



A STUDY ON KNOWLEDGE, ATTITUDES AND PRACTICES (KAP) FOR DISASTER RISK REDUCTION IN NORTHERN RAKHINE STATE

MYANMAR

ASSESSMENT REPORT

AUGUST 2015



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Cover photo: *Storm damage in Sittwe, July 2015 ©REACH*

About REACH

REACH is a joint initiative of two international non-governmental organizations - ACTED and IMPACT Initiatives - and the UN Operational Satellite Applications Programme (UNOSAT). REACH's mission is to strengthen evidence-based decision making by aid actors through efficient data collection, management and analysis before, during and after an emergency. By doing so, REACH contributes to ensuring that communities affected by emergencies receive the support they need. All REACH activities are conducted in support to and within the framework of inter-agency aid coordination mechanisms. For more information please visit our website: www.reach-initiative.org. You can contact us directly at: geneva@reach-initiative.org and follow us on Twitter @REACH_info.

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SUMMARY

Rakhine state is one of the poorest areas in Myanmar. It is isolated from the rest of the country by difficult and inaccessible geography and weak transport links. The state also performs poorly on a range of development indicators concerning hygiene, public health, education and other sectors. The northern part of the state is also grappling with complex and ongoing inter-communal tensions that have left around 145,000 people displaced into temporary camps. These factors have left the state's population especially vulnerable to the frequent natural hazards to which it is exposed. Rakhine has been hit with varying degrees of severity by at least 6 tropical cyclones since the year 2000, most notably Cyclone Giri in 2010 and Cyclone Komen in 2015 (the latter occurring less than one month after the completion of data collection for this study). Meanwhile, flooding occurs across parts of the state on an almost annual basis, while its low-lying coastline is exposed to a lower-level but still present threat from tsunamis.

In this context, REACH Initiative was mobilised to conduct a knowledge, attitudes and practices study across Maungdaw, Sittwe, Pauktaw, Minbya and Myebon townships in the northern part of Rakhine, as part of the consortium-run Program for Improved Disaster Management and Resilience Against Natural Disasters. The consortium is led by the International Organisation for Migration (IOM) and comprises of ACTED, the Asian Disaster Preparedness Centre, Swanyee Development Foundation and Swiss Resource Centres and Consultancies for Development. The project focuses on a wide range of activities for disaster risk reduction, including disaster management, evacuation shelters, safe construction practices, early warning systems and disaster education. The aim of the assessment is to inform programme activities as well as wider policy and programming in Rakhine state by highlighting key gaps in people's current approach to natural disasters, as well as capabilities and entry points for increased resilience.

Data collection took place between March and June 2015 from a mix of rural, urban and camp communities across all five project townships. The study adopted a mixed methods approach consisting of 1) a survey of a representative sample of 1,257 individuals stratified by age and gender to provide quantitative data; and 2) 20 age and gender-segregated focus group discussions conducted across all townships to provide complementary, in-depth qualitative data for more detailed contextual analysis of the trends observed in the survey. Key findings of the study are as follows:

- **Incidence and frequency of hazards:** People in northern Rakhine state are well aware of the kinds of natural hazards to which they are exposed. 94% survey respondents were able to name at least one natural hazard occurring in their area, with the majority identifying either cyclones (79%) or flooding (9%) as the primary hazard. People in Rakhine have survived multiple natural disasters in the course of their lifetime, with 77% reporting to have experienced two or more disasters. People also view Disaster Risk Reduction (DRR) activities as important, with 79% reporting that addressing the impact of natural disasters was a high priority for them. 74% of people also feel that natural disasters are becoming increasingly frequent as time goes on.
- **Impacts of and vulnerability to hazards:** Study participants were able to give a lucid account of both the short and long-term impacts of natural disasters on their communities, from damage to property and village infrastructure, to long-term shocks that can push households into debt or force them to migrate away in search of work. According to 67% of survey respondents, fishermen were reported to be the most vulnerable livelihood category to the impact of disasters. In terms of population categories, elderly people and children were felt to be most vulnerable (reported by 81% and 72% of people respectively), followed by poorer people (45%), and people with disabilities (42%). Notably, only 19% of respondents identified women as vulnerable. When discussing whether their area had

become more vulnerable to natural disasters over time, around half of all respondents felt that either climate change or deforestation were placing their communities at greater risk of exposure to natural disasters.

- **Information sources:** Radio broadcasts are by far the most common source of information on disaster forecasts in northern Rakhine, with three-quarters of people dependent on them for information. However, the lack of programming in different languages may represent a major barrier for sections of the state's Muslim population given the multiple dialects spoken in the project area. In addition, some study participants also raised concerns about overly technical language in cyclone forecasts, which they felt made warnings difficult to interpret. In contrast to the widespread uptake of radio forecasting, only 46% of people reported having a community early warning system to rely on. Broader education on DRR issues is extremely scarce—83% of people report that they had received no education or training on the issue.
- **Household-level preparation and management:** Households in Rakhine show somewhat variable levels of readiness to deal with a natural disaster, and a significant number reportedly have nowhere to go when it does strike. While 75% of people report having their important documents safely stored in one place, 58% have a household grab-bag with emergency items, and 48% have emergency food supply, only 29% have a list of important telephone numbers already prepared. In terms of evacuation, 35% of people did not know where they would go in the event of a disaster, with monasteries as the most common type of evacuation point for those who did. In addition, 80% of people said that under some circumstances, they might not evacuate all their household members—leaving men behind to safeguard property was the most frequently cited option.
- **Community-level preparation and management:** Beyond early warning systems, the presence of community-level disaster management systems is extremely sparse: only 13% of people report that their community has a disaster management committee, 6% say their community has a plan for dealing with disasters, and only 5% have ever taken part in a disaster preparedness drill. Just over half of people feel that people are likely to focus only on helping their own households and will not have time to support the community as a whole. However, evidence from the focus groups suggests that community cohesion can in some cases be quite strong, and points to the key roles of emergent organisations such as youth volunteer groups in providing help during disasters.
- **Roles and responsibilities in disaster management:** 42% of people say they have no understanding at all of who is responsible for performing what functions during a disaster. The lack of a common understanding of disaster response plans has negative implications both for the efficiency of any response, and for holding actors to account when they fail to deliver.
- **Disaster mitigation:** People's immediate priority for improving their ability to cope with natural disasters is the construction of better cyclone shelters, cited by 63% of those assessed. However, one-third also felt that the impacts of disasters on their communities could be reduced by better awareness-raising. One-third of respondents also highlighted the rehabilitation of local forest ecosystems as a mitigation priority, with 18% citing mangrove rehabilitation.
- **Age and gender differences:** The key variations across age and gender cohorts involved teenage girls and older women:
 - In the case of teenage girls, the data points to a lack of awareness of the dangers of natural disasters relative to other cohorts. Like teenage boys, they are less likely to have extensive personal experience of natural disasters. However, compared to the overall

average for all cohorts they are also less likely to view natural disasters as a high priority issue, less likely to cite injury or death as an impact of disasters, and much more likely to view their houses as safe when discussing why they might not evacuate during a disaster.

- For older women, the data suggests a broader lack of awareness of or participation in DRR preparation and response. Relative to all other age/gender groups, women over 60 are less likely to have attended school; less likely to view DRR as a priority; less likely to report making household-level preparations for a disaster; less likely to know where to evacuate, or to feel safe in their evacuation point; less likely to feel involved in either household or community-level disaster preparations; and less likely to have confidence in the effectiveness of actors involved in disaster response.

In both cases, these data point to potentially higher levels of vulnerability to natural disasters among older and younger women. This is especially important given, as discussed above, the relatively low proportion of people (19%) who *perceive* women to be vulnerable.

Overall, these results suggest that while people in northern Rakhine are aware of and engaged with the problem of natural disasters, they do not necessarily have the resources to prepare for and respond to these disasters effectively when time comes. Clear gaps exist regarding education, evacuation and community-level disaster management structures. When attempting to fill these, both government and non-government actors must also take into account the need to clearly define, agree upon, and communicate the roles and responsibilities of actors involved in disaster preparedness and management to all stakeholders.

Finally, while this study has focused specifically on the DRR cycle (specifically on its preparedness, response and mitigation phases), it is also critical to situate approaches in the context of wider daily challenges faced by people in Rakhine state, including accessing basic services, securing livelihoods, or building stronger and more resilient communities.

List of Acronyms

CBDRR	Community-based disaster risk reduction
DMC	Disaster management committee
DMP	Disaster management plan
DRR	Disaster risk reduction
FGD	Focus group discussion
GAD	General Administration Department
IDM-RAND	Program for Improved Disaster Management and Resilience Against Natural Disasters
KAP	Knowledge, attitudes and practices
MAPDRR	Myanmar Action Plan on Disaster Risk Reduction
MRCS	Myanmar Red Cross Society
NGO	Non-governmental organization
PWDs	People with disabilities

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INTRODUCTION

Myanmar's north-western coastal state of Rakhine is exposed to multiple natural hazards, including cyclones, tropical storms, flooding, earthquakes and their associated tsunamis. Rakhine has been hit by seven cyclones since 1968. Since 2000 alone, strong winds and storm surges from cyclones in 2004, 2006 (Mala) and 2010 (Giri) have caused major damage to infrastructure and livelihoods in coastal areas of the state, although fortunately without the huge loss of life accompanying cyclone Nargis (2008) in the Ayeyawady delta region. In addition, the region is vulnerable to the lower-frequency but still present threat of earthquakes and tsunamis from the Bay of Bengal, or inland from a local fault system north of Sittwe. Upland regions in the eastern parts of the state also experience occasional exposure to forest fires and landslides, with 46 people being killed by a landslide in Maungdaw Township in 2010.¹

People's vulnerability to these hazards is exacerbated by weak infrastructure and chronic underdevelopment. Physically, Rakhine is isolated from the rest of the country, largely cut off by inaccessible ranges of mountains and hills. Within the state there are few paved roads, with transport links in several areas being limited to weather-dependent boat routes.² The 2009–2010 UNDP Integrated Household Living Condition Survey ranked Rakhine state as second worst countrywide in terms of overall poverty (43.5% compared to the national average of 25.6%) and food poverty (10% against the national average of 4.8%).³ Subsequent World Bank reestimation using the same data recently revised overall poverty incidence in Rakhine upwards to 78%—the highest in the country compared to a revised national average of 37.5%.⁴ The state also fares poorly on a range of other sectoral indicators. For example, it has the lowest percentage of households with access to improved sanitation in the country (48% compared to a national average of 84%), as well as the lowest primary school enrolment rate (71.4% compared to a national average of 87.7%).⁵

These issues have been further sharpened by sectarian tensions resulting from an outbreak of violence in 2012. As of July 2015, around 145,000 people were living in displacement camps or temporary sites across the north of the state—many of which are built in low-lying coastal areas with few disaster management or mitigation measures in place. Affected populations are found to be especially vulnerable, frequently dependent on external support for food and shelter, cut off from livelihood activities by movement restrictions and a lack of opportunities in situ, and disempowered by lack of clarity over their legal status.⁶

Against this background, the Program for Increased Disaster Management and Resilience Against Natural Disaster (IDM-RAND) was launched in late 2014. Run by a consortium of organisations comprising IOM, ACTED, the Asian Disaster Preparedness Centre, Swiss Resource Centres and Consultancies for Development, and Swanyee Development Foundation, the program focuses on reducing disaster risk in targeted areas through interventions across six key priority areas: 1) improving readiness through improving local government disaster management planning and coordination; 2) improving construction practices to increase resilience; 3) improving the effectiveness of hazard early warning systems; 4) increasing disaster management and preparedness skills among local Disaster Risk Reduction (DRR) actors; 5) increasing awareness and education on DRR; and 6) protection of mangroves as a barrier against coastal hazards. It will run from 2014 to 2017 across the following five townships: Maungdaw, Sittwe, Pauktaw, Minbya and Myebon (see Map 1).

¹ United Nations Development Programme - Multi Hazard Risk Assessment in Rakhine State of Myanmar (Yangon, 2012).

² United Nations Development Programme – Local Governance Mapping: The State of Local Governance: Trends in Rakhine (Yangon, 2015).

³ United Nations Development Programme – Integrated Household Living Conditions Survey in Myanmar (2009–2010) (Yangon, 2011).

⁴ World Bank Group – Myanmar: Ending poverty and boosting shared prosperity in a time of transition: A systematic country diagnostic (Yangon, 2014).

⁵ Ministry of National Planning and Economic Development/Ministry of Health/United Nations Children's Fund – Multiple Indicator Cluster Survey 2009–2010 (Yangon, 2011).

⁶ See Myanmar Information Management Unit's Rakhine emergency page: <http://www.themimu.info/emergencies/rakhine>

In a secondary review of available documentation, the project identified a critical absence of community-level data on people's awareness about key aspects of disaster management and mitigation. This has resulted in a number of weaknesses in DRR planning at the state, township and community levels. Firstly, current government disaster management plans are not based on an adequate understanding of local vulnerabilities, capacities or existing practices. Second, space may exist within current training and mass communication materials on DRR for a greater focus on both local contexts, and the specific circumstances of different population groups (such as women, children, older people etc). Third, current emergency warning communication systems show weaknesses in dissemination of the appropriately targeted information through relevant channels at the village level.

To address these gaps, REACH conducted a Knowledge, Attitudes, and Practices (KAP) study of DRR in communities across the project area. Using a mixture of qualitative and quantitative methods, this study aims to contribute to the objectives of the project by:

- Providing a detailed assessment of Rakhine communities' current experiences and responses to natural disasters
- Highlighting key knowledge gaps; and
- Identifying potentials and capabilities for improved resilience

This will be used specifically to design better and more targeted outreach and mass communication materials, as well as to provide a resource to better inform policy and planning among both government stakeholders and the wider DRR community in Rakhine state.

The remainder of this document is organized as follows. First, the methodology and limitations of the study are outlined. Second, the study's key findings are presented according to the following sections:

- Demographics
- Incidence and frequency of hazards
- Impact of hazards and vulnerability to hazards
- Information sources
- Household-level preparation and management
- Community-level preparation and management
- Roles and responsibilities in disaster management
- Disaster mitigation

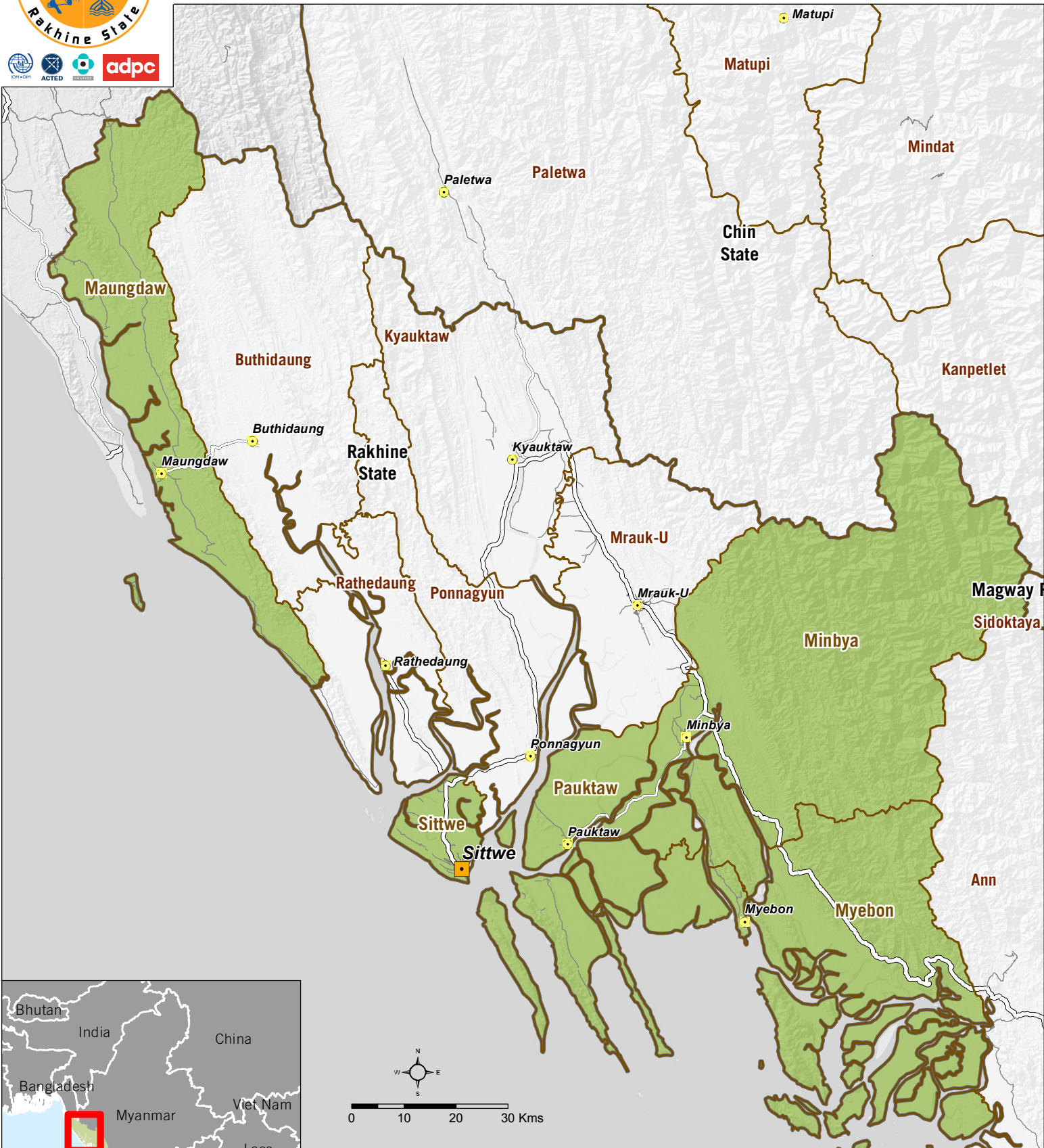
Finally, a summary of conclusions and recommendations are presented. Research tools are included in the Annex.



MYANMAR - Northern Rakhine State

IDM-RAND Consortium - Target Townships

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Production date : 6th AUGUST 2015



- State Boundary
- Township Boundary
- Target Township
- Primary Road
- Secondary Road
- Other Road
- State Capital
- Township Capital

Data sources:
Administrative Boundaries, Settlements: OCHA
Roads: OSM

Coordinate System: GCS WGS 1984
Contact: reach.mapping@impact-initiatives.org

Note: Data, designations and boundaries contained on this map are not warranted to be error-free and do not imply acceptance by the REACH partners, associated, donors mentioned on this map.

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METHODOLOGY

The study's target population was defined as all individuals living in areas at risk from natural hazards in Maungdaw, Sittwe, Pauktaw, Minbya and Myebon townships. The study adopted a three-step, mixed methods approach in order to collect data that was grounded in existing knowledge and triangulated across multiple information sources, while ultimately being representative of the study population as a whole. This consisted of:

- Desk-based literature review, including reviews of macro-level socio-economic data and hazard profiles
- Qualitative data collection through focus group discussions (FGDs)
- Quantitative data collection via a KAP survey

Secondary Data Review

The secondary data review undertook a desk study of available existing research on DRR in Rakhine state and the broader DRR context in Myanmar as a whole. Key documents reviewed include background documents on government DRR planning on capacity; mapping and analysis of hazards and vulnerability to natural disasters in the state; and community-level primary research on DRR issues in the state.⁷ Information from this review was used to inform study design, draft research tools, and ground subsequent data analysis.

Focus Group Discussions

A formative set of FGDs were conducted across all five townships in order to collect detailed qualitative data on the experiences and existing practices regarding DRR among the study population. This data was then used to inform survey questionnaire design, as well as to triangulate and contextualise survey results.

A total of 20 FGDs were conducted across five sites (one site per township). Sites selected for FGDs aimed to represent as wide a range of different contexts as possible, selected according to the matrix of criteria presented in Table 1 below:

⁷ Documents reviewed that were specific to Rakhine include: ACTED – Knowledge, Attitudes and Practices KAP Survey Final Report, "Building Community Resilience to Natural Hazards in Gwa Township, Rakhine State" (Yangon, 2014); ActionAid – MCCR DIPECHO IX Baseline KAP Survey (Yangon, 2015) [Embargoed]; ADPC/Malteser International – Study Report on Community Resilience in Rakhine State (Yangon, 2014) [Embargoed]; ADPC/Malteser International – Strengthening of DRR Capacity and community-based management of the mangrove forest ecosystem for adaptation to climate change in high-risk areas of Rakhine State, Myanmar (Yangon, 2014) [Embargoed]; United Nations Development Programme - Multi Hazard Risk Assessment in Rakhine State of Myanmar (Yangon, 2012); United Nations Development Programme – Local Governance Mapping: The State of Local Governance: Trends in Rakhine (Yangon, 2015).

Table 1: FGD site characteristics

Location	Location type	Religion	Existing DRR programming?	Impact of most recent disaster
Maungdaw	Rural	Muslim	No	Moderate
Sittwe	Urban	Muslim	Yes	Moderate
Pauktaw	Rural	Buddhist	No	Low
Myebon	Rural	Buddhist	Yes	Severe
Minbya	Rural	Buddhist	Yes	Severe

At each site, four FGDs of 8-12 people were conducted in order to reflect the views of both genders and a range of ages. In each location, one FGD was conducted with each of the following groups: Men over 30; men under 30; women over 30; and women under 30. Age categories were defined on the basis of the need to gather perspectives from older and younger people separately given their differing levels of experience of natural disasters. However, resources and time did not allow for further disaggregation into three separate age categories as took place in the survey component (see below). Discussions were conducted by gender-matched facilitators and recorded using smartphones. Data was then translated by facilitators and analysed using NVivo 10 qualitative coding software. Data were coded thematically according to the seven key focus areas of this report (see above), with greater importance ascribed to themes observed occurring across multiple different groups.

KAP Survey

Data collection for the KAP survey employed a two-stage cluster sampling approach to collect quantitative data representative of the study population as a whole, stratified across different age groups and genders. Cluster sampling was selected over simple random sampling as the most efficient methodology due to the widely dispersed study population and the high cost and slow speed of travel in northern Rakhine.

The study population was first divided into six strata according to age and gender: one each for women and men aged 15-19, 20-59, and 60+.⁸ These strata were chosen on the basis that one of the study's primary aims is to support the design of outreach materials for different target audiences, and the fact that no statistically representative sex or age disaggregated information of this nature currently exists. Owing to resource constraints, geographical stratification by township or by camp/non-camp population was not considered feasible. As a result, while sampling took place across all townships and areas, results do not allow for statistically representative comparisons to be made at either township or location level (rural, urban etc.).

The sample size for the survey was **calculated in order to provide representative data on each stratum at 95% confidence level with +/- 10% margin of error.**⁹ This produced a sample size of 192 for each stratum, rounded up to 210 to allow some scope for error in case targets were not hit. This in turn produced a total planned sample size of 1,260 (see Table 2 below).¹⁰ By weighting the data proportionate to the size of each stratum in Myanmar's population structure, this **sample size also provides an aggregate figure for the study population as a whole, representative at 95% confidence level with +/- 6% margin of error.**

⁸ The boundaries for these strata reflect the disaggregation of Myanmar's population in the most recent available data on the country's age structure (<http://esa.un.org/wpp/>), which served as a proxy for post-weighting results. In addition, following initial field experience, children younger than 15 are likely to require a different set of survey questions and specialized training for enumerators, and have therefore been excluded due to resource constraints.

⁹ This means that we can be 95% confident that the averages or proportions observed in the sample are true of the population of interest, to within +/- 10%.

¹⁰ Formula as follows: $n = (D)(Z^2 \times p \times q) / d^2$ where D = design effect (2), Z = confidence level (1.96), p = prevalence (0.5), q = 1-p and d = precision (0.10). This yields n = 192 per stratum, rounded up to n = 210 in order to allow round numbers of interviews to be collected in each cluster.

Table 2: Sample Size Per Stratum

	Men		Women	
	Planned	Actual	Planned	Actual
15-19 years old	210	209	210	209
20-59 years old	210	210	210	209
60+ years old	210	210	210	210
Planned total	1260			
Actual total	1257			

The sample was selected in two stages. The first stage involved selecting 30 clusters from a sample frame of primary sampling units (villages, urban wards, and IDP camp locations) covering the entire population of all study townships. Before selecting clusters, the sample frame was filtered using village tract-level data from UNDP's Multi-Hazard Risk Assessment of Rakhine State in order to remove any tracts deemed to be at zero risk from natural hazards.¹¹ Clusters were selected from this frame on the basis of probability proportionate to size using General Administration Department (GAD) village and urban ward-level population data, and OCHA camp population data. The breakdown of clusters according to township and location type is presented in Table 3 below.

Table 3: Cluster Selection

	Rural	Urban	Camp	Total
Maungdaw	7	2	0	9
Sittwe	1	2	4	7
Pauktaw	6	0	0	6
Minbya	4	0	0	4
Myebon	1	2	0	3
TOTAL	19	6	4	29

Once clusters were selected, the second stage involved collecting the required number of interviews per stratum within each cluster (7 interviews per stratum, for a total of 42 per cluster). Interview respondents were selected as follows: first, random transect walks were used to select households containing eligible respondents; second, respondents were selected randomly from among the eligible individuals present in each selected household by selecting people whose names came earliest in the alphabet.

Prior to data collection, survey tools were translated into Myanmar, back-translated to English for consistency checks, and field-tested in one non-study community in Pauktaw. The finalised tool was used by a team of five female and five male enumerators. In camps, data were collected by field staff of the camp management agency the Danish Refugee Council under REACH staff supervision. In Maungdaw, the language barrier among Muslim populations led to the hiring of a separate local team of enumerators for data collection in this township. All data were collected electronically using the Open Data Kit application loaded onto smartphones.

¹¹ United Nations Development Programme/ADPC, Multi Hazard Risk Assessment in the Rakhine State of Myanmar: Final Report (Yangon/Bangkok 2012).

Limitations

A critical limitation of this study is the choice of research tools used relative to the questions they seek to address. Specifically, the quantitative methods chosen in order to make significantly representative statements about the study population necessarily sacrifice a degree of contextual depth. In particular, they may also over-estimate people's knowledge gaps and under-estimate their capacities. Previous research has noted that indigenous knowledge, practices or understandings are often hard to put into words since they form part of the background experience of people's everyday lives.¹² This issue is compounded when survey respondents are faced by questions presented in a frame of reference ("natural disasters"; "disaster risk reduction") that may seem unfamiliar and arbitrary.¹³ For example, a community's farming techniques or construction practices may have developed in ways that inherently reduce their vulnerability to natural hazards, but community members may struggle to explicitly link these steps with DRR.

Efforts have been made to mitigate these limitations through extensive piloting of tools and the use of FGDs. Indeed, during FGDs the research team noted that community members were much better able to elaborate their understandings and practices in relationship to DRR than they were as individuals during the survey. However, the study's findings should still be taken as a broad snapshot of the situation in northern Rakhine as a whole, but not as a substitute for more intensive, participatory research at the community level.

Another key limitation encountered in field data collection was the presence of different dialects in different parts of the study area, especially in Muslim areas. Translation of the research tools into local languages other than Myanmar was not possible, meaning that enumerators had to translate questions into local dialects on the spot during interviews. This raises the risk that questions may have been asked in different ways by different enumerators to different respondents, leaving scope for misinterpretations and potentially affecting the validity of results in some areas. A related limitation in this respect is the fact that due to movement restrictions in place across Rakhine state and the virtual non-availability of bilingual enumerators in Sittwe, the survey had to use three separate teams of enumerators – one core team in Sittwe, plus additional secondary teams in Maungdaw, and in the Sittwe camps. Having higher numbers of enumerators involved is again likely to increase sampling error by increasing the variation of enumerators' possible interview styles and respondents' responses to them. The team attempted to mitigate these limitations by intensive review of the questionnaire and multiple rounds of interview simulation at the training stage, as well as repeated debriefing and close supervision while in the field.

¹² John Twigg, *Good Practice Review: Disaster Risk Reduction – Mitigation and preparedness in development and emergency programming* (London 2004), pp 131-145.

¹³ During FGDs in one community, older female participants said that while they found the sessions interesting, they also found them extremely tiring as they were not accustomed to thinking or talking in this kind of fashion.

FINDINGS

This section presents the main findings from the KAP survey and FGDs. The section first presents an overview of the demographic information of the sample; it then provides data on people's perceptions on the incidence and prevalence of natural hazards in their areas; on their perceptions on hazards' impacts and peoples' vulnerability to them; on information sources regarding natural disasters; on household and community-level disaster preparation and management; on understandings of roles and responsibilities of different disaster management actors; and on their understandings of possible longer-term mitigation approaches.

For ease of reference, quantitative findings presented in the following section represent the weighted average for the entire population unless otherwise stated. Separate figures for each stratum are only presented where their margin of error does not overlap with that of the weighted average. Similarly, in charts displaying responses to multiple-choice questions, only responses that have been selected by 5% or more of a weighted average of respondents have been displayed.

Demographics

The average age of respondents was 35. The average household size was 6.4.¹⁴ Regarding education levels, 32% of respondents reported no education at all, 39% reported receiving only primary education, 19% reported receiving up to middle school education, 6% reported receiving secondary education, 2% reported receiving further education, while 2% reported receiving monastic or other religious education. Older women were found to be less likely to have attended any kind of schooling (with 53% reporting no education), while teenage males were most likely to have attended at least primary school (only 15% reporting no education).

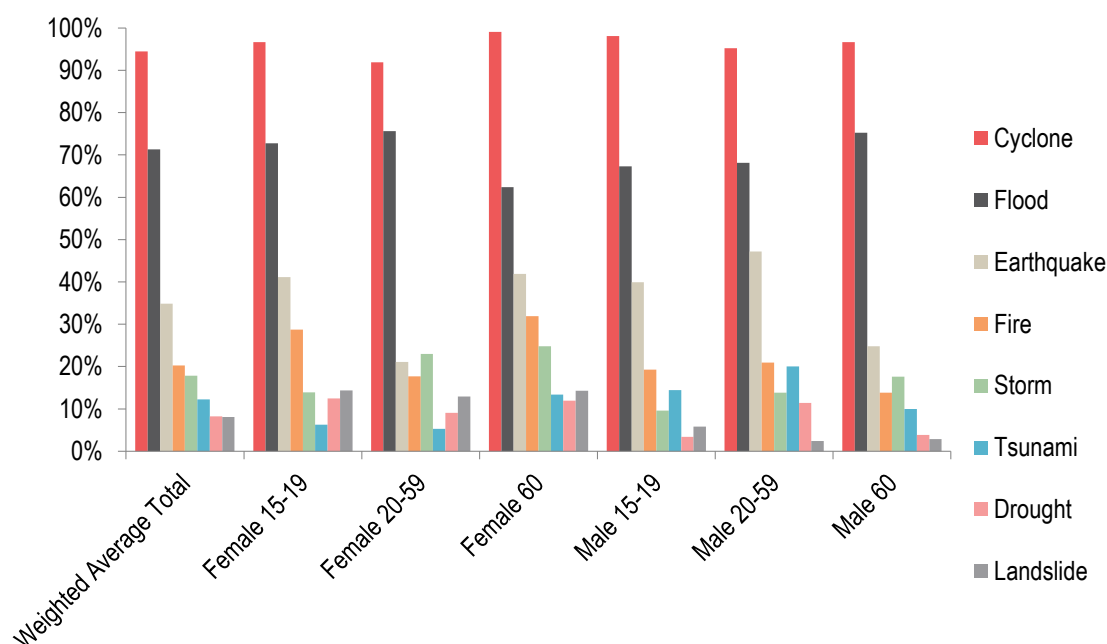
Incidence and frequency of natural hazards

This sub-section presents data regarding the hazards identified by study participants. For these hazards, participants described their understanding of frequency and regularity of each hazard in their area and the severity of problems posed. In general, people were able to clearly state which were the key hazards, and were generally in agreement that they posed a serious problem and urgently needed addressing. This is perhaps unsurprising given that a large majority of respondents reported living through several natural disasters over the course of their lives.

When asked how many natural hazards they could identify, 94% of survey respondents identified cyclones, 71% identified floods, 35% identified earthquakes, 20% identified fires, 18% identified storms, 12% identified tsunamis, and 8% identified droughts and landslides respectively (see Figure 1). Within each FGD, participants were collectively able to name at least three types of natural hazard, although younger women in both Muslim villages able to name markedly fewer than other group participants. All groups highlighted cyclones as a threat, with over three-quarters also identifying flooding and earthquakes, and around half identifying droughts and forest fires.

¹⁴ This is substantially higher than the average household size of 4.4 reported in 2014 census data for Rakhine, and is likely linked to a failure by the research team to adequately define the term during training.

Figure 1: Proportion of individuals (%) identifying different hazard types occurring in their area, by sex/age

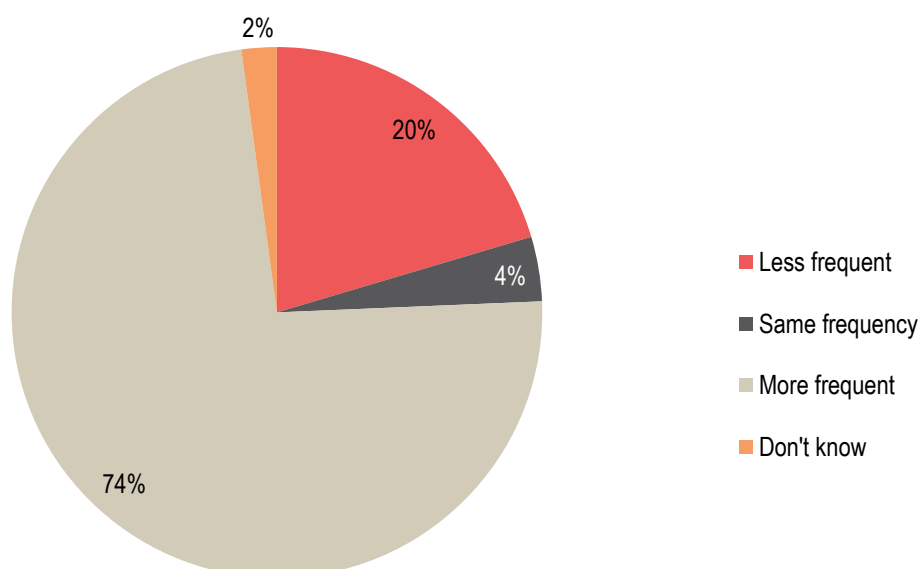


When asked which hazard was the biggest problem for their area, 79% of survey respondents identified cyclones, 9% identified floods, 3% identified tsunamis, 3% identified earthquakes, and 5% identified a variety of other hazards. In FGDs, participants likewise almost exclusively discussed their experiences of cyclones and flooding – in Myebon, Minbya, Pauktaw and Maungdaw, participants focused their subsequent discussions on their experiences during cyclone Giri in 2010. In Sittwe, younger participants discussed their experiences during the cyclone of 2004, while older people were able to recall what had happened during the 1968 Sittwe cyclone.

Over three-quarters of survey respondents reported experiencing a cyclone at least twice in their lifetimes. 15% reported only once, 31% reported twice, 27% reported 3 times, 11% reported 4 times, 9% reported 5 or more times, and 8% reported that they could remember or had not experienced the hazard. Unsurprisingly, teenagers had less experience of disasters, with only 18% able to remember more than 2 experiences of disasters compared to 47% for adults and 73% for older people. In FGDs, some older participants were able to correctly list the names and dates of the multiple cyclones they had experienced in their lifetime.

When asked if the main hazard in their community had changed in frequency over the past 30 years, 74% said it had become more frequent, 20% said it had become less frequent, 4% said it had remained the same, and 2% said they did not know (see Figure 2). Changes in the frequency of natural hazards were only discussed in six FGDs, (five older and one younger) but in all cases participants perceived that the interval between cyclones in particular had shrunk over the past decade.

Figure 2: Proportion (%) of individuals reporting increase in hazard frequency over past 30 years, weighted average



When asked how severe a problem the main hazard was for their communities, 88% of survey participants felt that it was a severe problem, 9% felt it was a moderate problem, 2% felt it was not a severe problem, and 2% said they did not know. However, compared to these averages, only 69% of older women felt that the problem was severe. When asked how big a priority addressing this hazard was, 79% said it was high priority, 15% said it was medium priority, 4% said it was low priority and 2% said they did not know. Again, older women were comparatively less likely to see it as a high priority at 54%, along with teenage girls at 57%.

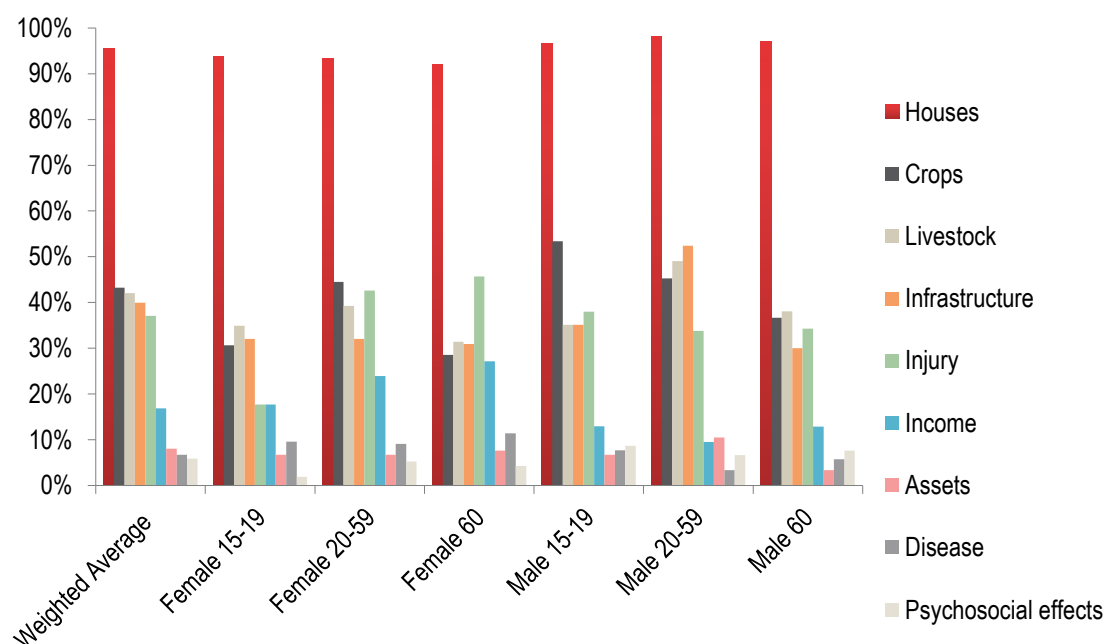
Impact of hazards and vulnerability to hazards

In this section of the study, participants were first asked to describe in broad terms the main impacts of natural hazards on their communities. They were then asked to identify which types of work and which kinds of people they felt were more vulnerable to natural disasters, and which ones were less vulnerable. Finally, they were asked to think of any changes which might have made their areas more vulnerable to the impact of natural disasters.

Hazard impact

When asked what the main impacts were when natural hazards struck their area, 95% reported damage to houses, 43% reported damage to crops, 42% reported damage to livestock, 40% reported damage to village infrastructure (especially water storage, roads and monasteries), 37% reported injury/death, 16% reported loss of income, 8% reported damage to productive assets, 7% reported disease, and 6% reported psychosocial issues. Teenage girls were comparatively less likely to cite injury or death, with only 18% doing so (see Figure 3).

Figure 3: Proportion (%) of individuals reporting different perceived main impacts of natural hazards, by sex/age



Data from the FGDs provides further contextual information on these broad impact categories. As with the survey data, the most commonly cited impact of natural disasters by FGD participants was damage to houses. For example, in the Maungdaw and Pauktaw communities, participants reported that around one-third to one-half of all houses were destroyed during Cyclone Giri, while in the Myebon community all but three houses had been destroyed.

In terms of impacts on livelihoods, participants in all groups except those in Sittwe (which appeared more dependent on fisheries) most commonly highlighted damage to paddy fields and crops as a major impact, with salination reducing crop yields for several years (see below). Loss of livestock and loss of fishing boats/nets were also raised in just under half of all groups.

In terms of impacts on individual wellbeing, around half of all groups discussed the risk of personal injury or death during natural disasters. However, actual deaths were only discussed in the Sittwe community, where fishermen had been killed both during the 2004 cyclone and during the Sittwe cyclone of 1968. By contrast, in Pauktaw and Myebon, participants pointed out that while physical damage to their villages had been quite severe during Giri, nobody in their communities had been seriously hurt. Health problems in the aftermath of disasters were also discussed in around half of all groups. These were most commonly discussed in relation to the contamination of village water supplies (open tanks in most cases) by floodwater. Significantly, participants of both genders in Minbya, Myebon and Sittwe also discussed the psychosocial impacts of surviving a disaster, which in these FGDs were felt to affect women more acutely. As one woman in Myebon explained, “Whenever I hear the sound of wind blowing, I don’t know what to do...at that time, my mind was not working properly and I was doing things like going up and down the stairs over and over again.”

Reflecting the health concerns above, the most commonly discussed impact of disasters on village infrastructure was damage to drinking water ponds, which had occurred during Giri in Maungdaw, Minbya, Myebon and Pauktaw. Given that ponds are often communities’ sole source of water supply, that water shortages are endemic to Rakhine even in normal years, and that communities are often unable to boil water due to the cost of fuel, the health and cost implications of such damage are likely to be quite severe and require further investigation. Following this, a minority of groups also discussed damage to health

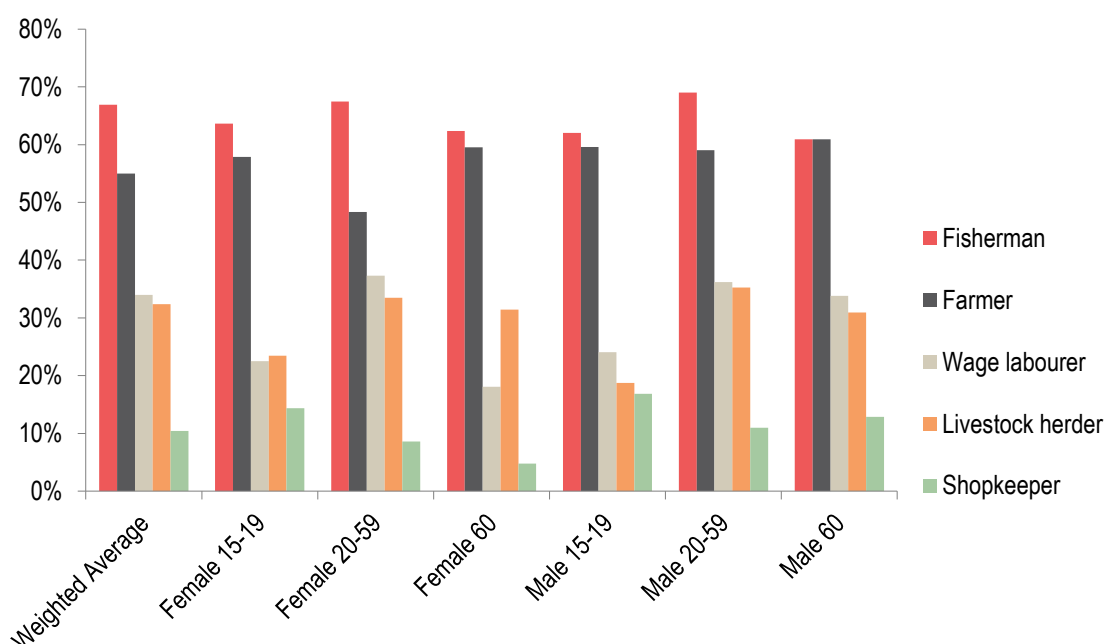
and education infrastructure—Giri had destroyed the schools in the Maungdaw and Myebon community, and the village clinic in the Myebon community.

Vulnerability to hazards

Vulnerable livelihoods

When asked which livelihoods they felt were more vulnerable to natural disasters, 67% said fishermen, 55% said farmers, 34% said wage labourers, and 32% said livestock herders. When asked which livelihoods they felt were less vulnerable to natural disasters, 48% said shopkeepers or businessmen, 40% said wage labourers, 9% said farmers and 8% said fishermen.

Figure 4: Proportion (%) of individuals reporting different livelihoods perceived as more vulnerable to natural disasters, by sex/age



Reflecting this data, the most severe impact on livelihoods reported by FGD participants was on fishermen, who had lost both nets and boats in recent cyclones. In Maungdaw, older men explained how borrowing to replace assets had driven fishermen into debt, while in Minbya and Sittwe participants explained that some fishermen had been driven out of their jobs entirely after losing their boats, forced either to start working as day labourers, or to migrate to other parts of Myanmar in search of work. Participants in Minbya added that while suffering farmers could expect to receive replacement agricultural inputs from non-government organisations (NGOs) and the government, fishermen had received less help. Notably, while participants did observe that livestock herders also lost assets in the form of their animals, this did not appear to translate into kinds of livelihood shocks experienced by fishermen.

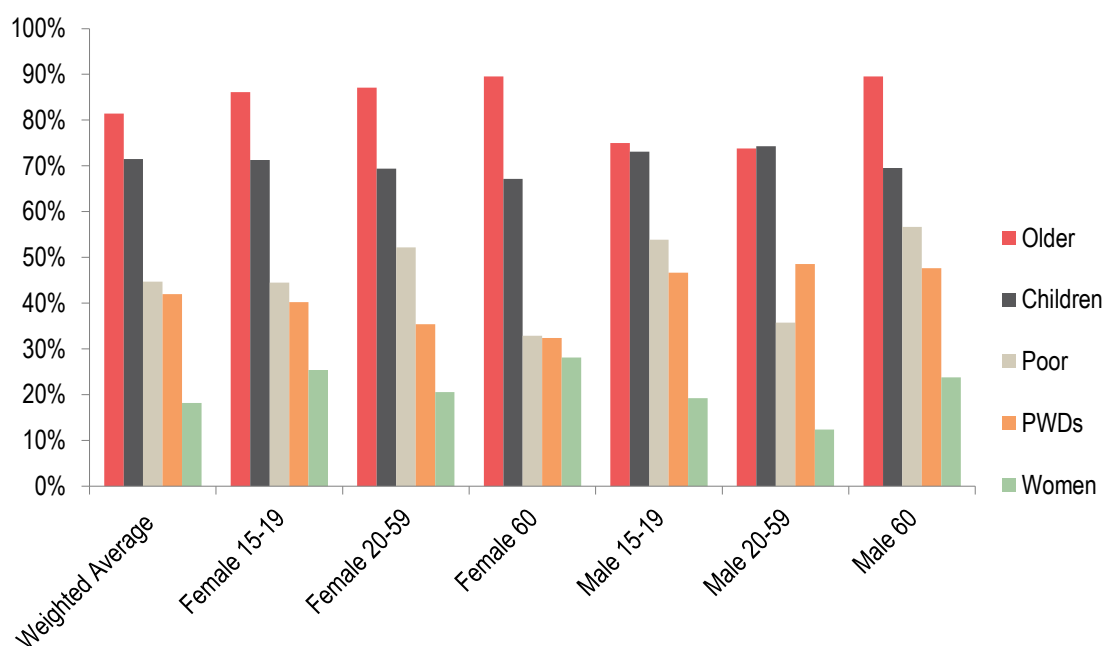
For farming households, the main issue identified by FGD participants was salination of their paddy fields. These could reportedly take anywhere between two and five years to return to their pre-disaster levels of productivity, likewise driving households into debt. Participants in Minbya and Myebon also added that these issues had been further compounded when damage from a cyclone was followed by prolonged dry seasons in subsequent years. Both older and younger women in Minbya also highlighted the loss of household vegetable gardens—a vital source of income for families otherwise reliant on casual labour—which could also lead to long-term decline in household incomes due to the amount of time they took to re-grow.

Ambivalence within the survey data on whether casual labourers were more or less vulnerable was also reflected in the FGDs. A smaller number of FGD participants in Minbya, Myebon and Pauktaw perceived day labourers as vulnerable, although in these cases this was linked to an immediate reduction in work opportunities in the aftermath of a disaster rather than longer-term impacts. However, others disagreed, arguing that because casual labourers had fewer productive assets to lose, they were less vulnerable than those engaged in other types of work.

Vulnerable populations

When asked which types of people they felt were more vulnerable to natural disasters, 81% said elderly people, 72% said children, 45% said poorer people, 42% said people with disabilities (PWDs), and 19% said women (see Figure 5). When asked which types of people they felt were less vulnerable to natural disasters, 78% said adults, 49% said richer people, 31% said men, and 8% said women.

Figure 5: Proportion (%) of individuals reporting different population types perceived as more vulnerable to natural disasters, by sex/age



As in the survey data, older people and children were most commonly perceived as especially vulnerable to natural hazards by FGD participants, and were mentioned by just over half of all groups. In both cases, people explained that this was because both children and old people were more exposed to health risks and malnutrition in the conditions following a natural disaster. Some participants also added that both children and older people were less mobile than adults, and that children in particular lacked awareness about what to do during a disaster.

Six groups also felt that women were more vulnerable, in particular pregnant women. This was again linked to mobility issues. Older women in both Muslim communities and older men in Sittwe also added that cultural restrictions on younger, unmarried women associating with men meant that Muslim girls might in some cases be too embarrassed or afraid to evacuate during a disaster. By contrast, older women in Myebon and younger women in Sittwe felt that men were more vulnerable, because they spent more time out of the house doing more dangerous activities like fishing.

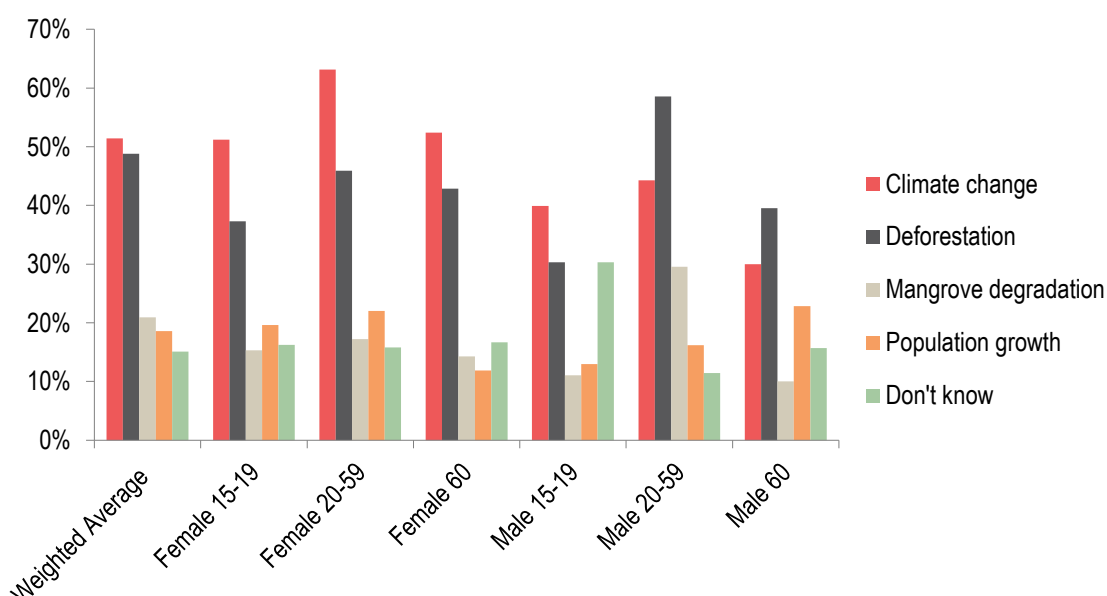
Only three groups discussed wealth as an aspect of vulnerability. In Pauktaw, older women unambiguously felt that poorer people would suffer more during a disaster as it would take them longer to recover in its aftermath. However, younger women in Pauktaw and older women in Maungdaw noted that while poorer people would take longer to recover, richer people had proportionally more to lose.

Significantly, despite featuring relatively prominently in the survey data, people with disabilities were only discussed as a distinct vulnerability category by one FGD.

Changing vulnerability to hazards

Survey participants were asked to identify any changes in their area that might have made the impacts of natural disasters worse. 51% reported climate change, 49% reported deforestation, 21% reported mangrove degradation, 19% reported population growth, while 15% could not identify any changes. Comparatively fewer teenagers (34%) cited climate change as making the impact of natural disasters worse (see Figure 6).

Figure 6: Proportion (%) of individuals reporting different perceived drivers of worsening disaster impacts, by sex/age



In FGDs, the issue of changing vulnerability to hazards was raised in the context of FGD participants' generally shared perception that disasters were becoming more frequent and more severe (see above). The most frequently cited cause of more frequent hazards was climate change. However, only younger women in Myebon framed climate change as being caused by increased carbon dioxide emissions. In all other cases, climate change was reported to be closely linked with deforestation, as also apparent in the survey data. FGD participants explained that overdevelopment or poverty was causing people to cut down too many trees, which was in turn perceived to be causing global warming and hence worsening hazards. In contrast to these explanations, younger FGD participants in both Muslim communities attributed all natural hazards to the will of god, with younger men in Sittwe explaining by consensus that they were punishment for people's sins. In Pauktaw, younger women also attributed natural disasters to over-exploitation of Rakhine's natural gas resources (an attitude shared by around 1% of the survey sample).

Information sources

Survey respondents and FGD participants were asked which sources of information they depended on to forecast natural hazards; whether their communities had a structured early warning system in place; and how reliable they felt their information sources were. More broadly, they were also asked if they had received any training or education about natural disasters in general.

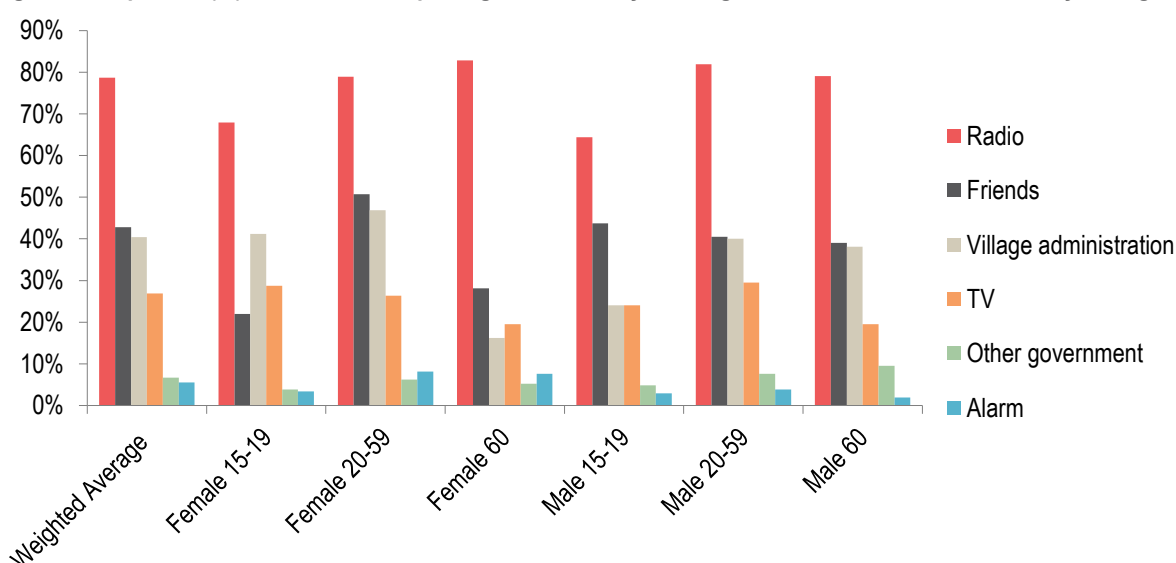
Early Warning

Types of early warning source

When asked about where they turned to for forecast information on natural disasters, 79% of survey participants cited radio, 42% friends, 40% village authorities, 27% TV, 7% various other government sources, 5% alarm systems, 4% police, and 4% that they did not know (see Figure 7). Teenagers were less likely to use radio, with only 66% reporting it as an information source, while both teenage men and older women were less likely to hear from village administrators (16% and 24% respectively).

- In total, 46% of all respondents listened to MRTV radio, 32% listened to Pyinsawaddy, 27% listened to BBC, and 10% listened to VOA.
- In total, 21% of all respondents watched MRTV TV, 7% watched Myawaddy, while 2% watched other channels.

Figure 7: Proportion (%) of individuals reporting different early warning sources for natural disasters, by sex/age



When asked whether their community had any kind of structured early warning system (EWS), 46% of people said yes and 50% said no, while 4% did not know. When asked which actors were involved in their early warning system, 37% said village authorities, 15% said township authorities, 15% said village-level volunteers, and 4% said a disaster management committee of some form (with 50% reporting nobody in the absence of any early warning system at all).

As with the survey data, the most commonly discussed source of warnings on impending storms or cyclones in all FGDs was radio. In Minbya, Myebon and Pauktaw, participants discussed listening to the radio directly, by contrast, in the Maungdaw and Sittwe communities participants said that because radio broadcasts were in Rakhine or Myanmar—languages not necessarily spoken by all people in Muslim communities—they had only heard information second-hand via other people listening to the radio. By

contrast, only participants in Pauktaw reported receiving any information from TV. Notably, younger women in both Sittwe and Maungaw communities reported being dependent entirely on word of mouth from friends or neighbours to hear cyclone warnings, since they did not understand the radio and spent less time outside of their houses relative to other groups.

In contrast to the survey data, the majority of FGD participants in all communities except Sittwe reported that their communities also received cyclone warnings through a basic EWS, in which village administrators would receive information by phone from township authorities, pass this on to either a proportion of household heads (Maungdaw), a dedicated early warning group (Minbya and Myebon), or a village crier (Pauktaw) for dissemination to the rest of the village. FGD participants in Maungdaw and Minbya noted that there had been no EWS system during cyclone Giri, but that during subsequent cyclone seasons it had been functioning well.

Reliability of early warning sources

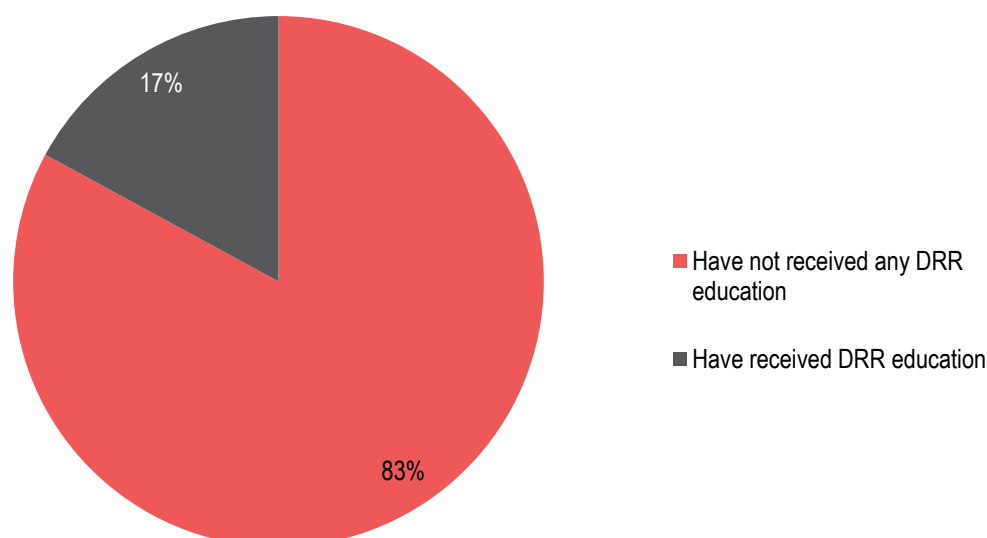
People were asked to rate the reliability of Radio, TV, township authorities, village authorities, friends/relatives, and the army as information sources, on a scale of 1-3 with 1 as unreliable, 2 as somewhat reliable and 3 as very reliable. Radio was rated as the most reliable forecast source, with 76% rating it “very reliable”, followed by township and village administrators (75% each), TV (73%), friends/relatives (60%), and the army (58%). Older women were less likely to rate TV as “very reliable”, with only 58% doing so.

In general, FGD participants felt that the information they received via the radio or village authorities was reliable. In Minbya, Myebon and Pauktaw, participants explained that before cyclone Giri, many people had failed to act on the warnings they received because they had never experienced a bad cyclone and were therefore unafraid of what might happen. However, they felt that people had been much more responsive to warnings received since Cyclone Giri. However, two important points were raised in further discussion of the reliability of radio broadcasts in particular. First, male participants in the Minbya and Myebon FGDs reported that villagers had not necessarily been able to understand the ‘technical’ components of radio warnings, such as wind speeds in miles per hour, or colour coding systems indicating the severity of impending cyclones. Second, participants in FGDs in Muslim communities noted that while they were able to glean information from radio broadcasts, the fact that this was usually conveyed second-hand meant that they did not necessarily understand the details or significance of what was being reported.

Education

When asked if they had received any kind of education or training about natural disasters, 83% of survey participants reported that they had received none, while 17% reported they had received some form of education from one or more sources (see Figure 8). Specifically, 8% reported receiving education from radio, 7% from NGOs, and 4% from television. Only 1% reported receiving DRR education at school. More older women reported receiving some education, with 34% doing so. This contradicts the dominant theme observed in other parts of the survey of older women being less aware of and less involved in household and community disaster responses.

Figure 8: Proportion (%) of respondents receiving DRR education, weighted average



In the FGDs, local and international NGOs were reported as the almost exclusive source of training. In the Minbya and Myebon communities, the Myanmar Red Cross Society (MRCS) had been a critical actor in training activities, having been widely active in both townships since Cyclone Giri. In addition to supporting the set-up of community disaster management committees, MRCS was widely reported to have provided training on disaster response, first aid and ecological conservation. In the Sittwe FGD community, an international NGO had very recently started running DRR trainings, but their activities in this regard were not yet widely known or understood by FGD participants. By contrast, in Pauktaw and Maungdaw, participants reported receiving little to no information on DRR (in the Pauktaw community, there are currently few NGO activities ongoing, but the Maungdaw community is covered by emergency food and health interventions). DRR education in schools was only reported by younger women in the Maungdaw community, though they were unable to elaborate on what it had contained.

Household-level preparedness and management

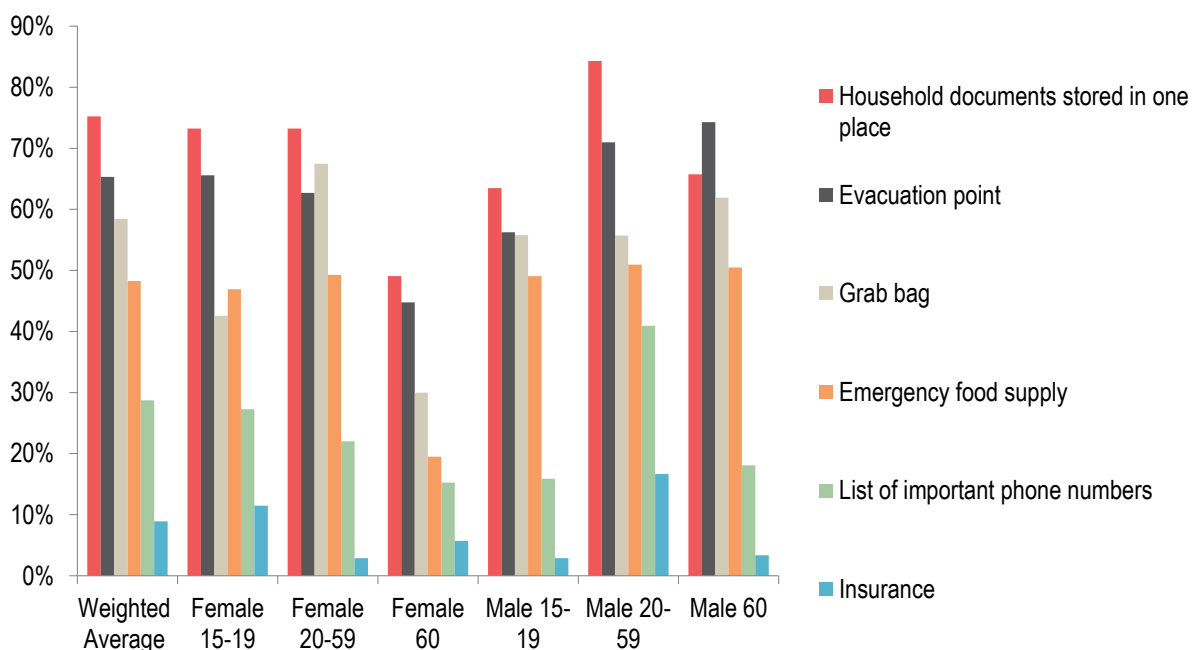
In this section, study participants were asked about their household preparedness in normal times prior to the onset of a disaster, and their responses during an actual disaster.

Disaster preparations

Survey respondents were asked what main actions their households would take if they heard a natural disaster were forecast. 55% said they would prepare all important documents, 54% said their entire household would evacuate to a safer place, 51% said they would secure their valuables, 24% said they would take measures to protect their house, 24% said they would evacuate some family members but leave others behind to look after their property, 20% said they would prepare supplies, 10% said they would evacuate their livestock, and 7% said they would take measures to protect their productive assets. 2% said they did not know what they would do. Both teenagers and older people were less likely to mention collecting documents (40% and 39% respectively) or valuables (35% and 31% respectively), while adult women (35%) were more likely to mention preparing supplies. These trends may represent specific division of roles among different household members.

People were asked if their household had any of the following: an emergency food supply, an emergency grab-bag with clothes and money, a list of important telephone numbers, household documents stored in one place, any form of household insurance, and an agreed household evacuation point. 48% had an emergency food supply, 58% had a grab-bag, 29% had a list of important telephone numbers, 75% had household documents stored in one place. Significantly, older women were least likely to report either an emergency food supply (20%), a grab-bag (30%), or a place to store important documents (15%).

Figure 9: Proportion (%) of individuals reporting different household preparations, by sex/age



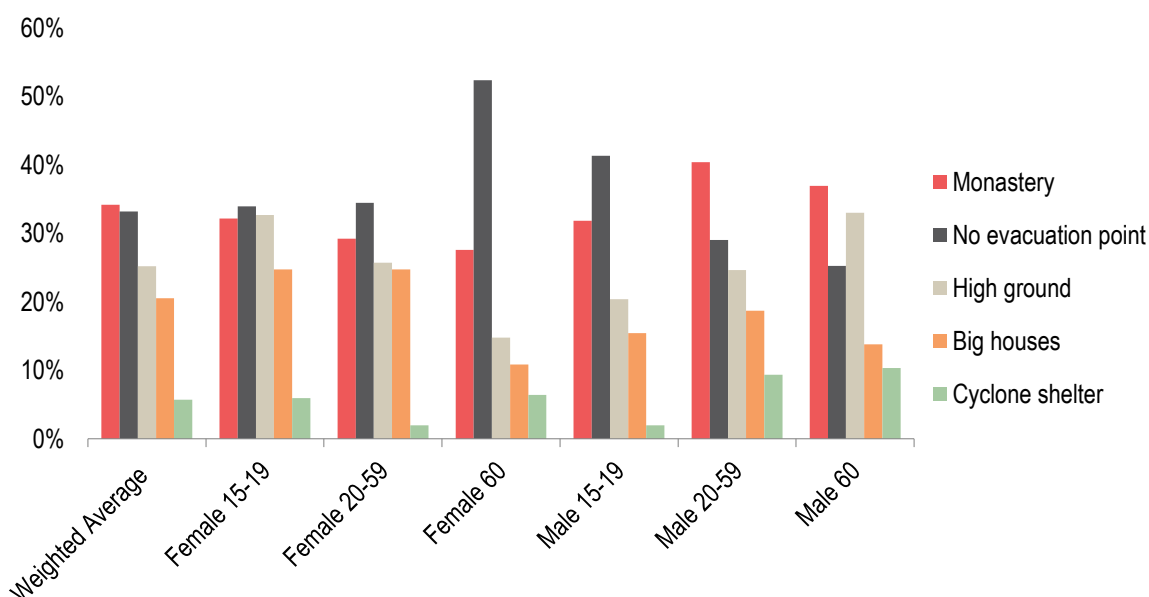
Household preparations listed by FGD participants broadly reflected those present in the survey data. Participants of both genders across all townships included preparing emergency bags of food, dry clothes and identity papers (although it was not clear if these were something that families kept at all times, or only when cyclone warnings were received), roping down their houses against wind, and burying valuable items.

When asked how involved they felt in household decision-making regarding what to do in a disaster, 87% of people said they would be “very” involved, 7% said they would be “somewhat” involved, and 5% said they would not be involved. Again, older women were less likely to indicate they would be “very involved,” with only 67% doing so.

During a disaster

Only 65% of people reported having a place to evacuate to during a disaster. This figure was markedly lower among older women, of whom only 45% reported knowing about an evacuation point. Of those who could specify an evacuation point or points, 34% of people identified a monastery or other religious buildings, 25% identified a point of higher ground, 21% identified big, well-built houses in their communities, 6% identified dedicated cyclone shelters, and 5% identified other places (see Figure 10). When respondents who had a preferred evacuation point were asked how safe it was, 61% of respondents rated it “very safe,” 29% rated it “somewhat safe,” and 9% rated it “not safe.” Older women were more likely to rate their shelters as only “somewhat safe” (50%).

Figure 10: Proportion (%) of individuals reporting different evacuation points, by sex/age

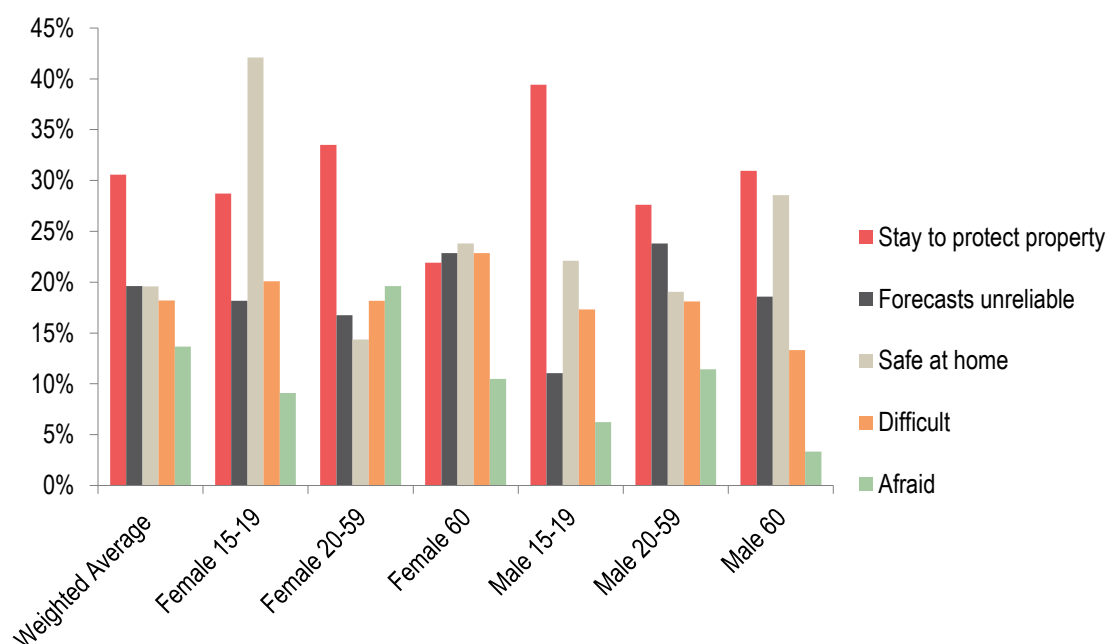


FGD participants largely reported the same spread of evacuation locations. In the Minbya, Myebon and Pauktaw FGDs, participants largely evacuated to monasteries during major storms or cyclones. In Maungdaw, some participants evacuated to a school in a neighbouring village and others stayed with friends or relatives in larger, better-built houses. In Sittwe, big houses were the only place participants reported evacuating to. However, FGD participants also highlighted that their experience of evacuation had not necessarily been a smooth one.

One issue raised was the lack of evacuation planning, especially in the Sittwe and Minbya communities. In Sittwe, younger participants of both genders reported not knowing what to do or where to go during the evacuation process. Younger women reported that they just looked to see where large groups of people were gathering and joined them, while younger men reported “running here or there in the road, because we did not know where to go or where we could stay” (This appears to reflect lower levels of awareness and coordination regarding DRR in this community more broadly). In the Minbya community, participants also reported that there was not enough space in their monastery during storms, since people also came from neighbouring villages to seek shelter there.

Following initial information from pilot FGDs, survey respondents were asked whether there was any reason why they would *not* evacuate their whole households. Around 80% of people said that under some circumstances, they might not evacuate everyone. Specifically, 30% said that some people needed to stay to protect their property, 20% of people said that forecasts were not always reliable, 20% felt their homes were already safe, 18% said it would be difficult to evacuate, for example for economic reasons or due to the presence of people with limited mobility, and 14% said they would be afraid to move. Teenage girls were more likely to say their homes were already safe, reported by 42% of this group (see Figure 11).

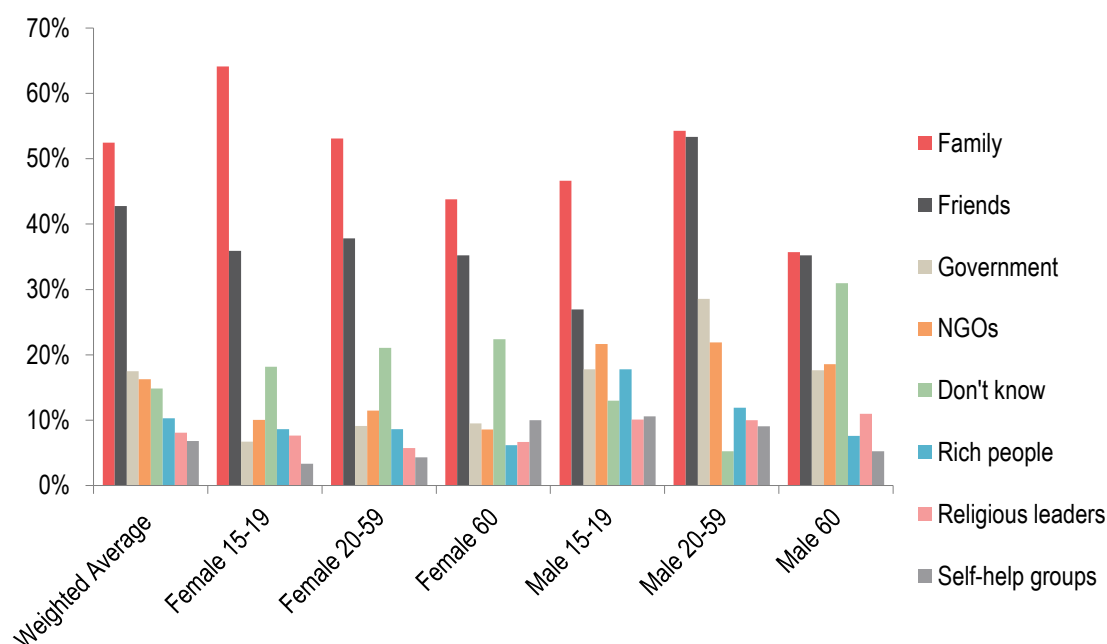
Figure 11: Proportion (%) of individuals reporting different reasons for not evacuating, by sex/age



Non-evacuation during disasters was also discussed in subsequent FGDs. In Maungdaw and Sittwe, it was felt that **social restrictions on younger, unmarried women from associating with men could constrain them from evacuating**, as discussed above. More broadly, around half of the participants across all communities except Sittwe reported that in some cases, men would stay behind to look after their properties after sending women, children and older people to evacuation points. This can be seen as a decision based on a calculated risk aimed at reducing economic losses. However, it should be noted that women in Myebon said that, since the experience of Giri, they had pressured their husbands to evacuate with them rather than staying home.

In terms of post-disaster experiences, survey participants were asked who they could rely on for help if their household suffered as a result of a natural disaster. 52% said family members, 43% said friends, 17% said the government, 16% said NGOs, 10% said rich people in their community, 8% said religious leaders, and 7% said self-help groups. 11% said they did not know who they could turn to for support. Teenage men were less likely to say they relied on friends (27%), while older men were both less likely to rely on family (36%) and more likely to not know who to turn to (31%) (see Figure 12).

Figure 12: Proportion (%) of individuals reporting different sources of support after disasters, by sex/age



Relatively few FGD participants discussed disaster relief outside of their immediate circle of family and friends. Within the community, participants in Minbya and Sittwe reported that community elders had collected funds from other community members to support the worst-affected, while in Sittwe older men and women reported that rich households had also provided food aid. In terms of external support, participants in all communities except Sittwe reported that their communities had received at least some disaster relief from a variety of UN agencies and international NGOs. By contrast, the only reference to government aid among FGD participants was in Minbya, where the army had reportedly helped to clear debris after cyclone Giri. This lack of state support was the source of widespread bitterness in the Pauktaw village, where male participants felt that the government had been much more generous in providing aid to other disaster-affected areas of the country (such as the Ayeyarwaddy delta after Cyclone Nargis) compared to Rakhine state.

Community-level preparedness and management

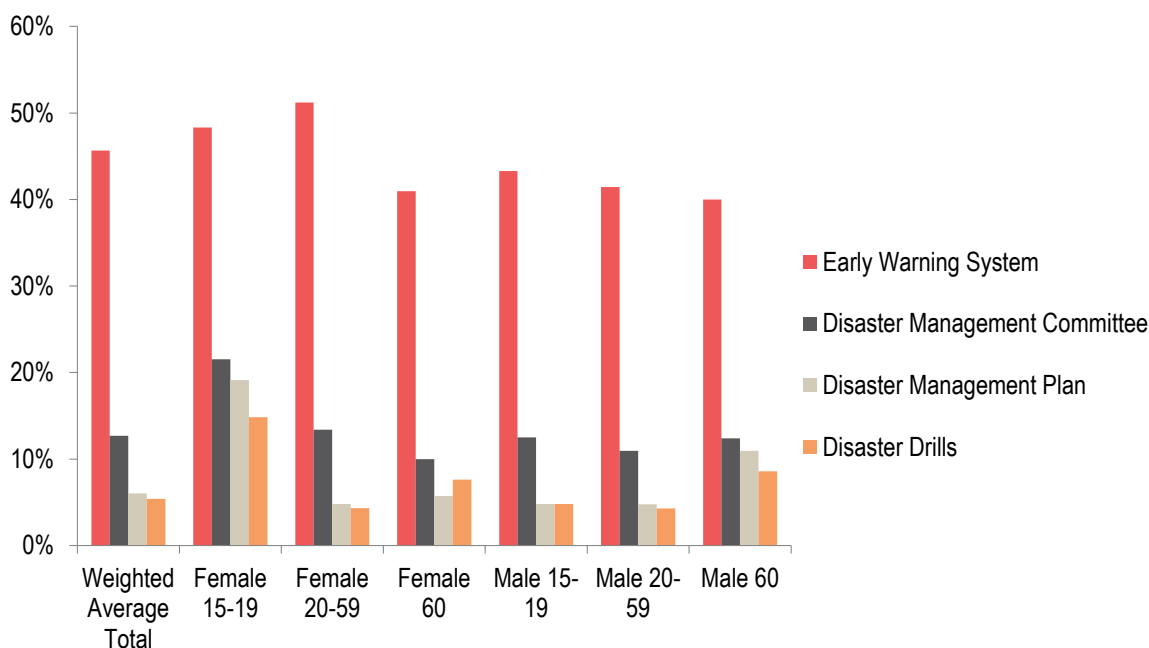
In this section, study participants were asked about community-level preparations in normal times prior to the onset of a disaster, and collective responses during an actual disaster. Notably, only a small minority of individuals reported the presence of community disaster management systems such as disaster management committees (DMCs) or disaster drills (see Figure 13).

Disaster preparations

When asked if their community had some form of DMC, 13% of survey participants said yes, 83% said no, and 4% did not know. In total, only 4% of people reported taking any part in a village DMC. Subsequent to Giri, the Minbya and Myebon communities appear to have established more formalised disaster-preparedness bodies. In Minbya and Myebon, MRCS had helped establish committees to raise awareness, support early warning systems and provide basic first aid. In Sittwe an international NGO had set up a system of village DMCs as recently as early 2015. In all cases, the committees as reported involved both men and women. However, the work of these committees was not always well-understood by all participants. In Minbya, for example, younger men acknowledged that a committee existed, but had no idea what it did.

Survey respondents were then asked if their community had any kind of disaster management plan (DMP). Only 6% of people reported the existence of a DMP, 88% said none existed, and 6% did not know. Respondents who were aware of a DMP reported its contents as mainly evacuation planning, followed by training. Only 3% of people surveyed overall reported being involved in disaster planning for their community. Related to this, participants were asked if their community had ever conducted a disaster preparedness drill. 5% said yes, 86% said no, and 8% said they did not know. Only 4% of people reported that they had ever taken part in a drill.

Figure 13: Proportion (%) of individuals reporting presence of community-level disaster management structures, by sex/age



As at the household level, survey participants were asked to rate the extent of their likely involvement if their community was planning how to respond to a natural disaster. 80% felt they would be “very” involved, 12% felt they would be “somewhat involved” and 7% felt they would not be involved. By contrast, only 60% of older women felt they would be “very involved.”

During a disaster

In order to explore the level of community cohesiveness during a natural disaster, a series of statements were read to the survey participants about how their community would react in the event of a natural disaster, and then asked which one they agreed with the most:

- 51% of people agreed most with the statement: “If there is a disaster, people will only help their own families.”
- 13% of people agreed most with the statement: “If there is a disaster, people will work together to support each other, but without much organisation.”
- 34% of people agreed most with the statement: “If there is a disaster, people will work together to support each other in an organised, well-planned way.”

In this context, adult males were relatively less likely to view their community as being concerned only for their own families (32%) and more likely to anticipate a collective, planned response (57%).

Discussing their experiences during cyclone Giri, participants in Minbya, Myebon and Pauktaw reported a relatively high level of collective action before and during the event, especially among young people. In

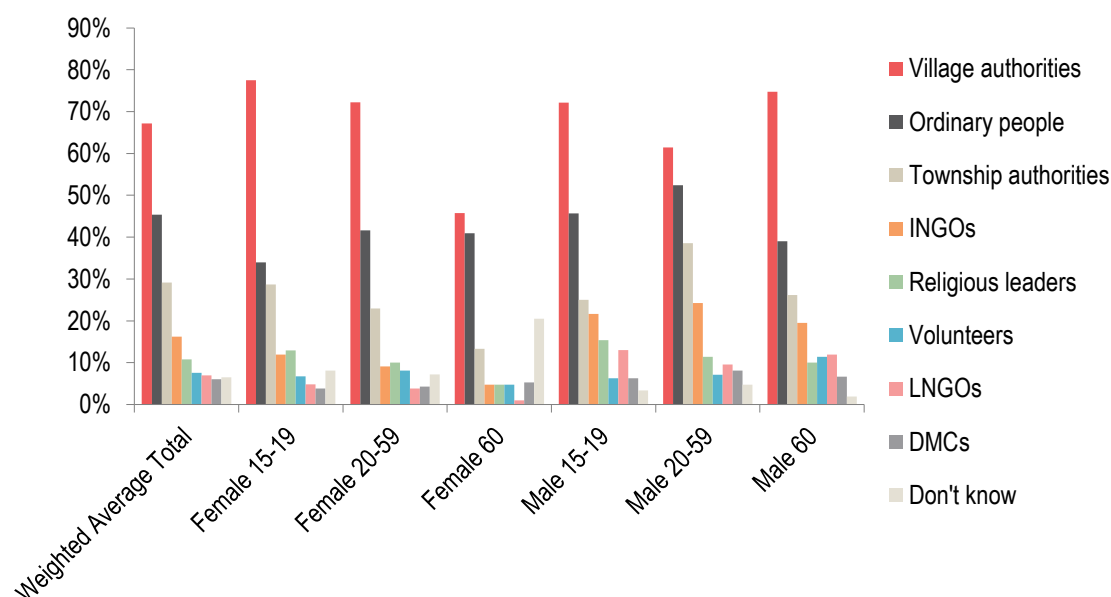
these communities (as well as in Maungdaw), participants reported that village administrators and village elders had held meetings after receiving warnings to discuss strategies for evacuating people. In Pauktaw, younger men then went on explain in detail how the community had banded together to help transport emergency supplies to the evacuation point (the local monastery), but had done so in an ad-hoc fashion without any pre-assigned responsibilities. In both Minbya and Myebon, participants explained that voluntary youth groups provided support in a more systematic function, with roles and responsibilities assigned. These were reportedly pre-existing groups that normally helped villagers during weddings, funeral services and other collective activities. In Sittwe and Maungdaw by contrast, participants reported comparatively little community-level activity during cyclone events. In Sittwe, this may be related to the site's status as a peri-urban area with several thousand inhabitants rather than a small village of a few hundred.

Roles and responsibilities in disaster management

In this section, study participants were asked a number of questions on their understandings and perceptions of the roles and responsibilities of different actors working in their community during natural disasters.

When asked who they felt played an important role in managing disasters in their area, 67% of people said village authorities, 45% said ordinary people, 29% said township authorities, 16% said international NGOs, 10% said religious leaders, 7% said volunteers, 6% said local NGOs, and 6% said disaster management committees. 6% were unable to identify anybody (see Figure 14). Older women were less likely to cite both village authorities (46%) and township authorities (13%) as key actors. As discussed above, in the narratives of the FGDs different actors were discussed at different stages of disaster response. Village and township authorities were mostly discussed in the context of early warning systems, ordinary people and volunteer groups (where these existed) were discussed as the key actors during a disaster itself, whereas NGOs and to a lesser degree the government were more commonly discussed as key actors during the recovery stage.

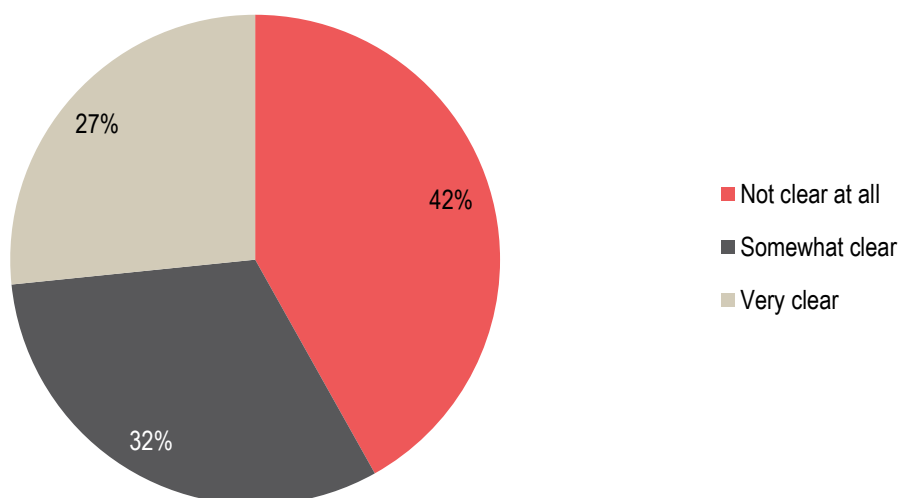
Figure 14: Proportion (%) of individuals reporting different key actors in disaster response, by sex/age



People were asked to rate the effectiveness of the following actors in responding to a disaster: village authorities, township authorities, religious leaders, international NGOs, local NGOs, and the army. Each actor was rated on a scale of 1-3 with 1 as ineffective, 2 as somewhat effective and 3 as very effective. International NGOs were rated the most effective, with 80% rating them “very effective,” followed by township authorities (77%), religious leaders (75%), village authorities (74%), local NGOs (73%), and lastly the army (60%). Older women were broadly less confident in the effectiveness of all actors compared to other age/gender groups, for example international NGOs (63%), township authorities (61%), religious leaders (58%), and local NGOs (52%).

People were then asked to rate how clearly they understood which actors were responsible for doing what in the event of a natural disaster. 42% of people said they had no understanding, 32% said they had some understanding, while 27% said they had a clear understanding (see Figure 15). Coupled with this, people were then asked if they were aware of any policies or laws regarding natural disasters in Myanmar. 91% said they were not, while only 9% said they were aware of something. Only 2% reported awareness of the national action plan for DRR, and only 2% reported awareness of the disaster management law.

Figure 15: Proportion (%) of individuals reporting different levels of understanding of roles and responsibilities during disaster response, weighted average



This lack of knowledge about Myanmar's current institutional and legal framework for dealing with natural disasters highlights two key weaknesses. First, it suggests that the response to any future disasters risks being disjointed and inefficient at the community level because people will be unaware of what is supposed to happen. This has already proven especially problematic in camp contexts, where IDPs in some cases reportedly refused to evacuate in government-provided vehicles due to a total lack of information and high levels of distrust about where they were being moved and why. Second, without knowing who is responsible for doing what during a disaster—either within their communities or externally—people have no way to either manage their expectations, or hold actors to account when they fail to deliver on their assigned roles.

Disaster mitigation

In order to keep questions simple, disaster mitigation was addressed in the survey questionnaire by first asking respondents to identify the resources people felt their community needed to better prepare for and respond to natural disasters; and then to explain what actions their community could take to reduce the effects of those disasters.

When asked what resources they felt their area needed to help it better prepare for and respond to natural disasters, 63% said cyclone shelters, 24% said training/awareness raising, 18% said early warning systems, 17% said flood defences, 16% said more NGO support, 12% said more government support, 9% said improved roads, and 8% said stronger buildings. 12% of people were unable to identify anything at all.

When asked what actions their community could take to reduce the effects of natural disasters, 32% said conduct more awareness-raising, 32% said plant more trees or rehabilitate forests (possibly reflecting the perceived causal relationship between deforestation and worsening natural disasters), 18% said rehabilitate mangrove areas, 13% said build flood defences, and 8% said better buildings. 32% were unable to identify any actions at all.

The most frequently suggested mitigation measures in the FGDs were related to evacuation. In about one-third of all FGDs, participants discussed the need both for better cyclone shelters, and for improved

roads in order to provide more effective evacuation routes. Smaller numbers of participants in all communities except Myebon also said that their communities needed organised committees to better handle planning and response for disasters. It should be noted that in both Minbya and Sittwe, such committees already existed. In contrast with the survey data, forest preservation was not widely discussed within the FGDs. However, it should be noted that in field observations at assessment sites, the survey team did report a relatively widespread community interest in ecosystem rehabilitation.¹⁵ Finally, echoing the survey respondents unable to think of any mitigation measures, younger people of both genders in Maungdaw and younger women in Pauktaw could offer no concrete suggestions on how to reduce the impact of natural disasters beyond asking for more external assistance.

The survey concluded by asking people about their interest in being involved with DRR-related activities in their area. 78% said they would be very interested, 10% said they would be somewhat interested, and 10% said they would not be interested at all. In FGDs, the level of interest and engagement with the subject was generally high, with older male participants in both Maungdaw and Pauktaw concluding discussions by explicitly requesting DRR interventions in their communities.

¹⁵ A participatory assessment report on mangrove ecosystem management and rehabilitation in the project area will be released by IDM-RAND in Autumn 2015.

RECOMMENDATIONS

The results of this study point to a number of promising aspects of people's knowledge and attitudes regarding natural disasters. People in northern Rakhine state have lived through multiple disasters and are well aware of the threats they pose. Most view dealing with the impact of natural disasters as a high priority and are interested in taking part in DRR activities. In addition, around half demonstrate an understanding of the link between natural disasters and environmental degradation.

However, it also highlights a number of gaps in people's capacity and resources to cope with natural disasters when they do occur. Very few people have received any education on DRR, either at school or through development programming. While the majority of people have access to early warning systems via radio broadcasts, these warnings are not always easy to interpret, or delivered in a language they can understand. In addition, the majority of people are dependent on ad-hoc disaster shelters such as monasteries and schools, and one-third report not having any evacuation point at all. While many people do prepare for natural disasters within their own households, structured preparedness mechanisms within the community are substantially less apparent: very few people report ever taking part in disaster preparedness drills, or the presence of disaster management committees working in their areas. This means that when disasters happen—as they all too frequently do—people are unsure about if and how the roles and responsibilities for managing them are designated.

These capabilities and gaps suggest a number of possible action points for both government agencies and local and international DRR actors operating in the project area. For ease of reference, these are presented below under the relevant components and sub-components of the Myanmar Action Plan for Disaster Risk Reduction (MAPDRR), the Myanmar government's main framework for implementing DRR activities in the country.¹⁶

Component 2: Hazard, Vulnerability and Risk Assessment

2.1 Vulnerability and risk assessment at various levels

- **Work to incorporate gender and age vulnerability analysis in all DRR programming.** Responses from younger and older women participating in the study indicate that these groups may be more vulnerable than others to the effects of natural disasters. DRR practitioners should ensure that these groups in particular are specifically accounted for and actively included in all future DRR programming.

Component 3: Multi-Hazard Early Warning Systems

3.2 Multi-hazard end-to-end early warning dissemination system

- **Work to improve accessibility of disaster forecasting.** Study participants pointed out that disaster warnings broadcast via radio in particular were not always easy to understand, or even in a language they could understand. DRR practitioners and government agencies should therefore develop appropriate targeting strategies to ensure that disaster warnings are accessible to all populations at risk.

Component 4: Preparedness and Response Programs at National, State/Region, District and Township levels

4.2 Multi-hazard response plan for region/state, district and township

- **Ensure that state, district and township disaster management plans are adequately broadcast to the communities they cover.** Many study participants felt they had little idea of who was responsible for performing which functions, and almost none had any knowledge of any government policies or plans

¹⁶ Ministry of Social Welfare, Relief and Resettlement, Relief and Resettlement Department/ADPC, Myanmar Action Plan on Disaster Risk Reduction (MAPDRR) (Yangon, 2012). A full list of MAPDRR components and sub-components is provided in Annex 3.

regarding DRR. As government and DRR practitioners work to develop DMPs at different administrative levels, they should ensure that they keep communities involved and informed of how these will work in practice. This is important for ensuring both that disaster response can occur smoothly, and that those involved can be held accountable.

4.7 Provision of safe shelter

- **Ensure that communities have access to adequate and properly serviced disaster shelters.** Over one third of the study population reported having no place to evacuate in the event of a disaster. Government and DRR practitioners should work toward ensuring that everyone is able to access shelter during a disaster. This approach could involve developing ways to provision and retrofit the spaces people already use, such as monasteries, schools, or even larger houses within communities themselves.

Component 6: Community-based Disaster Preparedness and Risk Reduction

6.3 Promoting community-based disaster risk reduction volunteerism

- **Extend the coverage of community-based disaster risk reduction (CBDRR) initiatives.** Given the relative absence of CBDRR practices such as disaster drills or DMCs, DRR practitioners should work to extend the coverage of CBDRR initiatives. Where possible, such process should attempt to involve existing or 'emergent' local groups who have previously fulfilled roles in disaster response.

6.7 Integration of community-based disaster risk reduction into community development projects

- **Mainstream CBDRR into livelihoods and early recovery programming.** The impact of Cyclone Komen and the start of the resettlement of a portion of Rakhine's internally displaced persons (IDPs) have recently shifted the operational landscape of Rakhine state. The resulting increased donor and agency interest in both early recovery programming and long-term livelihoods activities should therefore be used as an opportunity to mainstream CBDRR and disaster education into the design of future interventions in the state.

6.8 Development and implementation of community-based natural resource management programs

- **Leverage existing popular awareness of ecosystem degradation.** Around half the survey respondents felt that deforestation was making their communities more vulnerable to the effects of natural disasters. DRR practitioners should build on this to support communities in improving local natural resource management for DRR where appropriate.

Component 7: Public Awareness, Education and Training

7.2 National public awareness program

- **Extend coverage of DRR awareness-raising activities.** Less than one-fifth of survey participants reported receiving any education on natural disasters through any means at all. Given the high frequency of natural hazards Rakhine is exposed to, community education activities on DRR should be ramped up by both government and DRR practitioners as an urgent priority. In particular, actors should consider leveraging the widespread popularity of radio reported by study participants as a means to broadcast DRR messaging quickly to large numbers of people.

7.3 Awareness through school and school curriculum

- **Incorporate DRR into government and temporary learning space curricula.** Only 1% of study participants reported receiving any DRR training in school. Government education authorities supported by NGOs should fast-track the incorporation of basic DRR into school curricula, while NGOs running temporary learning spaces in IDP camps and other contexts should work to incorporate DRR into their day-to-day activities. Innovative approaches should also be explored to extend DRR education to monastic schools, accelerated learning programmes, and the range of informal and semi-formal learning spaces that characterize Rakhine's education environment.

7.10 Research and development on disaster risk reduction

- **Extend research on the vulnerabilities of different groups to natural disasters.** This research has only provided a limited picture of how and why different groups may be vulnerable to disasters in different ways. More in-depth, qualitative studies are needed to understand how women, men, boys and girls in different communities experience and respond to disasters in different ways. In particular, the absence of people with disabilities is a key weakness in the data of this study and should be urgently addressed in future research.

ANNEXES

Annex 1: KAP Survey Questionnaire

Informed Consent Statement

Hello, my name is ____ My role is ____ and I work for REACH Initiative, a research NGO which is based in Geneva. We are conducting an assessment across Rakhine state to understand how local people experience and deal with natural disasters. This assessment is not linked to any aid for any particular village community. Instead, its aim is to help the government and other actors plan to reduce the risk from natural disasters across Rakhine state. It is also designed to help develop education materials, which can be used in any community in the state.

We therefore cannot offer you any direct aid or incentives as a result of this interview. However, your opinions and experiences will make a very important contribution to our understanding of the problems you face. This will in turn support planning and policies that aim to benefit Rakhine state as a whole. Everything you say us will be kept confidential. We are interested to hear all your opinions, both positive and negative. At the end of this interview we will make a report and share it with all actors involved in disaster management planning, but we will not mention your names, or who said what.

You can decide whether you want to take part to take the interview or not. Once my questions have started, you have the right to refuse to answer any question, or to leave the interview at any time. If you choose not to take part or to skip any questions, it will have no negative impacts on your ability to access services from REACH or any other agency. Please feel free to ask me any questions now, or at any point during the interview. Do you consent to participate in this interview?

Questionnaire

1. Household information	
Date	
1.1 Township	- Maungdaw - Sittwe - Pauktaw - Minbya - Myebon
1.2 Location name	
1.3 Location type	- Village - Ward - Camp
1.4 Respondent gender	- Male - Female
1.5 Respondent age	
1.6 What is your highest level of education? [prompt; select one]	- Primary school - Middle school - Secondary school - University - Other _____ - None
1.7 Number of people living in household	
1.8 Does your household have any of the following?	- Television

[prompt; select as many as apply]	- Fridge - Phone - Car or truck - Bicycle
1.9 Main material of the flooring (observation) [prompt; select one]	- Sand - Earth/mud - Raw wood planks - Bamboo - Polished wood - Ceramic tile - Cement - Carpet - Other _____
1.10 What kind of toilet does your household use? [prompt; select one]	- No toilet - Pit latrine - Improved pit latrine (concrete slab) - Public toilet - Flush toilet - Other _____
1.11 What is the main source of water for the household? [prompt; select one]	- Surface water (river, pond etc.) - Rainwater - Borehole - Unprotected spring or well - Protected spring or well - Tanker truck or cart - Public tap - Piped into house - Bottled - Other _____
1.12 How many rooms are there in your dwelling? [prompt; select one]	- 1 - 2 - 3+
1.13 Do you have access to electricity via grid or generator? [prompt; select one]	- Yes - No
2. Natural hazards	
Note: In this interview, I will be talking to you about natural disasters. These are disasters caused by events in nature, not by man-made problems	
2.1 How many kinds of natural disasters can you think of? [do not prompt; select as many as apply]	- Cyclones/big storms - Flooding - Earthquake - Tsunami - Fire - Landslide - Drought - Disease - Don't know - Other _____

2.2 Which disaster do you think is the biggest problem for your area? [do not prompt; select one]	- Cyclones/big storms - Flooding - Earthquake - Tsunami - Fire - Landslide - Drought - Disease - Don't know - Other _____
Note: thank you – from now on, we will discuss only the disaster that you have identified as the biggest problem.	
2.3 In your lifetime, how many times have you personally experienced this disaster? [prompt; select one]	- 0 - 1 - 2 - 3 - 4 - 5+ - At least one time, but can't remember exactly
2.4 Compared to 30 years ago, do you think this type of disaster happens more often, less often, or the same as always? [prompt; select one]	- More often - Less often - Same as always - Don't know
2.5 What do you think are the main causes of this disaster? [do not prompt; select as many as apply]	- Nature - God - Climate change - Deforestation - Poverty - Lack of development - Don't know - Other _____
2.6 How big a problem do you think these disasters are for your area? [prompt; select one]	- Small - Medium - Large
2.7 Compared to other problems you or your area face, how big a priority is it to reduce the risk from these disasters? [prompt; select one]	- Low priority - Medium priority - High priority
3. Disaster impacts	
Note: In this section, I'd like to talk to you about what kind of effects [this disaster] can have. If you have personally experienced [this disaster], try to think of what happened the last time.	
3.1 What do you think the main effects of this disaster are? [do not prompt; select as many as apply; give respondent time to think]	- Injury or death - Damage to houses - Damage to infrastructure - Loss of productive assets - Loss of crops - Loss of income - Loss of livestock - Debt - Disease

	- Psychological effects - Don't know - Other _____
3.2 Are there any parts of your area's infrastructure or environment you think will be more affected by this disaster? [do not prompt; select as many as apply]	- Houses - Farmland - Fishing resources - Trees/forests/orchards - Schools - Health facilities - Water and sanitation facilities - Roads - Bridges - Don't know - Other _____
3.3 Can you think of any kinds of job or work in this area that will be more affected by this disaster? [do not prompt; select as many as apply]	- Fisherman - Livestock herder - Farmer - Wage labourer - Shopkeeper/businessman - Government employee - Police/army - No - Don't know - Other _____
3.4 Can you think of any kinds of job or work in this area that will be less affected by this disaster? [do not prompt; select as many as apply]	- Fisherman - Livestock herder - Farmer - Wage labourer - Shopkeeper/businessman - Government employee - Police/army - No - Don't know - Other _____
3.5 Can you think of any kinds of people in this area who will be more affected by this disaster? [do not prompt; select as many as apply]	- Older people - Adults - Children - Men - Women - People with disabilities - Richer people - Poorer people - People living in certain areas - No - Don't know - Other _____
3.6 Can you think of any kinds of people in this area who will be less affected by this disaster? [do not prompt; select as many as apply]	- Older people - Adults - Children - Men - Women - People with disabilities

	- Richer people - Poorer people - People living in certain areas - No - Don't know - Other _____			
3.7 In the past 30 years, can you think of any changes that have happened in your area which might make the effects of disasters worse? [do not prompt; select as many as apply]	- Deforestation - Mangrove degradation - Increased population - Increased poverty - Bad government - Worse community relations - Conflict - Poor construction - Building or farming in unsafe places - Bad farming practices - Worse infrastructure - No - Don't know - Other _____			
4. Information sources				
Note: In this section, we will talk about how you get information about disasters that happen in your area				
4.1 If a disaster happens in your area, where do you get forecasts or information from? [do not prompt; select as many as apply]	- Radio - TV - Friends, family, neighbours etc. - Village administration - Army/police - Other government - Alarm, siren, loudspeaker - Nothing - Don't know - Other _____			
4.1.2 Which radio stations? [if radio selected; do not prompt; select as many as apply]	- Myanmar Radio - Pyinsawady - BBC - VOA - Don't know - Other _____			
4.1.3 Which TV stations? [if TV selected; do not prompt; select as many as apply]	- MRTV - Myawaddy - Don't know - Other _____			
4.2 I am going to read out a series of information sources. For each, I would like you to tell me how good a source of information they are about disasters. [prompt; select one]	<table border="1"> <tr> <td>1. Bad</td><td>2. Average</td><td>3. Good</td></tr> </table>	1. Bad	2. Average	3. Good
1. Bad	2. Average	3. Good		
4.2.1 Friends and family				
4.2.2 Radio				
4.2.3 TV				
4.2.4 Village administration				

4.2.5 Township administration			
4.2.6 Army			
4.3 Do you know of any traditional ways people in this area use to predict disasters?	- Yes (describe) _____ - No		
5. Household disaster preparation and management			
Note: In this section we will discuss how your household might prepare for and respond to [this disaster]			
5.1 In your own household, what steps would you take if you heard this disaster was forecast? [do not prompt; select as many as apply]	- Evacuate everybody to a safe place - Evacuate some people to a safe place, but leave some people behind - Secure important documents - Secure valuables - Secure productive assets - Bring livestock to safe areas - Prepare emergency supplies - Strengthen the house against wind/rain - None - Don't know - Other (specify) _____		
5.2 Does your household currently have any of the following? [read out; select as many as apply]	- An agreed place to evacuate to - Emergency food supply - Emergency bag with enough clothing, cash and other supplies for each family member - List of important telephone numbers - Important documents stored in one place - Any kind of disaster insurance policy - None of the above - Don't know		
5.2.1 [If evacuation point selected] Where is the evacuation point? [do not prompt; select as many as apply]	- Storm shelter - Monastery - Big house - High ground - Don't know - Other _____		
5.2.2 [If evacuation point selected] How safe do you think this area is? [prompt; select one]	- 1. Unsafe - 2. Somewhat safe - 3. Safe		
5.3 Are there any reasons why some or all of your family would not evacuate if you heard [this disaster] was forecast? [do not prompt; select as many as apply]	- Safe enough here - Too expensive or time-consuming to evacuate - Afraid to leave - Need to stay to look after property - Forecasts are not reliable - No, we would all evacuate - Don't know - Other _____		
5.4 If your household was planning how to respond to [this disaster], would you be involved? [prompt; select one]	- 1. Not involved - 2. Somewhat involved - 3. Involved		

5.5 If your household suffered as a result of [this disaster], who could you rely on to help you? [do not prompt; select as many as apply]	- Friends or neighbours - Relatives - Rich people in the area - Religious leaders - Government authorities - Savings groups / self-help groups - NGOs - Nobody - Don't know - Other _____
6. Community disaster preparation and management	
Note: In this section we will discuss how your area might prepare for and respond to disasters	
6.1 Does your area have an organised way to warn people about disasters?	- Yes - No - Don't know
6.2 Who is involved in running this system? [do not prompt; select as many as apply]	- Village authorities/heads - Township authorities - Community volunteers - Disaster management committee - Don't know - Other _____
6.3 Does your area have a disaster management committee (or similar organised body)?	- Yes - No - Don't know
6.3.1 [If yes] Have you taken part in this committee?	- Yes - No
6.4 Does your area have any kind of plan to deal with disasters?	- Yes - No - Don't know
6.4.1 [If yes] what is in this plan?	- Risk assessment - Evacuation plan - Identify evacuation routes - Identify evacuation points - Evacuating/protecting productive assets - Drills - Training/awareness-raising - Relief to affected people - Don't know - Other _____
6.4.2 [If yes] did you take part in making this plan?	- Yes - No
6.5 Has your area ever practiced responding to a disaster?	- Yes - No - Don't know
6.5.1 [If yes] Have you ever taken part in this practice?	- Yes - No
6.6 If your community was planning together about how to respond to this disaster, would you be involved? [prompt; select one]	- 1. Not involved - 2. Somewhat involved - 3. Involved

6.7 Which sentence do you think best describes your area? [read out; select one]	1. If there is a disaster, people will only help their own families. 2. If there is a disaster, people will work together to support each other, but without much organisation. 3. If there is a disaster, people will work together to support each other in an organised, well-planned way. 4. None of the above.			
7. Roles and responsibilities in disaster management				
Note: In this section, we will discuss who the key actors are in responding to disasters in your area.				
7.1 Who do you think plays an important role in responding to disasters in your area? [do not prompt; select as many as apply]	- Ordinary people - Village authorities - Township authorities - Religious leaders - Army - Health services - INGOs - LINGOs or CBOs - Disaster management committees - Other volunteers - Don't know - Other _____			
7.2 I am going to read out a list of actors. I would like you to tell me how effective you think each one will be in responding to disasters in your area. [prompt; select one]	1. Not effective	2. Somewhat effective	3. Effective	4. Don't know
7.2.1 Village authorities				
7.2.2 Township authorities				
7.2.3 Army				
7.2.4 Religious leaders				
7.2.5 INGOs or UN agencies				
7.2.6 Local NGOs or CBOs				
7.2.7 [If selected] Local disaster management committee or similar body				
7.3 How clearly do you understand who is responsible for doing what when disasters happen in your area? [prompt; select one]	- 1. Don't understand - 2. Somewhat understand - 3. Understand - 4. Don't know			
7.4 Are you aware of any national government laws, policies or procedures concerning natural disasters?	- Yes - No			
7.4.1 [If yes] Can you name any? [do not prompt; select as many as apply]	- Disaster Management Law - National Action Plan on Disaster Risk Reduction - National Early Warning System - Don't know - Other _____			
8. Education and the future				
Note: In this last section we will discuss education about disasters, and what you think the main priorities are for reducing the threat of disasters in your area.				

8.1 Have you ever received any education or training about natural disasters?	1. Yes 2. No
8.1.1 [If yes] From what source? [do not prompt; select as many as apply]	- TV - Radio - Books/newspapers - School - NGO training - Word of mouth - Other _____
8.1.2 [If yes] What was the education / training about? [do not prompt; select as many as apply]	- Effects of disasters - Early warning systems - What to do during disasters - How to prepare for disasters - How to mitigate disasters - Don't know - Other _____
8.1.3 [If yes] Overall, how useful do you think this education has been? [prompt; select one]	- 1. Not useful - 2. Somewhat useful - 3. Useful - 4. Don't know
8.2 What do you think your area needs to help it better prepare and respond to disasters? [do not prompt; select as many as apply]	- Storm/cyclone Shelters - Training, education or awareness - Improved roads and transport - Improved building construction - Improved early warning systems - Improved planning - Improved health services - More support from NGOs - More support from government - Improved community organisation (committees etc.) - Poverty reduction/livelihoods - Don't know - Other _____
8.3 Apart from this, can you think of any actions that would reduce the effects of disasters when they do happen? [do not prompt; select as many as apply]	- Training, education or awareness - Change farming practices - Reforestation - Mangrove rehabilitation - Build flood defences - Safer buildings - Risk assessment - Improved roads and transport - Poverty reduction / livelihoods - Nothing needed - Don't know - Other _____

8.4 Personally, how interested would you be in taking part in activities to reduce disaster risk in this area? [prompt; select one]	- 1. Not interested - 2. Somewhat interested - 3. Interested - 4. Don't know
That is all the questions I have for you. Is there anything else you would like to add, or any issues we have missed?	(specify)
THANK YOU	

Annex 2: FGD Guide

Informed Consent Statement

Hello, my name is _____. My role is _____, and I work for REACH Initiative, a research NGO which is based in Geneva. We are conducting an assessment across Rakhine state to understand how local people experience and deal with natural disasters. This assessment is not linked to any aid for any particular village community. Instead, its aim is to help the government and other actors plan to reduce the risk from natural disasters across Rakhine state. It is also designed to help develop education materials which can be used in any community in the state.

We therefore cannot offer you any direct aid or incentives as a result of this discussion. However, your opinions and experiences will make a very important contribution to our understanding of the problems you face. This will in turn support planning and policies which aim to benefit Rakhine state as a whole. Everything you us will be kept confidential. We are interested to hear all your opinions, both positive and negative. At the end of this discussion we will make a report and share it with all actors involved in disaster management planning, but we will not mention your names, or who said what.

You can decide whether you want to take part to take the discussion or not. Once my questions have started, you have the right to refuse to answer any question, or to leave the discussion at any time. If you choose not to take part or to skip any questions, it will have no negative impacts on your ability to access services from ACTED or any other agency. Please feel free to ask me any questions now, or at any point during the discussion. **Do you consent to participate in this discussion?"**

[If recording] "To make sure that we record your views accurately, we would like to record this discussion. This recording will not be shared with anyone outside of the ACTED research team. It will only be used for translation purposes and will be destroyed as soon as translations are complete. **Do you consent to our recording this discussion?"**

- = Probing question. Do not ask unless question is not already answered by previous responses.

Section 1: Defining and identifying natural disasters

- What does the phrase "natural disaster" mean for you?
 - How many kinds of natural disaster can you list?
 - What kinds of disasters happen in this community?
 - How big a problem are they?
 - How often do they happen?
 - Has this changed over time?
 - What do you think causes these disasters?

Section 2: Experience of natural disasters

- Can you describe in detail what happened the last time this community experienced a natural disaster?
 - What kind of effects did the disaster have?
 - Did it affect everybody the same, or different people in different ways? How?
 - Did it affect different things (e.g. houses, crops) in different ways? How?
 - Short-term effects?
 - Long-term effects?
 - Did you receive any information or warning about the disaster?
 - From what source?
 - What did you do to protect yourselves from the disaster?
 - Within your families?
 - At the community level – was there any organised response?
 - We've talked about how the community responded to the disaster. What do you think were the good points about how you responded? What do you think could be improved?

Section 3: Information about disasters *[if answers have already been provided during Section 2 or Section 3, skip questions as appropriate]*

- Have you received any kind of education about natural disasters? Please describe.
 - Did this include education on disaster risk reduction?
 - Who did you get it from?
 - What are its strong and weak points? What changes would you make?
- Do you have any way to predict disasters before they happen?
 - Within the community itself?
 - From outside (e.g. radio, TV)?
 - What are the strong points and weak points of these methods? What changes would you make?

Section 4: Preparing for disasters and disaster resilience

- Do people in this community make any preparations in case a natural disaster takes place?
 - Do you make any preparations within your own households? Please describe.
 - Are there any preparations made by the whole community? Please describe
 - Who is involved? What are their roles?
 - If there are preparations, are they supported by people outside the community in any way? (e.g. government, NGOs)
 - What are the strong and weak points of these preparations? What changes would you make?
- Sometimes, how we live or how we work may make us more or less likely to suffer when a natural disaster happens. Can you think of any examples?
 - Have you seen any of these changes in your community recently?
 - Can you think of any changes you could make?

Are there any other issues you would like to discuss?

Annex 3: MAPDRR Components and Sub-Components

1 Policy, Institutional arrangements and further institutional development
1.1 Development of National Disaster Management Law
1.2 Enhancement of Disaster Risk Reduction Mandates of Ministries and Departments
1.3 Updation of Standing Order on Disaster Management
1.4 Strengthening and Capacity Building of Disaster Management Focal Points in each Ministry and Region/State, District, Township Disaster Preparedness Agencies
2 Hazard, vulnerability and risk assessment
2.1 Vulnerability and Risk Assessment at various levels
2.2 Hazard and Vulnerability Atlas of Myanmar
2.3 Landslide Hazard Zonation Map
2.4 Flood Risk Map
2.5 Drought Prone Area Map
2.6 Cyclone and Storm Surge Map
2.7 Seismic Zonation of Myanmar
2.8 Wider usage of Fire Hazard Zonation Map
3 Multi-hazard Early Warning Systems
3.1 Upgradation of Existing Early Warning Centers
3.2 Multi-hazard End-to-End Early Warning Dissemination System
3.3 Improved Metrological Observation and Forecasting
3.4 Enhanced Flood Monitoring and Forecasting Capacities at Township level
3.5 Landslide Study and Monitoring
3.6 Drought Study and Monitoring
3.7 Cyclone Tracking and Storm Surge Forecasts
3.8 Seismic Monitoring
3.9 Oceanic and Tsunami Monitoring System
3.10 Forest Fire and Haze Monitoring System
4 Preparedness and Response Programs at National, State/ Region, District and Township levels
4.1 Multi-hazard Preparedness and Response Plan for Quick deployment of Resources
4.2 Multi-hazard Response Plan for Region/State, District and Township
4.3 Emergency Operation Center
4.4 Strengthening Emergency Support Functions

4.5 Review and Expansion of Rapid Response Team
4.6 Cyclone Contingency Program for Delta and Coastal Region
4.7 Provision of Safe Shelter
4.8 Development of School Disaster Preparedness Program
4.9 Preparedness and response program for psychosocial impacts, epidemic and disease control in the aftermath of natural disasters
5 Mainstreaming of Disaster Risk Reduction into development
5.1 Updating and Enforcement of City Development Committee Law, Township Development Committee Law, and Building By-laws and Codes of Practices
5.2 National Land Use and Physical Planning Policy
5.3 Sustainable Coastal Development to Protect Against Natural Disasters
5.4 Landslide Mitigation in Risk prone Areas
5.5 Integration of Disaster Risk Reduction in Housing Sector
5.6 Integration of Disaster Risk Reduction in School and Health Facilities
5.7 Integration of Disaster Risk Reduction in Infrastructure Facilities
5.8 Sustainable Development in Dry zone area to Protect/Mitigate Against Drought
5.9 Flood Mitigation Plan for Agricultural Sector
5.10 Urban Earthquake Vulnerability Reduction Program
5.11 Risk Transfer and Sharing Mechanism
5.12 Introducing Disaster Impact Assessment (DIA) as part of the Planning and approval Process of Development Programs
5.13 Promoting Sustainable Development in the Mountainous Areas
6 Community based Disaster Preparedness and Risk Reduction
6.1 National Policy on Development of Community Based Disaster Risk Reduction
6.2 National Program on Community based Disaster Risk Reduction
6.3 Promoting Community based Disaster Risk Reduction Volunteerism
6.4 Establishing Community based Disaster Risk Reduction Resources Centers
6.5 Preparedness and Mitigation through Small Grants Program
6.6 Micro Finance Schemes
6.7 Integration of Community based Disaster Risk Reduction into Community Development Projects
6.8 Development and implementation of Community based Natural Resource Management Programs
6.9 Documentation of Community Based Disaster Risk Reduction Good Practices

7 Public Awareness, Education and Training
7.1 Awareness through the International Day for Disaster Reduction
7.2 National Public Awareness Program
7.3 Awareness through School and School Curriculum
7.4 Awareness through University Curriculum
7.5 Expansion Plan for Disaster Management Training
7.6 Training for Emergency Preparedness and Response at Township Level
7.7 Enhancing Training Capacities
7.8 Special Awareness Program
7.9 Establishment of Disaster Management Training Center
7.10 Research and Development in Disaster Risk Reduction
7.11 Regional Networking and Knowledge Sharing on Disaster Risk Reduction