

ADVANCED CENTRE FOR ENABLING DISASTER RISK REDUCTION

Research Brief 1

The Role of Research in Disaster Risk Reduction

The Advanced Centre for Enabling Disaster Risk Reduction (ACEDRR) has supported practitioners to engage in a number of research studies on specific aspects of disaster risk reduction. These studies have already impacted some of the decisions made at the field level by development practitioners.

What is the role of research in disaster risk reduction?

Aid practitioners often do needs assessments, monitoring and evaluation as part of their projects. Needs assessments answer the question, *what are this community's felt needs, and which of those needs can we address to have the biggest impact?* Monitoring and evaluation checks progress against a logframe, answering the question, *to what extent did we do what we said we were going to do?*

While these very practical inquiries do anchor and inform how aid practitioners implement their programs, there is room for research to answer the question, *what are the actual critical and systemic issues that are keeping people here vulnerable?* Only by answering this question will aid agencies be able to improve the way they implement disaster risk reduction programs.

But humanitarians and development workers are hesitant to undertake the research that could answer this question, fearing that research would be costly and time-consuming, and believing that precious resources would be better spent implementing programs.

The Advanced Centre for Enabling Disaster Risk Reduction (ACEDRR) at the Tata-Dhan Academy believes that there is an alternative to classical research, which can meet these needs



and help disaster responders and development practitioners to implement their programs more effectively, ultimately allowing them to enact more sustainable and cost-effective programs.

For this reason, ACEDRR has supported DHAN Foundation researchers to undertake three descriptive research investigations, each one specifically designed to inform DHAN's development activities to increase resilience of some of Tamil Nadu's poorest communities.

The first project looks deeply into the factors that threaten biodiversity and fishing activity in Palk Bay, Tamil Nadu, and comes up with recommendations to address these threats.

The second research project is an investigation into changing rainfall patterns in three areas of Tamil Nadu: Vellore, Nagapattinam and Madurai. This research analyzed rainfall patterns and made suggestions about the types of alternative crops that should be planted after considering how the rainfall patterns were shifting or changing.

The third research project was a risks and vulnerability mapping of 10 villages. The research looked deeply into the risks and vulnerability factors of 10 communities in Nagapattinam in order to lay the groundwork for future disaster management work in these communities.

These research projects for disaster risk reduction demonstrate different relationships between researchers and practitioners with each other, and between researchers and community members.

One lesson from these projects is about how research institutions, NGOs and communities can work together to reduce the disaster risk of the very poorest people in the world.

Types of Research

The research that ACEDRR undertook in its first phase, and that are presented here, are descriptive research projects. The aim of descriptive research is to describe data and characteristics about the population or phenomenon being studied.

Descriptive research does not allow researchers to demonstrate a causal relationship between the statistics and characteristics they find, but it does present the landscape of a scenario, one that would allow a reader, perhaps a practitioner, to identify ways and methods by which they could intervene.

Each of these projects was conducted by a team of DHAN's development experts who intended, from the very beginning, to use the research to improve the lives of the poor communities

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with whom they work. By having practitioners conduct the research, ACEDRR is taking advantage of the experts' familiarity with the issues, and desire to find solutions to real and pressing problems. Despite the fact that their experience brings clarity, it might also bring bias. Even though these projects are intended to be used directly for practice, it is important for practitioners doing research to work closely with advisors who can ensure that research is high-quality and objective.

DHAN calls this development research—research conducted for the express purpose of informing development programs.

While this type of research may not have the formal validity required by classical research, it does have a strong action component. And, where classical research might sit on a shelf in a library somewhere, the findings from each of these projects have already improved the accuracy of development interventions and improved the lives of the poor.

Risks and Vulnerability Mapping

Identifying the risks and vulnerabilities of the local communities is the first important step in the management of disasters. It lays the foundation for further disaster preparedness and mitigation activities. This pilot project explores how the coastal communities are affected by various hazards, what the factors are that cause the vulnerability of the local communities and how the communities manage disasters.

The research has generated risks and vulnerability maps for ten coastal villages. The maps are useful to reduce the vulnerability of these specific communities. The information available in the pilot report will be useful in preparing the contingency plan before disasters, and in implementing the plan during and after disasters.

ACEDRR supported a team of practitioners to undertake a pilot project in which they used participatory rural appraisal methods to help 10 villages in Nagapattinam map their vulnerability to future disasters. “We wanted to find out what makes people feel vulnerable,” said Gayathri, a leader on the project. The importance of this project is that it places a high value on the opinions of vulnerable people themselves.

By guiding community members through a transect walk, the creation of a community map, wealth rankings and seasonal calendars, the practitioners were able to get a sense of the major threats to the lives and livelihoods of people in these villages in Nagapattinam.

Because these villages sit near the notoriously wet Cauvery Delta, floods are their biggest regular threat. However, after a flood

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VULNERABILITY PROFILE OF NAGIPATTINAM

This pilot project took place in Nagipattinam, a coastal district of Tamil Nadu, which has its own unique set of disaster risks.

Nagipattinam is an area that faces frequent cycles of droughts and flooding. In the last 40 years, the area has suffered from 5 floods and 6 droughts. More than that, the Cauvery delta region of the district is known for occurrence of floods and droughts in the same year.

For example, from 1983 to 1984, the Southwest monsoon was very weak and rainfall was low. The inflow of water from Mettur reservoir was almost non-existent. This led to drought conditions from July to October 1983. Crops died, and farming families suffered.

With the onset of the northeast monsoon, from October to November 1983, paddy was planted. In December 1983

and into the new year, there were heavy rains in the delta. These led to unprecedented floods in Nagapattinam. Unfortunately, floods also ruin a farmer's crops. Only farmers who own land get government compensation for crop loss due to floods. Farmers who lease or borrow land received no compensation. This law is still in effect today.

Though farmers cannot control the weather, with a little advanced warning they can save their valuables and their families. Because floods occur as a result of heavy rains from monsoons, cyclones or storm surges, or from an overflow of the Mettur reservoir, they can often be predicted a few days before the occurrence.

In that case, an early warning is given on All India Radio and Television. When the warning is given, villagers make arrangements to keep their things in a safe place, and if necessary, seek shelter with family members in the upland areas.

communities face epidemics of water borne diseases. Droughts are also common.

Rather than simply map vulnerabilities though, this project went further. It helped community members take action to reduce their vulnerabilities. After the community had a clear diagram of their risks and hazards, they divided themselves into groups of volunteers—first responders who would jump to action when a hazard strikes.

Some of the villagers joined an early warning group, who would alert their neighbours when a hazard was approaching. Others signed up to conduct search and rescue missions, to evacuate their neighbours, to remove dangerous debris, or to administer first aid.

While this study focused only on integrating disaster risk reduction into the daily lives of vulnerable people, it has lessons to share with MFIs. For example, in Sri Lanka, the popularity of MFIs might be improved if they created products in conjunction with a community to address the vulnerabilities and hazards that threaten community members on a daily basis.

By mapping the vulnerability of poor communities with community members, self-help groups or corporate MFIs can determine which types of activities and products can best reduce disaster risk. These activities can also generate a market for microfinance products by helping vulnerable people better understand how such products will mitigate their daily risks.

Self-help model microfinance groups may be better situated to implement these kinds of participatory vulnerability mapping and

community-based response planning activities. While corporate MFIs can encourage or require their clients to undertake disaster risk and vulnerability assessments as part of their application process, if people lack interest in MFI products anyway, as evidenced by the Sri Lanka study, it's unlikely that stricter application requirements will bring them on board.

Disaster Risks and Vulnerability and the Livelihoods of Traditional Fisheries: A Study in Palk Bay Region, Tamil Nadu

There are 7.9 lakh individuals in Tamil Nadu whose livelihoods rely on the fishing industry. These are not just fishermen, but people who are involved in fish drying, selling, net making and mending, boat construction, fish transport, fish handling, fish processing and fish marketing. Anyone working in these professions relies heavily on a healthy and thriving fishing industry, which in turn, relies heavily on the conservation of fish stocks.

The ecosystem of Palk Bay, which contributes to the rich marine fish production in the region at present, is under threat due to destructive fishing habits. The indiscriminate use of habitat-destructive fishing practices like bottom trawling, coral mining, dynamite fishing, and effluent disposal from aquaculture farms, contribute to the destruction of the most important marine ecosystems in the region. This would lead to a definite reduction of fishery resources in the region, ultimately affecting the fishing activity and particularly the traditional fishers in the region of Palk Bay.

The study aimed to understand how the socioeconomic status of traditional fisher folk has changed over the years, to understand the impact of natural disasters on the ability of these fishing families to earn a living, and the role of different programs in protecting and promoting the livelihoods of these communities. Researchers hope that the findings will illuminate new areas of intervention for practitioners.

The study used stratified random sampling to select 300 households in six villages, based on whether motorized craft made up the majority of fishing boats, or whether non-motorized craft made up the majority. Researchers collected primary data by conducting detailed surveys with men and women in fishing families here. They also held group discussions in seven villages, only one of which corresponded to the villages where they conducted surveys, in order to understand the broader issues faced by fishing families who rely heavily on coastal natural resources.

The indiscriminate use of habitat-destructive fishing practices like bottom trawling, coral mining, dynamite fishing, and effluent disposal from the aquaculture farms, contributes to the destruction of the most important marine ecosystems in the region.



A researcher consults with residents during the research process. Participation by local community members is a critical component of all of DHAN's work.

Researchers bolstered their primary data with secondary data from relevant departments and research institutions, like the Department of Fisheries, and the Bay of Bengal Program, the Central Marine Fisheries Research Institute, among others.

Mechanised Craft			
Year	No. of craft	Marine fish production in tonnes (in percent)	Catch per craft in tonnes
1977	1855	24220.56 (12.00%)	13.06
2005	7711	298559.90 (76.61%)	38.72
Artisanal Craft			
1977	34190	177617.44 (88.00%)	5.20
2005	46709	95557.87 (24.52%)	2.05

From this work, researchers found that traditional fishermen, fishermen using artisanal or non-mechanized boats, are facing stiff competition from an increased number of mechanized boats in the area. The number of mechanized fishing boats and the catch per trawler has increased since 1977. While the number of traditional fishing boats has also increased since 1977, the fish catch per traditional fishing boat has significantly declined in the same time.

In addition to increased competition for fish, traditional fishermen, and everyone in the fishing industry, face declining fish stocks as a result of unsustainable fishing techniques.

Eighty five percent of respondents reported no benefit from NGOs, and the benefits reported from research institutes were almost nil.

In addition to drawing conclusions about greater need for housing, sanitation and public health initiatives, among other things, the researchers conclude that the risk of fisher folk to natural disasters is less pressing than their risks of livelihoods disasters. As a result, researchers recommend that practitioners help fisher folk strengthen their livelihoods by organizing themselves into groups, by gaining access to healthy credit through self-help groups or cooperatives, and by improving market access. They recommend that practitioners help community members diversify their livelihoods by adding value

to their fish catch through creating alternative products: for example, by drying and packaging fish, fisher folk can sell their wares at a higher price. Researchers also recommend formal education and community aquaculture to help diversify fishermen's livelihoods. Researchers recommend that practitioners help communities stabilize their livelihoods by creating and implementing effective policies around restricting the number of crafts that are fishing, and that the community work together to manage coastal resources. They suggest using the partnership model, where the government, non-governmental organizations and community members work together as partners.

The outcomes would help DHAN to fine tune its development plan of the people institutions already in function in Palk Bay, and take up necessary capacity-building initiatives to diversify the livelihoods of the coastal community. From this study, DHAN will initiate a campaign in coastal areas highlighting the need for conservation. The study is helping DHAN to fine tune its policy initiatives towards sustaining the livelihoods of the traditional fishing community, towards coastal resource conservation.

Rainfed Farming

Rainfed farmers in various parts of Tamil Nadu are very clearly dealing with the effect of climate change. Once predictable rainfall is increasingly varied and violent. Some farmers say that they are not getting rain in the critical months of the cropping season, others that the southwest monsoon has completely disappeared making groundnut impossible to grow. They agree, though that rainfall distribution is changing rapidly, and that the total amount of rainfall has declined in the last two decades.

As a result, frequent crop failure, by drought or excess rainfall, is common in rainfed areas. These disasters are compelling farmers to find coping mechanisms or else give up farming and find other ways of making their livings.

The goals of this study were to evaluate the existing cropping patterns employed by farmers in areas where rainfed farming is still a thriving source of income for farmers. The researchers would determine the strengths and weaknesses of these cropping patterns with regard to available rain. In order to do this they compiled and studied 40 years of rainfall data to determine trends in rainfall. They used these to identify the potential component crops and derive new cropping patterns given the realities of rainfall trends and that are socially and economically viable and environmentally adaptable.

The researchers cross checked their rainfall data with farmer's own experiences in three disparate areas of Tamil Nadu:

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Nattarampalli in the Vellore district, Vedaranyam in the Nagapattinam district and Tirumangalam in the Madurai district. While farmers suggested alternative cropping strategies based on this rainfall, they quickly learned that farmers take more into consideration than the rain when they plant.

For example, some farmers were able to keep plants producing for long after their traditional growing season if it was lucrative to do so. Many farmers made cropping decisions based on seed cost and sale price of the final good, to determine whether the crop would be marketable. Researchers, who came to the villages with suggested alternative cropping patterns in hand, soon realized that no solution that was not considered and agreed upon by farmers would take root.

Because farmers design cropping patterns by taking into account factors beside rainfall (the need for dry spell in the crop period for optimum growth, the ability of the crop/variety to withstand moisture stress/excess moisture, the ability of the crop to use dew, the soil moisture availability), rainfall analysis should be grounded in the vast reserve of real life experience of farmers, through repeated structured interactions with them, both for data inputs and for reality checking of the inferences.

“The samples we have taken varies drastically from place to place,” said Palanisamy, lead researcher on this study. [Rainfall data] cannot be extrapolated from district level data collection sites.

Researchers also determined that other researchers studying this issue should collect specific rainfall data from sites very close to target communities. “The samples we have taken varies drastically from place to place,” said Palanisamy, lead researcher on this study. It cannot be extrapolated from district level data collection sites.

After the project was completed, researchers completed pilot projects with three disparate regions, to look examine at micro level coping mechanisms in order to determine more useful recommendations than those in this report.

Conclusion

ACEDRR has made it its mission to determine the best kind of research for disaster risk reduction, including research that might help practitioners prepare communities for major hazards, and reduce their vulnerability, microstudies that can be implemented in one week, immediately following a disaster, that could help inform the response, and action research that could help target recovery efforts and allow those affected by the disaster to have more ownership over their wellbeing.

While these types of research diverge from classical, academic research, they bring the kinds of deliverables that development practitioners are looking for.

Project Summaries

Risks and Vulnerability Mapping: A Study in Coastal Villages of Nagapattinam District

Objectives

- To identify and map the risks and vulnerabilities of ten villages of Nagapattinam district.
- To identify the factors contributing to the vulnerability of the community to various disaster risks.
- To suggest specific measures for incorporating in the preparedness plan in response to various disaster risks.

Methods

- Mapped the vulnerability of ten villages using participatory research tools like time line analysis of disaster, social and resource mapping with disaster prone areas, pair-wise ranking of disasters, pair-wise ranking of critical facilities to disasters, seasonality analysis of disasters, and focus group discussions.
- Helped 10 villages begin planning a disaster atlas and a contingency plan to address common hazards.

Outcomes

- A map of the causal factors of disasters, the vulnerabilities of the community, the prediction of disaster and early warning systems, the nature of damage experiences, and local coping mechanisms for seven hazards common to Nagapattinam district (floods, cyclone, tsunami, drought, epidemics (human and cattle) and crop pests).
- Ten villages more aware of their risks and vulnerabilities and poised to engage in disaster risk reduction activities to reduce their vulnerabilities.

Lesson Learned

- Despite the huge impact of the tsunami, more people are affected every year by floods.
- Villages have coping mechanisms to deal with more common hazards, like

flash floods and animal diseases, but these could be more effective.

- The panchayat is the most important player when it comes to disaster risk reduction. While the state has ordered all panchayats to have disaster management committees, these committees need to be educated and trained in order to be more effective.
- Early warning systems exist but are not very useful. Panchayats should connect with early warning institutions to warn people well in advance of inclement weather that might cause flooding.

What is next?

The DHAN Resource Centre in Nagapattinam has conducted a training of trainers on how to map risks and vulnerabilities of villages to build the capacity of panchayats and NGOs to do similar work. The pilot report will be shared with NGOs, panchayats and academic institutions in the hope that it will be used as a reference guide that will promote more accurate disaster risk reduction projects in Nagapattinam and more high quality vulnerability mapping for disaster risk reduction in other areas.

Disaster Risks and Vulnerability and the Livelihoods of Traditional Fishers: A Study in Palk Bay Region, Tamil Nadu

Objectives

The overall aim of the study is to assess the disaster risk and vulnerabilities and livelihood related risks and vulnerabilities of the traditional fishing community and to arrive at possible areas of interventions. In this context, the specific objectives of the study are:

- To study the socio economic background of traditional fishers and its change over the years.
- To understand the traditional fishers' livelihood pattern, extent of dependence on different livelihoods, and its change over the years.
- To study the impact of natural disasters on the livelihoods of traditional fishers.

- To study the role and contribution of different programmes which are being implemented by different agencies to address the livelihood risks of traditional fishers.
- To derive possible areas of intervention to sustain their livelihoods.

Methods

- Conducted a sample survey in each village covering 50 households.
- Compiled secondary data from relevant departments and research institutions.
- Conducted primary data collection through a detailed survey covering traditional fishers both male and female and labours involved in fishing.
- Conducted interviews with key informants including village leaders, resource people in research and academia and leaders of community organisations, NGOs involved in coastal livelihoods and related government official.
- Used participatory rural appraisal techniques.
- Held focus-group discussions to understand the specific and broader issues in their livelihoods.
- Created case studies to record the experiences of traditional fisher folks.

Outcomes

- An awareness of the present socioeconomic and livelihood status of the traditional fishing community in Tamil Nadu among the researchers.
- A report on the livelihood sustainability of the traditional fisher communities.
- A documentation of possible areas of intervention to strengthen the existing livelihoods, diversified viable alternate livelihood options so that the natural resource is not over exploited.

Lesson Learned

- Fishing families face greater risks from livelihood vulnerability than they face from natural disasters.
- The declining fish resources, reduced

catch per effort, high input cost, operation and encroachment of mechanised crafts increase the livelihood risks and vulnerabilities.

- The coping mechanisms adopted by the community in managing the livelihood related risks are mainly borrowing from money lenders, banks and self-help groups.
- Existing development programmes have yet to address the risks of traditional fishers in a comprehensive manner. Many operate in a top down way with limited impact at the grassroots level.

What is next?

The outcomes will help DHAN to fine tune its development plan of the People Institutions already in function in Palk Bay and take up necessary capacity building initiatives to diversify the livelihoods of the coastal community. From this study, DHAN will initiate a campaign in coastal areas highlighting the need for conservation. The study will allow DHAN to fine tune its policy initiatives towards sustaining the livelihoods of the traditional fishing community towards coastal resource conservation.

Coping with Disasters: Participatory Designing of Efficient Cropping Patterns for Rainfed Locations

Objectives

- To evaluate the existing cropping pattern for its strengths and weaknesses with regard to available rain.
- To identify the potential component crops and a new cropping pattern given the realities of rainfall trends.
- To develop a new cropping pattern

that is socially and economically viable and environmentally adaptable.

Methods

- Researchers ensured effective participation of community at different stages of the research process like data collection, checking the inferences from secondary data analysis, identification of alternate crops and validation of recommendations.
- Researchers collected primary and secondary data, including rainfall data from near by India Meteorology Department (IMD) station and rainfall and Evapo-transpiration (ET) data from near by research station.
- Researchers also collected information regarding existing cropping patterns, rainfall requirement of particular crops, strengths and weaknesses of existing cropping patterns, change in cropping patterns over the years. Suitable alternate crops were collected from the farming community through workshops and focus group discussions.
- Researchers used the following methods for analyzing the data: coefficient of variation; initial and conditional probability levels; trends of the rainfall; length of growing period.

Outcomes

- In-depth understanding of rainfall pattern including distribution, dependability and changes over the years by the team members of RFDP and by the community.
- Identification of best practices and gaps related to the existing cropping patterns with respect to utilisation of rainfall.
- Suggestions for changing cropping patterns to optimally utilise the

current rainfall pattern.

- Enhanced skills and knowledge on rainfall analysis by a few team members.

Lesson Learned

- Because farmers design cropping patterns by taking into account factors beside rainfall (the need for a dry spell in the cropping period for optimum growth, the ability of the crop/variety to withstand excess moisture, the ability of the crop to use dew, the soil moisture availability), rainfall analysis should be grounded in the vast reserve of real life experience of farmers, through repeated structured interactions with them, both for data inputs and for reality checking of the inferences.
- Though climate change is happening everywhere, it affects each village differently. "The research we have taken varies drastically from place to place," said Palanisamy, lead researcher on this study. Researchers should collect specific rainfall data from sites very close to target communities. It cannot be extrapolated from district level data collection sites.
- Though climate change seems like a new issue in the public sphere, farmers are well aware of climate change and have already developed coping mechanisms to help themselves reduce their disaster risk.

What is next?

After the project was completed, researchers completed pilot projects with three disparate regions, to look examine at micro level coping mechanisms in order to determine more useful recommendations than those in this report. The lessons learned from all of these studies are being incorporated into the Rainfed Farming Development Team's future work.

Project Holders

Risks and Vulnerability Mapping

Dhan People Academy, DHAN Foundation
Pulloothu,
Ellis Nagar Via,
Madurai-625 016
Tel: +91-452-2475416/2475305,
Email: dpa@dhan.org

Disaster Risks and Vulnerability and the Livelihoods of Traditional Fisheries: A Study in Palk Bay Region, Tamil Nadu

ACEDRR, Tata-Dhan Academy
T.Malaipatti, Thenkarai (PO),
Mullipallam (SO), Solavandhan (via),
Madurai -625 207
Tel: +91-4543-293405/406, +91-452-2301510
Fax: +91-452-2602247
Email: tatadhanacademy@dhan.org
Website: www.dhan.org/acedrr

Coping with Disasters: Participatory Designing of Efficient Cropping Patterns for Rainfed Locations

Rainfed Farming and Development
Programme, DHAN Foundation
18, Pillaiyar Koil Street,
S.S Colony,
Madurai-625 016
Tel: +91-452-2610794, 2610805
Fax: +91-452-2602247
Email: rfdp@dhan.org
Website: http://www.dhan.org

Project Funding Support

OXFAM America
Global Headquarters
226 Causeway St., 5th Floor,
Boston, MA 02114-2206,
Fax: (617) 728-2594

Brief compiled by Kate Tighe. Edited and
designed at Tata-Dhan Academy.

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.

Tata-Dhan Academy

T. Malaipatti, Thenkarai (PO),
Mullipallam (SO), Solavandhan (via)
Madurai -625 207, Tamil Nadu, India
Tel: +91-4543-293405/406, +91-452-2301510
Fax: +91-452-2602247
Email: tatadhanacademy@ghan.org
Website: www.ghan.org/acedrr