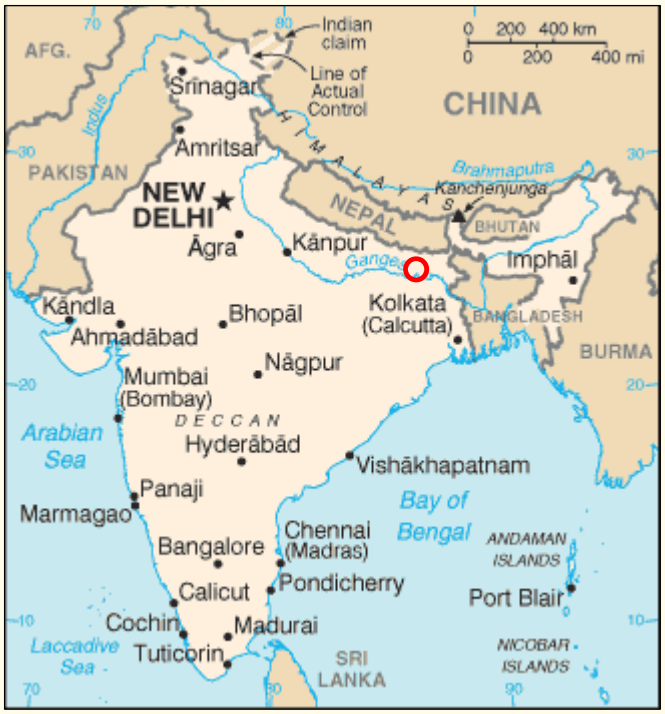
INDIA – Dharbanga District, Bihar



Community-Based Disaster Risk Reduction in the Indian State of Bihar

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.

Bibliographical reference: Paul Venton and Courtenay Cabot Venton. *Community-Based disaster risk reduction in the Indian State of Bihar*. Tearfund, Middlesex, 2005.

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.

Community-based
disaster risk reduction
in the Indian State of Bihar

21 million people were affected by the devastating floods that inundated vast areas of Bihar in July 2004.
Photo: AP/Wide World Photos

TEARFUND
CHRISTIAN ACTION WITH THE WORLD'S POOR

case study
Disaster Management

Summary

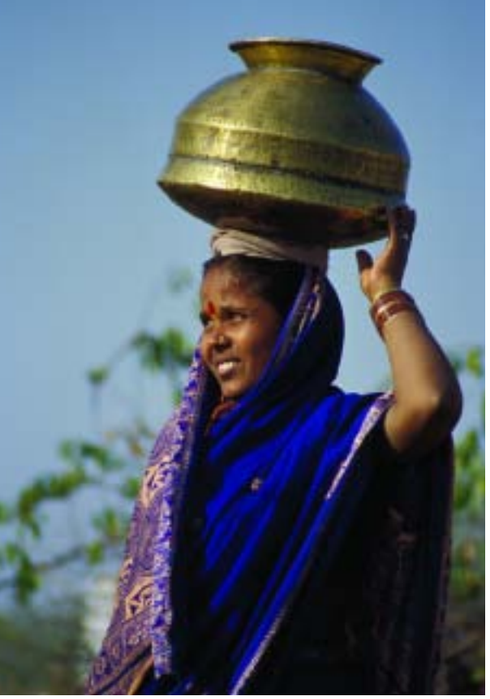
This case study highlights the chronic vulnerability to flooding that affects millions of people in Bihar, India, on a regular basis. It explains how their lives and livelihoods are affected and outlines some of the causes of their vulnerability. However, it also emphasises the positive impact that an Indian NGO is having in supporting and motivating vulnerable groups to cope with the flooding and find ways to reduce this recurrent risk of disaster. The principles of addressing vulnerability and its causes within Bihar, as demonstrated here, can be adapted and applied to suit other contexts.

Discipleship Centre (DC), a Delhi-based Indian NGO, has been implementing development programmes in the Dharbanga district of North Bihar for over ten years. In response to the devastating effects of flooding in 2002, DC responded with relief work in five villages. Recognising the need for vulnerability reduction in these areas, it began a Disaster Mitigation and Preparedness (DMP) programme in October 2002 to reduce the impact of flooding and address the causes of vulnerability.

Through the use of a participatory approach, DC has successfully motivated villagers to undertake risk reducing activities and increase capacity to cope. Specifically, DC has provided both physical help, through the supply of boats, raised hand pumps, and escape roads, and community capacity building, through the establishment of Village Development Committees (VDCs), women's Self Help Groups (SHGs), micro-finance schemes and volunteer training. DC has subsequently expanded this approach to benefit new villages in the district.

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

Volunteers from a Village Development Committee practice their flood response skills.
Photo: Caroline Irby/Tearfund



Women are particularly vulnerable whilst living in crowded unsanitary conditions on the embankments.
Photo: Jim Loring/Tearfund

Background

Bihar is one of the poorest states in India. It has a total population of approximately 86 million, the vast majority of whom live in rural areas. In fact Bihar has the highest rural population in India, as well as the lowest rural incomes in the country. Over 50 per cent of the population live below the poverty line. Bihar is also one of the most flood-prone states in India. According to recent estimates by the World Commission on Dams, 56.5 per cent of India's flood-affected people are from Bihar. Three-quarters of them live in North Bihar.

North Bihar contains eight major river basins, all of which drain into the Ganga (Ganges) river. During the monsoon season (approximately June to August), these tributaries flood large tracts of land. This happens regularly every year. The intensity and duration of flooding can vary, but large numbers of villages are consistently affected, and their populations forced to evacuate to higher land.

Dharbanga district is typical of much of North Bihar. Villages are characterised by yearly floods, high levels of poverty due to a lack of employment opportunities, very limited infrastructure (poor communication channels, no public transport, limited schooling) and a strong caste structure. In fact a feudal-like system is in operation whereby the majority of lower-caste villagers live on land belonging to higher-caste landowners, in return for working in their fields.

Flooding in rural areas increased significantly following the building in 1974 – 75 of embankments to protect Dharbanga town from the floods. The severity of flooding increased again when the embankment heights were increased in 1987. Additionally, floodwaters in Nepal are sometimes released from dams without prior warning, contributing to more rapid-onset flood surges. As a result, even if rains are light in Bihar, there can still be flooding. Finally, the development of raised roads, without adequate culverts, has had the effect of trapping floodwaters and preventing run-off, creating stagnant pools that waterlog the area.

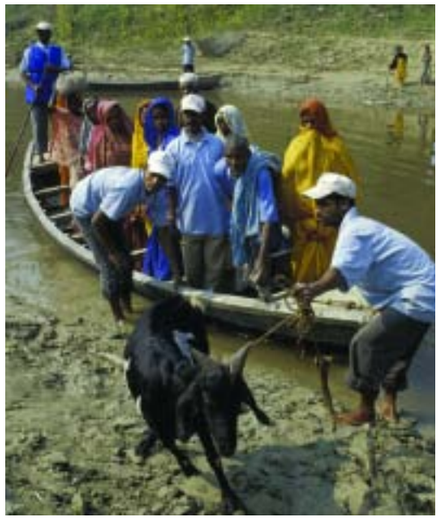
Ironically, when the floods arrive, villagers have to evacuate to Dharbanga town's flood protection embankments, often suffering loss of life, livestock and possessions. Village 'kutcha' homes (bamboo and mud walls with thatched or tiled roofs) are destroyed, and families are forced to live in bamboo and tarpaulin shelters on the embankments for the two to four months of flooding. Disease is common, and people are particularly prone to suffering skin complaints on the feet due to constant exposure to water. There is no cooking fuel, and employment is scarce. Women are particularly vulnerable as they have no sanitation facilities on the embankment, and are often left with the children as the men travel to find work. Children are unable to attend school and, in fact, the state government often closes schools during the flood period, resulting in state-wide education losses.

While the government provides emergency assistance, this is inadequate. Supplies are limited and not always usable – for example, rice may be provided, but villagers have no cooking fuel. When people return to their villages, they often find that low-lying water pumps have become blocked by silt and debris requiring repair.

56.5% of India's flood-affected people live in Bihar

Children are in danger from the flooding and are unable to attend school.
Photo: Photo: Courtenay Cabot Venton/ERM

Activities Undertaken



The goal of DC's Community-based DMP programme is:

'to prepare and enhance capacities of flood affected communities of 5 villages in Dharbanga district of North Bihar, to reduce vulnerability to floods and thereby protect their life, property and livelihoods.'

The project relies on a mix of physical interventions and social capacity building. Physically DC helped with the construction of an escape road, the building of a bridge and a culvert to aid communications between villages and allow floodwater to disperse, provision of boats for evacuation, and the installation of raised hand pumps.

Capacity building initiatives have included the establishment of Village Development Committees (VDCs), composed of members elected by the community, as well as smaller groups with specific responsibilities in the flooding (e.g. a Village Rescue and Evacuation Team, a Village Security Team, and a Flood Evacuation Centre Management Group). Each village has also established a women's Self Help Group (SHG).

Each community has created a Village Development Fund (VDF), with the help of DC. Households pledge to donate a certain sum of money each month to the VDF, and these savings are deposited in a local bank and supervised by the VDC members. The community maintains control over the funds, and uses them for mutually-agreed-upon activities, such as medical costs and boat repairs. As of June 2004, the five communities had saved a total of 21,000 Rupees (approximately £250).

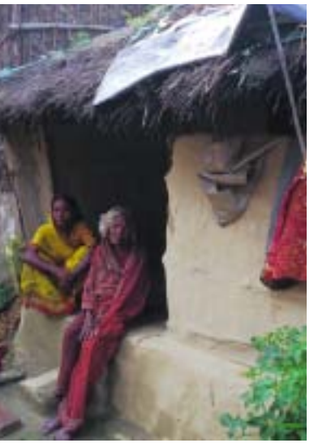
Far left: Volunteers organise an evacuation drill using a boat supplied by DC. They are also responsible for boat maintenance.
Photo: Caroline Irby/Tearfund

Left: A culvert through a raised road helps prevent water-logging by allowing flood water to escape.
Photo: Caroline Irby/Tearfund

The approach taken in this work has been instrumental in the success of the project. DC's entry point for each new village has focused on establishing trust and encouraging local ownership. Once the community decides that it wants DC involvement, DC uses Participatory Rural Appraisal (PRA) techniques to conduct disaster vulnerability and capacity assessments. Tools and techniques such as focus groups, hazard mapping and seasonal charts are used to gather data on the hazard, its impact upon the community and the vulnerabilities and capacities of the villagers. The next step is to help the community identify ways of reducing the risks to which they are exposed.

A village map, drawn by the community, using coloured dots to identify the most vulnerable households (perhaps those with elderly or disabled inhabitants). Prior to the flood season, red flags are placed on these houses so that people can quickly and easily be identified for priority evacuation.
Photo: Courtenay Cabot Venton/ERM

Impact of project



Most villagers live in mud, bamboo and thatch 'kutcha' houses that are frequently damaged or destroyed by the flood waters.
Photo: Caroline Irby/Tearfund

The DMP programme has had important impacts on the community, both through reducing vulnerabilities and by building on capacities. These can be defined in five categories: natural, physical, human, social and economic, as used in sustainable livelihood analyses.

Natural

The area is fairly rich in natural resources – for example, groundwater, forests and fertile soil. The programme has built on the existing resources by planting trees to increase soil stability and absorb floodwaters. However, during the flooding, nearly all crops are destroyed, either by submersion or excessive water logging of the soil. In response, farmers have changed their cropping patterns from year-round crops including maize, to crops that can be grown outside of the flooding season, such as wheat.

Physical

The few physical assets which villagers possess, including houses and tools, are frequently washed away by the floods. DC's programme has been able to reduce these losses. Perhaps the most significant has been the installation of raised hand pumps. These stay above flood levels, and therefore are still functioning after the flooding recedes, ensuring safe water supply for the communities. The use of the escape road and the boats has allowed speedy evacuation of villagers, especially the elderly and disabled, as well as livestock and possessions. While the programme

The raised escape road through a mango tree plantation aids evacuation of low caste villagers to safer areas.
Photo: Caroline Irby/Tearfund

has not been able to reduce the vulnerability of villagers to the loss of their homes, the establishment of the community fund in the longer-term may help to build more permanent 'pucca' structures. Raised platforms could also be a way of protecting 'kutcha' houses and the possessions stored within them.

Human

In all cases, villagers reported that the number of lives lost and the number of injuries due to the flooding had decreased, because of the availability of escape routes, boats, and the presence of trained teams of volunteers. Additionally, awareness of where the most vulnerable people live has helped to ensure that they are effectively evacuated. The DC programme has also initiated attitudinal change – villagers overwhelmingly feel that they now have the confidence to effect change and feel empowered to work towards development goals.

Social

A number of social issues impact upon these communities, perhaps most importantly the caste system, which causes substantial discrimination and lack of opportunities for development. DC has made significant steps towards reducing social vulnerability.

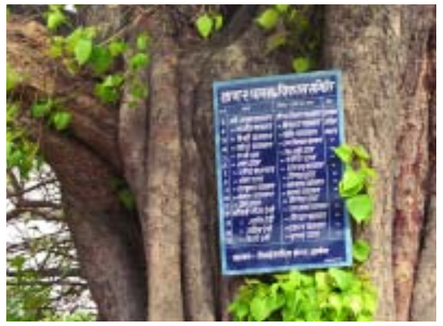
DC has worked with the Panchayats (elected council members for groups of villages) and with government-appointed Block Development Officers to raise awareness of people's vulnerability to flooding. Noticeable improvements have also occurred in relationships between the landowners and the landless. Villagers note that the landowners have become more sympathetic and helpful, despite caste differences, since the DC intervention. Villagers also cited that the creation of the VDC has greatly enhanced community relationships as well as increasing co-operation with neighbouring villages. There is a strong feeling that they have gained more confidence and have a greater sense of control over their development path.

The women's SHG has had a similar effect. Not only do the women have their own group, but they also have committee members as a part of the VDC and have received training under the DC programme. There is a marked improvement in the status of women in the community, and their increased self-confidence is evident.

Improved social organisation has led to the drafting and agreement of flood contingency plans, so that all know where to go and what to take when the evacuation signal is given. Life on the embankments has been significantly improved, by advance clearance of scrub and allocation of plots for specific purposes.

Economic

Communities in this area are extremely vulnerable economically, due to lack of land ownership and reliance on the landowners, lack of savings and lack of employment opportunities. Villagers earn on average 30 Rupees (approximately 40 pence) a day for their work in the fields, and only have work for approximately 110 days of the year. Communities are dependent upon moneylenders, and often have to borrow at 10 per cent interest (monthly) to buy medicines, repair homes, etc. The key economic impact of the DC programme has been the establishment of the Village Development Fund. This provides an important resource for the community, by providing a source of credit at 3 per cent interest (monthly), allowing the community greater access to goods and services (including agricultural tools and animals).



Far left: Raised platforms for hand pumps ensure that the flood waters do not contaminate or prevent access to water supply.
Photo: Caroline Irby/Tearfund

Left: The VDC members' names are displayed to enhance commitment and pride and to encourage accountability.
Photo: Courtenay Cabot Venton/ERM

In 2004, the DMP programme was integrated with existing DC development activities in Dharbanga District, and expanded to include ten new villages. To help achieve this, DC brought together members of the VDCs and women's groups in the original DMP villages, with representatives of the new villages to help build vision, trust and motivation for change. By replicating the programme among increasing numbers of villages, the benefits outlined above will reach a growing percentage of the population, initiating a cycle of progress.

Building relationships and breaking barriers

The DC intervention has improved relationships between the landless and the landowners. For example, in order to build an escape route, DC had to support community negotiations with 50 different landowners to allow access across their land. All agreed, and even donated food and drink for the villagers as they worked to build the escape road. This agreement was achieved partly by emphasising the added benefits of the escape route to the landowners themselves (who are better able to harvest and transport their mango crop in non-flood periods). Lines of communication have been opened up between caste groupings and levels of understanding have increased.

Photo: Caroline Irby/Tearfund

Root causes of vulnerability

Millions of people are forced to take refuge for many weeks on high ground every year.
Photo: Caroline Irby/Tearfund

Vulnerability and capacity assessment at the community level is key to understanding why the flood hazard affects people so severely. However, in order to effect long-term change, it is important to address the root causes of this vulnerability and to build upon existing capacities.

In Dharbanga, the DC programme has been able to very successfully build social capacity and equip communities to cope with floods, while also laying the foundation for further development. However, because villagers are forced to move to the embankment each year, they still face severe impacts including illness, loss of work, loss of education and loss of homes. These impacts cannot be reduced without addressing the root causes of people's vulnerability. These can be broadly identified as:

- lack of land ownership
- lack of work opportunities
- cultural beliefs regarding the caste system
- government prioritisation of other interests
- lack of integration of vulnerability reduction into development planning
- lack of international cooperation between Nepal and India regarding flood management.

The low caste villagers work the land for high caste landownwers.
Photo: Caroline Irby/Tearfund

Each of the five villages is located on the floodplain, on land owned by others. The landless villagers are all stuck in a cycle of poverty, where each year the floods destroy their houses, and in the following months they have to borrow to rebuild their homes that will again be washed away in the next flood season. They cannot move to high land because they do not own any land and do not have the economic resources to buy new land. So long as the communities are forced to move to the embankment, they will continue to suffer.

Further fuelling this cycle of poverty is a lack of work opportunities. Villagers work the land for the landowners, but this only provides them with a third of a year's work. While some alternative employment exists, such as making bricks and running rickshaws, men often have to migrate to other parts of the country in search of work. Lack of land and lack of jobs are further exacerbated by the cultural beliefs and the caste system, which discriminate against these groups.

While the Government has made clear choices to prioritise the town of Dharbanga and the development of industry (through creating the embankments), this focus has made villages outside the embankments more vulnerable to the flooding. The Government does initiate development activities in these villages, but disaster risk reduction has not been integrated into these efforts. For example, while hand pumps have been installed to supply clean drinking water to many of the villages, these pumps are often flooded and rendered unusable. Therefore they do not achieve the development objectives of the Government.

Bihar flood of 2004

Twenty-one million people in need of international co-operation

Following heavy monsoon rains in Nepal during July 2004, the Nepalese government were forced to open dams to release the trapped water. However, no warning reached the downstream communities across the border in India. The Kosi, Bagmati and Ganga rivers burst their banks inundating large areas of North Bihar, including Dharbanga District that had not even experienced any serious rainfall itself.

The floods were considered by the local media to be amongst the worst in 50 years. Yet again people were left with no alternative but to evacuate their homes, with the majority taking refuge on the embankments and road-sides without proper shelter, clothes, food or drinking water. Over 21 million people[1] were affected as 1.5 million hectares[2] of agricultural land was flooded. Around 674,000 houses[3] were destroyed with many more being damaged. 585 people[4] lost their lives.

The Village Development Committees, set up by DC in the villages, swung into action as flood response teams took up their designated roles. Pre-determined evacuation procedures were followed. The most vulnerable members of the villages were prioritised for transportation by boat to safety, and the remainder of the villagers followed along with livestock. They took up shelter under temporary bamboo and plastic sheeting structures that had been assembled ahead of time. The VDC then coordinated the distribution of food items; with DC support VDCs were able to help 3,450 households. The flood response teams even helped villages other than their own.

The difference between DC's DMP villages and others in the District that had not benefited from this approach was clear. The latter were characterised by a lack of warning systems, a lack of resources for evacuation and general disorganisation. The particularly vulnerable were not systematically assisted by the community. Overall there was a delayed and ineffective response to the flood resulting in heavy losses of life, livestock and household belongings.

Despite the significant efforts by DC staff and the villagers, sadly the former VDC Secretary, Mr. Sakhi Chand Paswan of Choti Balwahi village lost his life in the flood.

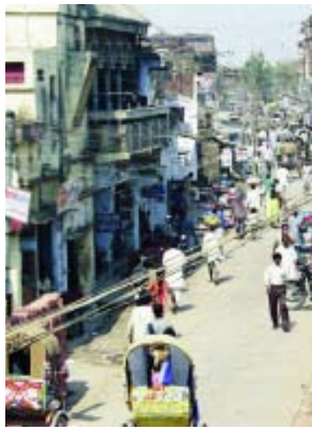
Future directions

In order to break the cycle of vulnerability, action needs to be taken, not only at community level, but also at government level. At community level, development activities need to integrate disaster risk reduction activities, utilising effective vulnerability and capacity assessment methodologies. DC is successfully demonstrating how development work can be made more effective by incorporating vulnerability reduction. They are also demonstrating the economic argument for tackling vulnerability which should encourage others to invest in disaster risk reduction.

Advocacy is an essential component to ensure that the root causes of vulnerability, such as land ownership, caste discrimination, a weak labour market and a lack of international cooperation between Nepal and India regarding flood management, are addressed. Policies that detrimentally prioritise town over village may also need to be questioned, debated and challenged. When the community was asked about the 'solution' to its flood problem, it said that the embankments should be torn down. The government officials, however, when asked the same question, felt that the embankments should be heightened.

The UNDP has set up a disaster risk reduction programme for Bihar State, which is working with the Government to reduce vulnerability. Initiatives linking together government-level policies with the "bottom-up" approaches of community-based NGOs, could be very beneficial and effective at addressing some of these root causes. There is thus a clear role for NGOs and other groups to provide links between local-level disaster management and the higher-level forces that influence and create vulnerability.

Women in Bihar play a critical role in addressing the reduction in vulnerability.
Photo: Courtenay Cabot Venton/ERM



Dharbanga town is protected by the flood embankments, however even they were breached by the severe flooding in July 2004.
Photo: Paul Venton/Tearfund

A Bihari woman, on a floating raft, manages to draw clean water from a hand pump before it is submerged under rising flood waters.
Photo: AP/Wide World Photos

Summary of Cost Benefit Analysis

A Cost Benefit Analysis (CBA) of the DMP programme in Bihar demonstrates that for every Rupee spent on the programme, 3.8 Rupees in quantifiable benefits have been achieved. This estimate includes many impacts from DMP such as the avoided costs of repairing hand pumps, the reduced loss of household possessions, tools, and livestock, the reduction in loss of life and injury, and the avoided costs of boat rental. However, there are additionally many benefits that are more difficult to value, such as community confidence, gender-related impacts, and reduced stress.

An isolated assessment of raised hand pumps illustrates the importance of integrating DMP into development. Low-lying hand pumps are rendered useless during flooding because they are submerged and often blocked by silt and debris, requiring repair. DC integrated their understanding of the disaster situation into their development work, and built raised hand pumps. A CBA of this initiative demonstrates that for every one Rupee spent on raised hand pumps, 3.2 Rupees of benefit are realised, in sharp contrast to the low-lying hand pumps, which do not provide any benefit once blocked.

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)

Low-lying hand pumps are rendered useless during flooding because they are submerged.
Photo: Caroline Irby/Tearfund

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'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 UNDP SITREP 02/08/04

2 Ministry of Home Affairs, Government of India SITREP 03/08/04

3 Disaster Management Department, Government of Bihar

4 Ministry of Home Affairs, Government of India SITREP 03/08/04

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