

## Indigenous Coping Mechanisms for Disaster Risk Reduction

*Vulnerable people develop their own disaster mitigation strategies, regardless of intervention from outside aid workers. By understanding these preparedness or coping activities, practitioners can build on them, rather than undermine them. ACEDRR has supported a local NGO to document 100 indigenous practices that farmers and herders in rural Tamil Nadu use to increase their disaster resilience.*

Many disaster risk reduction practitioners discover or create the coping mechanisms as part of their work that they introduce into a village that faces certain types of hazards.

But many local people in Tamil Nadu have already developed coping mechanisms that are reducing their vulnerability to disasters on a daily basis.

A better understanding of these indigenous coping mechanisms would help practitioners target their interventions and not disrupt the indigenous coping practices that local people use to build resilience in ways that work best for them.

The organization SEVA (Sustainable Agriculture and Environmental Voluntary Action) documented 100 indigenous and traditional coping mechanisms that rural people all over Tamil Nadu use to reduce their risk to disasters. In this case, disaster include agricultural hazards like drought, flood and pest, and diseases that affect humans and livestock, at a personal level or village wide, impacting poor people not resilient enough to cope.

“When we talked to people about disasters, people see only their direct losses, their own



losses,” said Vivekanandan, leader of this project for SEVA. “The risk of a disaster may be in any form.”

After documenting these practices, SEVA shared these among other rural villages, in the hopes that increased knowledge would help increase resilience for everyone.

SEVA also documented new and innovative ways that individuals increase their resilience to hazards. Here they took a different approach. Instead of sharing the details of these innovations freely, SEVA has tried to ensure that innovators get compensated for their hard work and creativity, either by helping them start businesses or helping them earn patents.

### 100 Coping Practices

SEVA profiled 100 disaster risk reduction practices, among these, a number of innovations on agriculture, animal husbandry, human and animal epidemics. These practices fall into three categories: indigenous knowledge, something locally known, without a direct source; traditional knowledge, something known from time immemorial; and innovations, practices invented by individuals.

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### Indigenous Practices

The coping mechanisms that SEVA considered “indigenous practices,” were practices common in a place but not from time immemorial.

For example, several years ago, farmers in Puliuangudi village used a new method to protect their coconut trees from rhinoceros beetles. These beetles can damage coconut trees to such an extent that they will produce fewer nuts and impact a farmer’s livelihood, potentially causing financial ruin for that farmer. Not only that, the beetles can spread, causing a disaster for the entire area.

Farmers here plant a ring of clay pots into the soil around a coconut tree, so that the top of the pots is at ground level. Then they fill the pots with a mixture of water and castor cake; after three days, the mixture ferments. The smell attracts adult rhinoceros beetles who fall into the pots and die.

Likewise, shepherders in Ramanathapuram District in Tamil Nadu prevent small pox epidemics in sheep by collecting pus from the boils of infected animals and using it to make a serum. This serum is delivered to healthy sheep to prevent the spread of the virus.

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the everyday risks they face: crop loss and livestock illness. The effectiveness of some of these interventions, though given credence by farmers who practice them, will have to be verified in order to make knowledge of these practices more valuable.

### Traditional Practices

Traditional practices, according to SEVA, are practices that local farmers or herdsmen have undertaken since time immemorial: practices passed down from generation to generation over hundreds of years.

For example, for generations, farmers in the Palladam, Kannivadi and Singampunari areas of Tamil Nadu have used bonfires to control groundnut pests. The fire is made from agricultural waste materials, and attracts female moths of the red hairy caterpillar, a pest to the groundnut, and one known to devastate a crop. Often the bonfire is made at night and moths are attracted to the light, and then perish in the fire. Another traditional practice that SEVA catalogued was a method for controlling foot and mouth disease in cattle. First, herders separate the infected animal from the others. Then they feed it a particular diet, consisting of bananas soaked in castor oil, pig meat and pearl millet, also known as *Panicum sumatranse*, and dried fish soup. Finally herders pour kerosene in the hooves of the animal.

Some traditional practices, like the bonfire to attract moths, make perfect sense, and are almost too self-evident. Other traditional practices are more complex. For example, scientific minds might wonder at the effectiveness of the practice to end foot and mouth disease, even though it has been practiced for generations.

Scientific verification of these practices would help development professionals to have more confidence in these traditional methods.

### Innovations

SEVA also sought out new and exciting ways that farmers and herdsmen were reducing their vulnerability to disasters like droughts, floods, epic crop failures, or epidemics. These innovations included new transplanting methods for sugarcane, new herbal pesticides for paddy crops, and control of blue tongue disease in sheep.

One example of the creative ways rural people are reducing their own vulnerabilities to major natural disasters came from a 51-year-old farmer in Pallapatti village in Nilakottai Taluk of Dindigul district. Dindigul district is particularly dry and prone to drought. One farmer there, a man named Mr Alagarsamy, successfully crossed the Yaazhpanam moringa tree with the

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Coimbatore local variety of moringa to create a new, drought-tolerant variety.

This drought-tolerant moringa is a useful innovation for farmers in dry and drying climates because this new variety of moringa needs less water, making it more resilient to rainfall changes. The variety also produces a large number of fruits all year round. Researchers estimate that a person can earn 2000 rupees per year from one tree.

Mr. Alagarsamy has named the new variety the Pallapatti Alagarsamy Vellimalaimurugan Moringa (PAVM) and he propagates the tree through stem cuttings. In this way, Mr. Alagarsamy has been able to sell more than 600,000 seedlings to farmers in other dry lands. He now operates a staff of 20 women, who graft seedlings in his nursery.

For his hard work, Mr. Alagarsamy recently won a micro-entrepreneurship award from Citibank. The cash prize was for 3 million rupees. It was SEVA that nominated him for the award.

Not only does SEVA hope this documentation will help spread the good practices to other vulnerable people who could benefit from them, they hope that the process benefits the innovator, as in the case of Mr. Alagarsamy's business.

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SEVA has published the addresses of each innovator in their final report, and encourages interested parties to contact innovators directly. Though many of these innovators do not have patents on their inventions, Vivekanandan thinks this process could help.

“By documenting these practices we are putting them in the public domain. Tomorrow, no one can claim they invented it,” said Vivekanandan.

### **Sheep Mortality**

Two of the innovations SEVA documented in the pilot project above were all-natural medicines that sheep herders could use to keep their sheep healthy.

In Tamil Nadu, sheep herders, already in fragile economic states, face economic losses when sheep die suddenly due to common diseases: sheep pox, blue tongue and foot and mouth disease. The deaths of livestock can throw a herder into a personal crisis. But if the disease spreads to other herds, which often graze in the same fields, it could become a village-wide disaster.

Mr. Mookan, a herbal healer in Melaurappanur village, Thirumangalam Taluk, in Madurai district, had developed a sheep bolus and de-wormer out of locally available ingredients that can save sheep's lives, and herder's livelihoods.

In SEVA's second pilot project, they worked with the Department of Livestock Production and Management at Madras Veterinary College in Chennai, to conduct a scientific study of the bolus and de-wormer, to determine if they worked effectively enough to patent.

Researchers undertook the study in 3 hamlets in Nallampalayam and 4 villages in Vembur. In total, 72 herders agreed to administer the bolus and de-wormer to a total of 2385 sheep, every month for six months.

Researchers deemed the de-wormer effective, because they were able to observe an 88.6 percent decrease in "eggs per gram" of sheep dung, consistent with store-bought chemical de-wormers.

Over the course of the study, there were no incidences of blue tongue or foot and mouth diseases. Though this does not prove the bolus was effective, all of the farmers participating in the study expressed interest in continuing to use both of the products even after the study ends.

Herbal remedies like these allow herders to maintain the health of their flocks without relying on veterinary medicine, which costs time and money, and without resorting to chemical solutions.

SEVA believes that even when inventors are rural farmers, not connected to the halls of power, they should not only get credit for their contributions, but should profit. In this pilot project, SEVA went beyond acknowledging local practices and instead sought academic verification for them, a critical step toward helping Mr. Mookan apply for a patent for his innovation to reduce the vulnerability of shepherds to livestock illness.

### **A Few Potential Conclusions: Looking Forward**

Whether an outside actor, like a researcher or an NGO worker, comes and helps them or not, local people are experiencing and coping with climate change. Local innovations are often cheap, efficient and easily to replicate. But community knowledge and local innovations do not get shared across villages, across states, across nations, unless they are backed by scientific validation.

Outside agencies like universities, NGOs and the government can play a vital role in documenting, verifying and sharing these indigenous coping mechanisms and then, armed with this complete picture, filling in the gaps.

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The scientific community has to participate in the community's own processes of knowledge, innovation and disaster mitigation before they can get a sense of whether they work, and then they have to replicate and test the innovation to demonstrate efficiency and replicability, before they bring the innovation to other areas.

One locally produced climate change adaptation might be relevant for another place, if the disaster context of the place is the same. But no intervention can be imposed from the outside, not even one developed in the hamlet next door. Communities where the innovation is being introduced have to determine, on their own, considering their own incentives and risks, whether the innovation would be feasible for them.

*Ensuring that recognition and financial compensation for climate change adaptations go back to the innovators is a critically important way for practitioners to ensure they are not engaging in exploitation of rural people, and also a way to inspire them to continue to innovate.*

By bringing local innovations to the national level, universities, NGOs and governments can also help local people profit from their innovations, as SEVA is doing. Ensuring that recognition and financial compensation for climate change adaptations go back to the innovators is a critically important way for practitioners to ensure they are not engaging in exploitation of rural people, and also a way to inspire them to continue to innovate.

### **Recommendations for NGOs**

By helping rural people apply for and get patents for their work, SEVA might enhance the prevalence and availability of homegrown disaster risk reduction innovations. NGOs have the muscle to determine whether local innovations are replicable or scalable. They can also spread the ideas around, making good practices available to those who could use them.

### **Recommendations for the Government**

The government can facilitate the requests for patents from these innovators, and offer other incentives for rural people to continue innovating in their quest to cope with climate change. Different government agencies can also incorporate the lessons learned from this research, and look closely at coping mechanisms already in place when they engage a community in development work or rebuild after a major hazard.

### **Recommendations for Universities**

Universities collect scientific data that could help rural people cope with climate change more effectively. But to be successful, they need to apply micro-level research methods to understand village experiences and coping mechanisms. Researchers can act as facilitators between rural villages and the scientific world, by validating and disseminating good local practices, and by making scientific knowledge applicable and relevant at the local level.

## Project Summaries

### Documentation of Indigenous Mechanisms on Disaster Risk Reduction

#### Objectives

- To document indigenous coping mechanisms on disaster risk reduction attempted by communities or individuals in Tamil Nadu state.
- To network with volunteers in other states to explore and document outstanding cases.
- To create a database and make available all documented practices to those in need of them.

#### Methods

- SEVA contacted NGOs, communities and academics to identify the specific communities in order to document successful coping mechanisms in Tamil Nadu State. In other states, SEVA worked through the Honey Bee Network volunteers to document outstanding cases of coping mechanisms.
- SEVA held discussions, conducted resource mapping and held interviews with community members for documentation.
- SEVA documented coping mechanisms, crediting the innovators.
- SEVA has taken steps to support innovators to profit from their work, by helping them receive patents for their work, nominating them for awards, connecting them to the media, or helping them establish businesses.

#### Outcomes

- A published list of 100 traditional coping practices and innovations for climate change adaptation, created with input from the Honey Bee Network.
- Upon receiving permission from innovators, SEVA will put this document on a public website.
- A toolkit for documentation of practices which may be a community knowledge or innovation.
- A special issue of 'Numvali Velanmai' newsletter published in Tamil for wider dissemination.
- Established link between SEVA and research institutes in order to validate such practices for further follow up.

#### Lesson Learned

- Outstanding practices were referred for awards or publication by SEVA in leading newspapers. This kind of attention can generate enthusiasm among farmers communities to follow such practices to get more income during drought situation, climate change or flood condition

#### What is next?

SEVA will record the outcome of success stories after the publication of selected practices or innovations for reaching wider audience, and will constantly upgrade in the practice or innovation after receiving latest information or development from the field.

### Preventing Mortality of Sheep and Against Disease Outbreak Among Livestock Keepers in Nallampalayam and Vembur Panchayats

#### Objectives

- To promote participatory action research to prevent mortality of sheep due to sheep pox. PPR (Tharai Kalisal or Poli vekkai noi), Enterotoxaemia and blue tongue disease in two localities: Nallampalayam panchayat in Dfharapuram block.
- To document the outcome of the treatment, management practices and disseminate to neighboring areas for wider replication.
- To strengthen livestock keepers association to cope with such calamities in the future through material and non-material resources.

#### Methods

- Selected 1028 sheep from 40 farmers in Nallampalayam to receive treatment and 1357 sheep from 32 farmers in Vembur district to receive treatment. Selected control groups in each area.
- Trained herders to prepare and administer the treatment.
- Monitored sheep's health for six months, including counting worm eggs per gram of sheep dung.
- After six months, analyzed findings.

#### Outcomes

- A booklet about the efficacy of herbal

de-wormer and masala bolus against sheep disease (in Tamil) for dissemination to the sheep herders in Tamil Nadu.

- Strengthened SEVA's sheep herders groups, the result of regular meeting, awareness on best management practices and collecting mechanism to overcome disaster related situation.
- The availability of an herbal de-wormer that is low cost, easy to make from local materials and does not have chemical side effects on sheep.

#### Lesson Learned

- By administering herbal bolus and de-wormer in more than 12,000 animals and repeated three times, SEVA has confirmed the effectiveness of the formulas.
- It is cheaper than the chemical treatment and many livestock keepers have developed the skill of preparing and administering the herbal medicine since the programme ended.
- This traditional practice, which has existed for many centuries, is being revitalized.

#### What is next?

They want to test whether this pattern of treatment for sheep is beneficial at all times and they want to apply for a patent so that the livestock keeper, Mr. Mookin, can benefit from his innovation.

### Project Holders

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## **ACEDRR**

The Advanced Centre for Enabling Disaster Risk Reduction (ACEDRR) is a specialized centre of Tata-Dhan Academy established to enhance the knowledge and practice on disaster risk reduction through research and pilot projects, training and education, networking, consultancy, and policy advocacy activities to ensure secured lives and livelihoods of vulnerable communities.

## **Tata-Dhan Academy**

Tata-Dhan Academy is promoted by DHAN Foundation, a pioneering grassroots organization, and Sir Ratan Tata Trust, Mumbai, to identify, nurture, and groom young graduates into development professionals through its flagship two-year Programme in Development Management. The Academy offers a number of short-duration Development Management Programmes and undertakes research, documentation, and consultancy services.

## **DHAN Foundation**

DHAN Foundation works with about 8,50,000 families in 12 states of India, striving to improve the lives and livelihoods of vulnerable communities by organizing them to reduce poverty and address their various development needs. The interventions are spread across urban, rural, coastal, and tribal contexts. DHAN works in different thematic areas including microfinance, tank-fed agriculture, information and communication technology for the poor, and local self-governance.

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