more flexible and integrated across sectors and scale and have feedback loops between different levels of government and communities.



**CASE STUDY
THREE:**
Drought
Mitigation
Initiative, Kenya

Drought Mitigation Initiative (DMI) Kenya

Overview

The Drought Mitigation Initiative consisted of two inter-related components: a water component and a livestock component. The water component sought to strengthen resilience to drought by improving access to reliable water and thereby mitigating the impacts of water stress in targeted locations. The livestock component sought to reduce vulnerability to drought and mitigate the impacts of climatic shocks in livestock based livelihoods, thus ensuring that pastoralism remains a viable livelihood in the face of growing challenges brought about through increased pressure on land, conflict and climate change. A coordinated, multi-sectoral and long term approach was adopted throughout the project.

The DMI was funded by the EC. Practical Action's partners in the two projects were Oxfam, VSF (Belgium and Germany) and Acted (Agency for technical cooperation and development). The project was implemented in Turkana and Pokot districts in Northern Kenya from 2008 until 2010.

The Development Challenge

Turkana is the poorest district in Kenya, with 94.9 % of the total population below the absolute poverty line². The Turkana - North Pokot area lies within the ASALS (arid and semi-arid lands) and is exposed to low rainfall and periods of extreme drought with occasional heavy rain causing flash floods. The area also has poor soils that are being eroded from floods and droughts. The predominant livelihood in the area is nomadic pastoralism which, whilst considered the most appropriate and sustainable livelihood for the area, remains highly vulnerable to shocks and hazards. There is increasing livestock deaths due to drought and disease and a loss of other assets which have only furthered the vulnerability of livelihoods.

Conflict in the area is increasing between farmers and pastoralists due to limited land and access to water. Conflict is also happening between pastoralist communities as they have been forced to move more widely with their herds looking for pastures. Combined with increasing human population and decreasing availability of accessible grazing and water, this has led to increased conflict with neighbouring communities who are competing for the same resources. It has also caused the breakdown of traditional peace agreements between the Turkana and Pokot. Poor coordination among development agencies has led to conflicting approaches and low impact of interventions. Over-reliance on short-term emergency projects have tended to undermine the sustainability of long-term development initiatives.

Communities have been unable to cope with these shocks and hazards and this has resulted in many people dropping out of pastoralism and being reliant on food aid. Since 2003 the area has been repeatedly classified as a humanitarian emergency and this has increased the level of emergency aid in the area.

This project therefore focused on supporting greater community participation in order to inform a coordinated district level emergency response and the harmonization of long term initiatives to mitigate drought.

Hazards and Stresses

The two main hazards and stresses in the Turkana-Pokot area are drought and conflict. To prevent and mitigate conflict, communities along the Turkana-Pokot borders were facilitated to map their current land uses and plan their resources more effectively. These maps were then used at both the community and intercommunity level to construct reciprocal grazing agreements and other resource-sharing arrangements. At the community level they were used to ensure sustained access of livestock to the dry season water and pasture. At the inter community level they were used to inform the planning of reciprocal grazing agreements and decrease resource based conflicts.

A monitoring system has been designed in collaboration with ALRMP (Arid Lands Resource Management Programme) to ensure that lessons from each area feed into both project planning and district coordination.

² Kenya National Bureau of Statistics (2007)

Under the water component of this project, this information has fed into district wide consultation on water infrastructure needs for grazing and used to identify priority sites for contingency water points. Drought preparedness plans have also been drawn up with communities which will build on the reciprocal grazing agreements.

To prepare for and mitigate drought, early warning systems (EWS) in the area have been improved so that communities are able to receive and respond to warning messages in adequate time. This has been achieved through linking early warning systems to district government agencies and regional bodies such as CEWARN (Conflict and Early Warning arm of IGAD³). Grassroots monitors, who are local community members that receive a small salary from CEWARN for their services, provide early warning information every week to district and regional bodies. They monitor drought, disease, conflict and arms stockpiling, weather patterns and water levels. Information on response measures are then fed back to the communities by the government through the grass-roots monitors. This has resulted in quicker responses from government authorities and has improved the early warning system in the area.

Project activities in the water component of the project also considered future changes in water levels by analysing past and predicted water levels and periods of drought. More boreholes have been dug in preparation for future use and more pumps have also been installed. A number of contingency boreholes have also been sealed to preserve water and can be opened up in times of future drought.

Livelihoods

Livelihoods in the Turkana-Pokot areas are highly dependent on livestock keeping and animal production. Reducing vulnerability to drought and ensuring pastoralism remains a viable livelihood in the face of growing challenges brought about through increased pressure on land, conflict and climate change requires a coordinated, multi-sectoral and long term approach.

Livelihoods were strengthened through increasing animal production. This was achieved through firstly, the provision of extension services that improved livestock capacity, and secondly, increased provision of safe and adequate water for livestock. The scarcity of water and pasture in the targeted areas were the main reasons behind conflict between communities. The water component of the drought mitigation initiative focused on the use of ground water for production as well as rainwater harvesting techniques. The project worked with communities to improve water pumps, catchments and shallow wells. Boreholes were also strategically located along livestock routes for animals to use in times of drought.

Availability of water for household consumption was also improved. Waste disposal has been improved and this has resulted in better hygiene and sanitation in targeted communities. Women and children in particular have been trained on water purification and storage. Expanding the availability of safe water coupled with environmental sanitation and hygiene promotion activities has improved the health of people in the targeted communities.



Photo: Water Harvesting through a reservoir (in the background) Turkana, Northern Kenya

³The Inter-governmental Authority on Development (IGAD) brings together Kenya, Uganda, Tanzania, Sudan, Ethiopia, Somalia, Djibouti and Eritrea. IGAD also works closely with the African Union (AU)

The livestock component of the drought mitigation initiative focused on improving extension services. Community based Animal Health Workers (CBAHWs or Para-vets) who are local people that have been trained in animal health to provide local advisory services have been strengthened. Drought and disease were causing livestock losses and it took up to a week to travel to the nearest town to seek veterinary help. By which time disease would have spread and livestock loss would have occurred. Through expanding and strengthening community based animal health workers, they are able to work in the villages ensuring villagers can access information and help quickly and easily. In addition, animal health workers have been linked to vets and veterinary organisations and private suppliers of drugs and have been helped to start community drug stores. This has ensured that vaccines are stored locally in case of disease outbreaks (epidemics). The project has also linked animal health workers to credit facilities in order to strengthen their businesses by buying medicines on credit. These animal health workers are then able to charge a small fee for their services and can afford to dispense drugs such as antibiotics and non-prescription drugs. Through access to information and services, animal health workers are able to expand their businesses and ensure sustainability of an efficient community based animal health service delivery.

The traditional role of CBAHWs has been expanded and the project has trained them in community based savings schemes. Through this approach CBAHWs and other community members have been empowered to better manage their assets and increase their incomes through diversification. Saving schemes included training on livestock and livestock marketing in order to strengthen livelihoods and encourage pastoralists to use the CBAHWs services.

Two Pastoral Field Schools (PFS) with 60 participants were also conducted. The two PFS groups have been instrumental in educating their members on animal health, human sanitation and hygiene, environmental conservation, climate change and natural resource management. The members now understand the importance of environmental protection and have actively engaged in planting of dry land trees as well as commercial cultivation of aloe which they harvest and process into shampoos and soap as an income generating activity. The PFS groups have initiated further income generating activities especially in livestock trade and making hides and skin products to

sell. The PFS also conducted camel production training (facilitated by the UN Food and Agriculture Organisation, FAO, for 10 days) including breeding indigenous breeds and maximizing gains from camel husbandry. This has stimulated camel husbandry among the PFS members who are now more aware of the benefits and profitability from camels and their ability to withstand drought conditions. More pastoralists have been able to experiment and adopt these new practices.



Photo: Camels in Turkana, Northern Kenya. Unlike cattle or goats, camels can survive long periods without water. Their milk is also nutritious and therefore crucial in times of drought when goats and cattle produce very little.

Governance

Natural resource user committees (such as water user associations) have been strengthened throughout the project and this has resulted in reduced conflict between Turkana and Pokot communities.

In Northern Kenya, village elders are traditionally responsible for decision-making over politics, water and rangeland use. Therefore Practical Action has built upon these traditional governance systems and strengthened their capacity to plan their natural resources effectively to reduce conflict. The community elders map their resources through Village Land Use Planning Committees (VLUPCs): this involves drawing on a map which resources are used, where and by whom at what time of year. Water points, livestock routes, communal grazing areas and maize growing areas are highlighted.

Community elders then make agreements over the use of land and were facilitated to sign a social contract through Peace Committees. These committees consist of elders who are respected by communities and are therefore socially rooted in the areas and can carry on after the project intervention has finished. These agreements assured each side that in times of need, each community could use each other's resources in a reciprocal manner. Penal codes for conflict or theft of each other's animals were highlighted and are upheld by village elders. This has resulted in the neighbouring communities being able to share resources in times of need. Incidents of livestock theft have also gone down. This model has been scaled up to other areas, including across the border in neighbouring Uganda, where Practical Action has given training in land use planning to village elders and other organisations.

The project has also had direct impact on strengthening both National and District structures which are responsible for coordinating emergency planning and response as well as dissemination of information. Communities have been linked to district authorities on early warning, and these are also linked to National and regional structures of drought and conflict early warning such as CEWARN. The peace committees also act as volunteer grassroots monitors in addition to those funded by CEWARN.

Future Uncertainty

The Drought Mitigation Initiative (DMI) did not prioritise adaptive capacity in their proposals. However, there are elements of the projects that will help farmers and pastoralists to adapt to an uncertain future, particularly drought. Potential to adapt has been supported through the strengthening of organisation, voice and institutions, which will ensure that the communities have the

correct tools and the necessary environment to allow them to adapt over the long term.

One of the main ways the projects have supported the enabling environment is through the establishment of peace committees. These committees have been prepared to further enforce water sharing arrangements through the signing of a social contract recognised by communities in Turkana and Pokot Districts as well as the government. This is a long term instrument that has improved understanding of the reason for conflict and prevention of future conflict.

In addition, the VLUPCs have ensured that communities are better able to adapt to change. Livestock routes have been agreed upon so that farmers and pastoralists no longer clash. There is much debate about whether supporting pastoralism is prolonging people in unviable livelihoods, or whether supporting the sedentarising of pastoralists into crop farmers will prove to be maladaptive and cause future conflicts over land rights. The VLUPCs are therefore a platform from which pastoralists and farmers can make informed decisions about their future livelihoods, but in order to do this effectively, they need more access to information.

Livestock have also been catered for in the future as boreholes have been prepared and can be used when needed. Rangeland has also been regenerated for future use so that pastoralists do not have to keep travelling further and further in search of new pastures.

Pastoralist field schools have trained pastoralists in camel rearing which increases pastoralists' resilience to climate change as camels are more resistant to extreme climatic conditions than other livestock. In addition the skills and knowledge gained from the pastoralist field school can help them access information and build their confidence to experiment and innovate so that they are able to make informed decisions about their future livelihoods and the choices available to them.

Early warning systems have also increased adaptive capacity of communities as they now have better access to relevant and timely information concerning drought and conflict as well as other hazard that affect the communities livelihoods such as disease outbreaks. The use of local grassroots monitors has meant that information is relayed to local communities and is helpful and can be acted upon quickly.

Conclusion

Community resilience has been strengthened through the DMI projects by building the adaptive capacity of pastoralists. In this case, adaptive capacity has been built through: natural resource management (in the form of village land use planning committees and peace committees); livelihood strengthening (through training community based animal health workers and pastoralist field schools); improving drought early warning systems and building capacity to act and respond to hazards by both communities and wider organisations such as the government.

Due to peace committees, pastoralists can now move their livestock to neighbouring areas without the threat of conflict. These committees have encouraged flexibility and will therefore lessen future risks of conflict as community institutions have been strengthened.

Pastoralist's livelihoods have also been made more secure through the provision of waterholes en route when they travel for their livestock to drink from. This allows them to stay in agreed areas and be less vulnerable in times of drought. In addition, pathways for livestock through farmland are also marked so that crop losses are lessened. This has resulted in decreased conflict between farmers and pastoralists. In addition the livelihoods of pastoralists have been strengthened and their ability to manage risks has greatly improved through pastoralist field schools whereby they access knowledge and information to diversify their livelihoods into camel rearing and other income generating activities. Risk is also mitigated through increased knowledge of rangeland use, climate change and livestock health.

Communities now also have the ability to secure clean and sufficient water for themselves and their livestock. Water pumps have enabled local women to secure access to water without having to spend hours walking to collect it from the nearest water point. They have access to water near their homes for more than nine months of the year and this has enabled them to spend their time on other activities.

The DMI worked cross-scalar and cross-sectorally. It has involved water and sanitation, animal health and markets specialists which have added to the holistic and integrated nature of the projects. These initiatives have also been linked to communities, local district official and national and regional bodies. Working across

these sectors and scales have ensured that communities are involved in decision making and feedback loops between communities and the government are effective in order to ensure resilience to future drought and conflict.

The DMI projects concentrate on the livelihoods, hazards and governance components of the V2R Framework. Thinking ahead, there are still areas for Practical Action to improve upon and it would be useful to look at the future uncertainties component more. Long term climate data could prove useful for decision making. Planning currently is largely reactive to current hazards and stresses and there needs to be more forward-looking planning and analysis.



A community based animal health worker shows the stock of veterinary medicines he has access to. Practical Action, Kenya.

CASE STUDY FOUR:

Greening Darfur, Sudan



Greening Darfur

Overview

From the late 1990s to 2006 Practical Action worked with communities in North Darfur to increase food security. A major component of this work was supporting the establishment of Community Based Organisations such as Village Development Committees and Women's Development Associations. These have flourished into three large networks; the Village Development Committee Network (VDC-net), Women's Development Associations Network (WDA-net) and the Market Network (M-net). These networks have been important in Practical Action's work in Sudan, including the Greening Darfur project.

Greening Darfur was funded by Christian Aid and implemented from January 2008 to February 2011. The purpose of the project was to rehabilitate and develop natural resources and natural resource based livelihoods in Darfur (where conflict and drought has led to serious degradation of the natural environment). The on-going conflict in North Darfur meant that a wider approach was needed beyond natural resource management or sustainable livelihoods. This case study illustrates the approach that Practical Action used and the importance of strengthening existing and established networks.



Photo: Collecting Water, North Darfur. Women have to travel long distances to collect water in Northern Darfur. Access to portable water and methods to carry water such as donkeys is an important part of the Greening Darfur Project.

The Development Challenge

North Darfur is one of the most drought prone areas of Sudan. 80% of its population of 1.75 million live in rural areas, where their livelihoods are based on natural resources for farming, herding and agricultural trade. Low and unpredictable rainfall have placed resources and livelihoods under intense pressure. Pressure on the natural asset base has fed into conflict dynamics in the region. In turn, conflict has had a devastating impact on livelihoods, further eroded the environment, and severely weakened established systems of resource governance. Livelihoods in El Fashir are mainly based on small scale farming complemented by livestock and forestry products. Low rainfall linked with poor water use efficiency had led to a decline in crop production and degradation of forest and rangelands. The collapse of rural economies due to conflict and drought has caused increased migration and displacement.

The Greening Darfur project covered 43 communities around the El Fashir area of North Darfur, covering 70,296 people. Based on the understanding that improved livelihoods are fundamentally dependent upon natural resources, related income and access to adequate food and water, the project took a multi-sector integrated approach to provide target communities with access to a wide array of interventions that suited their priorities and needs which had been assessed by participants themselves through participatory assessments. An integrated approach was taken through empowering community based institutions to create an enabling environment for better natural resource management.

Hazards and Stresses

The main hazards and stresses in El Fashir are drought and conflict. The activities undertaken during Greening Darfur did have a positive effect on local disaster preparedness and prevention. To lessen conflict farmers were encouraged to use shorter duration crops, so that they could be harvested before dry periods. This lessened conflict between farmers and pastoralists, as clashes often arose from pastoralists' livestock eating crops before they were harvested in dry periods.

In an attempt to address the stresses and disasters caused by successive drought cycles, water conservation was the main focus. The soil terracing on the *wadi* soils were improved in order to conserve water and

therefore secure crop yields at near average levels even in drought years. Other activities included: training communities and extension agents on construction of terraces, layout, levelling and controlled drainage techniques for the terrace designs; constructing 900 crescent-shaped terraces; subsidising the poorest households and villages with tools and revolving subsidies; and supporting 63 Village Extension Agents to support terrace construction within the communities.

In addition, 14 mini dams were constructed. Rehabilitation and/or construction also took place for 2 hand-dug wells, 6 shallow wells, 2 hafirs and 6 hand pumps. It is estimated that these benefited approximately 7,000 people and animals across 15 villages. To support the transportation of water, 50 donkey-drawn carts were also bought and distributed. As well as coping with hazards such as drought, these activities further support food production, food security and local food generation and therefore also positively affected the livelihoods of project communities.

To address conflict in the area, the project provided training on conflict resolution and consensus building in project communities. By using Practical Action's Participatory Action Plan Development (PAPD, see: Lewins, Coupe and Murray, 20074), communities were supported to identify and resolve problems related to natural resource use. Participatory Action Plan Development (PAPD) is a consensus building tool that seeks to identify and then solve environmental or livelihoods problems with community support and input. PAPD draws from several participatory techniques and principles and consists of six key stages. Its key features are firstly, recognising the wide range of stakeholders and their diverse interests in natural resource management and secondly, engaging these stakeholders fully. In the case of North Darfur, this involved establishing joint resource access, management plans and agreeing on development priorities.

Livelihoods

The livelihoods of communities Practical Action works with in El Fashir, North Darfur are small scale farming and pastoralism. Therefore a key component of the project was the regeneration of natural resource management systems for sustainable human and livestock use. By building social capital through the three civil society networks and a natural resource management approach, communities were able to improve environmental conservation and management. Activities included: terrace construction, community forests, shelter belts, rangeland and vegetation regeneration. Within this Practical Action hosted 10 environmental awareness sessions and trained 63 community members on tree seeding production and transplantation. Three community seed stores were established and the three networks organised seed fairs for communities to exchange and buy new seeds. Community nurseries were established, and approximately 210,000 tree seedlings of various different types were transplanted and 11 community forests were established. In addition, pastures management training was undertaken with 150 community members to raise awareness of rangeland rehabilitation and the importance of reserve areas.

Project communities have increased access to water for agriculture, livestock and human consumption, leading to increases in food production and reducing pressures on rangelands. For example, range production of staple crops has improved from about 1.7 ton/ha to 2.5 ton/ha reporting an increase of 40% as a result of rehabilitation, irrigation and the construction of crescent shaped terraces. It has also been noted that more than 20,000 households reduced the time taken to collect water by 50% due to the rehabilitation of 2 hand-dug wells, 2 hafirs (reservoirs) and 2 shallow wells.

Community based agricultural extension has also been used to strengthen livelihoods. Two training courses were held on forest protection and horticulture, land use and soil conservation, attended by 58 Village Extension Agents from 33 villages. This was supported by refresher courses for 33 of the existing extension agents. Advanced training on crop production was also conducted for 31 agents. A total number of 75 extension agents are working within the villages under the umbrella of the three networks. The extension agents were involved in seed

distribution and assisting farmers in applying some of the improved cultural practices including seeding dates and rates especially for the improved seeds distributed. In addition, 22 para-vets (community based animal health workers) have also been trained.



Photo: Distributing tools, El Fashir, North Darfur

Governance

Practical Action's previous experience in North Darfur has shown that civil society is well placed to take on opportunities to shape and implement rehabilitation and development strategies. This is why the Greening Darfur project prioritised the strengthening of existing civil society networks. The project built the capacity of the three Networks, VDC-net, WDA-net and M-net (incorporating 11 Village Development Committees) in: identifying their development priorities through participatory capacity building assessments; planning and implementing different programme activities; accessing alternative funding sources to finance their priorities; book keeping and project planning. As a result of capacity building, these networks were able to provide technical support and to equip their communities with the necessary skills that would assist them to achieve more secure livelihoods.

Good governance was part of the multi sector approach used by the project. It concentrated on strengthening links between the 3 networks with other service providers including government bodies such as the Range and Pasture Administration (RPA),

⁴To download the facilitators guide see: <http://practicalaction.org/page/1966>

Forests National Cooperation (FNC), Agricultural Extension and the Veterinary department. The networks now have linkages with traditional and local government institutions. They are gradually increasing in confidence and self-reliance and this has resulted in them being able to approach decision-makers and lobby for resources. For example, the North Darfur state forest corporation has supported the establishment of two community nurseries in El Fashir and the Ministry of Animal Resources in North Darfur has given official recognition to the work of para-vets due to lobbying from the networks.

In addition, the Participatory Action Plan Development approach (PAPD) was very helpful and was used during a local level conflict between two of the villages the project was working with where the construction of a dam inhibited the downstream village from accessing water. Community meetings used the consensus building approach and this resulted in agreements for water access to be reached through traditional 'Gudeia'⁵ agreements. The PAPD approach was also successfully used to resolve a number of other disputes during the project and beyond. The existence of an appropriate and evolving institutional environment to build consensus and allows fair access and entitlement to key local resources contributes to the adaptive capacity of communities to cope with conflict and other future uncertainties.

Future Uncertainty

The project was undertaken in an effort to build sustainable livelihoods and improve natural resource management. In order to do this, a livelihoods approach was used through strengthening incomes, resources and the three networks. The project prioritised needs of participants through participatory assessments, and this led to the needs of access to water and food security being prioritised. However, because of the conflict in North Darfur, there was a need to understand trends and reasons for conflict and build consensus across communities if project interventions were to be sustainable. The consensus building approach that Practical Action used gave communities the ability to plan ahead and make agreements over natural resource use and access.

The project also increased the communities' access to information through training the networks and also providing training courses on forest protection and extension which has increased skills and confidence which are needed in an uncertain future. Training and project management skills have increased the capacity of networks and strengthened their social capital and this in turn ensures that they are in a better position to access funds and resources on their own initiative.

In addition, the project increased access to water to protect people's livelihood assets through the construction of tube wells and crescent dams which have helped communities to protect themselves against uncertain future rainfall patterns.



Photo: Children planting seedlings in a community forest near El Fashir, Northern Darfur.

⁵Traditional agreements by local elders.

Conclusion

The Greening Darfur project set out to improve natural resource management in North Darfur and strengthen livelihoods and food security of communities. However in a conflict affected situation the project used existing networks and a consensus building approach as primary initiatives to achieve the end goals of improved livelihoods, food security and natural resource governance. Working with existing institutions, such as the VDC Networks, achieved impact and buy-in from a range of actors that would have otherwise been unreachable. In conflict situations these networks have been necessary in order for the project to keep working within these communities. Working in long term partnership with these networks has proved to be extremely beneficial, not only for achieving project goals, but also because these networks are continuing on their own initiative and are therefore achieving long term sustainable change. The networks have gone onto raise over US\$1 million from UN agencies to support their development initiatives. Strengthening community structures has empowered people to determine their own future by influencing decisions that affect their lives.

Whilst DRR or climate change adaptation were not specifically project goals, the project activities have incorporated hazard prevention and increased the ability of communities to be able to adapt to change, through increased understanding of trends such as drought, land degradation and conflict. Adaptation requires not only information about the hazard itself, but the community must be able to access information such as new crop species, weather information or funding opportunities into the future. The networks play a vital role in this access to information and provide the communities with needed information and services when there are no other avenues to gain this information in a remote and conflict affected area.

Something that may have been beneficial is incorporating historical climate data for scenario planning in order to work with uncertainty in the short to medium term. Although the Greening Darfur project was not designed with climate change as a key criterion, the activities of the project have none the less sort to enhance the adaptive capacities of communities as well as strengthen their livelihoods and the enabling environment in a conflict setting.

The Greening Darfur project has used innovative and flexible approaches of community empowerment through the strengthening of networks as well as a consensus building approach to deal with the nature of conflict in North Darfur. Traditional food security projects (seed distribution, agricultural training etc.) or livelihood approaches by themselves would have been less successful and may have collapsed during times of conflict. In addition, rather than working in silos, Practical Action worked across social mobilisation, participation, governance, conflict prevention, livelihoods, hazard prevention and natural resource management domains in order to work within a complex and challenging environment.



Photo: A community nursery, North Darfur

**CASE STUDY FIVE:
From Vulnerability to
Resilience, Bangladesh**



From Vulnerability to Resilience: Household Preparedness in Bangladesh

Overview

Since 2009, Practical Action has been delivering the five year project 'From Vulnerability to Resilience: Household Preparedness' (the V2R project). Funded by the Zurich Foundation and implemented in partnership with two local NGOs (Sharp and Manab Mukti Sangstha). The project is working directly with 2,000 ultra poor people (and an additional 6,000 families, indirectly) in four upazilas (districts) of the Sirajganj District to equip them with the skills, knowledge and appropriate technologies they need to develop more secure lives, cope with the risks they face, and adapt their lives and livelihoods successfully to meet future challenges. The Vulnerability to Resilience Project (V2R) builds upon the lessons learned from several other Practical Action projects in Bangladesh.

This case study illustrates the more recent work of Practical Action and the steps taken to integrate areas of sustainable livelihoods, DRR, governance as well as consider future uncertainty. Similarly to the LDCRR Project in Nepal, this case study highlights the need to address the middle levels of governance in order to fill the gap between policy and practice in areas of disaster risk reduction and risk assessments.

The Development Challenge

Bangladesh is highly prone to natural disasters and these are becoming more frequent and more severe. The poor, who have to live near to rivers, are especially vulnerable to extreme flooding and riverbank erosion which destroy their crops, homes and livelihoods. Many families have so few possessions that even a small shock is enough to make them destitute. As crops have been destroyed, income and food are in short supply for the poorest. The V2R Project works with families affected by severe flooding of the river Jamuna, which floods each year in June. This is one of the most erosive and damaging rivers in Bangladesh, creating high levels of vulnerability for poor households who live near its riverbanks. For people who live in areas covered by water during the monsoon season, such as in parts of Sirajganj District, it is impossible to grow crops during that season. Their homes are damaged or destroyed every year; many families are destitute and have to live in temporary and unsanitary conditions. Most of the deaths during times of flood are not due to drowning, but to disease spread by shallow

stagnant water. As livelihoods have been destroyed, the poor are unable to cope or recover from these shocks quickly, or prepare for the next flood. Many families often have to resort to borrowing from moneylenders, migration to other areas and also undergo periods of food insecurity from June until November each year, the *monga* season. The impacts of food insecurity and flooding have resulted in high levels of dysentery, diarrhoea and fevers in the area. Poverty is worsened as poorer families do not have access to adequate health care and other service providers.

The V2R project is working with 2,000 of the poorest families across 20 villages in the district of Sirajganj enabling them to better meet their nutritional needs and cope with the hazards, such as river flooding, land erosion and flash floods, which threaten their livelihoods. The project has focused 60% of its resources on the extreme poor.

Hazards and Stresses

The V2R project used vulnerability and capacity assessments in order to determine local level shocks, hazards and other stresses. People were then able to assess their resources and capacities to deal with disasters and plan ahead accordingly. Community members have been fully engaged in identifying the risks that they face through the formation of community based organisations to carry out disaster preparedness plans and livelihoods action plans. The main hazard for the people the project worked with is flooding. Flooding destroys or damages homes and crops, it blocks roads, and it contaminates water pumps and destroys assets such as seeds.

The vulnerability and capacity assessments and the baseline survey at the start of the project noted that in project communities there was no community disaster planning. Therefore the project invested in disaster preparedness and response. To help ensure that the local communities take ownership of the plans, volunteer groups have been formed to coordinate disaster preparedness, evacuation and post flood rehabilitation. Two hundred members of these groups have been provided with training, logistic support and emergency equipment including mobile phones, life-jackets, torches, radios and loud hailers to ensure better communication during disasters. In addition, evacuation boats have been constructed to prepare for disasters and can be used for income generation purposes when not needed for emergencies. Boat ambulances have been prepared and are maintained by community based organisations. Early warning systems and equipment have been installed in the project villages to ensure the communities have better access to weather information.

In addition, the disaster preparedness plans included the protection of vital assets and services. These include the construction of flood proof housing and two cluster villages. Cluster villages are a group of houses built on raised land. So far 50 households have settled into them (25 households in Bhatpiary and 25 ultra-poor households in the

second cluster village of Thakurpara). In addition, livelihood assets have been protected through the construction of yards, cattle sheds, and seed storage facilities in times of flood. Other protective measures have been used including tube wells which gives a clean water supply in times of flood. Water jars and flood proof latrines have been invested in to minimise the adverse health and sanitation impacts of flooding such as contamination with sewerage and flood water. Links with local hospitals have also been strengthened. Since the project started, the team has installed 43 tube wells, raised the bases of a further 85, distributed 2,000 water jars, and built 35 flood proof latrines. These technologies are all operating without problems. On average, each tube well is used by 5 families (both project beneficiaries and others). The prevalence of water-borne diseases like skin diseases, dysentery and diarrhoea has reduced significantly. As of year 3 of the project, 80% of beneficiary households now have excellent access to clean water and safe sanitation all year round.



Photo: Improved water facilities, Sirajganj, Bangladesh

Livelihoods

The livelihoods of the communities the project worked with are based on small scale farming and fishing. Effective recovery from flooding and other hazards has been facilitated through strengthening and diversifying livelihood strategies. Investments include the distribution of assets such as livestock, poultry accompanied by agricultural training to use these assets effectively. Cow, goat and sheep rearing have significantly increased earnings, and provide alternative sources of income for families to fall back on in times of need. In addition to asset transfers, there has also been considerable capacity building, such as training in animal health and production, in order for assets to be used effectively and to foster innovation and experimentation.

Agricultural training has included innovative approaches to agriculture that has been used elsewhere in Bangladesh successfully such as floating garden technology that allows poor farmers to grow seedlings and vegetables on floating platforms made from water hyacinth when floods occur. Improved rice varieties have been introduced to the area, with farmers stating they are very satisfied with the high yield, fine grain and high market price. Sandbar cropping is another technology that has been introduced to communities through the project. This enables landless families to grow vegetables on sandbars which are not otherwise used for agricultural purposes. Farmers are able to grow pumpkins in pits filled with homemade compost on the sandbars and these have been very beneficial for local families. For example, the average cost for each pit was Tk.72 (58p). A total of 10,790 pumpkins have been harvested, of which the local market price is Tk.772,432 (£6318) and the net income is Tk. 521,500 (£4265). On average that is Tk. 14,900 (£122) income per farmer.

For those families with no or very little land, training in homestead vegetable cultivation has been provided. Known as the 'Kalikapoor model' this vegetable gardening model requires less than 1.0 decimal of land to cultivate vegetables that can meet a family's vegetable needs for a whole year. For those with no land, this method has been improved to enable families to cultivate vegetables on their house roofs. In addition 13,670 saplings of coconut, litchi, carambola, guava, lemon and mehgoni have been distributed to 4,320 households in the area to plant in their homesteads.

Community-based fish farming has been facilitated to support access to productive assets. Training has also been given in fish production and cage culture. Community based fish farming allows poorer members of the community access to productive assets that they otherwise would not have access to because of a lack of social resources. Poorer members of the community are able to earn extra income whilst also ensuring adequate nutrition for their families.

So far, vaccination campaigns have been organized in 14 project villages for preventing the spread of anthrax in cattle. All events have been delivered with direct collaboration of the Department of Livestock Service in Sirajganj. A total of 1,800 cattle have been vaccinated against anthrax. De-worming tablets were also provided for cattle during these campaigns. Importantly, skilled livestock volunteers were heavily involved in the vaccination campaigns. This enabled them to gain valuable knowledge on animal health and skills to give vaccinations which will allow them to prevent diseases into the future.

Livelihoods have also been strengthened through other activities including agro-processing and off farm training in skills such as sewing, embroidery and light engineering. This type of employment is beneficial for families, increasing their incomes, the ability to meet basic needs and increase their resilience.



Photo: Aysha Begum using her skills in tailoring to make extra income for her family



Photo: Sandbar cropping, Sirajganj, Bangladesh

Governance

An important part of the V2R project is scaling up the community based disaster preparedness plans (CBDPP) and livelihoods action plans and linking them with middle levels of government. This includes involving union and upazila (local government) levels through workshops with line departments, members of disaster management committees and other professionals. Multiple risks and needs of local communities can inform local government planning and in turn influence national levels.

Including government officials in disaster preparedness plans also provides them with new approaches and new ways of thinking. This contributes to building adaptive capacity by facilitating more communication between communities and government officials.

In addition, a total of 13 linkage workshops were organized at the union level, where representatives of local government, community health clinics, high school committees, relevant field workers, CBO executive members, group members and volunteers were present. A total of 210 participants (117 women and 93 men) were involved in those workshops. These workshops has resulted in households receiving significantly improved health services from the health department and community clinics.

The V2R Project is working with government departments and personnel as much as possible, in order to link communities with

existing government schemes and services. This has included developing linkages with health service providers, for example hospitals and clinics, community clinics, the family planning department, and education service institutions through networking workshops. In addition, the V2R project has helped develop a good relationship between villages and upazila and district level line departments such as District administration, District Relief and Rehabilitation Office, Civil surgeon office, Sanitary Inspection, Livestock, Agriculture, Fisheries Department, Water board, Department of Public Health Engineering, Union Council bodies to access better services.



Photo: Community meeting for a disaster preparedness plan, Sirajganj, Bangladesh

Future Uncertainty

The possibility of increasing floods has been prepared for through disaster preparedness measures. Community skilled volunteers have been trained to provide early warning and emergency planning in communities. The V2R project has been innovative in the use of community volunteers as these volunteers have also been trained in livelihood skills so that they can earn an income at other times of the year when they are not needed for disaster work. This flexibility ensures that skilled volunteers remain able to provide their assistance during emergencies as they are locally based and do not have to migrate to other areas for work. This ensures the sustainability of the use of skilled volunteers even after the project ends allowing communities to have lasting access to relevant and timely information from these volunteers on hazards.

The livelihoods dimension of the V2R project also ensures that communities are able to develop their adaptive capacity as they are now equipped with new knowledge and skills. This has given them growing confidence in using these new skills to learn and experiment with seeds and crops as well as technologies such as floating gardens and sandbar cropping. Livelihoods have also been strengthened through linking them with government departments (agriculture and health)

The V2R project is also taking climate change scenarios into consideration and is starting to build these into project initiatives. For example, the technologies that are being implemented all consider future scenarios. The cluster villages, tube wells and plinth raising are raised more than the highest existing level of floods for anticipated future rises in water levels. Communities also have greater access to weather information as members of the CBOs are using their mobile phones and radios for information, daily news and weather bulletins as a part of the early warning system. Communities are informed of flooding situations through announcements using mega phones. A possible next step would be to link these CBOs with met offices, research departments and government departments to access longer term climate information.

Conclusion

The V2R project is still a current Practical Action project and therefore it is difficult to comment on project outcomes. However, the

processes involved in this innovative and flexible project can be commented on. The project staff have been able to benefit from the use of the V2R framework and this has been beneficial for staff training purposes. For example, practical and highly technical staff that focus on agricultural extension have had to think about governance issues and effects of climate change which they otherwise would not have thought about.

Access to information and knowledge has been bought about through the DRR, livelihood and governance dimensions of the project. Innovation and technology development has been bought about through the livelihoods dimension of the project, particularly through new agricultural techniques. Participation has been promoted through the governance aspect of the project. The use of CBOs has ensured a participation of community member in assessing and informing the project of local needs. In addition the V2R project has linked these communities with government departments wherever possible, especially within disaster risk reduction.



Photo: A livestock producer with her young goats, V2R Project, Practical Action, Bangladesh.



CASE STUDY SIX:

Practical
Solutions for
Indigenous and
Migrant
Communities in
Peru

Practical Solutions for Indigenous and Migrant Communities in Peru

Overview

The Practical Solutions for Indigenous and Migrant Communities Project (also known as the Awajún Project) is an on-going project currently in its third year. Funded by the Big Lottery.

The main objective of the project is to increase the capacity of the indigenous Awajún communities in the Alto Mayo region of Peru to plan ahead for their future as their traditional livelihoods are under threat. There is large scale deforestation in the area which has caused environmental degradation and landslides which is undermining livelihoods and increasing hazards. There is also increasing conflict between these indigenous communities and migrant settlers to the area. These settlers are often farmers who have little resources themselves and have moved to the area in search more land. However, they have brought unsustainable farming practices to the forest and are exacerbating the environmental degradation. Conflicts have erupted between the settlers and the Awajún natives over the use of natural resources and over land rights. The project therefore seeks to improve the livelihoods of both Awajún and migrant communities by raising their awareness and improving their capacity to develop mechanisms that will gradually discourage unsustainable land use practices.

The Development Challenge

The San Martin region of Peru, has the highest rates of population growth and deforestation in the country. Practical Action is working within this region in the provinces of Rioja and Moyobamba, together known as Alto Mayo. Alto Mayo has a total surface area of 770,000Ha, of which 75% is forest or protected forest. 140,000 Ha of this land is home to indigenous Awajún communities. Practical Action has been working with fourteen of these Awajún communities and helping them achieve more sustainable natural resource governance systems.

Nine of the fourteen Awajún communities have divided their land between households; the remaining five Awajún communities still work the land communally and do not recognise individuals or households as having a “right” over a particular area of land. This has resulted in these communities being at risk of land invasion from incoming settlers. Rapid population growth due to increased migration into the area is increasing conflicts between Awajún communities and migrant settlers, known as ‘colonos’. Around 5,000 migrant settlers have leased land from the Awajún and a further 2,000 migrant settlers have invaded Awajún lands without agreement or paying land rent. The colonos practice slash and burn agriculture, cutting and

burning the forest back before planting maize and coffee. Maize, an annual crop, quickly depletes the soil and leaves the land severely degraded after a few years. Both indigenous and migrant communities are exposed to higher occurrences of disasters due to natural threats and pollution of their water sources. With increasing vulnerability and competition over resources there are increasing conflicts over land, lease disputes and farm boundary disputes between the indigenous community and settlers. Added to these are other conflicts around illegal extraction of timber, undervaluation of timber, and the commercial exploration and exploitation of natural resources (oil, gas and, lately, water).



Photo: Training in compost production



Photo: Trained woman vaccinating chickens, Practical Solutions for Indigenous and Migrant Communities, Peru

Hazards and Stresses

The main sources of hazards and stresses in the area are conflict from disputes over land leasing and land rights, land degradation and water pollution from deforestation and unsustainable slash and burn agriculture practiced by migrant settlers to the area. Deforestation is causing floods and water contamination which in turn cause health problems in Awajún communities.

Practical Action is fostering processes of dialogue between the indigenous Awajún and migrant groups in conflict. Processes are based on evidence of Awajún territorial rights and environmental damage identified through environmental impact assessments with the communities involved.

The hazard of water contamination is being addressed through the use of rainwater harvesting techniques which have helped six local schools provide clean drinking water to 135 school children. Installation of gravity fed water systems and rehabilitation of existing water systems are being carried out in both Awajún and migrant communities. Also, sanitation systems are being installed to improve the health of communities.

Livelihoods

The livelihoods of Awajún communities are based on hunting and gathering. Some community members are small scale farmers. The migrant settler's livelihoods are based on small scale farming. The livelihoods of the Awajún communities are seriously undermined by the pressures of deforestation and water pollution on their traditional natural resource governance system. Their traditional occupations of hunting and gathering are threatened as resources are depleted. Livelihood diversification and strengthening is therefore an important element in this project if sustainable natural resource governance is to occur.

Practical Action has been involved in training both Awajún and migrant communities in agricultural techniques. This has included training community extension agents in reforestation and plant nurseries. Communities are now replanting coffee and other local trees to improve soil quality and prevent erosion. Natural cropping and intercropping techniques have also been supported to prevent the use of agrochemicals and to prevent pests. This agroecological approach encompasses a range of techniques to draw on and replenish natural resources. The focus of the approach is on the entire ecological system to generate environments that are productive and naturally resource conserving, while being socially sustainable, culturally sensitive, socially just and economically viable. Through this approach both Awajún and settler communities have started organic coffee farming. This has not only lessened the use of harmful chemicals, but has also increased family incomes.



Photo: Harvesting Organic Coffee, Practical Solutions for Indigenous and Migrant Communities Project, Peru.

Practical Action has also been working to increase food security and reduce the level of malnutrition, mortality and morbidity within these communities. Small livestock production (chicken and guinea pigs) and fish production are being supported by the project to achieve better livelihood security. Water and sanitation systems have been installed for the health and wellbeing of the communities affected by water pollution which have been identified as major stresses and hazards to community members. The project also started fruit orchards in order to increase food security and nutrition. So far, forty families (approximately 200 people) have each established a new garden with a variety of plants to enrich their diets: *sacha* potato, sweet potato, native fruits and *bituca* with seeds provided from the nursery gardens. In addition the project is working with communities to preserve native species of trees and herbs through the collection of seeds. Women elders have been particularly knowledgeable about the important native species of medicinal trees that these local communities are now trying to preserve and rejuvenate through seed collection. Maintaining agricultural bio-diversity is very important and is essential in supporting the surrounding eco-system and way of life of the Awajún.

Governance

An important component of this project has been to develop the capacities of Awajún communities to influence government and policies through organizational strengthening, renewing legitimate leadership, and facilitating better communications with other indigenous movements and networks in the country. This approach included education on international standards that protect indigenous rights and intercultural education in schools. This strategy involved both the chiefs of Awajún communities, 'colonos' and authorities from the justice system and the government.

Practical Action is working with the FERIAAM (Regional Indigenous Awajún Federation of Alto Mayo) which is comprised of Awajún leaders. They have joined together in order to overcome the multiple pressures on their indigenous livelihoods. These pressures include illegal invasion from settlers, illegal logging cartels, pressure from oil companies for access to their land and uncontrollable tenants with unsustainable farming practices. Practical Action is working with these Awajún leaders to enable them to be able to negotiate

with these actors on their own terms. Both to benefit from the development process without being exploited and also to ensure the native fauna and floras the Awajún depend upon are not destroyed in the process.

Previous government forest protection orders to promote conservation had not worked and after the protection orders had ended, Awajún farmers went back to renting out their land for needed income. Through vulnerability and capacity assessments two strategies were developed to promote forest conservation: the promotion of diversified livelihoods and agricultural training in agro-ecological forestry and also the strengthening and enforcement of indigenous natural resource governance systems.

Achievements of this process included the production of a database of tenants so that the Awajún can keep track of who is on their land. A GPS computerised system of tenant registration has been developed and the facilitation of standardised lease agreements known as 'model contracts' are being used whenever leases are renewed or other opportunities arise. The 'model contracts' cover the land lease and include rents and regulations over deforestation and land degradation. The model contracts use the Awajún system of native justice and it is gaining increasing recognition in national law. The registration of tenants is now in full force and it is estimated that between 40 and 60 per cent of tenants have been registered. So far, 300 land tenure agreements have been revised and rents set to provide incentives for environmental protection, 35 per cent of the 'Colono' have more secure land agreements and the Awajún landowners have gained more secure rents from their land.

The Project has also successfully facilitated the signing of a declaration by all Awajún leaders on their responsibilities as leaders to ensure better agricultural practices, land management and anti-corruption principles. Training has also been given on auditing and financial accounting to enable local community organisations to use their resources more effectively.

The FERIAAM has also been successful in negotiating with the regional government of San Martín and the local district of Moyobamba over the issue of land invasion. The meeting, which took place in 2011 resulted in local authorities sending inspectors to Awajún areas in order to ensure the settlers were not damaging the environment. Those settlers that are found

damaging the environment would then be converted into tenants of the Awajún with stricter natural resource management regulations.



Photo: A meeting of the FERIAAM

Future Uncertainty

The Awajún indigenous communities are facing great changes to their way of life. Practical Action has supported Awajún communities through strengthening their voice and influence over decision making. With greater influence over policies and land use regulations at both local and district levels they are able to engage with the challenges of natural resource governance into the future. The FERIAAM is now working with other indigenous rights networks as well as the regional government of San Martín, something which may not have been possible without the facilitation and capacity building measures from the project. The project has also helped to mediate between different stakeholders, the Awajún, the settler 'colono' communities and the government. Mediation and social mobilisation is important if communities are to adapt and claim their

rights. Consideration of the governance context has been crucial in building the communities' resilience in this setting. In this case, governance at community level has been strengthened through the FERIAAM and the creation of new 'model' leases. However, addressing governance issues at other levels is also important if impacts are to be sustained and long term change is to be achieved at scale. An enabling environment is necessary if the Awajún are to ensure their land agreements are to be enforced. This means working with local and regional government.

Raising awareness has been another core part of capacity building in the Awajún communities. Understanding the impact of slash and burn agriculture and current deforestation practices has led to increased knowledge and experimentation with other agricultural practices. Community extension agents were trained in reforestation techniques to support local bio-diversity. This knowledge is then passed onto other members of the community. Raising awareness about indigenous rights and increasing access to information through supporting the Awajún's networking with other indigenous rights groups across Peru has also been important in building adaptive capacity.

Conclusion

The Awajún case study has incorporated sustainable livelihoods through diversifying and securing livelihoods. This has included: supporting the sustainable management of forest resources; promoting access to technologies such as organic coffee growing and water and sanitation systems and improving access to markets and service providers. The success of these sustainable livelihood interventions however, is highly interdependent on the other dimensions of the V2R Framework such as adequate governance and thought about the future. Governance has been particularly important in the success of better natural resource management and the strengthening of community organisation and voice. Training community leaders in leadership skills, and facilitating their linkages with other indigenous rights networks and in negotiating with regulators has meant communities have greater voice in decision making and were then able to influence the government land tenure system.

Lessons Learnt

There were difficulties in accessing data for some projects that have yet to finish and therefore evaluations have yet to be conducted. There have also been difficulties in finding evidence of projects that were addressing adaptive capacity and future uncertainties. Many of the project goals address elements of adaptive capacity or resilience, however, tangible evidence of these has been hard to find through current mid term reports and project evaluations. This only highlights the need for further research into better monitoring and evaluation of resilience.

Despite these difficulties there have been valuable insights into how Practical Action is operationalizing resilience. The following are lessons learnt from the case studies:



Photo: Harvesting potatoes, Practical Action, Peru.

1) Understanding context is better through an integrated approach and this will promote effective interventions

Understanding the context of any intervention is critical and an integrated approach is a means to understand the context better. Livelihoods, hazards, governance and changing trends are all interconnected in reality. Projects with entry points in disaster risk reduction (such as the Peru and Nepal case studies above) are also working to increase adaptive capacity in response to climate change and other trends and have worked to strengthen links with local and district governments in order to ensure plans are implemented and are supported.

In the cases of Greening Darfur and the Awajún project in Peru, threats to livelihoods and food security were the entry points. However conflict and natural resource degradation were the two main sources of hazards and these had to be addressed in order for local people to be able to achieve better food security. In North Darfur, the project enabled farmers to use shorter duration crops, so that they could be harvested before dry periods. This lessened conflict between farmers and pastoralists as crops were harvested before livestock entered farmers' fields. As conflict often arose from pastoralist's livestock eating crops before they were harvested in dry periods. In Peru, following the end of forest protection orders supported by government and other organisations, Awajún farmers were able to rent out their land to incoming settlers who used unsustainable farming practices for needed income. This meant that forest protection orders were not working as a means to protect the forest. Through vulnerability and capacity assessments Practical Action with community members, identified other livelihoods strategies such as small animal production and were able to diversify income sources. As a result this improved natural resource management and built sustainable livelihoods strategies in the long term.

Therefore a key lesson has been that all four areas of the V2R are interconnected and the approach enables development practitioners to understand the linkages between the components better. Livelihood outcomes are dependent on the assets that people have access to, but this access is dependent on the institutional environment which governs access to resources and how people use these resources. In turn, the governance context will influence how people can respond to future uncertainty and their decision making ability and adaptive capacity. Resilience is therefore

not achieved by seeking to address one component of the V2R in isolation, but each of the four components of the V2R is shaped by each of the other components. Project programmers therefore could benefit by taking all of the four components into account and analysing the interactions between them.

In Peru, previous initiatives by other organisations had failed to facilitate better natural resource management with Awajún and settler communities because they had only used a natural resource management approach. Practical Action's holistic approach tackled drivers of risks as well as built capacity for natural resources management and increased productivity.

Furthermore, understanding the governance context in which people live (mapping policy processes, formal and informal institutions), is essential to build resilience. Working with local, district and national government officials can build adaptive capacity and scale-up best practice from the community level. Understanding the blockages, such as lack of access to information and services) can help to pinpoint which governance institutions require partnership building to promote resilience.

2) Building technical capacities can help to cope with future uncertainty

Ensuring that appropriate technologies are accessible to all is at the heart of Practical Action's work. We define technologies as skills and knowledge, physical hardware such as tools or water points, and the way they are organised, used and controlled. Building technical capacities for food security involves helping farmers to use appropriate technologies to overcome the physical and environmental constraints of fragile areas, improve productivity and incomes and adapt to climate change.

Appropriate technologies are those which are cost effective for small-scale producers, managed by them and are viable for long term sustainable use.

By building technical capabilities, Practical Action enables small scale producers to access appropriate technologies by building on local knowledge to strengthen existing technologies. This also helps farmers to access and adapt technologies, as illustrated by the V2R project case study. The training of community based extension agents are also integral to Practical Action's strategies and they focus on linkages between government agencies, researchers and other relevant

sources of knowledge to ensure sustainable long term access to technologies and advice. By training and linking up to sources of information poor producers then have the ability to continue to make decisions and have flexibility to experiment and try out new ideas into the future based on their own initiatives.

For example, in Peru, farmers have been trained in agricultural production, from seed varieties, irrigation systems, livestock rearing to harvesting and more. As a result, they have put their knowledge to use and have cultivated crops such as avocado based on their own initiative. In Nepal, farmers have used the knowledge from farmer field schools to expand their businesses in off season vegetables on their own initiative, independently of the project. Other farmers in Nepal have learnt from bee-keeping training and have expanded their bee keeping operations. Similarly, through capacity building of Networks in North Darfur, Sudan, networks have fundraised for new projects from other international organisations such as the UN.

3) Long term partnerships at different levels can build adaptive capacity

The Greening Darfur case study illustrates the need to work in partnership with local organisations. Practical Action has been working with Village Development Association networks over more than fifteen years and has built up trust and good working relationships with members. Only through these long term relationships were project staff able to interact with local villagers and projects continue through outbreaks of violence.

4) Building on past experience is essential

Building on past experience is essential for building relationships as well as gaining knowledge. The V2R project in Bangladesh is the product of lesson learning from various other projects involving hazard prone areas. Past projects which have mainly dealt with DRR⁶ and food security⁷ have now been integrated with climate change, livelihoods and governance to a greater extent within the V2R project.

In North Darfur, previous projects to build the capacity of the three community-based networks helped the Greening Darfur project continue during times of conflict and has allowed Practical Action to scale up. In addition Practical Action's projects in Kenya, such as the DMI projects built upon past work with pastoralists and traditional governance

structures. In Peru projects built on past work in DRR and forestry management. This has contributed to the development of programmes and organisational learning.

5) Consensus-building approaches bring tangible benefits, especially in conflict situations

Lessons have been learnt in conflict prevention through the use of Participatory Action Plan Development (PAPD) and other consensus building approaches in North Darfur, Kenya, Bangladesh and Peru in order to work in conflict affected areas. PAPD involves participation from a range of stakeholders which is essential for understanding the diverse local realities and priorities for each group. Consensus building has been crucial in working with both Awajún and settler populations in Peru. Also platforms that bring relevant social actors together are key in mobilising capacity for social learning, negotiation and collective action. In Kenya, consensus building approaches has given a platform from which both Pokot and Turkana can negotiate. This has resulted in tangible benefits to local communities as access to water has increased. PAPD also emphasises local informal institutions that are often overlooked in the mainstream environment. For example in North Darfur, negotiations used traditional agreements which have meant they were trusted and sustainable in the local contexts and in turn, led to the success of the project.

6) Empowerment and agency are vital

Empowerment to build people's capacity to determine their own future as well as to access and influence institutions and decision making process is central to Practical Action's approach. Building self-reliance is key. This is achieved through valuing and respecting people's livelihood choices and building on local skills, capacity and knowledge to strengthen those livelihoods. The case studies illustrate this can be achieved through strengthening local institutions, such as Village Development Committees, Women's Development Associations and other Community Based Organisations. These organisations vary considerably, some are connected to the lowest level of government (e.g.in Nepal) and others are integrated with traditional structures (e.g. in Sudan). Other groups are more specific and represent the interests of groups within communities such as women, fishers or farmers and others are based on social institutions such as savings and loan groups or water management groups.

⁶ For example the 'Disappearing Lands: Supporting communities affected by river erosion' project funded by Big Lottery

⁷ For example the 'Food Security for Sustainable Livelihoods' project, funded by the EC.

Community organisations can provide a forum for analysing the causes of their situation of poverty and envisage and plan for positive solutions for both communities and individuals. Community based approaches promote local ownership of processes of change, and can ensure better management of knowledge and resources. This can strengthen sustainability long after external support phases out.

Practical Action has developed guiding principles to support the process of working with community organisations and help overcome some of the challenges they face. There can be obstacles to mobilising community organisations which can include problems of dependency, accountability and the maintenance of existing hierarchies where the interests of the group is captured by elites, therefore not addressing the needs

of poorer members. Our guidelines contain three main principles that experience has shown are important when working with community organisations: facilitate community empowerment and self-reliance through a 'light touch' that encourages empowerment and lessens dependency on external actors; include and represent all members of the community to ensure their voices are heard; meet practical needs to ensure wellbeing as community organisations can be most effective and sustainable in situations where they meet people's specific on-going needs. In order to enact these principles, Practical Action uses a number of tools in different contexts to encourage successful and self-reliant community organisations which include facilitation, community based planning and capacity building measures.



Strengthening community based organisations; The V2R Project, Bangladesh.

7) Working with local and district officials is needed to make scaling up possible

There is often a ‘missing link’ between village level projects and the national level policy and Practical Action has been working to bridge this gap by linking with local and district and national government officials and processes throughout our work. Before the projects highlighted here, many people had no links with government agencies. Now community members are better placed to demand services and have their voice heard in decision making processes. In Nepal, local government has supported integrated planning by communities and scaled up the outcomes within district development plans. Similarly, in Nepal Practical Action is working with the Ministry of Local Development and the Ministry of Home Affairs to scale up its DRR work with different districts and to integrate climate data into vulnerability assessments and programme design and action based on village development plans. At the National level, success can be also seen with working in partnership with the Ministry of Education in Peru for agricultural training.

Despite these attempts by Practical Action to scale up this approach and link the district level to national and community levels, work is slowed by lack of support from the donor community. Most DRR funding goes directly to national governments (e.g. through the Global Facility for Disaster Reduction and Recovery) or to non-governmental organisations (NGOs) for local implementation. Little funding is available to help bridge the gap between national-level policies and local-level plans through collaboration with meso-level governance systems.

The case studies presented here illustrate the work that Practical Action is doing to build capacity and foster institutional linkages by

developing institutional frameworks for community-based disaster risk management, bringing together ministerial levels and district governments, setting up village, district and national project coordination committees and offering training at each level on DRR that is centred around resilient livelihoods. By building capacity and working with meso-level governance systems, Practical Action is promoting a sustainable approach to DRR that has both short- and long-term impact and this should be supported by the international and donor community.

8) Flexibility is needed to work with uncertainty

A flexible, programmatic approach is needed in order to work across all dimensions of the V2R. The Awajún case study illustrates this well; the project itself did not start with hazard assessments or climate change data. However, it used knowledge from previous projects in the same area to complement its work on natural resource management, governance and livelihoods. In this case barriers between disciplines were broken down and thinking in ‘silos’ of livelihood, governance, DRR or natural resource management were avoided and worked across in order to achieve more holistic and successful outcomes.

Flexibility is also needed to address future uncertainty and therefore future scenario planning should be essential in development interventions. Practical Action is working on building future uncertainty into all of its programmes. The case studies presented here are initial steps to include and analyse how Practical Action currently considers future uncertainty. However, there needs to be greater analysis of how adaptive capacity can be achieved and it can be evaluated and monitored.



An emergency simulation drill on an evacuation boat. The V2R Project, Bangladesh.

Recommendations from Evidence

The findings from the case studies in this briefing paper point to the following recommendations for policy and programmes. It also highlights gaps for further research:

Recommendations for policy and programmes:

1) Using a comprehensive framework such as the V2R can increase programme effectiveness

Programmes that are designed to alleviate poverty may benefit from analysing all four aspects of the V2R framework and integrating them into programme design. This includes disaster risk reduction, sustainable livelihoods, governance and future uncertainty.

2) Local Needs must be prioritised

International and regional-level strategies and policy interventions should be appropriate to national level programming and local conditions. International policy initiatives have witnessed good progress; however they have failed to be implemented at the grass roots level (Oxley, 2011). In order for these initiatives to be achieved in practice, local needs and vulnerabilities must be addressed, adaptive capacity must be taken into account and voice of vulnerable people needs to be strengthened. Local people are the drivers of change and therefore they should be supported and their voice strengthened.

3) Link up and influence meso-level governance systems

Meso-level governance should not be bypassed. Local, district, municipal government and service providers are very important for implementing national initiatives at local levels. Donors and national government should not miss out the meso level to promote resilience as they are well placed to scale up best practice from the local level to district level as well as to influence budgetary processes for integrating DRR and Climate Change into development processes.

Disaster management policies are formulated at a national level in most countries, as are development policies. These national level policies then guide the practices at the district level. The implementation of development, disaster and climate related policies tend to be separate, under the control

of different Ministries, with the result of poorly integrated local level planning and practice. This can lead to disjointed activities at the community level and wasted time and resources (Oxley, 2011). Therefore another recommendation is that budget allocation by international donors and National governments is needed for DRR at the District level.

4) Programmes to provide useful knowledge about climate change

Vulnerability to climate change needs to be integrated into programme design. Facilitating access to climate data and knowledge on how to use the information for decision making is an important intermediary role for non-governmental organisations.

There is currently confusion over climate change and variability data. Many development problems are currently being blamed on climate change when there are other underlying causes. Local people need accurate information and training on climate data. In addition local government and agricultural departments also could benefit from being trained in understanding climate data.



V2R Project, Bangladesh

Recommendations for further Research:

1. Indicators of resilience to measure impact

There needs to be more research on characteristics of resilience and their indicators. Whilst there has been progress in conceptualising resilience (Bahadur et al, 2010) indicators still need to be tested. Once indicators are clear, there also needs to be more research on how to measure these indicators for effective monitoring and evaluation (Villanueva, 2011). In relation to the above point, there also needs to be clear evidence of impact. This can only be achieved through robust indicators.

An important consideration for researchers is problems with measuring outcomes in the long term. If levels of resilience are to be considered as the level of 'bounce back' or 'bounce back better' (DFID, 2011 & Twigg, 2009) then there are two questions to consider: Firstly, how do we do it? How do we measure this better 'bounce'? And secondly, how do we overcome the practical problem of time scale? There are problems with measuring outcomes in the long term as funding mechanisms do not allow for long term engagement and follow up investigations are rare. It is very difficult to measure outcomes in the short term due to a lack of information.

These case studies are only the start, and provide evidence of the benefit of building resilience into programmes. Measurement of resilience is important as this will give evidence on whether resilience is more effective than other approaches, and highlight any trade-offs.

2. Resilience in urban areas

So far, most studies of resilience have focused on rural agricultural areas. However, with increasing urbanisation, population increases and growing informal settlements, urban areas are experiencing increasing levels of risks and hazards and more research is required on urban areas. The UNISDR 'Resilient Cities' campaign⁸ is a beginning, but more research is necessary.

3. Climate data clarity

Difference between climate change and climate variability must be understood by development practitioners. There needs to be further action on how climate change data can

be used for better programming in order to help smallholder farmers to cope with and adapt to weather variability. This is likely to be of great practical assistance both immediately, and in the longer term (i.e. extremes already experienced within current variation pose major challenges to farmers, and both these extremes and their frequency are likely to become more common with climate change). Well trained NGO and agricultural extension staff could facilitate farmers to be aware of and understand a greater range of coping and adaptation strategies than they currently use and determine which are appropriate to both their local and individual circumstances and how to implement these (for an example of Practical Action's work in this see the project: Mainstreaming Climate Change Adaptation in Zimbabwe's Extension System⁹). Trained staff could also help farmers to view and interpret local historical climate data (e.g. how often seasonal rainfall is below a certain level) and consider implications for selecting different crop management strategies. Similarly they could help farmers interpret seasonal climate forecasts which are currently not made available in an easy to use format to, or used by, the majority of smallholder farmers in the countries Practical Action works in.



Photo: Kibera informal settlement, Nairobi, Kenya, Practical Action, Kenya

Resilience in urban areas is a growing area of interest

⁸United Nation International Strategy on Disaster Reduction Resilient Cities Campaign: www.unisdr.org/we/campaign/cities

⁹For more information on the project: Mainstreaming Climate Change Adaptation in Zimbabwe's Extension System, please see www.practicalaction.org/nuffield-project

Conclusion: Reflecting on achievements

The case studies presented in this paper illustrate Practical Action's work in building resilience into its programmes. They provide an evidence base for operationalizing resilience and for including processes and resources that are essential for supporting adaptive capacity. All of the case studies presented here support the idea that resilience thinking can be useful beyond the DRR sector. They also reinforce the need for organisations to be proactive in reaching out to build partnerships and alliances with people and organisations operating outside of their specialist intervention areas. This means they also require an investment and challenge our traditional way of working. Though we are only beginning to gather evidence on the cost effectiveness of the From Vulnerability to Resilience (V2R) approach, we have already seen increases in

people's food security, disaster management plans at the district level reflecting local level risks, safer and diversified livelihoods and increasing innovation. However there are still a range of challenges including a lack of relevant climate data, appropriate tools and incentives in organisations to support integration of sectors, a lack of scenario planning methods and clear indicators on which to base planning, monitoring and evaluations.

Practical Action is beginning to monitor and evaluate resilience as an outcome and process through its programming. This is a challenge as resilience needs to be evaluated over the long term, as well as over the short term. The V2R framework is a start and has proven to be a useful step forwards in improving our understanding of the complex process of adaptation, and ultimately better Practical Action's assistance to those most in need and most vulnerable to the impacts of a changing climate.



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Cropping on Sandbars, V2R Project, Bangladesh.

ANNEX ONE:

Table: How each project covers aspects of the V2R Framework:

	SUSTAINABLE LIVELIHOODS	HAZARDS AND STRESSES	GOVERNANCE	FUTURE UNCERTAINTY
LCDRR PERU	<p>Farmer leader school (increased knowledge, technology and experimentation)</p> <p>Demonstration plots for crops and irrigation</p> <p>Revolving funds</p> <p>New guinea pig breeds (increased incomes)</p> <p>Recovering native varieties of crops</p> <p>Access to more options for farming such as animal breeds (guinea pigs) new varieties of seeds, hydroponics, fertilizers, better storage and irrigation.</p>	<p>Vulnerability and capacity assessments should encompass everything</p> <p>Participatory disaster preparedness and response plans</p> <p>Training community civil defence committees</p> <p>Simulation drills</p> <p>Disaster preparedness and response activities</p> <p>Earthquake resistant housing</p>	<p>Capacity building for proposal development to get funding from municipal government</p> <p>Capacity building of district officials to process rural funding proposals</p> <p>Capacity building of district officials in livelihood centred DRR</p> <p>Strengthening links between local, district and national levels</p>	<p>Improving understanding of climate change trends</p> <p>Ensuring access to climate and weather information for farmers</p> <p>Increase capacity of farmers to manage agricultural calendars through resilient farmer field school- increasing confidence and flexibility to learn and experiment</p>
LCDRR NEPAL	<p>Farmer field schools</p> <p>Demonstration plots of new vegetables</p> <p>Improved crop varieties (improved incomes)</p> <p>Livestock keeping/ livestock health camps (increasing incomes)</p> <p>Livelihood diversification: bee-keeping</p> <p>Off farm activity promotion</p>	<p>Vulnerability and capacity assessments</p> <p>Disaster preparedness and response plans</p> <p>Flood Early Warning Systems</p> <p>Disaster preparedness and response activities (wild animal fence, gabions, embankments)</p>	<p>Capacity building of VDCs</p> <p>Capacity building of district officials in livelihoods centred DRR</p> <p>Strengthening links between local, district and national levels</p>	<p>Improving understanding of climate change trends</p> <p>Ensuring access to climate and weather information for farmers</p> <p>Flood early warning systems</p> <p>Access to more technologies- new and diversified crops for changing weather conditions</p>

<p>DMI KENYA</p>	<p>Pastoralist field schools- increased knowledge of animal health, climate change, natural resource management</p> <p>Livelihood diversification training for pastoralists</p> <p>Extension services- animal health workers</p> <p>Water harvesting and rainwater harvesting</p> <p>Improved sanitation</p> <p>Community based saving schemes/ Village community banks</p>	<p>Land use mapping and planning</p> <p>Drought preparedness plans and activities – sealed boreholes</p> <p>Drought Early Warning Systems</p> <p>Grassroots monitors- monitoring drought, disease and conflict</p> <p>Consensus building approach to lessen conflict</p>	<p>Natural resource user committees strengthened- reduced conflict</p> <p>Peace committees</p> <p>Resource mapping and user agreements enforced by village elders- this has been scaled up by other actors</p> <p>Strengthening national and district emergency planning and response</p> <p>Linking local communities with district authorities and service providers</p>	<p>Saving schemes for future uncertainty</p> <p>Pastoralist field school improved understanding of climate change and future trends- promotes use of camels.</p> <p>Access to timely information on drought, disease and conflict</p> <p>Peace committees- power sharing and reducing conflict</p>
<p>GREENING DARFUR (SUDAN)</p>	<p>Capacity building assessments of civil society networks</p> <p>Pastures management training given.</p> <p>Capacity building networks- training in finance, funding.</p> <p>Community forests established</p> <p>Community seed stores and seed fairs organised.</p> <p>Increased access to water- rehabilitation of wells, hafirs and shallow wells. Donkey drawn carts to carry water.</p> <p>Community based agricultural extension in forest protection, horticulture, land use, soil cultivation.</p> <p>Paravets/CBAHWs trained.</p> <p>Improved seed distribution and improved agricultural practices such as dates seeds are planted.</p>	<p>Hazard defences- terrace construction, community forests, shelter belts, rangeland and vegetation regeneration.</p> <p>Conflict prevention measures- consensus building approach used.</p>	<p>Strengthening links between networks and service providers (government, range and pastures administration, agricultural extension services and veterinary departments)</p> <p>Regeneration of natural resource management systems</p> <p>Training on conflict resolution and consensus building given (PAPD).</p> <p>Strengthening civil society networks</p>	<p>Environmental protection lessons- tree and seedling transplanting training, pastures management, community forests. These all improved understanding of trends and their impacts as well as build confidence and flexibility to learn and experiment.</p> <p>Conflict resolution and consensus building training improved understanding of conflict and ways to build consensus- powersharing.</p>

<p>V2R BANGLADESH</p>	<p>Volunteer groups formed and trained to start formation of community based disaster preparedness plans.</p> <p>Strengthening livelihoods by distribution of assets- livestock, poultry, seeds.</p> <p>Agri-food processing training- chutney making etc.</p> <p>Agricultural training and extension.</p> <p>Cow, goat and sheep rearing has increased incomes</p> <p>Promoting increased access to technologies- floating gardens, sandbar cropping.</p> <p>Fishing training- cage culture support, fish production training, community based fish farming.</p> <p>Establishment of seedling nurseries</p> <p>Off farm training- sewing, embroidery and light engineering</p>	<p>VCAs informed community based disaster preparedness and livelihood action plans.</p> <p>Training in and emergency equipment provided for disasters- lifejackets, boat ambulances.</p> <p>Links with hospitals strengthened</p> <p>Flood early warning systems.</p> <p>Measures to protect vital assets/ seed stores/ raised plinths/tube wells</p> <p>Flood proof housing, cluster villages.</p>	<p>Community disaster preparedness plans linked to local government</p> <p>Community based organisations trained</p> <p>Management of boat ambulances and evacuation boats maintained in participatory way by CBOs</p>	<p>Skilled volunteers trained- in both disaster preparedness and livelihood options</p> <p>CBOs, local NGO staff and skilled volunteers trained in understanding local trends, disaster management and climate change</p> <p>Access to timely information increased through the use of skilled volunteers</p> <p>Increased access to technologies such as floating gardens and sandbar cropping increases adaptive capacity</p>
<p>PRACTICAL SOLUTIONS FOR INDIGENOUS COMMUNITIES (AWAJUN)</p>	<p>Livelihood diversification and strengthening- fish farm training, small livestock production.</p> <p>Training in better agricultural techniques</p> <p>Training community extension agents in reforestation</p> <p>Organic coffee farming raising incomes</p> <p>Natural cropping and intercropping increases sustainable management of productive assets- seed storage/orchids/ preservation of native seeds and herbs</p>	<p>Deforestation and water pollution lessened. Forest regeneration undertaken.</p> <p>Water and sanitation systems installed</p>	<p>Leadership training for Awajún leaders</p> <p>Strengthening the FERIAAM and linking them to regional government and indigenous rights networks</p> <p>Training in indigenous rights and natural resource management</p> <p>Consensus building approach used to reduce conflict between Awajún and settlers</p>	<p>Consensus building approach has resulted in Awajún increasing their decision making power- now have more control over land leases and land use. Power sharing between Awajún and settlers.</p> <p>More communication between FERIAAM and San Martin government over environmental controls.</p> <p>Better understand of trends of deforestation and its impact- landslides, water pollution.</p> <p>More confidence and flexibility to learn and experiment through training and linkages to service providers</p>



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Back Cover: Growing tomatoes, Mainstreaming Livelihood Centred DRR Project, Practical Action Nepal

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