



Photo: M. Samper/Mercy Corps

CLIMATE RESILIENT DEVELOPMENT CASE STUDY SERIES | **NEPAL & TIMOR**

# A Market Development Approach to Climate-Informed Disaster Risk Reduction

Mercy Corps is demonstrating a new approach to sustainable Disaster Risk Reduction (DRR) by economically incentivizing climate-informed DRR measures in Nepal and Timor Leste. This case study highlights lessons learned from the program and offers insights for the consideration of other global climate-informed DRR programs.

## PROBLEM

Most traditional DRR programs in low-income communities are effective at saving lives, but are far less effective at mitigating the economic losses suffered by poor communities. Apart from protecting lives and property, they are rarely tied to strategies that build economic security and increase incomes. Additionally, community-level DRR depends on the diligent efforts of local volunteers, whose enthusiasm diminishes with the high opportunity cost of time.

Despite their differences in climate and geography, both nations are food insecure and disaster prone. Nepal's annual monsoon season brings flooding and landslides—with evidence that climate change is adding to the severity and frequency of these events. Through the pressures of land and resource scarcity, Nepal's poor populations find themselves living in inherently vulnerable locations. In Timor Leste, higher temperatures and greater intensity of extreme rainfall and droughts have

increased the frequency and severity of disasters. Local topography and climate make it particularly susceptible to slow onset disasters related to soil erosion, deforestation, and declining soil fertility. Timor Leste today is one of the most food insecure countries in the world with more than 80% of its population relying on agriculture for both food and income. Nepal and Timor Leste both demonstrate the shortcomings of traditional DRR approaches.

Despite the scale of the problem, many communities in Nepal and Timor Leste remain unprepared, with many DRR activities to date focusing on early response alone. In both nations, past DRR projects have benefited disaster prone communities and sub-districts. However, the sustainability of these efforts is often limited by a lack of economic incentives, links to government support and capacity across scales, and proper analysis of the root causes of vulnerability.



## OUR APPROACH

The three-and-a-half-year program, Managing Risks through Economic Development (M-RED), was explicitly designed to move beyond standard DRR approaches. Mercy Corps took a “nexus” approach, integrating DRR and market systems development (MSD) approaches throughout the \$4.8 million program. M-RED sought to test an effective and sustainable model for DRR that is directly linked to economic security in vulnerable communities. M-RED’s practical approach ensures that communities not only have plans to cope with the next disaster, but have made critical investments and built relationships instrumental to their success, while influencing the disaster policies and practices that impact their long term resilience.

In each country, M-RED partnered with stakeholders<sup>1</sup> to form the appropriate nexus interventions through an Integrated Disaster and Economic Analysis (IDEA)<sup>2</sup>. The IDEA process extends beyond the

typical Vulnerability and Capacity Assessment (VCA) and Participatory Disaster Risk Assessment (PDRA), by following a broader systems approach that combines the standard DRR and economic development assessments (such as livelihoods and market development opportunities), as well as relevant climate change data and gender-sensitive information collection.

The IDEA process can be broadly summarized to include:

- Participatory mapping and data collection around community hazards.
- Community level assessments combining VCA and PDRA<sup>3</sup> methodologies.
- An assessment of local and sub-national markets.
- Analysis of key climate trends.
- Subsection selection and detailed Market Assessment.
- Formulation of Community Action Plans (CAP) that include mitigation and market plans where community and sub-district priorities are linked to central and sub-national government master planning budgets, and DRR policies to capital investments for disaster mitigation.
- Funding and implementation of nexus interventions as revealed by the CAPs.



Photo: C. Tamang/Mercy Corps

1. Stakeholders included government officials at national, district, and sub-district levels, private sector actors, and community members.
2. To develop IDEA, Mercy Corps convened a wide range of internal stakeholders with prior DRR and economic development programs from Mercy Corps offices in Indonesia, Nepal, and Timor Leste, as well experts from the technical support units of Environment, Energy and Climate Change, and the Economic and Market Development.
3. At the community level this included livelihoods assessments and calendaring (seasons, holidays, hazards); mapping (livelihoods, infrastructure, hazards, market access, gender activities, resources access and control, etc.); focus group discussions; review of climate change information, and its impact on hazards and livelihoods.

## OUTCOME

The results of the IDEA process informed the selection of all nexus interventions that are mutually beneficial for all parties: community needs, market systems opportunities, and government plans and priorities. M-RED currently supports nexus interventions in 64 disaster-prone communities in Nepal and Timor Leste that include the following:

- Sugarcane planted on silted and erosion-prone riverbanks in Far West Nepal.
- Fodder planted on erosion and landslide-prone slopes in Far West Nepal.
- Banana planted on erosion-prone slopes and riverbanks in Timor Leste.
- Legumes planted on erosion-prone and marginal lands with poor fertility in Timor Leste.
- Agroforestry trees planted with land management techniques on erosion-prone slopes in Timor Leste.

The following are two M-RED projects in Nepal that exemplify how market systems interventions incentivize disaster risk reduction while simultaneously increasing farmer profits:

### **Sugarcane plantation for riverbed protection in Lalitpur**

In Lalitpur-3 village, in the Kailali district of Nepal, yearly flooding of the Guraha and Mohana rivers is a significant hazard affecting lives and livelihoods. River cutting and deposits of sand both affect



Photo: M. Samper/Mercy Corps

agricultural land, resulting in less land holding and a declining production. In 2010, extraordinary flooding displaced many families and left only a portion of the returning families' land usable.

M-RED's IDEA process identified the sugarcane sub-sector as a priority nexus intervention that made sense both in the Nepalese market system

and as a crop to mitigate environmental risk. Sugarcane can be grown in silty riverbeds to help reduce flooding and river cutting, convert silt to productive agricultural land<sup>4</sup>, and generate income. Although some communities were already cultivating sugarcane and were connected with this processing factory, they had not cultivated sugarcane on marginal lands. The market scanning process further detected a molasses factory near the village.

In 2013, Mercy Corps led the trailing of sugarcane-based siltation reduction measures in 115 acres of marginal land in Lalitpur, resulting in a value<sup>5</sup> of

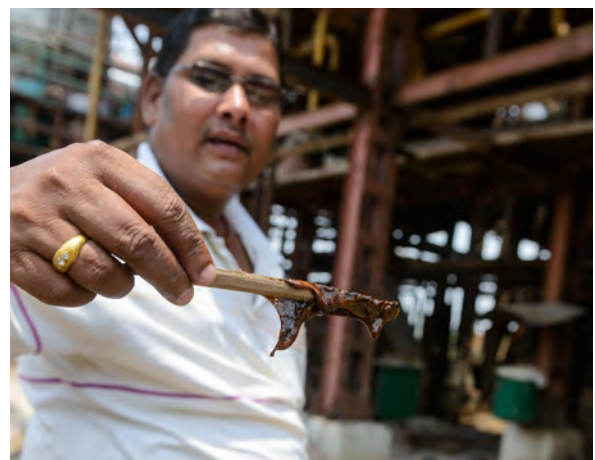


Photo: M. Samper/Mercy Corps

4. The pilot projects include: integrated solid waste management, groundwater conservation through bio-pores, strengthening teachers' and students' capacity for adaptation and response to disaster and climate change, flood forecasting and early warning system, and a pre-feasibility study on rainwater harvesting.

5. Ten cities and West Java province (nine cities and 11 regencies), representing 6.1 million people, have demonstrated an interest in replicating the ACCCRN program. One city has signed an MOU; five cities have signed Letters of Intent to replicate the ACCCRN program.

\$39,000. Mercy Corps helped bring in buyers and increase production through a traditional market systems approach. It is even helping a private owner establish a new Molasses Mill in a remote production area, as a way to capitalize on the increased volume of sugarcane production brought on by M-RED. The community has also made cash gains from selling sugar, thatch that grows naturally near the sugarcane, and other cash crops.

The income-generating potential of sugarcane has proven an invaluable tool to mobilize communities to construct and maintain riverbank infrastructure, and to invest in cultivating and reclaiming marginal and hazard-prone lands. The results have reduced the seasonal emigration of men for employment, and encouraged 22 families to return to the riverbank to rebuild their homes and increase their agriculture production in that marginal area.

#### **Dairy fodder for slope management and erosion control in the hilly areas of Dadeldhura**

In Dadeldhura district, vulnerable communities are located in highly erosion-susceptible watersheds where boulders and sand are carried by landslides and flashfloods. These events are becoming more extreme and unpredictable with changing rainfall patterns. The residents are increasingly becoming vulnerable to loss of property and productive land, and forcefully displaced.

Through the M-RED process, the stakeholders jointly prioritized planting of fodder species in marginal lands as a nexus intervention that will mitigate the impact of erosion on soil and slopes, while also contributing to improved dairy production for communities. The market scanning process revealed the dairy industry as a target growth sector for hilly areas, where cows, buffalo, and goats are commonly raised. Fodder is thus linked to market potential through dairy production providing an incentive for risk-reducing grasses on unstable slopes. In these areas, communities have low knowledge about fodder practices to maximize dairy production while reducing and reversing the environmental impacts of grazing.

In 2013, Mercy Corps worked with farmers and local government to plant more than 200,000 fodder plants—Amriso and Napier grasses—valued at \$20,000. M-RED's interventions also improved dairy production through trainings on shed management

and livestock management (shed and silage); health promotion; and facilitation of market linkages with the other dairies. M-RED has also supported farmers to build stables that reduce degradation and give them greater control over cattle nutrition.

The M-RED intervention has contributed to increases in dairy production and quality. Since the onset of M-RED, the Chilling Center in Dadeldhura has substantially increased its storage volume and frequency of sale to the regional dairy, linked by M-RED. The Chilling Center has increased its daily



Photo: M. Samper/Mercy Corps

milk collection from 50 liters to 500 liters, and its sales to the regional dairy from 100–200 liters up to 600–800 liters every two days.

After witnessing the results of these two nexus interventions, M-RED received requests from communities nearby to expand and scale up the program. Replication of the M-RED program in six new communities is already underway.

## LESSONS LEARNED

The M-RED program brought many lessons during the first two-and-a-half-years of the implementation of the integrated DRR and MSD nexus projects in the diverse environments of Nepal and Timor Leste. Lessons informing replication and expansion of the model include:

### **1. Climate-informed DRR programs should support long-term development goals.**

DRR strategies need to go beyond the traditional approaches of structural mitigation and community capacity building. The nexus approach taken by M-RED shows that broader development outcomes like livelihood and market systems development can be supported by DRR programming.

### **2. Sustainability requires stakeholder engagement.**

The participatory nature of IDEA prioritized the mobilization of all stakeholders from the earliest stages, including government, private sector, civil society, and community members. The result has increased ownership and less reliance on Mercy Corps for the sustainability of interventions.

### **3. Private sector partnerships increase the sustainability of DRR strategies.**

Too often DRR gains are lost when development programming comes to an end, and financial support is lost. The nexus approach made it possible to bring private sector resources into DRR work. By pairing our MSD approaches with DRR we were able to facilitate the financial sustainability of DRR interventions while support economic development gains.

### **4. Disaster resilience requires customized solutions.**

Because MSD is time and staff intensive, the program focused on just a couple of sub-sectors in each country. This, however, led to an overly prescriptive application of sugarcane and dairy production in the target areas. The program aimed to correct this by adapting elements of the existing nexus projects, and by testing several new nexuses in the final year of implementation.

### **5. The nexus of MSD and resilience is more than just increased incomes.**

Approaches share a set of common principles that allow MSD to support resilience efforts—if resilience is made an intentional goal. But to build resilience, project implementers ultimately must focus on more than just increasing income and productivity, and should also incorporate capacity-building as an explicit market systems development goal.<sup>6</sup>

### **6. Measuring the DRR impacts and economic outcomes differ.**

For example, in the dairy case described above, the program provided a range of interventions to improve slope management (including application of fodder species, reduced open grazing, and the promotion of better shed management techniques), as well as a range of interventions to improve dairy production and market links (including livestock health workshops, access to improved cow breeds, and promotion of optimal feeding practices). As a result, the program has seen significant increases in dairy production. The majority of those changes, however, are not directly linked to the fodder planting on the slopes. In this case, measuring DRR impacts of fodder has been challenging, while measuring economic outcomes is much easier. The program is still trying to understand how to best measure the overall contribution of this nexus intervention to improve climate and natural hazard resilience among the target communities.

6. Is Market Systems Development Inherently a Resilience Approach? ([Event Resources](#)) – Eliot Levine and Sasha Muench, Mercy Corps (March 2015)



45 SW Ankeny Street | 888.842.0842  
Portland, Oregon 97204 | [mercycorps.org](http://mercycorps.org)



**CLIMATE RESILIENT DEVELOPMENT  
TEAM CONTACTS**

Eliot Levine  
Senior Climate Adviser  
[elevine@mercycorps.org](mailto:elevine@mercycorps.org)

David Nicholson  
Director, Environment,  
Energy and Climate  
[dnicholson@dc.mercycorps.org](mailto:dnicholson@dc.mercycorps.org)

Laura Bruno  
Regional Program Manager , M-RED  
[lbruno@field.mercycorps.org](mailto:lbruno@field.mercycorps.org)

