INDIA – Khammam District, Andhra Pradesh

Development & Risk Reduction in Hazard-Prone Communities of Andhra Pradesh in India

CRA Toolkit
CASE STUDY

This case study is part of a broader ProVention Consortium initiative aimed at collecting and analyzing community risk assessment cases. For more information on this project, see www.proventionconsortium.org.

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Click-on reference to the **ReliefWeb country file for India**:
http://www.reliefweb.int/rw/dbc.nsf/doc104?OpenForm&rc=3&cc=ind

Note:
A Guidance Note has been developed for this case study. It contains an abstract, analyzes the main findings of the study, provides contextual and strategic notes and highlights the main lessons learned from the case. The guidance note has been developed by Dr. Ben Wisner in close collaboration with the author(s) of the case study and the organization(s) involved.

Development & risk reduction in hazard-prone communities of Andhra Pradesh in India

Photo: Richard Hanson/Tearfund

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case study
Disaster Management

Summary

This case study highlights the impact that floods and droughts are having on poor communities in Andhra Pradesh (AP), India. It highlights the role that an indigenous Indian NGO is having as it integrates disaster risk reduction activities into long-term development work so as to reduce the impact of these hazards on the most vulnerable groups. Importantly, the approach adopted recognises some of the causes of people's vulnerability. The principles of addressing vulnerability and its causes within Andhra Pradesh, as demonstrated here, can be adapted and applied to suit other contexts.

EFICOR (The Evangelical Fellowship of India Commission on Relief) has been active since January 2003 in implementing development projects that integrate disaster risk reduction. Activities have been within Khammam district, AP, alongside a longer history of supporting local partners in the area. By relying heavily on capacity building, training and some physical interventions, they have been working successfully towards both short and long term solutions to reducing people's vulnerability to floods and droughts. Their work has resulted in community empowerment, greater access to clean water and increasing food security due to alternative cropping schemes.

As well as the humanitarian imperative, a strong economic argument is presented in favour of integrating risk reduction into development programming.

Children are affected by the serious droughts and floods in Andhra Pradesh.
Photo: Courtenay Cabot Venton/ERM

Background

The summer of 2003 brought temperatures of over 50 degrees Celcius and exacerbated the serious drought conditions.

Photo: Richard Hanson/Tearfund

Andhra Pradesh (AP) is in the south-east of India, bordering the Bay of Bengal. It is well endowed with natural resources, and 40 per cent of the land is used for agriculture. The state has the fifth-highest population in India, with approximately 76 million people. AP is also a centre for technical and scientific excellence, with a high number of research and training institutions. Nonetheless, approximately 30 per cent of the population live below the poverty line. The state is prone to many types of hazard, including flooding, cyclones[1] and drought.

Khammam district has a population of approximately 2.6 million. It is one of the hottest districts in southern India, with summer temperatures known to reach over 50 degrees Celsius. Seven rivers run through Khammam district, the most significant of which is the Godavari River, contributing to a very fertile land. Major crops include rice, groundnut, chillies, cotton and tobacco, and forests too play an important role in the economy of the district with products such as teak, eucalyptus, cashew and bamboo.

Villages in this region are poor and inhabited primarily by tribal peoples who rely on farming as their main livelihood. Some cultivate their own land while others share crop or work in the fields for richer landowners. There are few alternative employment opportunities. Most households own some livestock, and have a few minor implements such as cooking equipment and tools. The majority of houses are made of mud with thatched roofs. While infrastructure is basic, the villages do have electricity, road access and water supplied via government-installed hand pumps.

The two most prominent hazards facing Khammam district are flooding and drought.

Flooding is a prevalent problem along the major rivers, and affects the area most years during the monsoon season (June to August). Normal floods typically last three to four days, but according to the villagers the most severe flood, which occurred in 1986, lasted for 20 days. More severe floods can damage crops, including rice, and as a result, villagers have adapted their crops and cropping patterns to reduce the impact of flooding. For example, the village of Bhandarigudem historically harvested chillies between June and September, but, because of the risk of flooding, this crop has been shifted so that planting occurs after the flood season in September, with harvesting in April.

While flooding can cause displacement and destruction, it can also bring many benefits: fishing increases, teak wood carried by the flood waters is used in the villages or sold, and fields receive important nutrients.

Drought during the summer (April to June) can also pose a serious threat to communities in Khammam. For the last four years the region has suffered from below-average rainfall and record high temperatures. This drought has affected rain-fed agriculture the most; few of the villages have irrigation, and only fields next to rivers can be watered.

Both flooding and drought also affect village water supplies. During flooding, hand pumps are submerged, and often rendered unusable after the flooding (villagers have to pay to have them cleared and repaired). During drought periods, villagers report that the government wells dry up and therefore they become reliant on river water.

Flooding and drought also have important consequences for health. During flooding, water-borne illnesses, such as diarrhoea and cholera, plus various skin conditions, are significant problems. Standing water creates good breeding conditions for mosquitoes, and malaria increases. During the drought season, heat stroke is a common problem.

Within Khammam district, EFICOR has targeted ten vulnerable villages with a Disaster Management Programme, and is expanding its programme to 20 new villages identified as very vulnerable in two neighbouring mandals (local administrative blocks).

Rice seed beds are particularly vulnerable to drought.

Photo: Jim Loring/Tearfund

Villagers are able to take advantage of road access to local markets.

Photo: Paul Venton/Tearfund

Activities Undertaken

EFICOR has been involved in testing alternative crops to help improve food security.

Photo: Geoff Crawford/Tearfund

EFICOR has implemented a range of development projects that include disaster risk reduction in these villages. Their work relies heavily on building the capacity of the local villagers to drive development within their own communities, supplemented by specific physical measures. In each of the ten villages, EFICOR has established a Disaster Management Committee (DMC), and trained 20 young people as an emergency response task force. In relation to flooding, these young people are responsible for rescue and evacuation. Vulnerability and capacity assessment and contingency planning have been conducted in each village, and women's Self Help Groups (SHGs) and farmers groups have been established.

EFICOR has also initiated a number of physical improvements. They have installed raised hand pumps in seven of the villages, and made provision for repairs by training mechanics and issuing toolkits. EFICOR has also tested alternative cropping systems in the villages to help with food security. Each village selected two farmers to receive an improved variety of rice, cotton, chilly or okra. The crops are considered to be more resistant to pests (which are most prevalent during heavy rains/flooding). These varieties should also prove to be more suitable in drought conditions. They have also provided diesel powered irrigation pumps to two villages, benefiting approximately 35 farmers. It is intended that these will extend the duration of the cultivation period and offset the impact of drought. EFICOR has also facilitated tree plantation.

Community-led entrepreneurship

When EFICOR supplied toolkits to repair hand pumps to the villages, the intention was to ensure that communities could be responsible for maintaining their own hand pumps. During 2004, eight villagers reported that they had begun to use these toolkits to repair pumps in other villages, earning 300 Rupees (approximately £3.60) per repair. This was used to supplement their agricultural income.

Impact of project

The Godavari river in Khammam District is prone to flooding, inundating adjacent farm land.
Photo: Paul Venton/Tearfund

By integrating development with disaster management, EFICOR has been able to create changes in the communities where it works that are sustainable in the face of hazards. Vulnerability and capacity assessment has been key in this process. The impact of the disaster management activities can be described in a number of categories: natural, physical, human, social and economic, as used in sustainable livelihood analyses.

Natural

Flooding and drought primarily impact crops, and EFICOR has responded by introducing a pilot programme trialing improved varieties of rice, cotton, chilly and okra considered more suitable to the hazard characteristics of the region.While it is difficult to measure the impact of this initiative based on a single year's results, this mitigation approach has the potential to significantly improve household food security (also see 'economic' category).

Physical

EFICOR's primary initiative to reduce vulnerability has been in relation to water supply. Previously, many villagers had to walk 1-2 km to get drinking water during droughts, because government-installed hand pumps dried up (see the Summary of Cost Benefit Analysis for greater detail). During flood times, these wells become blocked and contaminated. By installing raised hand pumps, with deeper pipes, EFICOR has ensured a water supply for villages in both flooding and drought conditions[2]. Because the flooding is relatively brief, and there is nearby high ground, villagers do not report loss of other assets, such as tools and household goods. The provision of diesel powered irrigation pumps has also benefited villagers by allowing easier distribution of water to crops.

Human

While the loss of life as a result of both hazards tends to be minimal, illness is a significant secondary problem. EFICOR's training and capacity building activities have strengthened the community's ability to cope with illness.

While the number of cases of illness during droughts and floods has not necessarily decreased, first aid training has helped villagers to feel more confident about dealing with minor illnesses and injuries, and in identifying and referring problems that require medical attention. New skills have also been imparted through the hand pump caretaker training programme and the technical support for growing alternative seed varieties.

Social

As a result of the capacity building and training inputs, villagers are better able to organise themselves and feel more confident. Young people are trained in rescue and evacuation techniques, and show pride and strength in demonstrating their new team skills. Villagers frequently mention that flooding has become less of a problem in their community. This is not because the levels or duration of the floods have changed, but because they feel empowered through their training to deal effectively and in an organised fashion with the hazard

The establishment of farmers' groups has helped to facilitate the exchange of information. EFICOR has also been instrumental in establishing women's Self Help Groups that have empowered women and given them a voice in the community, as well as ensuring that women are a part of the Disaster Management Committee.

Villagers feel confident that they can manage the hazards they face.
Photo: Courtenay Cabot Venton/ERM

Villagers feel empowered through their training to deal effectively with the flood when it comes

Economic

Drought is a relatively new hazard and poses the most significant threat to livelihoods. If droughts intensify, it could change the viability of living on the land as is experienced in other districts of Andhra Pradesh. EFICOR has had important impacts on the community's approach to safeguarding agricultural income. Their pilot cropping programme is helping villagers to experiment with alternative seeds and cropping patterns that are conducive to flood and drought conditions, thereby reducing the threat of crop failure. This programme is supported by the introduction to farmer's groups of diesel powered irrigation pumps to supply agricultural land with river water. EFICOR has also undertaken important training and capacity building activities to enhance farmer awareness and understanding of alternative cropping patterns, thereby reducing the vulnerability inherent in mono-cropping.

Above:While some own small plots of land, many villagers work for landowners in their rice fields.
Photo: Geoff Crawford/Tearfund

Left: A raised hand pump with deep tube well installed by EFICOR to help ensure access to clean water during floods and drought.
Photo: Courtenay Cabot Venton/ERM

Root causes of vulnerability

Many grow chillies as a cash crop, which is sold into local markets for export.
Photo: Courtenay Cabot Venton/ERM

Communities in Khammam provide a good illustration of adaptation to local conditions. For example, with regard to the flooding, each village acknowledged that the floodwaters bring important benefits to their crops, and therefore they are content to move to higher ground for a short period each year. They report that for much of the year they have food, work and some savings, all of which can help to reduce vulnerability. However, future concerns over the severity of floods and droughts could overwhelm existing coping capacities.

Vulnerability and capacity assessment at the community level is key to successfully identifying the weaknesses of the community, and building on existing strengths, both apparent and hidden. However, in order to effect long-term change it is important to address the root causes of vulnerability.

Firstly, villagers report that they do not have access to government programmes, such as irrigation facilities and housing development projects. In most instances, villagers have not been able to meet the requirements stipulated by local officials so as to be included in the government programmes, and have been unfairly excluded. Additionally, tribal farmers are frequently not even aware of government schemes set up specifically to benefit STCs (Scheduled Tribes and Castes). The lack of irrigation facilities, sometimes provided through government schemes, has been cited as a particularly important problem for villagers. This is because of their dependency on rain-fed agriculture, which makes them more vulnerable in times of drought.

Secondly, villagers are vulnerable to external market forces for the prices obtained for their crops. Many grow chillies as a cash crop, which is sold into local markets for export. Trends in globalisation and international market forces have brought down the price of chillies in recent years, and this has in turn reduced farmers' income.

Thirdly, farmers are often reliant on each seasons' crops to provide resources for the next season. Thus, if the summer crop is not good (for example, if the flooding is severe), farmers do not have adequate resources to plant their winter cash crop. Consequently they are forced to lease land to the wealthy, and then to work on that land for a small wage. Thus they lose the potential benefit from having a cash crop. A lack of banking services, savings schemes and affordable credit are all contributory factors.

Future directions

In order to break the cycle of vulnerability, urgent actions need to be taken – not just confined to the local level, but also in connection with government planning and international forces that can affect people's vulnerability.

At the community level, development projects need to integrate disaster risk reduction activities. EFICOR is demonstrating how this can be achieved through measures such as the introduction of alternative cropping systems and hand pumps that suit the hazard characteristics of the region. The economic argument for this approach, highlighted in the Cost Benefit Analysis (see text box), should encourage others to invest in disaster risk reduction.

The findings of this study can also be used to influence government development planning. For example, if future government hand pumps were installed to a deeper depth and on suitable raised platforms, their benefits would be considerably enhanced. Also the village level contingency plans, drawn up in the EFICOR villages, could be linked to existing government emergency procedures at District and Block/Mandal level to improve the effectiveness of disaster response.

Finally, advocacy is a crucial component to ensure that the root causes of vulnerability are addressed. For instance, awareness and access to government programmes for Scheduled Tribes and Castes (STCs) could be improved. In addition more could be done to ensure farmers secure a good price for cash crops. This could include the creation of farmer's cooperatives and may even require the expansion of the project's influence to challenge macro-scale trading arrangements[3].

Red hot chillies.
Photo: Courtenay Cabot Venton/ERM

Low-lying hand pumps can be rendered useless in times of flood, and many do not draw water in times of drought.
Photo: Courtenay Cabot Venton/ERM

In order to break the cycle of vulnerability, action needs to be taken – not only at the local level, but also at the national and international level.

Summary of Cost Benefit Analysis

A Cost Benefit Analysis (CBA) of the installation of raised hand pumps in Khammam district, AP, by EFICOR demonstrates that for every one Rupee spent, 13 Rupees-worth of quantifiable benefits have been achieved[4]. This assessment is particularly important because it highlights the value of integrating disaster risk reduction into development programming. Because the government hand pumps are shallow, they dry up during the drought, requiring households to walk long distances to collect river water, in turn creating health problems. EFICOR, by taking account of the drought problems, digging deeper wells and installing raised platforms, has been able to provide a consistent year-round water source. While these wells are much more expensive, when viewed in light of the time and health savings, they are clearly a financially-sound investment to meet the immediate needs of the villagers. The introduction of alternative crop varieties may also have a significant economic benefit, but it is too early to quantify this, and harder to establish a conclusive causality, as various factors influence crop yields.

For full report see: Courtenay Cabot Venton and Paul Venton, Disaster Preparedness Programmes in India: A Cost Benefit Analysis, Network Paper 49 (London: ODI, 2004)

A man collects water from the Godavari river and carries it back to the village.
Photo: Paul Venton/Tearfund

‘More effective prevention strategies would not only save tens of billions of dollars, but tens of thousands of lives. Funds currently spent on intervention and relief could be devoted to enhancing equitable and sustainable development instead, which would further reduce the risk of war and disaster. Building a culture of prevention is not easy. While the costs of prevention have to be paid in the present, their benefits lie in a distant future. Moreover, the benefits are not tangible; they are the disasters that did not happen.’

Kofi Annan, Annual Report on the Work of the Organisation of the United Nations, 1999

NOTES

1 Particularly devastating cyclones affected Andhra Pradesh in 1977 and 1996.

2 While the long term sustainability of drilling deeper wells is debatable, there is an immediate need for clean water supplies

3 See, for example, the work of Fair Trade, www.fairtrade.org.uk

4 A sensitivity analysis of the CBA, that varies the duration of the drought, shows that this value could potentially range from 3.7 Rupees to 20 Rupees

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