

# An ounce of **prevention**

**ACT Alliance's understanding  
of disaster risk reduction**



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Cover photo: An Afar woman in Ethiopia fetches water from a shallow well. Ethiopia’s large pastoralist population, which includes the Afar people, are seeing their livelihoods threatened by the negative impacts of climate change, such as an increasing frequency and intensity of drought.  
Credit: Krackhardt/Diakonie Katastrophenhilfe

This publication was produced by ACT Alliance’s Climate Change and Disaster Risk Reduction Community of Practice (CoP). ACT communities of practice allow members with a common interest in a particular aspect of humanitarian, development or advocacy practice to develop their understanding and share good practice that enhances the impact of the CoP members’ own work as well as the work of the wider ACT Alliance. The Climate Change and Disaster Risk Reduction CoP is chaired by Peter Rottach (p.rottach@t-online.de).

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Disasters are turning points in human life. Destruction in the wake of disasters is often widespread, leaving survivors the daunting task of rebuilding their lives from scratch. Feelings of anger and disappointment come to the fore and questions arise. Could we have prevented this? How do we restore what is lost? Who is responsible?

The Bible (John 6:1-14, Mark 6:35-44) tells us about a boy with five small barley loaves and two small fish that miraculously fed 5,000 people. In the story, Jesus tells his disciples to give the people something to eat. After some time searching, they find only the boy's food. The disciples ask people to sit down in groups, as Jesus had instructed them to do. Jesus gives thanks, breaks the loaves and divides the fish. He gives the food to the disciples to distribute to the people. That day, 5,000 people were miraculously fed and the disciples picked up 12 basketfuls of leftover bread and fish.

The story of five loaves and two fish is one of many chapters in the Bible that explain how faith works through love. Jesus does not ask if the disciples have it in them to feed the thousands. He asks them to step aside from their positions of comfort. He asks them to find out, to organise and to prepare – and to feed the 5,000. He directs them to compassionate ministry with those suffering and shows that, with Him, all is possible. No one else is responsible. The responsibility lies with us.

This report offers ACT Alliance's perception of disaster risk reduction (DRR), and the role that the alliance plays in reducing risk and increasing community resilience. Through its global membership, ACT Alliance brings together unique reach and knowledge. With a rights-based approach to development at the core, we work hand-in-hand with local communities to reduce risk and foster resilience. Through preparedness we save lives and reduce

the financial burden of disasters.

For ACT Alliance, the global commitment to DRR can be implemented through participatory and coordinated action by people affected by disaster, civil society organisations and governments. The Hyogo Framework for Action, created to give impetus to the global work on DRR, seeks to build the resilience of nations and communities to disaster. Governments have reported steadily increasing progress in implementing Hyogo priorities and objectives at a national and regional level. But much remains to be done – especially at the local level, where ACT Alliance members' community-based approaches to DRR are most effective.

Integrating climate change issues with DRR is key. Reducing greenhouse gases must be seen as a disaster reduction priority. We need to integrate DRR into climate change adaptation strategies and create resilience strategies that incorporate climate risks and development needs.

Let me thank all of you who have joined and who will join the efforts in reducing risks and saving lives.

A handwritten signature in black ink, appearing to read 'John Nduna'.

**John Nduna**  
General Secretary, ACT Alliance

## Chapter 1:

# Learning the LANGUAGE of disaster risk reduction

### DISASTERS

ACT Alliance defines **disaster** as “a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources”.<sup>1</sup>

### HAZARDS

A **hazard** is “a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage”.<sup>2</sup> Hazards can be classified as **natural hazards** (such as a volcanic eruption) or **man-made hazards** (such as an explosion inside a chemical plant).

Natural hazards are of greatest concern to ACT Alliance. These are the ones often faced by the vulnerable people and communities with whom ACT Alliance members work – although man-made conflict, and the resulting damage and displacement, is also a significant hazard.

It is important to understand that there is no such thing as a “natural disaster”, but only a “natural hazard”. A natural hazard such as an earthquake or flood will only develop into a disaster when it adversely affects a group of people; how much these people will be affected will depend on their level of vulnerability. Disasters are a combination of hazardous events, peoples’ vulnerability and exposure to such events, and insufficient capacity or measures to reduce or cope with the potential negative consequences.<sup>3</sup>



A floating vegetable garden in northwest Bangladesh, where ACT Alliance member RDRS is supporting flood-vulnerable households to adapt their livelihoods and increase their DRR capacity, including by planting flood-resilient crops.

While changing the scope and nature of hazardous events is usually beyond human capabilities, some natural hazards are exacerbated by human actions. For example, flash flooding and landslides caused by heavy rains in a mountainous region are made worse by human deforestation. Human production of greenhouse gases has led to global warming and increased frequency of some extreme weather hazards.<sup>4</sup>

### VULNERABILITY, EXPOSURE AND RESILIENCE

The term **vulnerability** refers to the characteristics and circumstances of people or communities, systems or assets that makes them susceptible to the damaging effects of a hazard.<sup>5</sup> Vulnerability is the result of social, economic, political, cultural, institutional, and environmental conditions and processes. The level of vulnerability

is a measure of capacity and coping ability, which are in turn dependent on a combination of factors – these include exposure, poverty, weak governance and poor national policy making, as well as poor choices made by individuals and communities.

**Exposure** is defined as the physical presence of people, livelihoods, environmental services, resources, infrastructure or economic, social or cultural assets in geographical places that could be adversely affected by physical events such as natural hazards.

**Resilience** is defined as “the ability of a system, community or society exposed to hazards to resist, absorb, accommodate... and [restore] its essential basic structures and functions”.<sup>6</sup> Resilience is the opposite of vulnerability and reflects the connectedness of disasters, development, sustainability and the environment. ACT Alliance seeks

to reduce vulnerability to hazardous events by building the resilience of individuals and communities.

### **VULNERABLE GROUPS AND INDIVIDUALS**

Who are the vulnerable groups and individuals of interest to ACT Alliance?

Generally speaking, people of lower socio-economic status will be more vulnerable and more exposed to natural disasters because of their living conditions and the precarious environment in which they live. Differences in the quality of housing, infrastructure and services available can greatly reduce or increase the impact of a disaster.

Socio-economic vulnerability arises from inequalities in education, wealth, disability, health, gender, age, class, and access to basic services. For those who are socio-economically vulnerable, the process of disaster recovery will be slow, if not impossible, and the long-term impacts on health, development and productivity will intensify poverty.<sup>7</sup>

### **DISASTER RISK REDUCTION (DRR)**

ACT Alliance uses the United Nations International Strategy for Disaster Reduction (UNISDR) definition of DRR: “The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including

through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.”<sup>8</sup>

ACT Alliance believes DRR can only be effective through participatory and coordinated action by affected people, civil society organisations and governments.

## **NATURAL HAZARDS**

| <b>BIOLOGICAL</b>  | <b>GEOPHYSICAL</b>  | <b>HYDROLOGICAL</b>   | <b>METEOROLOGICAL</b>   | <b>CLIMATOLOGICAL</b>  |
|--|---|---|---|--|
| <p>Disasters caused by exposure of living organisms to germs and toxic substances:</p> <ul style="list-style-type: none"> <li>• epidemics</li> <li>• insect infestation</li> <li>• animal stampede.</li> </ul> | <p>Events originating from the solid earth:</p> <ul style="list-style-type: none"> <li>• earthquakes</li> <li>• volcanic eruptions</li> <li>• dry mass movements – rock falls, landslides, avalanches, subsidence.</li> </ul> | <p>Events caused by the deviation in the normal water cycle and/or overflow of bodies of water caused by wind set-up:</p> <ul style="list-style-type: none"> <li>• floods – general, flash, storm surge, coastal</li> <li>• wet mass movements – rock falls, landslides, avalanches, subsidence.</li> </ul> | <p>Events caused by short-lived (minutes to days) atmospheric processes:</p> <ul style="list-style-type: none"> <li>• storms – tropical cyclones, extra tropical cyclones, local storms.</li> </ul> | <p>Events caused by long-lived (seasonal to decadal) processes:</p> <ul style="list-style-type: none"> <li>• heatwaves and cold spells</li> <li>• rising air and sea temperatures</li> <li>• sea level rise</li> <li>• drought</li> <li>• wildfires – forest, land.</li> </ul> |

## Chapter 2:

# Concept, methodologies and key CONSIDERATIONS for DRR

### HISTORICAL DEVELOPMENT OF DRR

Historically, DRR has been closely tied with disaster recovery. The concept of “build back better”<sup>9</sup> – ensuring disaster recovery interventions leave communities stronger than they were before the disaster struck – is well established in approaches used by agencies and organisations in disaster response. Unfortunately, DRR has been too closely tied to disaster recovery and in practice is not seen as the priority. Most funding for DRR is still provided as part of disaster response and recovery efforts, and represents only 1% of total disaster management funding.<sup>10</sup>

Although DRR began as a subset of humanitarian aid, understanding grew that disasters and development are closely tied, because disasters threaten losses to human, economic and social capital assets. For example, many donor government policies support the concept of Linking Relief, Rehabilitation and Development (LRRD),<sup>11</sup> although aid budgets do not yet fully reflect this understanding.

DRR is now being considered for integration within several international policy initiatives, climate change adaptation efforts and the new Sustainable Development Goals, which will replace the Millennium Development Goals when they expire in 2015. The World Bank, the European Commission, the Red Cross Movement, the Global Network for Disaster Reduction (GNDR)<sup>12</sup> and several agencies within the UN – such as UNISDR, the UN Development Programme (UNDP) and UNICEF – are all engaged in DRR. The commitment by governments and the UN has consequences for humanitarian and development funding and brings a new

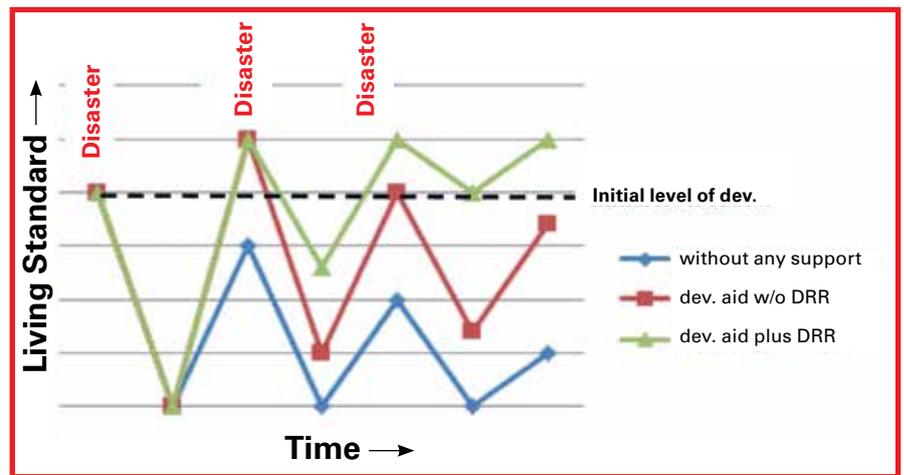


FIGURE 1: ECONOMIC GROWTH PATTERNS WITH AND WITHOUT DRR.<sup>13</sup>

focus on innovation, accountability and sustainability.

The new spotlight on DRR and disaster resilience is both a blessing and a curse. While governments are now holding themselves to higher standards in DRR, they are also expecting non-governmental organisations (NGOs) to demonstrate sustainability in DRR projects and to mainstream DRR in all development projects. Success in DRR efforts is notoriously difficult to prove in the absence of a disaster, and more evidence of impact is now expected of organisations implementing such projects.

New networks, communities of practice and funding competitions have been established with the sole purpose of identifying and sharing best practices on DRR.

### COST-EFFECTIVENESS OF THE DRR APPROACH

The essence of DRR is pre-emptive action ahead of disaster. The old saying, “an ounce of prevention is better than a pound of cure” (attributed to American

founding father Benjamin Franklin), certainly applies when comparing the costs of prevention, preparedness and mitigation to the costs of disaster relief. Seeds, inputs and training for drought-resistant crops cost far less than food aid to keep people alive after their drought-susceptible crops fail. Awareness raising and training in positioning housing outside a flood basin is far cheaper than rebuilding houses that collapse after flooding.

DRR is not capital intensive but rather, people intensive. It is about empowering communities and individuals to overcome vulnerabilities created by unjust systems, lack of capacity and hazardous environments. Empowered communities have the skills and the self-confidence to plan and execute DRR activities themselves, or to lobby government and other stakeholders for additional action and resources. This local ownership of DRR action is essential for long-term sustainability. Sensitisation and capacity building leading to empowerment for DRR are low-cost activities compared to disaster relief.

## DRR PROMOTES RESILIENCE

The risk of loss from disasters is increasing faster than the rate at which countries are growing their GDP.<sup>14</sup>

Development gains risk being overtaken by disaster setbacks. Figure 1 (previous page) explains how economic growth patterns in a country both with and without risk reduction differ after a disaster. It also shows how peoples' livelihoods develop with DRR, without DRR and without any long-term support:

This connection between DRR and development has led to the current focus on resilience within the development and humanitarian practitioner communities. Resilience reflects the link between disasters, development and

sustainability. It is something donors, the UN, governments and many INGOs are striving to achieve.<sup>15</sup>

## DRR CONCEPTUAL FRAMEWORK

An integrated approach to DRR reduces vulnerability to hazards, and strengthens coping mechanisms to respond and recover if a hazard strikes. An effective DRR framework includes the following:

- **Risk assessment** – an analysis that identifies the hazards and vulnerabilities of communities at risk of disasters. Important drivers of risk include poorly planned and managed urbanisation, environmental degradation, inappropriate land use, poor or unsuitable construction,

poverty, climate change and weak governance.

- **Knowledge development** – raising awareness of risk and of potential risk-changing processes, such as climate change, through education, training and research.
- **Public infrastructure and commitment** – including enabling legislation, policies, plans, funding and community action to reduce disaster risk.
- **Environmental management** – optimum land use, urban planning, protection of critical resources, application of science and technology, partnerships and networks.

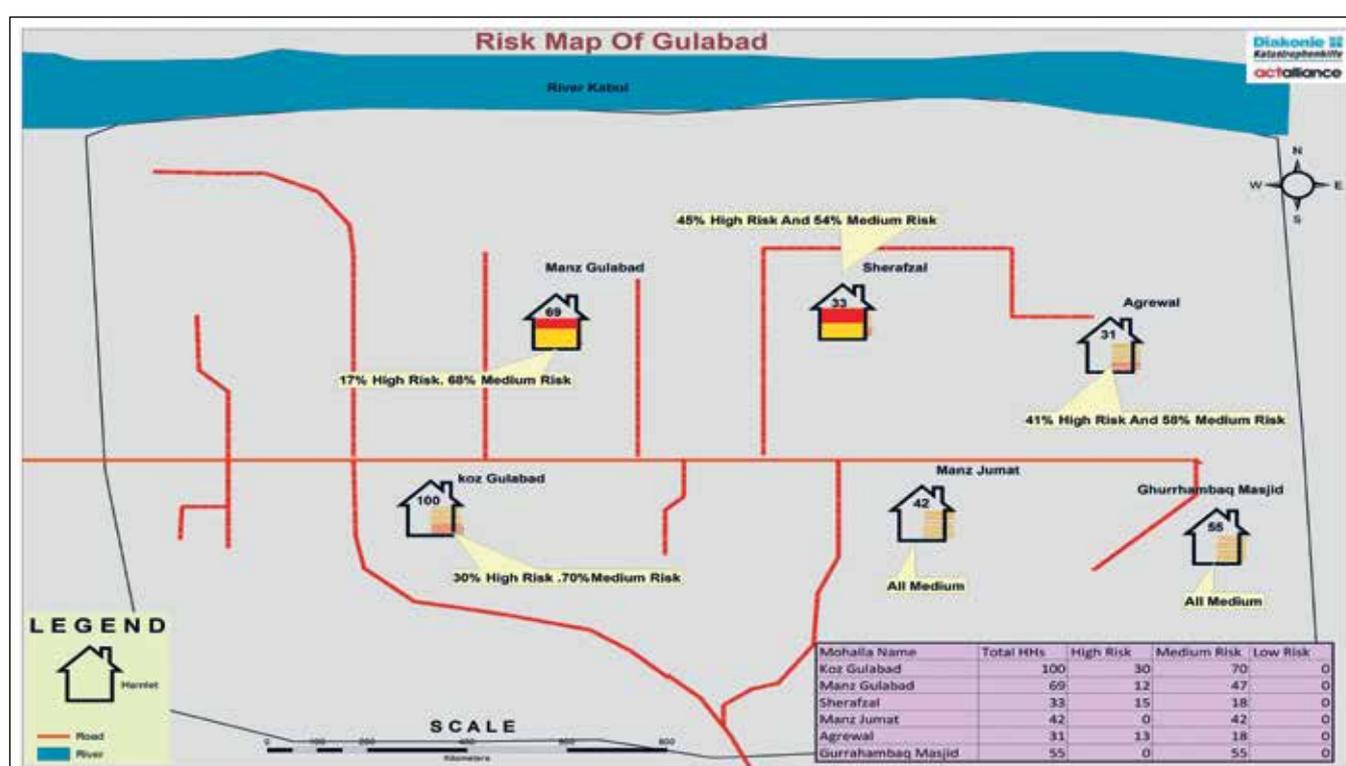


FIGURE 2: AN EXAMPLE OF A RISK MAP – GULABAD, PAKISTAN.

- **Disaster prevention, preparedness and mitigation**

- both national and community-based measures, including early warning systems.

What differentiates a DRR approach from a relief and recovery approach is the understanding and assessment of risks faced by disaster-affected populations, as opposed to their needs. This is not to say that the urgent needs of people in disasters to survive and recover should be ignored. Rather, DRR requires a more fundamental analysis of the nature and the extent of potential hazards and existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend.

## RISK ASSESSMENT

Many agencies quantify risk through use of the following formula:

**Risk = Hazard x Vulnerability**

Diakonie Katastrophenhilfe,<sup>16</sup> an ACT Alliance member, promotes a risk assessment tool in which relative risk is assessed and calculated using this formula, and numerical values are assigned to hazards and vulnerability.

Using this tool, the first step is **hazard assessment**. Hazards like drought, floods, cyclones or landslides are scored according to magnitude and frequency. Compiling a historical record of previous disasters allows, to some degree, a projection into the future. Disaster-affected community participation in hazard assessment is essential, and communities document their assessment in a **hazard map**. Figure 2 (previous page) shows an example of a risk map.

In the second step, **vulnerability is assessed**. If the intention is to reduce disaster risk for individual households, vulnerability assessment is done on a household level; for community risk reduction, the assessment will be done on a community level. For vulnerability assessment, three parameters are used:

- **Exposure** describes the extent to which a family's or community's assets are located inside or outside hazard zones.
- **Fragility** is the measure of likelihood of death, injury or trauma within the family or community when exposed to the mapped hazards. Indicators used for assessing fragility might

include the number of people needing assistance when a disaster strikes, degree of solidarity amongst neighbours supporting each other in a disaster, accessibility of emergency shelters, or availability and knowledge of how to use first aid kits.

- **Resilience/capacity** is a measure of livelihood resources, including access to finance, land resources, human skills and social relationships. Indicators for resilience/capacity might include size and quality of land, number and type of livestock, educational level and vocational skills, relatives abroad, or development interventions by NGOs, government and other stakeholders including private enterprises.

Assigning relative numerical values for exposure, fragility and resilience/capacity will give a value for vulnerability. A relative risk score can then be calculated from the risk formula for each household or community. This score is then entered on the hazard map. (Note the numerical risk score entered for each area on the risk map in Figure 2.)

By using indicators for fragility and lack of resilience that can be influenced by an outside intervention, the impact of a DRR action or project can be more easily measured by simply applying the risk formula before and after the action or project.

The risk assessment tool is not only a systematic, transparent and participatory way of planning a DRR intervention, but also an efficient progress and impact monitoring instrument.

## COMMUNITY-BASED DISASTER RISK MANAGEMENT (CBDRM)

Another similar DRR approach used by many ACT Alliance members working at a community level, CBDRM, is described by the Asian Disaster Preparedness Center (ADPC) as "a process of disaster risk management in which at-risk communities are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities."

This means the people are at the heart of decision making and implementation of disaster risk management activities. The involvement of the most vulnerable is paramount and the support of the least vulnerable is necessary. The ADPC CBDRM Manual<sup>17</sup> is a valuable tool for ACT Alliance DRR practitioners.

## LOCAL PARTNERSHIPS FOR IMPLEMENTING AND PROMOTING DRR

Most ACT Alliance members are national organisations working in their own national contexts. Partnership with other like-minded national organisations comes naturally. For ACT Alliance members working internationally, partnerships with national humanitarian and development NGOs are critical in establishing and sustaining a DRR approach locally. Direct engagement and capacity-building of local communities by international NGOs using participatory methods will be effective in those local communities, but replication and scaling-up is best achieved through working with and through local NGOs and NGO networks.



A home in northern Bangladesh built on a plinth to raise it above expected flood levels.

# Current and future ISSUES in DRR

## INCREASING FREQUENCY OF HAZARDOUS EVENTS

ACT Alliance's DRR response to disasters is even more important as hazardous events leading to disasters increase. Figure 3, produced by global insurance company Munich Re, shows a significant increase in climatological, hydrological and meteorological hazardous events over the last 30 years. It expresses the increase in natural hazards, but time also shows increased levels of vulnerabilities. With unabated population and poverty growth, more people are forced to live in high-hazard zones. It should be noted that Munich Re defines "natural catastrophes" in terms of financial loss and loss of human lives, so vulnerability is partially factored with hazard event frequency.

## HYOGO FRAMEWORK FOR ACTION

The Hyogo Framework for Action (HFA)<sup>18</sup> is a 10-year global plan adopted by 168 nations in 2005 to reduce risk and vulnerabilities to natural hazards. The key elements are:

- Ensure DRR is both a national and local priority with a strong institutional basis for implementation.

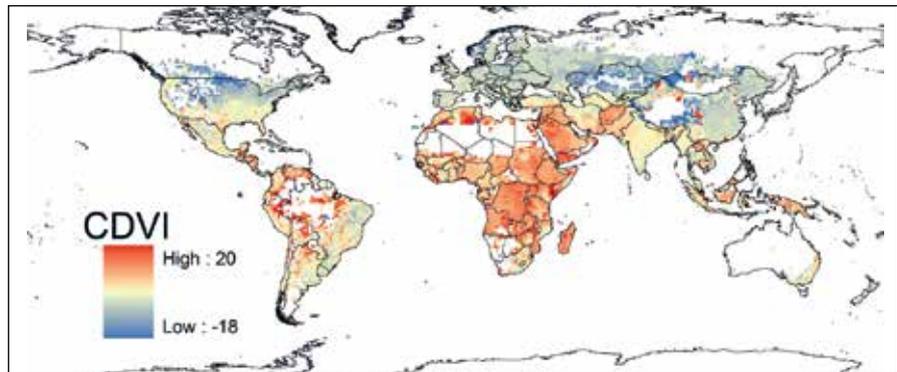


FIGURE 4: A GLOBAL MAP OF CLIMATE CHANGE DISASTER VULNERABILITY INDEX.<sup>23</sup>

- Identify, assess and monitor disaster risks and enhance early warning.
- Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
- Reduce underlying risk factors.
- Strengthen disaster preparedness for effective response at all levels.

Since 2005, the HFA has assisted governments to introduce and enhance national DRR legislation, set up early warning systems, and strengthen disaster preparedness and response. While it has resulted in measureable progress at national level, it has not been sufficiently

implemented locally, and it remains difficult to increase local resilience to hazards, especially in the most vulnerable segments of society.<sup>19</sup> This presents a strong opportunity for ACT Alliance, whose members understand how to engage with vulnerable communities in a participatory design of DRR interventions that reduce risk and vulnerability.

## CLIMATE CHANGE

The Intergovernmental Panel on Climate Change in its Fifth Assessment Report<sup>20</sup> clearly states that: "Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia... Human influence on the climate system is clear. This is evident from the increasing greenhouse gas concentrations in the atmosphere, positive radiative forcing, observed warming, and understanding of the climate system." However, the worst effects will be felt in poorer, developing southern nations.

A global map of climate change disaster vulnerability index (CDVI)<sup>21</sup> – where scientific projections of climate change are combined with demographic

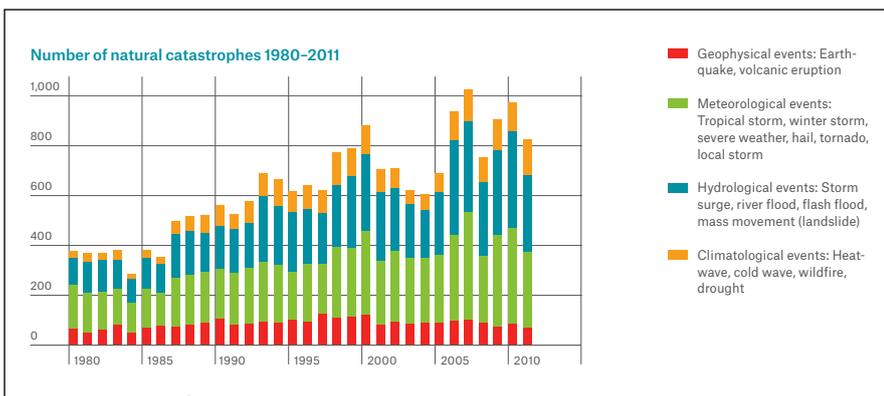
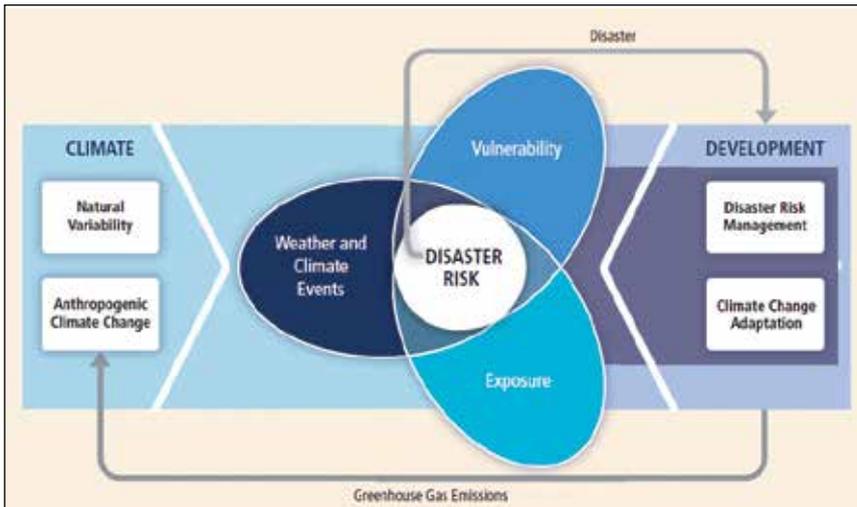


FIGURE 3: NUMBER OF NATURAL CATASTROPHES 1980–2011.<sup>22</sup>



**FIGURE 5: CLIMATE DISASTER RISK.<sup>24</sup>**

and economic factors to produce a map of relative total vulnerability to the negative impact of climate change – gives an unambiguous picture of how vulnerability varies with geography (see Figure 4). Susceptible communities will increasingly struggle to survive extreme weather as their traditional livelihoods no longer support them.

The Stern Review<sup>25</sup> estimated the future annual economic cost of unmitigated climate change to be around 5% of global GDP. More recent national case studies by the Economics of Climate Adaptation Working Group<sup>26</sup> project economic costs from 1-12% of GDP, with poorer countries less able to cope with the cost falling into the higher end of this range. Added to these economic costs are substantial health and environmental costs of rising temperatures. All other threats pale in comparison.

An IPCC special study<sup>27</sup> graphically represented climate disaster risk as the intersection between weather and climate events, degree of exposure to these events and the degree of vulnerability of communities exposed to events (Figure 5). It illustrates how climate disaster risk has an impact on development progress and how development progress itself contributes to climate change. Climate change adaptation and climate disaster risk management have been seen as two distinct approaches by development practitioners. But the IPCC study found that closer integration of the two could provide benefits at all scales. Climate change adaptation interventions are essentially DRR for a very slow-onset disaster with long-term impact on traditional livelihoods.

**RAPID URBANISATION**

Recent years have seen a marked increase in the global urban population for a variety of reasons. For the first time in history, more than half of the world's population lives in towns and cities. Projections put estimates for 2030 at almost 5 billion people living in urban centres, with urban populations doubling in Africa and Asia (Figure 6).

People move from rural to urban centres in the hope of better economic prospects, better access to services, or because large cities can provide anonymity and protection for refugees or internally displaced people. Rapid urbanisation has given rise to megacities and informal settlements, such as slums and shanty towns, which house millions of people, many of whom live in conditions of extreme poverty. Most such settlements are built on flood

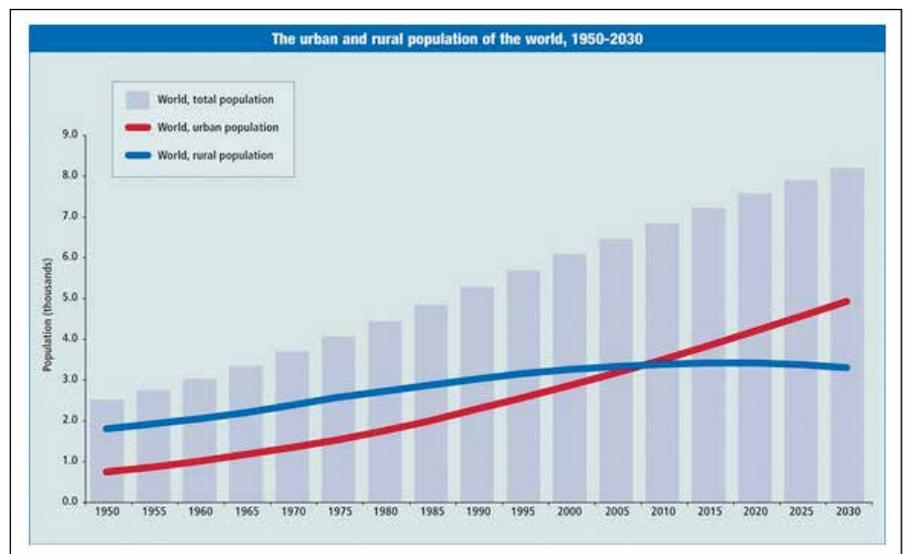
plains, slopes liable to flash floods and landslides, or in densely populated areas where fires can start and spread easily. Furthermore, residents of city slums are more susceptible than people in rural areas to food supply chain disruption and disease epidemics.

All megacity residents, whether slum dwellers or not, are vulnerable to an increased risk of infrastructure failure or epidemic, simply due to the geographical concentration of huge numbers of people.

**BUSINESS AS A PARTNER IN DRR**

An often overlooked key stakeholder in DRR is private business. There are types of businesses that are obviously engaged during a disaster response, such as construction supply businesses. But all businesses can be affected by disasters that strike their communities and they are therefore a potential partner in identifying solutions. Businesses can provide funding for DRR, provide influence with government, and even be an active part of disaster preparedness and response.

Creative thinking and open discussions with businesses of all sizes can enhance DRR initiatives significantly. As non-traditional actors in DRR, they can bring a fresh perspective to solutions, such as exploiting new technology. Furthermore, engagement on DRR can be the beginning of a longer relationship between ACT Alliance members, communities and business for other development projects.



**FIGURE 6: THE URBAN AND RURAL POPULATION OF THE WORLD, 1950-2030.<sup>28</sup>**

# DRR and CLIMATE CHANGE

## DRR AS A COMPREHENSIVE PARADIGM FOR CLIMATE ACTION

It is clear that climate change will increasingly present high risks for large populations in the developing world. These are the people of interest to ACT Alliance. ACT is engaged in advocacy for a global agreement to reduce greenhouse gas emissions in developed countries, support low-carbon development paths for developing countries, and provide adequate resources for poor communities negatively impacted by climate change to adapt their livelihoods.<sup>29</sup> But ACT Alliance members are also implementing mitigation and adaptation projects on the ground around the world – and DRR is the most appropriate framework for analysis and design of interventions to counter the major climate change impacts for poor and vulnerable communities.

ACT Alliance members have many years of collective experience responding to drought and flood emergencies and, in recent years, increasing use of DRR. The DRR approach and methodology needs little adaptation when applied to **climate-driven extreme weather disasters**.

For ACT Alliance, a major focus of **climate change adaptation** is building the resilience of traditional agricultural, pastoral and fishing livelihoods in the face of local climate change. But it also includes action for better natural resource management and governance in the face of climate change challenges. It starts with participatory learning together with vulnerable communities, looking at what changes to local climate have happened and are projected to happen. Projections and forecasting from climate models

developed by national meteorological organisations are combined with local community knowledge and experience, in order to get a picture of what the specific climate change risks are at a local level. This then forms a basis for action planning to counter or mitigate these risks to local livelihoods and natural resources.

The basic DRR approach of identifying and quantifying risk and implementing action to reduce this risk is relevant and works well for both quick onset and slow onset climate disasters.

## CLIMATE CHANGE AND FUTURE EXTREME WEATHER EVENTS

A recent IPCC report cautions against attributing all changes in extreme weather to climate change.<sup>30</sup> The uncertainties in historical records and incomplete understanding of physical mechanisms causing such extreme weather events do not provide high enough statistical confidence in linking individual extreme events with global warming. There is medium confidence in linking heatwaves and extreme rainfall, but only low confidence in linking hurricanes/cyclones, tornados, hail and extreme droughts with global warming. This does not mean there is no link, but only that it cannot be proven at a high statistical level at this time.

The DRR methodology in hazard assessment for extreme weather hazards is not compromised by this IPCC warning. Rather, it is a matter of integrity and transparency that ACT Alliance members counter the popular tendency to attribute all bad weather (and any other negative circumstances, for that matter) to climate change. Oversimplifying the complex

reality of natural, social and economic circumstances disguises local effects and contributions to such problems. It also paralyses local initiatives and incentives to correct these local effects.

## POTENTIALLY CONFUSING TERMINOLOGY

It is important to note the difference between climate change mitigation and disaster risk mitigation as understood by the international bodies dealing with climate change and DRR.

The IPCC defines climate change mitigation as technological change and substitution that reduce resource inputs and greenhouse gas emissions per unit of output.<sup>31</sup> The UNISDR defines disaster risk mitigation as the lessening or limitation of the adverse impacts of hazards and related disasters.<sup>32</sup> This also is the definition adopted by ACT Alliance in DRR work.

Meanwhile, the IPCC says mitigation is **reducing greenhouse gas emissions driving global warming** and climate change disaster, while the UNISDR says mitigation is **reducing the impact** of a climate change disaster.

### CLIMATE CHANGE

#### quick-onset effects

- flash; cyclones; landslides; hail; storm surges; tidal surges; tidal waves

#### slow-onset effects

- increased global temperatures reducing yields of staple foods and increasing endemic area of vector-borne diseases
- increased frequency of droughts, floods, glacier melt
- change in rainfall patterns and sea level rise

## Chapter 5:

# DRR RECOMMENDATIONS for ACT Alliance members

**1.** ACT Alliance members should seek to reduce the risk of climate change by reducing their own institutional carbon footprint, as well as increasing the number of DRR interventions with communities and individuals.

**2.** ACT Alliance members are encouraged to participate in the ACT Alliance Climate Change and Disaster Risk Reduction Community of Practice (CCDRR CoP) to share experience and good practice.

**3.** ACT Alliance members are encouraged to use participatory risk assessment in DRR, letting people decide what or who is vulnerable. They are also encouraged to focus on capacities as well as vulnerabilities, and recognise that people are agents of change.

**4.** ACT Alliance members are encouraged to build multi-stakeholder partnerships for DRR programmatic and advocacy work – public sector partnerships with local, regional and national governments; and private sector partnerships with businesses, academics, research institutes and smallholder producers.

**5.** ACT Alliance members should reassess disaster risk for urban areas in their countries of work and consider DRR interventions for high-risk urban population groups. Members of CCDRR CoP will seek to form consortia for implementing pilot urban DRR initiative(s) in the coming year.



ACT/paul jeffrey

A boy rides his bicycle along a flooded street in Biñan Laguna, in the Philippines. This community has seen increased flooding from the Laguna de Bay in recent years. ACT is helping local residents to reduce their vulnerability to this type of hazard.

## Examples of DRR

# GOOD PRACTICE in ACT Alliance

## 1. FLOOD DRR THROUGH EARLY WARNING NETWORK IN NEPAL

The Kosi River that stretches across the borders of eastern Nepal and the Indian state of Bihar is known as “the river of sorrow”. Predictable floods, due to monsoon rains in the river’s upstream catchment areas, and a lack of timely information to downstream communities in Bihar and in Nepal’s Terai Region, have often resulted in severe loss of lives and livelihood.

The extremely high flood in the river basin in 2008 is still remembered by many people as a catastrophe that could have been prevented. The flood caught governments and people by surprise and exposed the lack of preparedness and information sharing between upstream and downstream communities. A sudden release of water in the barrage breached the embankments and affected more than a million people. Had an early warning system existed in 2008, hundreds of lives could have been saved.

After the disaster, ACT Alliance members DanChurchAid<sup>33</sup> (DCA) and the Lutheran World Federation (LWF) Nepal,<sup>34</sup> together with Integrated Development Foundation (IDF) India,<sup>35</sup> began a DRR programme focused on building the risk management capacity of communities in the river basin to reduce their vulnerability. This included formation of village disaster management committees and task forces, skill building on preparedness such as rescue and first aid, vulnerability assessments, contingency planning and dissemination of flood early warning messages.

One of the key initiatives was efforts to establish cross-border networks and alliances on early warning. This involved partners at national and local level, local governments in Nepal



River monitoring equipment has been installed at strategic locations of the Kosi river: this equipment includes a flood gauge early warning system at Triyuga River in Fattepur, Nepal.

and India, and technical support from Nepal’s Department of Hydrology and Meteorology. During consultations facilitated by DCA, LWF and IDF, community institutions, civil engineers from Kosi river barrage management, the Department of Irrigation and local authorities identified gaps at various levels and steps to take, in order to generate and share information.

Critical steps were taken, notably the installation of rain gauge stations at strategic locations upstream and downstream, and the setting up of emergency operation centres. Efforts were also made to sensitise stakeholders on the importance of timely and understandable early warning messages, so that communities are able to take action and move to safer places.

There have been no critical floods in the basin since 2008; however, it is evident that the risks would be far lower in the event of flooding, because of the community preparedness and efforts

from local authorities and the Department of Hydrology and Meteorology.

## 2. BIG RIVER RISING: MANAGING THE RISK OF FLOODING IN POOR URBAN COMMUNITIES IN THE PHILIPPINES

### A disaster-prone neighbourhood

The Philippines experiences around 20 typhoons a year and is now considered the third most vulnerable in the world to natural disasters and climate change. Twenty of the largest cities and more than half of the population live in disaster-prone areas.

Banaba is a settlement with over 4,000 inhabitants located on a floodplain outside Manila. It is highly exposed, but it lacks flood prevention infrastructure. Residents are poor or low-income traders and labourers with limited options for relocation or retrofitting their houses. Land tenure is not secure, so insurance is not an option. Before 2012, residents would rely on the alarmed cries of pigs

to determine if river levels were high enough to warrant evacuation.

With funding and support from Christian Aid and UK aid from the UK Government, residents of Banaba teamed with scientists at the University of the Philippines to create an accurate flood prediction and early warning system.<sup>36</sup> University scientists trained residents to monitor and collect information related to flooding, and the local Centre for Disaster Preparedness (CDP) linked them with upstream communities that also monitor river metrics. This data was sent to the university specialists and processed in computer flood models to generate an accurate prediction of the critical indicators of dangerous flooding.

The data was then used to calibrate a flood gauge painted on the pylons of a highway bridge that crosses over the community near the home of Belen de Guzman, a 52-year-old mother-of-five trained by CDP as a river monitor. Belen coordinates the evacuation of her community when the levels indicate imminent danger and is also part of the wider early warning systems of the nearest city council. Despite being an illegal settler, her information is critical for local civil protection and emergency response systems in metropolitan Manila. The city is a good example of the fast-growing megacities that will populate the developing world in the mid-21st century, when the effects of anthropogenic climate change will be fully visible.

Allan Vera, Senior Programme Officer at Christian Aid in the Philippines, said: "If we really want poor people to understand future risks and have opportunities to thrive and not just survive, we have to collaborate with scientists. This will help to protect poor people from future disasters and give them information to make the right decisions.

"Our partners continue to work with vulnerable communities, preparing them for future emergencies. By mapping hazardous areas and conducting mock evacuations and rescue operations communities are prepared and more confident of contending with the impact of such extreme weather. Partners have reported that communities are much less afraid of facing such extreme weather events, because they know what to do and how to do it."

#### **Big River Rising<sup>37</sup>**

In August 2012, heavy monsoon rains battered the Philippines, displacing 700,000 people into evacuation centres. Belen was filmed by a Christian Aid crew as she nervously monitored the rising water that threatened her neighbourhood.

The Christian Aid film – Big River Rising – demonstrates the direct and immediate impact of DRR programmes on people's lives: something that is often considered difficult. It does this by using an interactive multimedia approach, rather than more traditional reporting or evaluation techniques. The

web documentary also explores how collaboration with local scientists can explain how rapid and uncontrolled urban development interacts with global climatic changes to make Asian megacities and their poorest communities more vulnerable to flooding.

Finally, this training enables local civil society to develop life-saving early warning systems and community evacuation plans tailored to local conditions, despite the uncertainties and complexities involved in predicting flood risk in the context of rapidly growing cities in developing countries.

### **3. CLIMATE CHANGE DRR FOR PASTORALISTS IN ETHIOPIA**

The negative impacts of climate change are already being felt in Ethiopia. Increasing frequency and intensity of drought is particularly affecting the livelihoods of Ethiopia's large pastoralist population. The pastoralists inhabiting the arid lowlands of Ethiopia have long been of interest to ACT Alliance member the Lutheran World Federation Ethiopia (LWF),<sup>38</sup> due to their socio-economic marginalisation, but now climate change threatens their very existence.

LWF has implemented a disaster risk reduction intervention amongst the Afar people of Chifra District, in northern Ethiopia. The intervention began with sensitisation of the general population to climate disaster risk, leading to the formation of community-managed



Volunteer Belen de Guzman, from Banaba in the Philippines, was trained by CDP as a river monitor. She coordinates her community's evacuation process when river levels pose a threat.



Voluntary closure of over-grazed range land in northern Ethiopia allows for regeneration.



Pastoralists in northern Ethiopia have been supported to grow drought-resistant crops such as cassava and moringa.

disaster risk reduction committees (CMDRRCs). These committees were then trained in disaster risk assessment and analysis, and in risk reduction action planning. This participatory analysis and planning identified three major climate risks and risk reduction action areas:

- i. Conflict over increasingly degraded and over-grazed range land – a rolling, voluntary closure of designated areas of range land so that the closed areas are able to regenerate naturally.
- ii. Conflict over decreasing water sources for livestock and people – vegetative and structural protection of water source catchment areas increase supply.
- iii. Decreasing viability of the pastoralist livelihood to deliver a basic quality of life – diversification of livelihoods and nutrition through cultivation of vegetables and drought-resistant cassava and moringa.

#### 4. FLOOD DRR IN NORTHWEST BANGLADESH

ACT Alliance member RDRS Bangladesh<sup>39</sup> is working with around 70,000 extremely poor people living on the banks and sandbars of the Brahmaputra, Tista and Dharla rivers of northwest Bangladesh. The aim of this work is to enhance the DRR capacity of the poor rural communities and local authorities, in order to alleviate poverty in Lalmonirhat and Kurigram Districts.

The ephemeral nature of the Bangladeshi river sandbars means that a large number of landless poor cannot establish claim to the land on which they live. These people are in constant danger of high water and sandbar erosion during regular seasonal flooding and periodic major flood disasters, such as those that occurred in 1988, 1998, 2004 and 2007. These flood disasters promote a vicious downward poverty spiral from which it is extremely difficult for vulnerable sandbank dwellers to emerge.

The methodology RDRS employs involves the formation and capacity building of over 100 village disaster management committees (VDMCs). Capacities gained as a result include risk assessment and mitigation, emergency preparedness, and livelihood adaptation to the flood hazards.



These pumpkin crops planted on river sandbar land in northwest Bangladesh are part of livelihood adaptation action plans to help poor communities cultivate flood-resilient crops.



Sand dams have helped to improve local ecosystems and rejuvenate vegetation cover in northeast Kenya.



Communities in arid and semi-arid areas of northeast Kenya are being supported to use greenhouses to cultivate high-value crops.

Some flood preparedness and mitigation measures employed by the VDMCs include building plinths to raise houses above expected flood levels, planting flood-resilient trees on river banks to reduce erosion, and renovating community schools and local government buildings to be used as flood shelters.

RDRS also facilitated a participatory climate change analysis that supported livelihood adaptation action plans for flood-vulnerable households, including planting flood-resilient food crop varieties according to a seasonal calendar that minimises the risk of flood damage.

These grassroots interventions were supplemented with efforts to link the VDMCs and district and national level disaster preparedness and management structures, and advocacy for government

agriculture policy supporting vulnerable sandbank dwellers.

#### 5. DROUGHT DRR IN KENYA

In east Africa, ACT Alliance member Church World Service (CWS)<sup>40</sup> is working with communities in arid and semi-arid areas of northeast Kenya to deal with rainwater deficit and drought hazards. Drought risk reduction is accomplished through community-based water development and livelihoods adaptation activities, including:

- Community sensitisation and training to increase awareness of climate change risk and knowledge of how this risk can be managed.
- Securing more reliable water supply for consumption and crop irrigation through sand dams, rock water harvesting and storage facilities.



**Sand dams and rock water harvesting are being used in arid areas of northeast Kenya to secure a more reliable water supply.**

- Innovative, low-cost greenhouse cultivation of high-value vegetable crops using solar powered pumping and drip irrigation.
- Drought-resistant staple food varieties cultivated using dry land conservation farming techniques with organic manure.
- Community reserve/contingency fund created from surplus vegetable sales for use in communities' own disaster response action.

The quality of life and livelihoods of several thousand people in West Pokot, Baringo and Mwingi Districts have been enhanced through:

- Improvement in water availability for local communities throughout the year.
- Improved local ecosystems and rejuvenation of vegetation cover in

areas with sand dams, especially upstream from the dam sites.

- High numbers of women are now engaged in income generation, taking advantage of the time previously spent on fetching water from distant sources.
- Diversification of livelihoods through introduction of vegetable cultivation for household consumption and sale of surplus.
- Evidence of higher household income evidenced by an increase in girls' school enrolment, attendance and performance.
- Improved health and hygiene of most participating households.
- Confidence and self-reliance of communities enhanced through reserve fund.

## **6. REDUCED RAINFALL DRR IN INDIA**

Traditional rice cultivation using flood irrigation depends on substantial rainfall during the growing season. Reduced rainfall is a predicted climate change hazard for the region, and presents an existential risk to the livelihoods of small rice farmers.

In addition, increasing and excessive use of nitrogen fertilizers is resulting in nitrate pollution of water supplies and the release of nitrous oxide, a greenhouse

gas driving climate change into the earth's atmosphere.

ACT Alliance member Christian Agency for Rural Development (CARD)<sup>41</sup> is promoting a Low Input Good Agricultural Production System (LIGAPS) for rice farmers in the Pathanamthitta District of Kerala, India, as an effective climate change DRR strategy. LIGAPS involves the integrated use of six production practices that protect livelihoods in the face of climate change and reduce negative impact on the environment:

- Selection of high-quality seeds by soaking seeds saved from previous harvest in saline water and discarding all those that float.
- Seedlings for transplantation are raised in mat nurseries of a compost-rich soil layer spread over a mat made of coconut fronds and covered with a thin layer of soil to maintain moisture content and avoid seed drying; this results in more robust seedlings.
- Two individual seedlings at four-leaf stage are planted 20cm apart: a much lower density than traditional practice that assumes not all seedlings are viable. This and the previous two practices reduce seed requirement by 85%.



**A rice farmer in Kerala, India, uses a leaf colour chart to check nitrogen requirements, as part of a climate-resilient strategy promoted by CARD.**



Kishapu is a semi-arid region in Tanzania.

Tanzanian farmer Elias Nangale with his woodlot, produced using drip irrigation.



Drip irrigation using recycled plastic bottles helps seedlings to survive the drought period.

- Organic manure is applied variably using a leaf colour chart to determine nitrogen deficiency, resulting in more efficient use of limited quantities of manure.
- Alternative watering and dewatering, rather than constant flooding of rice fields, reduces irrigation water requirement by 50%.
- Biological control of rice parasites such as leaf folder, stem borer and cut worms is undertaken using *Pseudomonas* bacteria and *Trichogramma* (micro-wasps that are parasites of butterfly and moth eggs).

Over 1,600 farmers practicing LIGAPS have achieved a 90% increase in production of rice, with a 20% reduction in the cost of production, and have also lowered the risk to their livelihoods of reduced rainfall due to current and future climate change.

The reduction in nitrous oxide emissions due to the decreased use of nitrogen-based fertilizer is estimated to be 0.3kg per hectare per crop season (100 kg/hectare CO<sub>2</sub> equivalent).

## 7. DROUGHT DRR IN TANZANIA

Kishapu District, a semi-arid region in northern Tanzania, has always been a challenging environment for its inhabitants, who are a mixture of small farmers and pastoralists. Both livelihoods are threatened by the increasing frequency and severity of drought events, most likely due to climate change.

ACT Alliance member TCRS Tanzania<sup>42</sup> is working with communities in Kishapu to build livelihoods that are resilient to increasing drought hazards. The main components of the intervention are:

- Agriculture livelihood resilience through use of appropriate irrigation technology. Drip irrigation using recycled plastic water bottles has reduced the risk to small farmers' livelihoods from droughts that threaten traditional rain-fed agriculture.
- Rainwater harvesting and storage for both human consumption (from roof collection) and agriculture (sand dams).
- Entrepreneurship training and establishment of local savings and credit institutions for local textile craft producers, enhancing their income generation opportunities.

- Building appreciation for the beneficial micro-climatic effects of reforestation using local drought-resistant species of trees for longer term sustainability of water sources.

TCRS has been working in 12 villages with an approximate population of 30,000 people – around 10% of the total population of Kishapu District. There have been visible positive changes in the environment and in the quality of life for the people in the intervention area. The strongest evidence of this comes from the self-replication of the promoted activities in neighbouring areas.

# Conclusion

## **ESSENTIAL STEPS TOWARDS RESILIENCE – ACT ALLIANCE'S PERSPECTIVE**

The year 2015 marks an important milestone in the global debate on the way forward for climate protection, hunger and poverty eradication, and reducing the risks of disasters. Many people expect that by 2015, new international and legally binding agreements will be signed. It is hoped these agreements will include ambitious goals and strategies for all stakeholders – including governments, civil society and the private business sector – paving the way towards enhanced resilience among the world's poorest and most vulnerable people.

ACT Alliance believes that true resilience requires a comprehensive, integrated approach that combines disaster risk reduction, climate change adaptation and sustainable development. ACT has defined its expectations for the post-2015 framework in a policy paper titled "Development Policy Beyond 2015: Ending poverty and making power accountable".<sup>43</sup> The opening words of that policy paper – reproduced below – serve as a fitting conclusion to this report:

"For ACT Alliance, the post-2015 development policy framework would need to support the ability of people to live in freedom, without fear or injustice, enjoying their full human rights within planetary boundaries. Our vision is to end poverty and to make power accountable. We need to move away from the belief that the economic growth would eventually solve it all and benefit all. In essence, there is a need for transformation of relationships and institutions that are broken, unjust or unbalanced. We need to transform our economies so that they foster resilience and sustainability for the people and for the planet.

"The ACT Alliance calls for an ambitious, universal and global post-2015 development framework which reflects rights-based approach to development. The post-2015 development framework

needs to address root causes of poverty, conflict, insecurity and ecological destruction and the key concerns of poor people and communities.

"The development policy framework post-2015 must be based on commitments to universal human rights standards, a common universal set of goals requiring action from all countries but allowing national differentiation based on context, capacities and need. For ACT Alliance, the post-2015 development policy framework needs to address inequalities, make power accountable, and create conditions for living within planetary boundaries and without fear. The framework needs to have a robust implementation, monitoring and reviewing framework.

"The United Nations needs to agree on one participatory process to define the post-2015 development framework, which will bridge the gaps between the Millennium Development Goals, Sustainable Development Goals and the post-2015 framework goals. It is essential that the process is inclusive of expertise of those affected by injustice and those living in poverty."

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