
The urgency to support resilient livelihoods: FAO Disaster Risk Reduction for Food and Nutrition Security Framework Programme

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DISASTER RISK REDUCTION IN THE CONTEXT OF CLIMATE CHANGE AND FOOD INSECURITY

The multiple threats to food and nutrition security, their negative and cumulative impact, and the clear **links between shocks and hunger** reveal the fragility of current food production systems (and also of sustainable development) and their vulnerability to disasters, crises and conflicts. The Special Report on Managing the Risks of Extreme Events and Disasters to advance climate change adaptation (SREX) stresses the interaction of climatic, environmental and human factors leading to impact and disaster. The character and severity of impacts and of risks depend on the shock (or extremes) themselves but also on the exposure (presence of people; livelihoods, environmental services and resources; infrastructure; or economic, social or cultural assets in places that could be adversely affected) and vulnerability (the propensity or predisposition to be adversely affected) (IPCC, 2012).

Disasters have adversely affected the lives and livelihoods of millions over the past years with particular deleterious consequences for the poor and politically marginalized. The impacts of the catastrophic earthquake in Haiti in January 2010 and floods in Pakistan in July 2010 show how disaster risk and poverty are closely interlinked. The 2011 Horn of Africa drought crisis also stresses the interconnection between natural disaster and conflict situations, magnifying the impact of the drought. Meanwhile, in 2011, floods in Australia, the earthquake in Christchurch, New Zealand, and the earthquake, tsunami and nuclear disaster wreaking havoc in northeastern Japan are a stark reminder that developed countries are also very exposed. Less visible internationally, hundreds of smaller disasters associated with climate variability have caused enormous damage in Benin, Brazil, Colombia, the Philippines, Indonesia and other countries. These events reveal how risks are continuously constructed through existing development gaps and growth in economic and population exposure. Moreover, as the Japan disaster highlighted, there are emerging risks and new vulnerabilities associated with the complexity and interdependency of the technological and

ecological systems on which modern societies depend. Large-scale or mega-disasters with interactions between physical and technological hazards and the exposure of countries to a wide range of emerging risks and new patterns of vulnerability can trigger cascading and concatenated system breakdowns at different scales, which are difficult to model or to prepare for, but which can exponentially magnify negative impacts and affect multiple countries or regions or even the planet (UNISDR, 2011).¹

The vast **majority of damage, losses and impacts** are extensive in character, occurring throughout a country's territory. A rising number of localized disasters are responsible for significant impact on human and natural resources such as housing, crops, livestock and local infrastructure, and particularly affect low-income households and communities.² The past 20 years have seen an exponential increase in the number of local areas reporting losses (Figure 1). Increasing extensive risks are closely related to the challenges low- and medium-income countries face in addressing underlying risk drivers and reducing vulnerability. Most governments have yet to find effective ways of reducing and managing natural and human-induced disaster risks.

Assumptions about disasters are being increasingly challenged, as new drivers of risk emerge and interact. A number of potential and plausible risks are difficult to identify or have profound potential consequences, so it is difficult to find an entry point for risk modelling and analysis³. There may be no precedent for the emerging risks associated with low probability hazards as research reveals the increasingly complex vulnerabilities related to the growing interconnection and interdependency of societies. The risks associated with increased incidence and spread to new geographic areas of transboundary plant pest and animal diseases also loom ahead.⁴ As such, there is a growing probability of 'simultaneous crisis' where different hazards/shocks occur at the same time, 'sequential crisis' where hazards trigger cascading disasters in a range of interlocked systems and 'synchronous failures' (i.e. the March 2011 Japan earthquake-tsunami-nuclear crisis) where different risks converge and interact.

As with disaster and crisis risk management in general, the additional challenge of **adapting to climate extremes/change** requires increased attention to underlying conflict and disaster risk drivers, reducing vulnerability and strengthening risk governance capacities. If disaster risks can be reduced, then the magnifying effect of climate change will also be reduced and adaptation will be facilitated. Disaster risks and climate change threaten food and nutrition security (FNS) and actions on both fronts are needed to protect and build the resilience of livelihoods. As indicated in Figure 2, both disaster risk reduction (DRR) and climate change adaptation are concerned with the increase in the number and

¹ This second edition of the United Nations Global Assessment Report on Disaster Risk Reduction provides a current resource for understanding and analysing global disaster risk. Drawing on a large volume of new and enhanced data, it explores trends and patterns in disaster risk globally, regionally and nationally. In parallel, more than 130 governments are engaged in self-assessments of their progress in implementing the Hyogo Framework for Action (HFA), contributing to what is now the most complete global overview of national efforts to reduce disaster risk.

² FAO in its "save and grow" policy guidance indicates that about 2.5 billion smallholders are particularly at risk with vulnerable livelihoods.

³ Between 1601 and 1603 Russia suffered the worst famine in the country's history. It is estimated that over two million people starved to death in Russia as a whole. It was only recently, however, that climate researchers established a conclusive link between the failure of harvests in Russia in 1601 and the ash cloud produced by the catastrophic explosion of the Huaynaputina Volcano in southern Peru on 19 February 1600.

⁴ As seen with the bird flu-H5N1 and H1N1 pandemics.

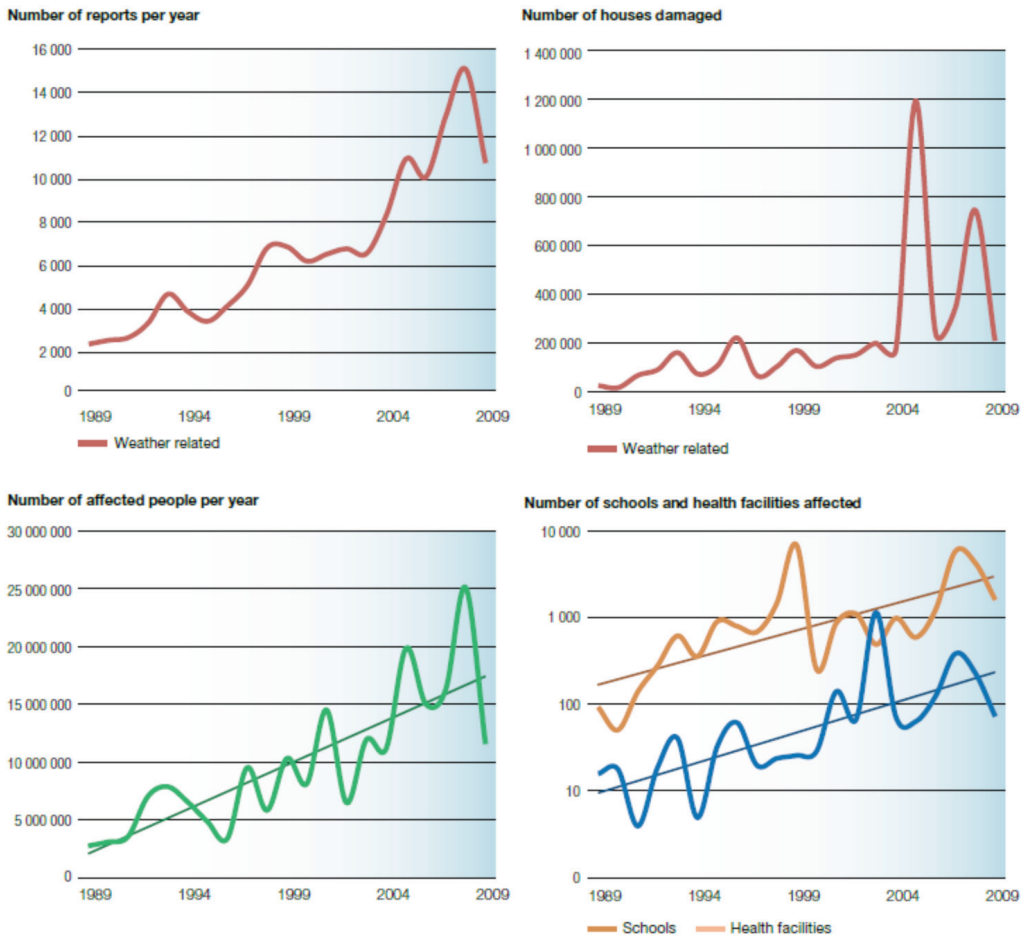


Figure 1. Extensive risk trends by indicator (for the 21 countries and states included in the GAR11 analysis)

scale of extreme climate-related hazards, and the changing patterns of risk and vulnerability expected from climate change. As the world is expected to experience climate-related hazards on an unprecedented scale, it is necessary to scale-up and accelerate efforts in both DRR and climate change adaptation, with the shared policy objective of supporting sustainable development and the achievement of the Millennium Development Goals. Decades of DRR experience and research, and the methods and tools developed and practised, can be used to guide adaptation planning and to help countries better manage the expected change in the frequency and intensity of severe weather patterns.

Short-, medium- and long-term humanitarian and development policies/strategies/programmes and actions must urgently be redefined to take into account and reduce the various and interconnected risks to reach millions of risk-prone citizens.

Countries with **weak governance, political instability or in conflict** (complex emergencies or protracted crisis) are likely to find it difficult to address underlying conflict and

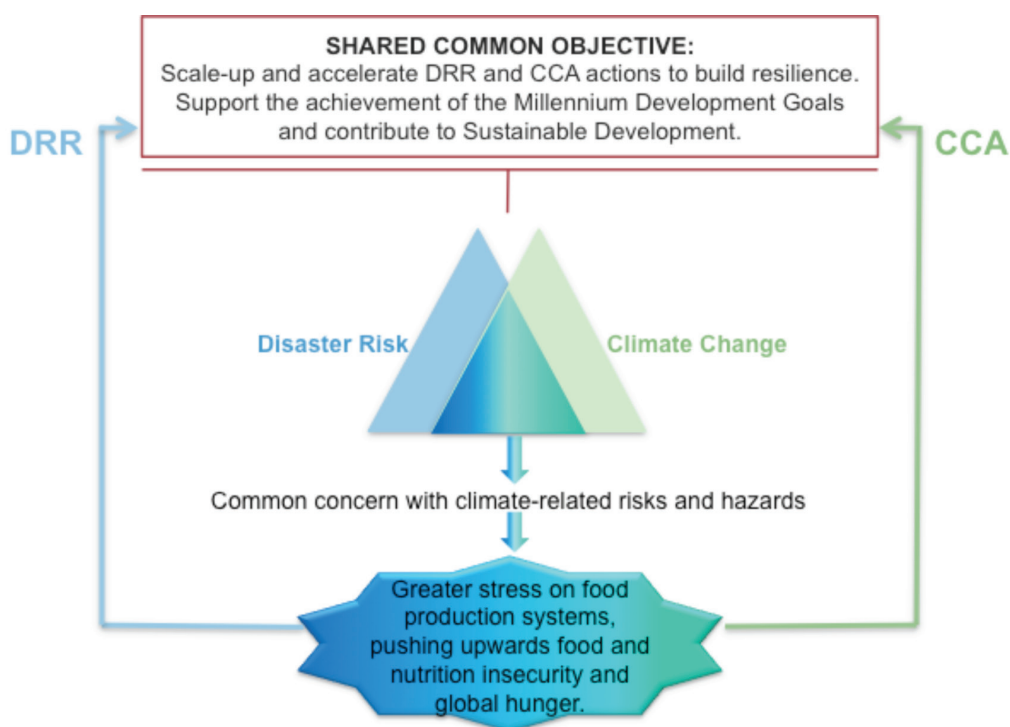


Figure 2. Disaster risk reduction and climate change adaptation

Source: FAO (2011).

disaster risk drivers (i.e. degradation of hazard-regulating ecosystems such as wetlands, mangroves and forests, high levels of poverty and political/economic marginalization, badly managed urban and regional development, etc.). Extreme hazards and events are not synonymous with extreme risks. When similar numbers of people are affected by hazards of similar severity, wealthier and poorer countries generally experience radically different losses and impacts. **Poverty is both a cause and consequence of disaster risk** (UNISDR, 2009). Across all the major hazards, poorer countries with weaker governance⁵ tend to experience higher mortality and greater relative economic loss compared with wealthier countries with stronger governance. Mortality risk, for example, is approximately 225 times greater in low-income countries compared to OECD countries, when similar numbers of people are exposed to tropical cyclones of the same severity (UNISDR, 2011). Whereas relative wealth is a key determinant, governance factors, such as the strength of democracy and voice and accountability, all play roles in the social construction of risk. The quality of a country's governance appears to have a significant influence on the underlying drivers of risk. Risk drivers and increasing poverty and inequality interact through multiple feedback loops and together translate hazards into disaster risk. Mortality is still rising in the countries with the weakest risk governance capacities, affecting particularly women and children.

⁵ Governance refers to the actions, processes, traditions and institutions by which authority is exercised and decisions are taken and implemented.

The alleviation of hunger and poverty is strongly correlated with DRR. Millennium Development Goal 1 (Target 1C) strives to eradicate extreme poverty and hunger, and aims to halve by 2015 the proportion of people who suffer from hunger. The World Food Summit goal is to reduce, by 2015, the number of undernourished people by half. Yet these targets are compromised by natural disasters, protracted crises and armed conflicts that reverse development and poverty-reduction gains, destroy livelihoods, reduce food production and increase hunger. Worldwide, there are 925 million undernourished people, and hungry people account for 16 percent of developing countries' populations (FAO, 2010). Future investment must be guided by the principles of sustainable development while also promoting prosperity and peace.

HAZARDS, THREATS AND CRISES AFFECTING FOOD AND NUTRITION SECURITY

Floods, hurricanes, tsunamis and other hazards destroy agricultural infrastructure and assets, crops, inputs and production capacity. Drought alone has caused more deaths during the last century than any other physical hazard. Asia and Africa rank first among continents in the number of people directly affected, while Africa has a high concentration of deaths associated with drought (UNISDR, 2011). These natural hazards have a direct impact on agriculture and food security. They interrupt market access, trade and food supply to the cities. They reduce income, deplete savings and erode livelihoods. They also have a negative consequence for animal production by reducing range productivity and rangeland yields, leading to food insecurity, overgrazing and degradation of ecosystems. Livestock is central to the livelihoods of the poor. It forms an integral part of mixed farming systems. It is an important source of employment, income, quality food, fuel, draught power and fertilizer. Fisheries and aquaculture, a sector that is a critical contributor to food supply, income generation and food security, also suffers tangible losses as a result of natural disasters, including damage to fishing infrastructure and productive assets such as docks, landing and processing facilities, boats and fishing gear. In addition, diseases threaten fish and contribute to food and nutrition insecurity among rural populations dependent on fish farming. Over 500 million people depend, directly or indirectly, on fisheries and aquaculture for their livelihoods. Fish also provide essential nutrition to three billion people, including at least 50 percent of the animal protein and essential mineral intake of 400 million people in the poorest countries. New transboundary aquatic animal diseases continue to appear, causing losses in aquaculture and capture fisheries and adversely affecting local economies. For example, in 2009, fish stocks in the Zambezi River Valley were infected by epizootic ulcerative syndrome, threatening to spread the disease to seven countries surrounding the river basin and potentially affecting the food security and livelihoods of 32 million people.

Transboundary plant pests and diseases, such as locusts, armyworms and wheat rust, and transboundary animal diseases such as African swine fever, foot-and-mouth disease and Rift Valley fever, have a direct economic impact by reducing or eliminating agricultural and livestock production. Furthermore, pests and diseases may adversely affect prices and trade, negatively affecting farm income. Reduced productivity of crops or animals can have a long-lasting effect as well. Pest infestations can impair fertilization rates or seed recovery.

Diseases can have lasting effects on livestock output by delaying reproduction, leading to a reduced population and extended food and nutrition insecurity.

Wildfires in forests and other natural resources also affect rural livelihoods. An estimated 150 to 250 million hectares of tropical forests are affected by wildfire annually. Close to 1.6 billion people – more than 25 percent of the world’s population – rely on forest resources for their livelihoods and most of them (1.2 billion) use trees on farms to generate food and cash. Moreover, many countries in the developing world draw on fuelwood to meet as much as 90 percent of energy requirements and this creates additional energy risks.

The natural resources degradation or environmental factor: as highlighted by the United Nations International Strategy for Disaster Reduction, “the environment and disasters are inherently linked” because of the strong dependency and interconnectedness of natural resources with the environment (UNISDR, 2004). Deforestation, degradation of catchments/watersheds, degradation of land and desertification, depletion of reefs and coastal ecosystems especially of corals and mangroves, among other factors, reduce nature’s defense capacity against hazards and aggravate the impact of disasters such as floods, landslides, storm surges, hurricanes and drought. Disasters in turn contribute to ecosystem degradation and loss, including increased soil erosion, declining rangeland quality, salinization of soils and biodiversity loss. Increasing environmental degradation reduces the availability of goods and services to local communities, shrinks economic opportunities and livelihood options, and ultimately contributes to greater food insecurity and hunger. It further drives increasing numbers of people to marginal lands and fragile environments. To reduce risks, it is vital to build the resilience of the natural resource base, and to promote sound environmental and natural resource management practices and the sustainable use of ecosystems. Healthy and diverse ecosystems are more resilient to hazards. Forests are estimated to save between USD 2–3.5 billion per year equivalent in disaster damage restoration of key forest ecosystems (Sudmeier-Rieux and Ash, 2009). They can be used as shelterbelts and windbreaks, and also play an important role in protecting against landslides, floods and avalanches. Trees stabilize riverbanks and mitigate soil erosion, while woodlots provide fuelwood, timber and fodder. Wetlands serve to store water, provide storm protection, flood mitigation, shoreline stabilization and erosion control. Barrier reefs, barrier islands and mangroves can help mitigate hurricane risk, storms and tidal surges. Getting the right energy source and technology can play a significant role in managing the environment in support of risk reduction, such as in the productive use of land (e.g. liquid fertilizer from biogas) and/or by reducing deforestation through the use of improved or non-wood-dependent cooking stoves.

Water scarcity, projected to increase worldwide even without climate change, is also intricately linked to disaster risks and food insecurity. The exploitation of subterranean water reserves, for example, is contributing to desertification in many parts of the world; as subterranean water levels recede, the soil near the surface dries out and plants wither and die. With continued deforestation and exploitation of subterranean water reserves it is likely that many more parts of the world will face severe water shortages. Agriculture accounts for more than 70 percent of the world’s total water use. Irrigation is a direct

source of livelihood for hundreds of millions of the rural poor in developing countries. As farmers face the challenge of accessing an increasingly scarce resource, groundwater levels continue falling each year, causing more rivers to dry up. In arid and semi-arid regions water scarcity is almost endemic, placing greater pressure on both surface and groundwater resources to meet domestic and irrigation demands. Drought is another major cause of water shortage with devastating impacts, especially in countries with reduced capacity to absorb the shocks. Prolonged or frequent drought episodes can lead to the irreversible stage of desertification unless adequate measures are taken to increase the resilience of countries prone to such phenomena. DRR efforts need to support enhanced management and conservation of water resources. This includes improved capture and utilization of rainfall, such as rainwater harvesting, and the adoption of water conservation technologies and practices that use less water and reduce water loss, such as using drip and furrow irrigation to increase water productivity.

Inadequate **land-use planning and tenure** contribute to increasing the vulnerability of communities exposed to hazards. Land zoning and land-use management, including regional and territorial planning, need to consider the spatial parameters of physical vulnerability based on hazard and risk mapping. Better land access and secure tenure enable food production and provide an incentive for landholders to invest in improving their land with soil protection measures, tree planting, improved pastures, water conservation technologies or sustainable crop production.

The effective management of land, water systems, forests, wetlands, soils, and other resources is necessary for redressing the root causes and environmental drivers of vulnerability and risks, especially for food and nutrition security.

The incidence of **food crises**, which are caused by severe adverse weather conditions, natural hazards, economic shocks, conflicts, or a combination of these factors, has been rising since the early 1980s. There have been between 50 and 65 food emergencies every year since 2000, up from 25 to 45 during the 1990s (FAO, 2008).

Economic crises constitute yet another threat that impacts on poverty and hunger. The past two years have witnessed a rapid increase in the number of hungry, largely influenced by the global food and fuel crisis. A similar pattern was observed between 2003 and 2005 and in 2007–2008, with high food prices followed by a rapid increase in chronic hunger. In 2008, 75 million people were added to the total number of undernourished relative to 2003–2005 (FAO, 2008). World food prices surged to a new historic peak in February 2011 and these high prices are expected to persist in the future. These crises create poverty traps and increase the prevalence of food insecurity and malnutrition by reducing real income and forcing the poor to sell their valuable assets, decrease their food consumption and reduce their dietary diversity. The impact is strongly felt in low-income, food-deficit countries that may face problems in financing food imports, and for poor households that spend a large share of their income on food. The urban poor are particularly affected by soaring

food prices. They do not produce food but rather invest the bulk of their income on food expenditures and have no alternative access to food other than local markets.

Countries in **protracted crisis** situations, which are characterized by recurrent natural disasters and/or conflict, longevity of food crises, breakdown of livelihoods and insufficient institutional capacity to react to the crises, show high levels of food insecurity. On average, the proportion of people who are undernourished is almost three times as high in countries in protracted crisis as in other developing countries (FAO, 2008). The level of undernourishment in this set represents 166 million people, roughly 20 percent of the world's undernourished people (or more than a third of the global total if China and India are excluded). In countries in protracted crises, the Millennium Development Goal 1 and the World Food Summit goal are very unlikely to be met by 2015. These poor food security outcomes are long-lasting and are closely related to recurrent natural disasters and/or conflict, the number of years in crisis, the breakdown of livelihoods, weak governance or public administration and, most importantly, the overall insufficient capacity to react to the crises (in some of these countries crises are localized to only certain areas or regions).⁶ Development and investments that generate or exacerbate inequalities or deepen exclusion can increase the risks of conflicts.

Food and agriculture sectoral strategic guidance is needed to help countries to comply with the Hyogo Framework for Action (HFA) and to reduce and manage multihazards and various risks magnifying vulnerabilities to food and nutrition insecurity (especially for the poorest). At global, regional, national and local levels, coherent interventions and systems are needed to build, prevent, protect and restore resilient livelihoods of farmers, herders, fishers, foresters and other vulnerable groups (estimated to be more than 2.5 billion smallholders according to FAO "Save and Grow") against various threats and shocks. Crisis and disaster risk reduction and management for food and nutrition security are vital for ensuring one of the most basic human rights – "the right to food and freedom from hunger". At all levels, correlated or nested governance, information and early warning, preparedness and crisis response systems and mechanisms for DRR for agriculture and food and nutrition security related sectors should be urgently developed to face the hunger and poverty challenges ahead.

THE FAO FRAMEWORK PROGRAMME: DISASTER RISK REDUCTION FOR FOOD AND NUTRITION SECURITY

Providing DRR for food and nutrition security related sectors or the urgency to support resilient livelihoods of vulnerable smallholders: In line with the above findings, sectoral DRR is urgently needed. DRR for food and nutrition security is a crucial gap. Therefore, FAO recently developed and released its new Framework Programme on Disaster Risk Reduction for Food and Nutrition Security. This interdisciplinary framework provides strategic direction to FAO member countries and partners for the implementation of DRR measures in agriculture, livestock, forestry, fisheries, aquaculture and natural resources management at local, national, regional and global levels. The document

⁶ Extracted from *Addressing food crises - towards the elaboration of an agenda for action in food security in countries in protracted crisis*, High-Level Expert Forum (HLEF), Introduction – setting the context of 36th CFS recommendations on further analysis and actions on food security in protracted crisis. (FAO, 2010).

is online and available for direct download⁷ at http://www.fao.org/fileadmin/templates/tc/tce/pdf/FAO_Disaster_Risk_Reduction.pdf

The summary of the FAO corporate strategic framework programme of DRR for FNS is as follows:

Through its disaster risk reduction activities, the Food and Agriculture Organization of the United Nations (FAO) seeks to protect livelihoods from shocks, to make food production systems more resilient and more capable of absorbing the impact of, and recovering from, disruptive events.

Disaster risk reduction protects development investments in the agriculture, livestock, fisheries/aquaculture and forestry sectors, helping the world's most vulnerable people become food secure. Disaster risk reduction is vital for ensuring one of the most basic human rights – the right to food and freedom from hunger. Furthermore, disaster risk reduction creates a multiplier effect that accelerates the achievement of Millennium Development Goal 1: the eradication of extreme poverty and hunger.

At FAO, disaster risk management is a corporate priority. It is expressed in FAO's Strategic Framework 2010–19 through Strategic Objective I: Improved preparedness for, and effective response to, food and agricultural threats and emergencies. As an integral part of this objective, FAO makes a specific commitment to disaster risk reduction: “countries' vulnerability to crisis, threats and emergencies is reduced through better preparedness and integration of risk prevention and mitigation into policies, programmes and interventions”.

The FAO Disaster Risk Reduction for Food and Nutrition Security Framework Programme serves to support and provide strategic direction, to FAO member countries and partners, for the implementation of Disaster Risk Reduction for Food and Nutrition Security programmes.

This Framework Programme reflects the Hyogo Framework for Action and strives to assist member countries implement its five Priorities for Action for the agricultural sectors. It also responds to recent recommendations made on disaster risk reduction by the Committee on Agriculture, the Programme and Finance Committee, the Committee on World Food Security and the Committee on Fisheries. It contributes to meeting the needs of member countries, as expressed in the Regional Areas of Priority Action and identified by FAO Regional Conferences held in 2010.

The goal of the FAO Disaster Risk Reduction for Food and Nutrition Security Framework programme is to enhance the resilience of livelihoods against threats and emergencies to ensure the food and nutrition security of vulnerable farmers, fishers, herders, foresters and other at risk groups.

While the Framework Programme supports national government partners, the direct beneficiaries are smallholders in developing countries, including small-scale farmers, fishers, herders, foresters and the urban poor – particularly women – whose lives and livelihoods are threatened. Small-scale farmers represent 90 percent of the rural poor and make up the majority of the world's hungry population.

⁷ FAO has also developed a framework programme called “FAO Adapt” in relation to its climate change adaptation for food and nutrition security. The “Climate-Smart Agriculture” concept is also relevant as well as its “Save and Grow” strategy. All these are also relevant for resilient communities and resilient food systems.

At the core of the Disaster Risk Reduction for Food and Nutrition Security Framework Programme are four integrated and complementary thematic pillars:

PILLAR 1 – ENABLE THE ENVIRONMENT

Institutional strengthening and good governance for DRR in agricultural sectors.

Pillar 1 seeks to support the enabling environment of member countries, with appropriate legislation, policies and institutional frameworks for disaster risk reduction for food and nutrition security in agriculture, livestock, fisheries/aquaculture, forestry and natural resource management, and to strengthen the institutional capacities to implement these.

PILLAR 2 – WATCH TO SAFEGUARD

Information and early warning systems on food and nutrition security and trans-boundary threats.

Pillar 2 seeks to strengthen and harmonize food and nutrition security information and early warning systems to better monitor the multiple threats and inform decision-making in preparedness, response, policy, advocacy and programming.

PILLAR 3 – PREPARE TO RESPOND

Preparedness for effective response and recovery in agriculture, livestock, fisheries and forestry.

Pillar 3 seeks to strengthen capacities at all levels in preparedness to improve response to, and recovery from, future threats to food and nutrition security, and to reduce their potential negative impact on livelihoods.

PILLAR 4 – BUILD RESILIENCE

Prevention, mitigation and building resilience with technologies, approaches and practices across all agricultural sectors.

Pillar 4 seeks to address the underlying risks to food and nutrition security and build the resilience of livelihoods through the application of technologies, practices and approaches in farming, fisheries/aquaculture, forestry and natural resource management.

Together, the four pillars address core themes in DRR for FNS. Each pillar directly contributes to one of the Priorities for Action in the Hyogo Framework for Action. The pillars include options for capacity development that indicate, by way of example, a range of technical services, technologies, good practices that FAO can provide, and from which member countries can select based on their needs and priorities.

The four pillars address DRR as a whole. They are interdependent and mutually reinforcing. The Framework Programme promotes the integrated implementation of the four pillars for a more holistic approach, striving to maximize the synergies and complementarities between the pillars and hence the critical links between good governance, early warning, preparedness, mitigation and prevention.

The four cross-cutting priorities of the Framework Programme are in line with the core functions of FAO's Strategic Framework. They include:

- 1) capacity development
- 2) knowledge management and communication
- 3) strategic partnerships
- 4) gender equity

The Framework Programme gives strategic direction and guides the implementation of DRR measures for FNS in member countries. FAO has been implementing disaster risk reduction activities within the context of its Strategic Framework and Programme of Work and Budget, including the development of regional programmes on disaster risk reduction and disaster risk management. Building on existing DRR interventions, the Framework Programme consolidates FAO's cross-sectoral expertise on DRR under one umbrella. It is a coherent corporate commitment for scaling-up actions for disaster risk reduction for FNS at local, country, regional and global levels.

RECOMMENDATIONS

On the way forward, FAO recommends the following set of five actions:

- provide increasing importance and substantial investment in the key four pillars of the DRR for FNS as an entry point for climate change adaptation;
- generate and maintain an enabling policy and institutional environment for improving DRR for FNS to reduce vulnerability and exposure to disasters risks of livelihoods and ecosystems on which they depend;
- continue improvements and investments in early warning, risk analysis and food security and nutrition surveillance, accountably linked to mechanisms for mitigating, preparing for and responding to food and nutrition crises;
- support and increase timely resource allocation to crisis prevention and preparedness capacities for communities, civil society institutions, private sector, governments, regional and international bodies;
- promote research, innovation and measures to enhance resilience of individuals, communities and ecosystems in the face of known and emerging risk patterns.

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