A Conceptual Framework for a Training Curriculum on Natural Disaster Risk Reduction and Management for Agriculture and the Rural Space

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A Conceptual Framework for a Training Curriculum on Natural Disaster Risk
Reduction and Management for Agriculture and the Rural Space
Purpose

This paper presents the conceptual framework for a training program on integrating disaster risk reduction and climate-change mitigation into Agriculture and Rural Development Department (ARD) programming. Its target audience consists of World Bank task team leaders and their national counterparts and partners working in agriculture and rural settings.

While a growing body of literature and training material incorporates disaster risk reduction and management into agricultural and rural development programming, no comprehensive training program has yet been devised to relate this literature to ARD operations in practical terms. The framework presented here is intended to:

1. Raise awareness and understanding of disaster risk reduction and management and climate change perspectives, issues, and policies directly for ARD-related sectors;
2. Share existing technical expertise, resources, and experience with ARD field staff and partners;
3. Engage and consult staff in discussions and development of practical guidelines and tools.
Introduction

ARD and the World Bank have developed a number of risk-management tools to respond to the increasing incidence and frequency of natural disasters related to climate change. Financial instruments such as weather index insurance and new methods for needs assessments in the aftermath of disasters have been among the most prominent of such tools. Other agencies, notably Deutsche Gesellschaft für Technische Zusammenarbeit GmbH (German society for technical cooperation) (GTZ) have also developed expertise in disaster risk reduction and management in agricultural and rural settings. Bank publications documenting policies, concepts, and experiences include the following:

• Managing Agricultural Production Risk: Innovations in Developing Countries, published in 2005, was an early effort to document experiences and to rate the efficacy of instruments to distribute the burden of weather- and natural disaster–related risk so that the burden of the risk does not fall entirely on developing countries.

• Agriculture Investment Sourcebook, Module 10 “Managing Agricultural Risk, Vulnerability and Disaster,” published in 2005, presented analyses of a range of issues and lessons from the experience of ongoing country-based efforts.

• Response to the Food Crisis, published by the International Development Association in 2008.


Training courses offered by the Global Facility for Disaster Risk Reduction (GFDRR) and the World Bank Institute (WBI) combine raising awareness about emerging issues with the development of technical skills and know-how. However, few, if any, of these explicitly treat agriculture and rural development, and none incorporate learning tools tailored to the needs of ARD practitioners.

ARD, therefore, needs to integrate considerations of climate change and disaster risk reduction and management more fully into its work. Training for key personnel and partners should enable them to limit the sector’s exposure and vulnerability to natural hazards. In the context of ARD’s work, a number of challenges have been encountered in attempting to alleviate the impacts of these hazards in the rural space. These include limited capacity to implement
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natural disaster risk-mitigation measures. There are, moreover, no comprehensive guidelines for conducting natural disaster risk-reduction measures tailored to ARD from which World Bank staff can draw. Even in disaster-prone countries in which ARD is active, disaster risk management and climate-change mitigation is not always prioritized in business plans, country assistance strategies, or poverty-reduction strategies. This makes it difficult for ARD to allocate resources to natural disaster risk mitigation and management.
Part I: The Context

Between 2000 and 2006 there were on average 395 natural disasters per year, affecting 116 countries, killing on average 73,946 people, and affecting a further 234 million. The disasters resulted in an average $81.86 billion of economic damage per year. The 2004 Indian Ocean tsunami and 2005 Pakistan earthquake together resulted in losses of over $100 billion.

According to the Food and Agricultural Organization (FAO), between 2000 and 2007 an estimated 98 percent of natural disasters were the result of climate-related hazards—notably droughts, floods, and windstorms. Between 1987 and 2006 the average number of hydrometeorological hazards (droughts, floods, tropical storms, and wild fires) reported jumped from 195 (1987–1998) to 365 per year (2000–2006). Inevitably low- and middle-income countries are the worst affected.

Natural disasters are caused by a number of factors, including population growth, environmental damage, unplanned urbanization and extreme weather caused by climate change. An estimated 75 percent of natural disasters in fact originate from weather-climate extremes. In 2007 the Intergovernmental Panel on Climate Change (IPCC) stated that the warming of the climate system is now “unequivocal” and is tied to rising air and sea temperatures. The changes in climate and weather patterns will have significant impacts across many regions and directly affect a wide range of agricultural activities. These can be classified into interrelated biophysical and socioeconomic impacts.

<table>
<thead>
<tr>
<th>Biophysical Impact</th>
<th>Socioeconomic Impact</th>
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<tr>
<td>Increased number of areas vulnerable to droughts—particularly in parts of Africa, the Mediterranean, and southern Asia</td>
<td>Decline in agricultural yield and production</td>
</tr>
<tr>
<td>Qualitative and quantitative physiological effects on crops, pastures, forests, etc., including increased weed and pest challenges</td>
<td>Reduced gross domestic product (GDP)</td>
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<td>Increased numbers of heat waves over land</td>
<td>Price fluctuations</td>
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<td>Changes in soil and water quality/quantity</td>
<td>Changes in geographical distribution of trade regimes</td>
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<td>More frequent heavy precipitation</td>
<td>Increased number of people at risk of hunger and food insecurity</td>
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<td>Higher sea levels, higher salinity, and shifts in fish habitation</td>
<td>Migration and potential civil unrest</td>
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<tr>
<td>Increased and more intense cyclones in the North Atlantic</td>
<td></td>
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Climate Change and Natural Disasters

According to the FAO, 60 percent of the croplands, pastures, and forests in the world are increasingly exposed to threats from climatic variability and in the long term, climate change. Abnormal changes in air temperature and rainfall directly impact the scale and intensity of droughts and floods and have long-term implications for ecosystems.

The impact of changes in precipitation and rainfall on rain-fed (as opposed to irrigated) agriculture are not yet well understood. However, estimates indicate that in Africa between 25 and 42 percent of species habitats may be lost as a result of climate variability. This has direct implications for both food and non-food crops. In developing countries overall, an estimated 11 percent of arable land may be affected, including a reduction in cereal crops in up to 65 countries—approximately 16 percent of their agricultural GDP. In addition to air-temperature changes, changing ocean circulation patterns can affect fish populations and the marine environment.

To ensure sustainable development, the United Nations Development Programme (UNDP) notes that strategies are needed to adapt and build resilience against the negative impacts of climate change at several levels.

- **Local level.** The most severely impacted communities in developing countries will be the communities in the regions most exposed to climatic impacts (e.g., flood- and drought-prone areas).
- **Sectoral level.** The most adversely impacted sectors are likely to include agriculture, water-resource management, coastal-zone management, and disaster (e.g., floods, cyclones, droughts) management.
- **National level.** Within and across sectors, an important feature of national policy-making will be the need to strengthen existing policies that enhance a country’s ability to respond to its vulnerabilities to climate change, while seeking to cease policies and actions that may lead to “maladaptation” to climate change.
- **Regional and subregional level.** Much of the climate change impact will be felt acutely at the regional and subregional level in West, Eastern, and Southern Africa and South Asia. In these areas, regional and subregional planning and coordinated actions may be necessary.

How does climate change adaptation link to disaster risk reduction and management?

- Seventy-five percent of all disasters originate from weather-climate extremes.
- Disaster risk reduction and management and climate change adaptation are both strategies aimed at enhancing sustainability, resiliency, and human security.
- The two have a similar sectoral focus and rely on the same policies and measures.
- Disaster risk reduction can promote early adaptation to climate change.
- Climate-change awareness can prompt implementation of disaster risk reduction policies and techniques.
Rural Areas and Agriculture

Rural communities in which the vast majority of the world’s poor reside—some 820 million people—are particularly vulnerable to the range of disasters that can be accelerated and intensified by climate change. Statistics compiled by the World Bank are telling.8

- Over 95 percent of deaths caused by disasters are in developing countries.
- The direct and indirect losses to developing countries is 20 times that of industrialized countries.
- Between 1983 and 2003, direct economic losses associated with natural disasters increased fivefold to $629 billion.
- In 2004–2005, as a result of the Pakistan earthquake and Asian Tsunami the damage to the agricultural sector alone was an estimated $1.8 billion.
- By 2004, some 2 billion people were affected by natural disasters.
- The most vulnerable agricultural areas in the world comprise between 18.5 percent and 27.5 percent of the world’s surface, and are home to millions of people.

Although unit cost per affected area is lower in rural areas than in urban areas, owing to lower population density, more localized impacts, and less high-value infrastructure, rural communities in developing countries are generally more vulnerable to disasters. This vulnerability is the result of a number of factors, including limited technical capacity and financial resources at the local level, and poor planning and construction—often due to poverty and corruption. GTZ notes other factors that are characteristic of rural areas, including the following:9

- **Lack of effective decentralized structures.** Too often, emergency measures and civil defense and state services are organized centrally and nationally with poor rural outreach.
- **Long distances, poor transport and communication links** lead to limited access to information, including to the warnings and emergency communications that are necessary for early response. These deficits exist both between local institutions and populations and between local authorities and specialist organizations working at national or higher levels.
- **Lack of know-how in disaster management and lower levels of education and organization** limit opportunities to learn from the experience of counterparts who have experienced similar conditions.
- **Heavy reliance on natural resources and agriculture** often leads to overuse of land resources and the depletion of soil, increasing the potential impacts of crises. When disaster strikes, rural communities are affected by crop and animal losses, by the destruction of infrastructure and homes, and by disease. Their situation is compounded by limited resources to cope with disasters, lack of assets and savings, and undiversified sources of income. In 1998, Hurricane Mitch in Central America devastated much of the region. In Nicaragua alone, flooding and storm damage affected 13 percent of the area used for production of food and crops for internal consumption.
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and 10 percent of the area used for export production. In Honduras, Mitch resulted in a 41 percent drop in GDP and a staggering 292 percent loss in tax revenue.\(^\text{10}\)

Poor countries are clearly far more affected than developed countries when disasters strike. This is in part due to the lack of effective infrastructure and command centers and limited (if any) investment in preventive measures. But the lack of planning and foresight has immense economic and social consequences. Between 1985 and 1999, the world’s wealthiest countries lost some 5 percent of GDP to natural disasters, as compared with 13 percent among the poorest countries.\(^\text{11}\)

Hazard and Vulnerability

Hazards are, for example, earthquakes, floods, landslides, and droughts. Vulnerabilities are, for example, settlements on hazardous locations, poor construction quality in buildings, poverty, etc. They express weaknesses and deficits. Vulnerability is the possibility of sustaining damage. Risk arises from the intersection of hazard and vulnerability.

There is no risk without vulnerability; for example, an earthquake in an uninhabited desert does not represent a risk. However, an earthquake in Mexico City would result in vast destruction and loss.

Source: GTZ.

Agriculture is arguably the sector that is the most sensitive to climate change and natural disasters. While the impact and conditions vary across regions and is affected by levels of development, the damage to the agricultural sector in each context remains profound. When disaster hits, the direct consequences can be devastating in terms of human life and destruction of communities. Years of development can be destroyed within hours. Often the impact on local flora and fauna and environment is long term.

In the United States, for example, Hurricane Katrina resulted in an estimated $1.1 billion loss for Louisiana fisheries in 2005. Toppled trees caused waterways to be blocked, depleting oxygen levels in the water and killing millions of fish.\(^\text{12}\)

Countries in which agriculture is a major contributor to the GDP face the greatest risks from the effects of climate change and the intensity of natural disasters. In Georgia, for example, where agriculture represents 26 percent of the GDP, a regional drought in 2000–2001 led to a 6 percent drop in overall GDP.\(^\text{13}\)

Natural disasters result from poor development outcomes as well as from climate change, and the risks of disaster can accumulate over years. The depletion of water resources is a case in point. Overreliance on irrigated crops leads to aquifer depletion and soil salinization. Rapid population growth and increased demand for food lead to demographic shifts that place new pressures on land resources, including settlements and agricultural activity in areas at high risk of floods or landslides.
When emergencies happen, the financial resources delivered to address them necessarily focus first on the most immediate humanitarian needs. Investment in reconstruction and rehabilitation follow, and generally accounts for the weight of human and financial resources allocated. In tsunami-affected areas of Asia for instance, an estimated 80 percent of the $10 billion to $11 billion costs associated with damages related to reconstruction. Social and psychological problems emerge and take root in communities where families are ruined and from where many take flight. Long-standing skills in agriculture and rural development are lost. Crime rates often rise. Other characteristics that typify postdisaster settings include the following:

- Food insecurity and lack of resources and credit, which can lead to depletion of assets (livestock sold or killed, crops destroyed);
- Death of income-generating members of the household and destruction of assets, often leaving family members vulnerable (children, women, single fathers);
- Lack of shelter for people and livestock (animal shelter is particularly problematic as it is often not planned for or considered);
- Public health concerns arising from poor sanitation, polluted waters (due to flooding or drain blocks and stagnation of water);
- Physical changes to the landscape—the impact varies according to the nature of the hazard. Tsunamis and hurricanes can cause saltwater to drain into freshwater areas, affecting marine life. Earthquakes, floods, and fires can change arable lands and erosion patterns. Established communities may have developed coping strategies, but newly settled populations that have been displaced by earlier disasters or conflict face increased risk with such rapid changes.

Amid the negative consequences, however, there are also pockets of opportunity. In many cases new technologies, improved seed and plant quality, and more inclusive, community-driven decision-making processes have been introduced during recovery and reconstruction.

Often, the time after a disaster is when marginalized people—many of whom are women and agricultural producers—gain a voice and find new sources of support. For example, in India following earthquakes in 1993 and 2001, housing-reconstruction programs were moving slowly. House owners had limited access to grants, information, and materials. Vulnerable groups had even less access and therefore even lower rates of participation. The local government was also bypassed. With progress slow and uneven, the program was reformed to include a community-participation component; an education, training, and outreach component, with women appointed as communication assistants; and facilitation of basic services by local governments, including water, transport, materials, and banks. The reforms helped increase participation in the process, build local capacities, empower the poor, increase access to economic resources, and promote local partnerships and networks. A range of social networks emerged, including among newly mobilized women and youth. Day-care services were established for children and seniors, on-site
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training was provided to house owners, and information about grants and loans and other resources and services became more localized. A popular information campaign disseminated knowledge about techniques to make structures more resistant to earthquake-related damage.

While communities and states naturally tend to be more inclined to prioritize disaster risk management and reduction during periods of reconstruction, the challenges of incorporating disaster risk reduction and management into agricultural and rural development programs prior to crises persist. Meeting these challenges effectively will reduce vulnerability to disasters and soften the impacts and improve the response to emergencies when they do occur. “Disaster risk management tries to reduce the hazard and/or the vulnerability. It is mostly simpler and more effective to affect the vulnerability of people, e.g. through safer construction methods in the case of earthquakes or better preparation of the population for disaster, than to counter the hazard itself (e.g. earthquake, storms). All these activities are part of disaster risk management, which focuses on the period before a possible natural disaster” (GTZ).
Part II: Conceptual Framing and Priorities of Disaster Risk Reduction in Agricultural and Rural Settings

Multilateral efforts are now underway to develop effective means of reducing and managing risks, and to ensure improved protection and reconstruction measures. Many countries are beginning to respond by developing preventive approaches, decentralizing management capacities, and integrating disaster risk management into development processes.

UN-led efforts are providing guidance and setting priorities. The 10-year Hyogo Framework for Action, covering 2005 to 2015, was endorsed by 168 countries. The Framework provides a “global blueprint” for disaster risk reduction (DRR), complete with terminology, guiding principles, priorities, and a range of practical measures. These are familiar to governments and can be used and adapted according to conditions. The five priorities for action in the Hyogo Framework are to:

1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.
2. Identify, assess, and monitor disaster risks and enhance early warning.
3. Use knowledge, innovation, and education to build a culture of safety and resilience at all levels.
4. Reduce the underlying risk factors.
5. Strengthen disaster preparedness for effective response at all levels.

These priorities all apply to agricultural and rural settings.

Priority 1: Ensure that disaster risk reduction is a national and local priority with a strong institutional basis for implementation

Acknowledgment of the problem is a key first step. Increasingly, development practitioners are noting that crisis and natural disasters should be considered as ordinary rather than extraordinary events in the development cycle. This is particularly important in the context of climate change. Countries must therefore identify and assess their potential risks and vulnerabilities and institute a culture of prevention.

This is a central feature of effective disaster risk reduction and management. It can be the most challenging aspect of the work needed because in many cases it requires a fundamental departure from business as usual. New norms and standards are needed, and they can be made effective only if there is sufficient political will. There should be a national-level approach and push to
ensure that all sectors and communities are addressed. However, often time the will and demand for change emerges more strongly at the rural and local level, where the impacts of disasters are most acutely felt. In effect, governments and multilateral organizations should seek out these partners and existing resources to develop and support.

**Good Practice: Institutional Capacity Building**

Africa: In 2006 the U.S. Agency for International Development (USAID) partnered with the University of Cape Town, South Africa, to develop disaster risk and vulnerability reduction capabilities across the continent. Building on existing know-how and commitment, they are establishing university-based DRR units and programs specific context and capabilities in formal education, short courses, trainings, research, and advocacy.

In South Asia, for example, the nongovernmental organization (NGO) Practical Action has been a lead actor in developing the “Disaster Resistant Sustainable Livelihoods” framework, which takes a holistic approach to disaster risk and poverty. The framework takes into account a range of issues pertaining to the region, including the following:

- The importance of the multifunctionality of agriculture, forestry, fisheries, and rural communities and the need for conservation measures that allow sustainable development in these sectors.
- Emphasis on addressing people’s livelihoods and well-being to encourage participation and ownership of disaster-prevention efforts in rural and agriculture-based communities.
- Focus on the need for effective and responsive governance structures—national and local—that advance development and strengthen communities’ asset base.

The framework is presented to governments and international communities as a tool to inform policy-making, planning, and investment decisions.

National-level legislation pertaining to disaster risk reduction may entail the establishment of a national authority with responsibility for disaster risk management. To be effective, this national authority will include representatives of relevant private and public stakeholders, including those representing agriculture and other ministries whose portfolios relate to rural development. The national authority would need to maintain offices at provisional and local levels to allow for the mutual exchange of top-down and bottom-up flows of information.

Budgets must reflect the costs of introducing new standards into development plans at the national, regional, and provincial levels, and clearly defined divisions of responsibility are generally required to optimize coordination and rationalize budget allocations between the respective levels. Developing the capacity to carry out the new roles is especially fundamental at local levels.
FAO provides a number of disaster risk management–related policy areas that apply to agriculture:

- Construction standards for agricultural infrastructure to minimize risks
- Clear definitions of the criteria by which emergency situations should be declared, and the timing and sequence of emergency response
- Promoting stakeholder and community participation with specific efforts to include and support marginalized sectors of the population, particularly women
- Mapping of disaster-prone areas
- Land-use planning and measures to control degradation, desertification, and deforestation
- Water management
- Forestry conservation
- Management mechanisms and agreements for trans-border animal and plant disease control.

A number of infrastructure-related measures pertain to specific types of hazards, and apply to rural contexts in addition to agriculture.

- In cases of flooding, defense measures such as construction of dams and sea walls; natural protection such as reforestation of watersheds; and drainage pumps and flood shelters near schools and in communities;
- In cases of cyclones or earthquakes, buildings, animal shelters, and storage facilities could be retrofitted to be earthquake- or cyclone-proof;
- In cases of droughts, dams and more effective water-management systems could be established, including water pumps for irrigation from rivers and drought-resilient water points.

In many instances, financial mechanisms such as disaster insurance policies, postdisaster emergency credit, and other microfinance instruments are being
considered and devised for farmers and other rural agricultural workers. However, most such instruments are in their infancy in the context of severe natural disasters that destroy basic social structures such as informal safety nets that enable victims to draw on provisional support from friends or family. Many commercial insurance companies are unwilling to provide sufficient insurance coverage to poor and isolated rural communities. Yet, a number of initiatives have emerged that tackle the challenges while providing basic cover for the rural poor.

**Good Practice: Disaster Risk Insurance in Bangladesh**

In 1991 a natural-disaster-management program was established and since 1997 compulsory group-based insurance has been included. Under this program 2% of the savings balance is annually transferred to a fund that will pay twice the amount of the savings deposit in the case of property damage due to disasters, while savings stay intact... With more than two million clients in 20,000 villages and 2,000 slums in 57 districts of the country, this insurance fund has wide geographic diversification. It covers 10% of the population of Bangladesh for property insurance and 25% for life insurance... The scheme has been relatively effective in terms of claims settlements. Until 2004, 20.06 million taka were paid from the compensation fund to the affected families of 4,448 deceased group members, and 20.29 million taka to 14,525 members for property losses due to cyclones, river erosion, or tornadoes.


**Priority 2: Identify, assess, and monitor disaster risks and enhance early warning**

In many parts of the world, natural disasters have historically been considered a stroke of fate. Nothing could be done to stop them, although it was recognized that action could be taken to recover from them. In modern times, developing countries have grown reliant on international emergency aid as part of their response. As the severity and frequency of natural disasters has increased, there is growing realization in industrialized and developing countries that early warning systems and disaster risk assessments can greatly reduce the potential for catastrophic harm.

The technological dimensions of climate-related early warning systems (EWS) are developing rapidly. At one end of the spectrum the use of traditional media such as television, radio, community radio, telephones, and more recently text messaging and online media play a crucial role in warning the public and informing people about how to remain safe. These media must be better incorporated into disaster management planning and programming. In the immediate aftermath of crises, specialized software can aid in tracking missing people, delivering emergency aid, and managing online requests. In southern Sudan, information and communication technology (ICT) is being used by a consortium of international and national actors to map out potential locations where insecurity may arise. Among the criteria they consider are water
sources, environmental degradation, movement of pastoralists, and patterns of land usage.

Geographic information systems (GIS) and remote sensing software that maps, analyzes, stores, and facilitates quick retrieval of data are also being used. These systems can provide extraordinarily detailed information about specific locations, conditions, terrain, etc. Using GIS and satellite imagery it is possible to develop longitudinal images and three-dimensional maps of areas that capture environmental changes, and the impacts of human development and natural processes. This information can be used to monitor conditions and to mitigate and manage risk in planning before emergencies take place, and to enable early warning systems (EWS).

GIS can also aid in recovery, assessing damage, prioritizing, ensuring uniform distribution of aid, and so forth.

The cost of EWSs can be a serious hindrance in many countries. Where there is a lack of political will to promote the use of these systems, for all intents and purposes the cost is prohibitive.

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**Early Warning Good Practice: Acknowledge and Draw on Local Knowledge**

Among the Simeulue community in Indonesia, ancestral stories warn that when the buffalos rush to the hills, a tsunami is coming. In 2004, based on this story and their observations, this community of 80,500 people moved to the hills. Only 7 people died among them, compared to over 160,000 across the rest of Indonesia.

*Source: Early Warning Systems in the Context of Disaster Risk Management.*

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The measure of an effective EWS is whether information is reaching vulnerable communities in a timely manner and how that information is acted upon.

Traditionally EWS were framed around three pillars: monitoring conditions, forecasting events and situations, and notifying or issuing the warning itself. As with conflict early warning, disaster EWS have come to the realization that “early response” is critical. Moreover, it is increasingly evident that while technology and knowledge of the risks are key stepping stones, effective EWSs are people-centered. In other words, the warnings must be designed:

- To reach those at risk (across communities, the medium and the message of warnings can vary according to the target audience—women, men, young, old etc). For example, given that women and men tend to work in different spheres and sectors, information needs to be directed at them accordingly. It cannot be assumed that men will inform the women.
- To communicate in an accessible manner and in a language that is relevant and understandable to the target beneficiaries.
- To recognize and draw upon the local and indigenous knowledge that exists in local settings regarding impending disasters.

Development agencies have a range of approaches for assessing and managing risk. GTZ, for instance, frames risk as the “intersection of hazard
and vulnerability.” The risks associated with a major earthquake in an uninhabited desert are very different from those associated with a similar earthquake in a major urban center (e.g., Mexico City) or rural area (e.g., Bam in central Iran). Similarly, the vulnerability and resilience factors also vary within similar categories—for example, an earthquake in rural, mountainous Pakistan can have a significantly different impact from one in the rural plains of Iran or in rural Japan. Existing infrastructure (or lack of it), government responses, and community organizational capacities are among the range of factors that can heighten or mitigate vulnerability and resilience.

- **Hazard analysis** assesses the likelihood, magnitude, and duration of an extreme natural crisis or disaster.
- **Vulnerability analysis** assesses the potential damage, losses, and social causes and consequences of a natural disaster. Within this, the resilience and coping strategies of communities also need to be considered.

**Risk Analysis**

Risk analysis aims to derive and determine measures that could either prevent or improve preparation and responses in case of an event. Consideration of the **continuum of risk** is one of the approaches espoused by members of the African Urban Risk Analysis Network (AURAN). While they have framed it in terms of risks identified in urban settings, the model can also be usefully adapted to rural and agricultural settings. Within the continuum, risks can be categorized according to scale, as in:

- Disasters such as earthquakes, generally infrequent but with the likelihood of high numbers of casualties.
- Slow-onset but long-term disasters, such as droughts, with varying intensity and range.
- Smaller-scale disasters that may be seasonal or specific to a region, such as floods and forest fires, that may entail some casualties.
- Everyday risks, such as accidents and injuries, that have long-term consequences for families and dependents but could through education and improved equipment or infrastructure be reduced in scale and impact.

The FAO advises that disaster risk reduction measures should be “based on an assessment and prioritization of the hazards and risks that people face, as well as their ability to cope and withstand the effects of these hazards. This should be done in an integrated way” that:

- identifies the typology, frequency, and severity of a hazard (hazard assessment);
- identifies the geographical areas and communities that are most vulnerable (hazard mapping);
- identifies the key factors contributing to vulnerability as well as local coping and adaptive strategies and capacities;
- assesses gaps in national policies and institutions to instigate disaster risk management systems;
assesses the role and capacities of relevant line ministries (e.g., agriculture and fisheries, forestry, rural development) in disaster risk management and their linkages with other institutions, including emergency response agencies as well as other ministries (e.g., health, education).

Given the complexity of disaster risk reduction and management, numerous tools and processes exist for intervention, drawing on various disciplines. They include flood management, payment for environmental services, land-use planning, promoting income and employment, environmental impact assessment, and capacity-development tools and protection plans and early warning systems.  

Early Warning and Early Response

Significant resources have been dedicated to improving “early warning.” Early warning systems “combine diagnostic tools to evaluate weather-related or other data with communication networks to disperse warnings about imminent disasters, every day storms, and even potential failure of flood control mechanisms such as dams. They can be lifesaving interventions, and the lack of adequate warning has proved to cause preventable deaths.” For example, if the Indian Ocean region had had a more effective early warning system (as exists in the Pacific) human casualty rates from the 2004 Asian Tsunami could have been much lower. Ideally, a component of crisis early warning should be integrated into development programs from the outset.

Early warning systems are important for rural and agricultural communities and often need to be tailored to the local cultural context. For example, in many places, radio may be the most effective means of alerting communities, but in mountainous regions such as Nepal, where over 90 languages and dialects are spoken, it cannot be assumed that national radio alerts will be heard or understood by everyone.

Moreover, information is often passed and disseminated through systems and networks used only by men. This can result in women and their dependents (children, the elderly, the sick) being left uninformed and unprepared. To be effective, therefore, the information gathering and analysis dimensions must be tied to the dissemination through a variety of approaches, including: public education, capacity building, institutional development, and community participation (in the provision of information and determining means of sharing warnings).

A key problem is that too often the systems set up by governmental agencies are not connected to local populations. The risk of neglect and vandalism can be high. In Central America the Organization of American States (OAS) addressed this by experimenting with “low-cost, low-tech flood warning systems in four watersheds in Honduras and Nicaragua. Using simple but strategically located materials (PVC piping and string) they relied on people from affected communities to make daily readings, analyze information, and warn in case of floods. When Hurricane Mitch made landfall, the communities using these participatory flood warning systems had long since evacuated their homes. No lives were lost in these communities.” As a result of this
success, the government of Honduras has worked with the World Bank to extend community-based early warning systems.

**Priority 3: Use knowledge, innovation, and education to build a culture of safety and resilience at all levels**

A global culture of safety and prevention is fundamental to effective disaster risk reduction. Knowledge management and education are essential elements. A number of innovations are underway, combining information technology with traditional means of communication. In Africa, for example, RANET (Radio and Internet for the Communication of Hydro-Meteorological Information for Rural Development) is a collaborative initiative bringing national hydrometeorological services together with NGOs and local communities to make weather, water, and climate information available to rural and remote populations. RANET is seeking to broaden its communication tools—such as radio, Internet, and text messaging—and provide training and capacity building so that communities can better mitigate the impact of disasters.²⁵

In Central America in 2002, a radio soap opera titled *Tiempo de Huracanes* was launched in six countries over 74 local stations at the beginning of the rainy season. The aim of the campaign was to provide an alternative type of information on disaster risks to the most vulnerable communities. *Tiempo de Huracanes* consists of four stories in the context of floods caused by the heavy rains and hurricanes. These stories take place in communities with different levels of preparedness and deal with issues occurring before, during, and after the disaster.²⁶

Disaster risk reduction can also be integrated into educational curricula and capacity-building initiatives in rural settings, so that all stakeholders—women, men, and children—are taught and empowered to engage in resource management and risk reduction.

The Hyogo Framework also calls on states to “ensure equal access to appropriate training and educational opportunities for women and vulnerable constituencies; promote gender and cultural sensitivity training as integral components of education and training for disaster risk reduction.”

National level actors have much to learn and gain from the experiences of local communities and different stakeholders (women, men, boys, girls etc). “Depending on their function in the household or community and their familiarity with their local environment, they may be the first to notice changes that are indicative of larger phenomenon. They may also be the first responders to famine or other crises.”²⁷

“For example, if men engage in fishing and water-related activities, they need to know how best to survive potential earthquakes and tidal waves. For women, on the other hand, if they tend to work inside homes or in fields, the risks they face (such as a roof collapsing) and related survival strategies may be different. They also need to be educated regarding the preparation of emergency kits or materials to take with them in the event of a natural disaster.”²⁸
A Conceptual Framework for a Training Curriculum on Natural Disaster Risk Reduction and Management for Agriculture and the Rural Space

The role and function of women and men can vary enormously across rural and agricultural communities. Their access to and use of information may vary as well. Often they specialize in different aspects of agricultural work—for example women may be responsible for animal husbandry and men for fieldwork. Thus they have different information and knowledge to share. They also need to be informed about risk-reduction strategies that are relevant and tailored to their activities.

Priority 4: Reduce the Underlying Risk Factors

Addressing the structural or direct causes of risk is an important pillar of DRR and prevention. There are macro-level and international dimensions such as curbing carbon emissions or managing climate change at a global level. But targeted and localized efforts are equally important, for two key reasons. First, reducing local-level risks improves the chances of protecting assets, crops, livestock, and human life. It also builds community resilience. Second, reducing risks at the micro level contributes to risk management and reduction at the macro level. More resources can be directed toward development, and not just recovery. It strengthens self-reliance and the culture of safety.

Good Practice: Environmentally Friendly, Cost-Efficient Typhoon Damage Reduction

“...A Vietnam Red Cross mangrove planting programme implemented in eight provinces in Vietnam to provide protection to coastal inhabitants from typhoons and storms cost an average US$0.13 million a year over the period 1994 to 2001, but reduced the annual cost of dyke maintenance by US$7.1m. The programme also helped save lives, protect livelihoods and generate livelihood opportunities.”


The measures needed to reduce risk vary enormously across regions, climates, and the nature of products and depending on the agricultural activities undertaken. Timing is also a variable. Some measures can be initiated at the outset of programming or productive activity (e.g., selection of resilient seeds), while other measures can be triggered later in the process (e.g., pest control or postharvest storage management).

Similarly, risk-reduction measures can be preventive or aimed at limiting or reducing the potential extent of damage incurred.

The FAO offers a range of technical and sector-specific interventions for reducing underlying risk that pertain to agricultural and rural settings.

Agricultural Measures

- Appropriate crop selection (new variants, drought/saline/flood-resistant crops), animal selection;
- Improved cropping and cultivation methods (diversification, intercropping, soil conservation, adjusting crop calendars);
Improved postharvest management (higher/drier storage facilities, food drying, processing, shipment);
- Pest control;
- Improved water management, including better design, maintenance of irrigation systems, rain harvesting, and conservation;
- Introducing reforestation and agroforestry methods.

Localized Infrastructural Measures
- Raised seed beds, wind breaks, fire breaks;
- Proofing of storage and animal shelter facilities;
- Routine clearing of drainage systems and erosion control;
- Safe rescue places, platforms, strategic animal fodder reserves;
- Drought-resilient water points;
- Earthquake-proof fish ponds and irrigation facilities;
- Flood-safe seed- and fodder-stocking infrastructure.

Needless to say, acknowledging and supporting the coping strategies developed by communities and sectors of the population is critical. Across Asia, Africa, and Latin America, women and men working in the agricultural sector are devising their own means of reducing the risk of disasters. Thus, the process of community consultation and engagement is fundamental to risk-reduction strategies.

Priority 5: Strengthen disaster preparedness for effective response at all levels

Countless initiatives can and should be undertaken to minimize the likelihood and extent of a natural disaster, but that does not eliminate the need for early response, which can greatly reduce the impact of a natural disaster. This requires preparedness and planning, some of which can be undertaken early in programming; for example:

- Demographic profiling of communities at risk—numbers of women, men, boys, girls, elderly, disabled; capacities and functions they have; and formal and informal leadership structures can be critical information during emergency-response efforts. They can help target assistance more quickly and directly. Establishing community-based systems of information sharing (the equivalent of telephone trees) are critical in the aftermath of disasters for assessing loss, damage, and needs. Similarly, such systems can be used to convey early-warning alerts (discussed above) across communities and among different stakeholders (e.g., through women’s networks, schools, areas of activity, etc.)

The FAO further identifies contingency planning for during and after disasters and protective infrastructural and household-preparedness measures.

- Contingency planning includes lifesaving measures (evacuation procedures, identification of safety sites, search-and-rescue systems) as well as planning
to save equipment, livestock (e.g., by moving them to higher ground, vaccination for those exposed to flooding), seeds, produce, etc.

- Structural measures can include clearing drainage systems; pruning trees in advance of hurricanes; preparing buffer capacities for food, fodder, and water; ensuring basic medical and veterinary supplies; making stand-by equipment (water pumps, rescue boats) available; and emergency harvesting (if time allows).

**Building Back Better**

Key opportunities can arise in the midst of crisis. The chance to “build back better” is perhaps the most significant. Building back better is both literal and figurative.

Literally speaking, the need to rebuild infrastructure—housing, shelters, schools, etc.—is an opportunity to build according to stricter specifications. For example, in Afghanistan a rural school was built with light roofs to minimize earthquake damage. But the roof was not strong enough to withstand the weight of winter snows, so it collapsed.

**Needs Assessments and Issues to Address**

- Existing and predisaster physical structure of farmer systems, local knowledge, and its role in maintaining agricultural sustainability
- Feasibility of facilitating access to seeds
- Targeting and stakeholder identification
- Normally existing informal and formal seed channels
- Social, gender, cultural, and class relations in the farming system
- The natural environment (land mines, soil fertility, etc.)
- The situation of displaced individuals
- Coordination with other areas of disaster recovery and relief
- Livelihood recovery
- Selection and multiplication for seed distribution (if required)
- The impact of the disaster on all the aforementioned factors
- Transition to long-term development


New buildings and planning can also take advantage of environmentally friendly materials, combining local natural resources and traditions with new innovations. It is also the chance to ensure that new buildings can double up effectively as shelters in case of future disasters.

The principle can also apply to the range of tools, seeds, crops, and other resources that communities need to ensure a sustainable livelihood—one that is less vulnerable to the impact of natural disasters. Seed security for example
is of primary importance to achieving long-term food security. But experience
to date reveals that while the intentions of external actors may be good, the
way in which interventions are planned and implemented is not always
effective. Too often, the agricultural capacity of communities is not restored
fully. This is due to a range of issues, including:

- Lack of preparation and planning;
- Limited understanding of the processes related to agricultural rehabilitation
  and recovery after a disaster;
- Ineffective (or no) needs assessment, including for seed initiatives and false
  assumptions about how farmers access seeds, resources, etc; and
- Lack of coordination among agencies involved in relief and recovery efforts.

While relief practitioners know that needs assessments are critical, too often
assessments are either not conducted, or undertaken only partially or as a
one-off exercise. Yet the conditions are changing so rapidly that for a targeted
and sustained response, a continuous process of information gathering and
recalibrating programming is needed. Experts in this field typically cite
participatory methods as the way forward—with multiple benefits—in reality
it is not often practiced.\textsuperscript{29}

In part, this is due to the pressures for results imposed by the outside world.
But in the aftermath of disasters, people in communities cannot or will not
engage in needs assessments. Some international actors have devised methods
to overcome this difficulty. For example, Save the Children Fund (UK) (SCF)
uses a household economy approach “for field monitoring in emergency
situations throughout Africa. Because this methodology involves an
understanding of farmer seed systems, it has also been used to support
information collecting methods in post-disaster agricultural needs
assessments.”\textsuperscript{30}

Metaphorically, “building back better” encompasses the opportunity to
strengthen community capacities, ownership, while ensuring that external
interventions are not doing or compounding existing harm to sectors of the
population. This is particularly pertinent to women, who, despite their
contributions to rural development and agriculture, often remain
marginalized and excluded from benefits. Moreover, in the aftermath of crisis
they are often more vulnerable to physical violence and sexual abuse. In
Sri Lanka, for example a coalition of 60 women’s organizations, called the
Coalition for Assisting Tsunami-affected Women (CAWTAW) organized fact-
finding missions to tsunami-affected areas. The missions confirmed
allegations of rape and sexual molestation of women survivors in the days
immediately after the tsunami and later when they sought refuge in
temporary camps.\textsuperscript{31}

In addition to taking account of the physical security needs of women and
men, effective recovery requires better assessment and understanding of the
gendered division of labor before, during, and after crises. This is critical both
to assisting recovery and to avoiding hampering it. “In Sierra Leone, for
example, a World Bank study noted that agricultural rehabilitation was
hindered because seeds were distributed to households and the needs were expressed by the household heads, who were—typically men. Yet women and men in Sierra Leone farm different crops and thus required different sets of tools and seeds. Care International adopted an alternative approach of distributing seeds to all adults. In this way, women obtained groundnut seeds (a crop typically planted by women), and this contributed to their income generation and empowerment alongside men.32

There are numerous organizations and tools available offering methods for planning and supporting postdisaster recovery and reconstruction. For example, the Australian nonprofit, Projectaid offers a complete package (including CD-ROMs) for planning recovery efforts.33 The UN system, including the Office for the Coordination of Humanitarian Affairs (OCHA) has handbooks and guidance tools for staff. In spite of the progress being made, there is still a gap between humanitarian relief and long-term recovery. This is evident not only in terms of financial resources but also in the nature of aid provided. For example, there is a dichotomy between the provision of food aid versus agricultural aid, the timing of seed and tool distribution, and the range of materials provided or priorities for reconstruction. While much of the rhetoric is focused on early recovery through self-help, the practice varies considerably. These are challenges that development practitioners need to take account of when planning and implementing initiatives, particularly if DRR issues are being mainstreamed.
Part III: Developing a Training Program

There is a common set of issues pertaining to disaster risk reduction that can be included and explored in training for ARD personnel and their national counterpart. But there is no one-size-fits-all approach to training. The curriculum, agenda, and materials (exercises, examples, etc.) used must be tailored to each specific context (e.g., region, geography, type of agricultural activity, nature of the most common hazards and disasters, etc.).

Training programs should draw on and reflect priorities identified in existing policy frameworks, institutional, and national commitments regarding proactive DRR. These frameworks not only specify obligations that exist (at the national level or by the World Bank) but also offer opportunities for ARD personnel and their partners. Examples and lessons drawn from existing practices of the World Bank or other entities should inform the sessions.

Components of a Curriculum and Training Program

1. Vision. A curriculum or training plan must contain a vision statement that includes a rationale that reflects the needs, the framework, and the stated outcomes.

   Sample: Many natural disaster risk-management tools have been created to respond to the increasing incidents and frequency of natural hazards and events, but few comprehensive natural disaster risk-management training tools have been developed and targeted for agriculture in particular and rural development at large. While the importance and impact are recognized, natural disaster risk reduction is not yet mainstreamed in the work of ARD. This, combined with the lack of targeted training has left agriculture and rural development still highly exposed and vulnerable to natural hazards.

   This curriculum has been designed to improve the ability of ARD staff and their counterparts to integrate natural disaster risk mitigation and recovery measures into all programs so that the risks and damages associated with natural disasters are reduced and more effectively managed.

2. Objectives. Training objectives must be expressed in terms of outcomes—What should participants be able to do? And what should they know?

   Sample Objectives:

   • To increase staff awareness of and familiarity with evolving disaster risk-reduction policies and practice, with particular application in agricultural and rural settings;

   • To increase understanding of effective means of ensuring gender-sensitive disaster risk reduction and ARD planning and programming;
To build staff capacities to mainstream and systematize disaster risk reduction into a complete program life cycle through exposure to existing technical resources and lessons drawn from past or ongoing initiatives;

To enable an exchange of experiences between field and headquarters (HQ) personnel and national counterparts;

To elicit and offer practical, concrete tools and approaches that enable Bank staff (and their counterparts) to integrate disaster risk reduction into their work in a sustainable and compelling manner;

To identify gaps and elicit ideas for enhancing ARD’s capacities to implement disaster risk-reduction programming;

To draw on the findings from the workshops to initiate a preliminary action plan for the full integration of disaster risk reduction at all relevant levels and areas of work in ARD.

3. **Scope and Sequence.** The curriculum design must include scope and sequence. This is especially important for a curriculum designed for professional development and in-service training for Bank staff. Many individuals may not take the entire course, but rather attend only the modules that are most relevant to his or her work. Therefore, the curriculum must explain how the modules build (or do not build) on one another, in what ways they are sequential, and whether there are prerequisites. The scope and sequence clarifies timing and duration of the modules. Given work pressures on staff it is important to offer flexibility in the training, for example:

- Full-time 2-day workshop—suitable for field/regional offices, where trainers are sent in for an intensive program.
- Part-time courses—4 half-day sessions over 4 to 8 weeks—at HQ.
- 1-day full-time workshop + 1 to 2 days of sector-specific planning with trainers. Depending on the needs of the country offices, trainers can design a 1-day session and follow up with one-on-one discussion/planning sessions with each unit/sector.

4. **Methods.** The curriculum must be explicit about the methods that will be used. The integration of real-world applications is recommended. In other words, not the old-fashioned transmission-of-information model, but rather an approach that:

- Elicits responses and experiences from participants.
- Allows participants to integrate the knowledge, using problem-solving and participatory approaches.
- Encourages participants to apply instruction/examples to their job/functions.
- Enables participants to improve Bank procedures and normalization of disaster risk reduction into practice areas.
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The methods should match the objectives. Recommended methods include:

- Interactive instruction/discussion (a balance of input from trainers so that staff have the opportunity to gain new knowledge and learn, while they also discuss and share their own experiences).
- Simulations and case-based exercises that provide an opportunity to develop models.
- Collaborative, problem-solving activities that provide teams/units the opportunity to plan together.
- Activities designed to help staff develop action plans for their units.
- Use of technology (Web, interactive simulations, distance learning, etc.).

5. Curriculum. The curriculum is the totality of the training program. It should include:

- The modular series comprising sector- or region-specific individual units and a selection of introductory and skills-based units.
- An individual syllabus for each unit.
- The Modular Series. Given the range of users and beneficiaries, the modules should aim to be stand-alone entities that can be used in different permutations and combinations depending on the context. There should be:
  - Introductory/policy-framing units
  - Skills units
  - Content modules/series

Introductory and Framing Units

Each workshop should provide an overall framework that clarifies the links between the conceptual developments, the policies and practice of DRR. In other words, in completing a workshop participants should have a deep understanding of:

- What is meant by DRR: components and overview of existing and evolving policies and practice.
- Why DRR matters to ARD: providing a snapshot of the economic, social, and security implications of disasters as well as reflecting on the benefits that DRR can bring to ARD practices—for example introducing new/innovative practices and produces, creating an opportunity for more participatory approaches to community-based assessments and problem solving; empowering local stakeholders.
- Ensuring gender sensitivity in all aspects of DRR and ARD programming: As participants are being introduced to disaster risk-reduction issues, it is a key opportunity to fully integrate gender sensitivity throughout the program/training. This is especially important given the significant differences in women’s and men’s vulnerabilities and experiences of natural disasters, ranging from inequality in legislation (e.g., land rights/ownership)
to access to information and early warning and opportunities to participate/benefit from recovery. The differential needs, circumstances, and strengths of women and men must be accounted for throughout the program.

- **How to integrate DRR sensitivity into ARD programming:** Understanding of existing tools and processes to take key steps toward disaster risk-reduction integration/programming, including risk analysis, participatory planning, etc.;

- **Building on experience:** The workshops could be a key venue for sharing information and know-how on good and bad practices and experiences from across the world.

- **The Skills Units:** Each workshop provides an opportunity to enhance staff skills as well as knowledge. In particular for DRR planning and implementation, experience/exposure to participatory methods for needs assessment, planning, and programming are key. Existing training units/techniques can be adapted.

- **The Content Modules/Series:** The content modules require the most attention, and should be tailored to the needs of the participants to ensure maximum benefit. Given the complexity of issues pertaining to disaster risk reduction and management, it is worth developing a modular series of units pertaining to each type of disaster; for example:
  1. Floods
  2. Droughts
  3. Cyclones/hurricanes
  4. Landslides
  5. Fires
  6. Earthquakes,
  7. Volcanoes

Within each module, sessions can focus on the types of actions needed for integration of DRR in different types of agricultural activity/production (e.g., crops, livestock, agricultural infrastructure).

There are many variables that need to be taken into account. For example, communities experiencing flooding may have to cope with very different issues based on geography (e.g., coastal vs. mountainous regions), population density, nature and quality of infrastructure and services, local culture and traditions, etc. There can be huge variance within countries. It would be difficult to develop “off-the-shelf” materials to cover every condition. But a basic set per type of disaster could be considered.

The issue experts and trainers selected would need to tailor their workshops to the specificities of the participants. A sample 2-day agenda for disaster risk reduction and mitigation flooding and agriculture is attached in Annex 1.

- **Individual syllabuses for each unit:** Each of the units should a detailed plan of content, expected outcomes, activities, and assessment plans, required course materials and additional resource. Taken together, the syllabi provide an outline of the entire series. In each case the Hyogo Five Point
Priorities can provide the overarching framework, into which the range of topics and skills can be integrated, (e.g., policy development, risk analysis, early warning, education/capacity building, recovery, etc.).

- **Follow-up projects and seed funding:** To ensure full understanding of the issues, the course could offer an intermediate-level program, in which participants return to their duty stations and undertake a small DRR-related project. Seed funds could be made available to those who wish to pursue this option. The work can be documented and assessed in a follow-up workshop (6 to 12 months after the preliminary sessions).

- **Type of approaches:** Each module would incorporate approaches to DRR—notably mainstreaming or targeted interventions. The sessions could also integrate discussions and skills building for participatory assessment/programming processes.

- **Instructor’s Guide/Manual:** An instructor’s guide should be developed for each module. The guides should include syllabi, notes on methods, assessment and evaluation tools, and lecture notes (i.e., module content). Instructional guides serve to make the implementation of the training program consistent across various locations and Bank departments/units. This is critical for quality control, both in terms of the trainers’ competence, and for ensuring that participants in different offices receive the same information and same training.

- **Pilot Training:** Because this curriculum is being designed to address a gap in the field, the development of content will require special time and attention. A pilot training program would allow participants/Bank staff to provide feedback on the material developed and its applicability. The pilot session would also be an opportunity to test the instructor’s manual to determine how accessible/usable it is for facilitators.

- **Assessment:** The curriculum design must include assessment tools to measure the trainees’ (participants’) learning against performance expectations. Assessment is different from evaluation of the training by the trainees (which is also necessary, see below). To consider:
  - Pretraining versus posttraining knowledge/needs assessments. This is recommended for each module. Also worth considering is a delayed, or subsequent, posttraining assessment, which would be designed to assess how the knowledge and skills are being integrated in the participants’ work.
  - A thorough assessment of participants’ learning at the pilot stage would provide important data for the design of the bigger project.

- **Evaluation:** The curriculum should include an evaluation of trainers and each module by participants.

- **Resources:** The curriculum should include a list of resources, existing tools, reading materials, as well as recommended or additional texts. The Bank could develop a manual, a CD-ROM and/or website that includes these resources for employees and participants.

- **Translations:** From the outset, plans and budgets should include resources for the translation of the curriculum into key languages (e.g., Spanish, French, Swahili, Arabic, etc.)
6. **Certification Options:** The program can offer multiple levels of certification to enable staff to pursue DRR issues in depth.

   **a. Basic Training:** Participants who complete a single-module 2-day workshop can receive a Basic Training certificate.

   **b. Intermediate Training:** Participants who complete a 2-day workshop and undertake a follow-up project can receive a higher-level certification.

   **c. Advanced Certification/Training of Trainers (TOT) component:** The curriculum and training program should include a TOT component so that sectoral experts can be trained in the course content and in the skills needed to provide training to other staff. Individual who have demonstrated an ability to use participatory methods to achieve desired outcomes and improve staff performance would be recommended. A TOT program, designed to make sure that trainers are familiar with the course content and methods, as well as thorough instructor’s guides (see above) will go a long way toward ensuring quality control and achieving objectives. Evaluations can be used to identify problems and respond to participants’ needs.

7. **Experts and Resource Personnel:** A number of technical experts will be needed to help develop the content of each module and session. ARD in partnership with the Bank’s Disaster Risk Management team could establish a working group of internal personnel to guide the development of the curriculum and identify key experts (internal or external) to assist in the development of the modules, and review materials developed. ARD could also maintain a list of resource people to present specific sessions of workshops and/or to facilitate entire workshop modules.

8. **Funding for Development and Roll-out of Training Program:** Once the scope of the training program is determined (e.g., range of modules, levels of certification, TOT option, etc.) a realistic budget and time frame are needed. Clearly, the initial development of the curriculum and testing will be costly. A number of approaches can be considered to defray the costs:

   - **Partnering with like-minded organizations:** Given the dearth of material, it is likely that there are other organizations (multilateral, regional, development agencies, NGOs) interested in such a program. For example, the FAO is also exploring the need for training materials on DRR and agricultural/rural development. The Bank could consider a partnership for the development of the basic curriculum. The Bank could host a meeting of like-minded organizations to determine the opportunities for partnership.

   - **Offering training services at a cost:** In rolling out the training, ARD could seek nominal contributions from country offices to cover the costs of facilitators, trainers, and others who prepare and provide the tailor-made trainings. This is minimal compared to the costs incurred for the development of the broader curriculum.
Part IV: Next Steps

This framework was shared with a number of World Bank and external colleagues for review and input. The issues raised were incorporated into the final draft and presented at a “Knowledge Product Review Meeting” on May 4, 2009, to determine next steps for the initiative. The need for a comprehensive training and knowledge-sharing program was reaffirmed. It was also noted that the timing is right, as the Bank is currently supporting the development of national disaster-risk reduction and management plans in a number of countries. The complex range of issues was also recognized as was the validity and relevance of the Hyogo Priorities as a framework.

As a means of moving forward in a targeted and manageable manner, the following suggestions were made:

- **Identify and tailor sessions to multiple audiences:** It was noted that while there is a need to share and develop technical knowledge and expertise at the field and practitioners’ levels, sustainable and systematic integration of disaster risk reduction and management consideration will not take place without the support and buy-in of key national ministries—notably, the ministries of finance, planning, as well as agriculture and other line ministries. As such it is necessary to ensure that modules/seminars are developed that tailor the issues to this audience and can frame the issues in a broader context of national development and/or human security goals and priorities.

There are two ways of approaching this issue. First, in developing the modules, a series could be designed specifically for nontechnical, senior-level audiences. The content could combine information about international policy frameworks (e.g., the Hyogo Framework for Action [HFA]), the social and economic cost of disasters, together with an overview of the range of measures that are needed to increase resiliency. An alternative approach could be to run workshops/seminars with the explicit goal of ensuring a mix of stakeholders, so that policy makers and practitioners, local- and national-level actors, are not only exposed to information together, but have an opportunity to broaden their understanding of each other’s perspectives, and establish networks for collaboration and partnership. This approach would require a mix of plenary and break-out sessions to enable a balanced mix of general and issue-specific topics to be covered.

- **Reach out and partner with other practitioners:** As noted above, there is a wide range of actors involved in disaster risk reduction and management and climate-change management. There are numerous projects underway and tools being developed. There is also an ad hoc mix of training programs available through different organization, but nothing comprehensive. To avoid duplication and promote coordination, ARD is advised to reach out to key actors, notably the FAO, World Meteorological Organization (WMO),
UNDP, the ProVention network, Oxfam and other NGOs—particularly regional actors—to determine existing resources and identify subject specialists and facilitators. It is also a means of raising awareness of and generating buy-in and partnerships for this initiative among these actors from the outset.

Within the Bank, it was suggested that ARD could coordinate with the GFDDR regarding their ongoing efforts. In particular, the development and availability of comprehensive training modules/courses could be of interest to the global center of expertise on disaster risk reduction that is currently being discussed/is underway. For example, the Center could ultimately house and manage the training program and related resources. The GFDRR is also developing a series of best-practice notes for field staff on early recovery and response to disasters. ARD could work with the unit to ensure comprehensive coverage of issues pertaining to agriculture and the rural space.

- **Africa Focus:** Given the existing support and interest from the African division, it was agreed that the initial phase of modules and trainings to be developed should focus primarily on the African context. The emphasis could be on some or all countries currently developing national disaster risk reduction and management strategies. This would be an effective means of narrowing and tailoring module development to the specific needs of those countries. It would also enable ARD to hone in on regional/national expertise and resources to ensure that they are included in the process and that the Bank is supporting and developing them.

- **Type of Disasters:** The countries selected would naturally determine the range of disasters to focus on for the training materials. In Africa (as elsewhere), the majority of disasters are hydrometeorological in nature. So in the first instance, it was advised that modules developed could focus on the management, reduction, and recovery from flooding, landslides, droughts, fires, and coastal storms. The added benefit of this approach is that it would naturally introduce climate-change–management issues into the framework.

- **Rural Livelihoods as Framework for Content Modules:** A final suggestion made related to the matrices developed for the training modules. Bearing in mind that in parts of Africa a significant percentage of rural household income is from nonfarming activities, it would be necessary to broaden the scope of disaster risk reduction and management and ARD issues beyond crops, livestock, and infrastructure. Moreover, disasters have a wide-ranging impact on livelihoods, including the destruction of tools and depletion of social capital and other assets. It was suggested, therefore, that the matrices be expanded to address rural livelihoods more comprehensively. Given the diversity of issues and specificity of each region, a practical approach would be to focus on a subgroup of countries and tailor training modules to their needs.

- **Country Selection:** As a preliminary step, ARD could coordinate with the African division with regard to the five countries in which they are
Agriculture and Rural Development

currently active on disaster risk reduction and management planning—Ethiopia, Ghana, Madagascar, Mozambique, and Togo. The following steps could be taken immediately:

a. Assess and determine which country/countries to focus on (as a pilot for the trainings).

b. Identify the range of disaster types that need to be addressed (e.g., droughts, floods, etc., depending on the region, geography).

c. Map out key components of rural livelihoods/agricultural communities that need to be addressed in the context of disaster risk reduction and management and climate change mitigation planning and training.

d. Identify existing international/national/regional organizations and/or other resources engaged in disaster risk reduction and management activities, particularly those engaged in training and capacity building vis-à-vis ARD issues.

e. Specify target audiences.

f. Bring together a group of issue experts (e.g., seed, livestock, livelihood, etc.) to determine the range and substance of modules needed, including those for raising awareness among policy makers.

g. Develop a preliminary set of modules and training session (2 to 3 days) to test in the country with a cross section of stakeholders.
## Annex 1: Sample Template for Module Content (with focus on hydrometeorological events that affect climate change)

**Module Series 1: Flooding—Prevention, Risk Management, and Effective Recovery**

<table>
<thead>
<tr>
<th>Type of Activity Addressed in Each Workshop Unit (based on HFA priorities)</th>
<th>Impact of Flooding on Rural Livelihood</th>
<th>Other Rural Nonagricultural Income-Generating Activities</th>
<th>Agricultural and Other Rural Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crops</td>
<td>Livestock</td>
<td></td>
</tr>
<tr>
<td>• Promoting a Culture of Prevention and Safety: Policy development/legislations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Planning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Risk-reduction measures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early warning, monitoring, assessments, and analyses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Information dissemination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Disaster preparedness and response</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>• Recovery and building back better</td>
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<td></td>
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</tbody>
</table>

*The unit developers/trainers should have sufficient expertise to tailor discussions to the conditions that participants are faced with—e.g., geographic variance (coastal, mountainous, plains), population density, seasonal variability.*
### Module Series 2: Droughts—Prevention, Risk Management, and Effective Recovery

The unit developers/trainers should have sufficient expertise to tailor discussions to the conditions that participants are faced with—e.g., geographic variance (coastal, mountainous, plains), population density, seasonal variability.

<table>
<thead>
<tr>
<th>Type of Activity addressed in Each Workshop Unit</th>
<th>Impact of Droughts on Rural Livelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crops</td>
</tr>
<tr>
<td>• Promoting a Culture of Prevention and Safety: Policy development/education and information</td>
<td></td>
</tr>
<tr>
<td>• Planning</td>
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<tr>
<td>• Recovery and building back better</td>
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</tbody>
</table>
### Module Series 3: Cyclones—Risk Management and Effective Recovery

<table>
<thead>
<tr>
<th>Type of Activity Addressed in Each Workshop Unit</th>
<th>Crops</th>
<th>Livestock</th>
<th>Other Rural Nonagricultural Income-Generating Activities</th>
<th>Agricultural and Other Rural Infrastructure</th>
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</thead>
<tbody>
<tr>
<td><strong>Promoting a Culture of Prevention and Safety:</strong> Policy development/education and information</td>
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</table>
Module Series 4: Landslides—Prevention, Risk Management, and Effective Recovery

<table>
<thead>
<tr>
<th>Type of Activity Addressed in Each Workshop Unit</th>
<th>Impact of Landslides on Rural Livelihoods</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Promoting a Culture of Prevention and Safety: Policy development/education and information</td>
<td>Crops</td>
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<tr>
<td>• Planning</td>
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<td>• Recovery and building back better</td>
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</tbody>
</table>
Module Series 5 (Optional): Fires and/or Pests—Prevention, Risk Management, and Effective Recovery

<table>
<thead>
<tr>
<th>Type of Activity Addressed in Each Workshop Unit</th>
<th>Impact of Fires on Crops</th>
<th>Impact of Fires on Livestock</th>
<th>Impact of Fires on Other Rural Nonagricultural Income-Generating Activities</th>
<th>Impact of Fires on Agricultural and Other Rural Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Promoting a Culture of Prevention and Safety: Policy development/education and information</td>
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Module Series 6 (Optional): Earthquakes/Volcanoes—Risk Management and Effective Recovery

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<thead>
<tr>
<th>Type of Activity Addressed in Each Workshop Unit</th>
<th>Impact of Earthquakes on</th>
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<tbody>
<tr>
<td></td>
<td>Crops</td>
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<tr>
<td>The unit developers/trainers should have sufficient expertise to tailor discussions to the conditions that participants are faced with—e.g., geographic variance (coastal, mountainous, plains), population density, seasonal variability</td>
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<tr>
<td>- Promoting a Culture of Prevention and Safety: Policy development/education and information</td>
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<tr>
<td>- Planning</td>
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<td>- Risk-reduction measures</td>
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Annex 2: Sample Agenda for a 2-Day Workshop on Flood Disaster Risk-Reduction Measures

Flood Disaster Risk Reduction in Agricultural and Rural Development
Module 1 Workshop Agenda

<table>
<thead>
<tr>
<th>DAY 1</th>
<th>Session/Content</th>
</tr>
</thead>
</table>
| 9:00–9:50 | Opening remarks:  
Introductions  
Goals, agenda, and expectations  
Warm-up plenary session—elicitive exercise to determine levels of understanding/experience:  
Type of hazards/disasters? Impact of flooding?  
Coping strategies? Actions of WBI to mitigate?  
Partners? |
| 9:50–10:50 | Session 1: DRR: Clarifying Terms and Concepts  
Presentation and group discussions |
| 10:50–11:05 | BREAK |
| 11:05–11:45 | Session 2: Global Context and the Hyogo Framework  
Presentation/Discussion:  
Current threats and risks/impacts  
How is the WBI tackling/managing risks?  
Plenary: Answering questions |
| 11:45–13:00 | Session 3: Flood DRR Measures—National/Local Policies/Legislation/Planning  
Plenary discussion (10 min)  
Presentation (20 min)  
Group exercises (45 min), for example: Fisheries  
✓ Land use—crops  
✓ Water management  
✓ Rural housing and infrastructure |
| 13:00–14:00 | LUNCH |
| 14:00–15:30 | Session 4: Flood DRR—Risk Analysis, for example:  
✓ Identifying/categorizing risk, resilience, and vulnerabilities (crop, livestock, infrastructure risks to flooding)  
✓ Methods included; participatory assessments  
✓ Existing tools/experiences |
### Employment and Rural Development

<table>
<thead>
<tr>
<th>Time</th>
<th>Session/Content</th>
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<tbody>
<tr>
<td>15:30–15:45</td>
<td><strong>BREAK</strong></td>
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<tr>
<td>15:45–16:55</td>
<td><strong>Session 5: Early Warning and Response Systems for Flooding:</strong></td>
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<tr>
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<td>✓ Regional</td>
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<td>✓ National</td>
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<td></td>
<td>✓ Local/rural communities (crop, livestock, housing/infrastructure protection measures)</td>
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<td></td>
<td>✓ Plenary presentation/discussions and group exercises</td>
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<tr>
<td>17:00</td>
<td><strong>Close Day 1</strong></td>
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<tr>
<td><strong>Day 2</strong></td>
<td><strong>Session/Content</strong></td>
</tr>
<tr>
<td>9:00–9:15</td>
<td><strong>Review of Day 1 and Day 2 Agenda</strong></td>
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<tr>
<td>9:15–10:15</td>
<td><strong>Session 6: Physical Agricultural Preventive Measures</strong></td>
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<td>Presentation (e.g., Resilience against flooding for crops, livestock)</td>
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<td>Group work</td>
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<tr>
<td>10:15–11:15</td>
<td><strong>Session 7: Infrastructural preventive measures</strong></td>
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<td>Presentation (e.g., flood shelters, raised seed beds, housing, harvest protection, etc.)</td>
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<td>Group work</td>
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<tr>
<td>11:15–11:30</td>
<td><strong>Break</strong></td>
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<tr>
<td>11:30–12:45</td>
<td><strong>Session 8: Education and Information for Culture of Safety and Resilience</strong></td>
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<td></td>
<td>Discussions</td>
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<td>Presentation</td>
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<td>Group work/plenary</td>
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<tr>
<td>12:45–13:45</td>
<td><strong>Lunch</strong></td>
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<tr>
<td>13:45–15:15</td>
<td><strong>Session 9: Strengthening Preparedness and Early Response in Aftermath of Disaster</strong></td>
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<td>Discussions</td>
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<td>Presentation (contingency planning, demographic data, building back better)</td>
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<td>Simulation group work/plenary</td>
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<tr>
<td>15:15–15:30</td>
<td><strong>Break</strong></td>
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<tr>
<td>15:30–17:00</td>
<td><strong>Session 10: Applying DRR to Country Situation:</strong></td>
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<td>Elements of an Action Plan</td>
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<td>– Priorities</td>
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<td>– Partners</td>
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<td>– Resources/tools available</td>
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<td>– Indicators of progress (over the next 6 months)</td>
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<tr>
<td>16:45–17:00</td>
<td><strong>Evaluations and Close</strong></td>
</tr>
</tbody>
</table>
A Conceptual Framework for a Training Curriculum on Natural Disaster Risk Reduction and Management for Agriculture and the Rural Space

Endnotes


3 Ibid.


8 Kryspin-Watson et al.


10 Kryspin-Watson et al.

11 Ibid.


13 Kryspin-Watson et al.


15 GTZ, Disaster Risk Management in Rural Areas of Latin America and the Caribbean.

Agriculture and Rural Development

http://www.un.org.cn/public/resource/ec5e6f584054f7e49b38a37dd4cf2a41.pdf


21 FAO, 200X.

22 For more tools see http://www.interaction.org/files/cgi/6460_tools_for_mainstreaming_DRR.pdf

23 Kryspin-Watson et al.


25 Available at: http://www.ranetcommons.net


32 Quoted in *Gender and Agriculture Sourcebook*.