RESILIENT LIVELIHOODS

DISASTER RISK REDUCTION FOR FOOD AND NUTRITION SECURITY

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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FOREWORD

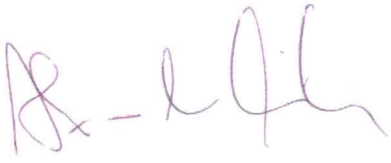
Disasters and food insecurity are directly interconnected. Floods, hurricanes, tsunamis and other hazards destroy agricultural, livestock and fishing infrastructure, assets, inputs and production capacity. They interrupt market access, trade and food supply, reduce income, deplete savings and erode livelihoods. Drought, plant pests and diseases such as locusts and armyworms, and animal diseases like African swine fever have a direct economic impact by reducing or eliminating farm production, by adversely affecting prices and trade, and by decreasing farm income. Economic crises such as soaring food prices reduce real income, force the poor to sell their assets, decrease food consumption and reduce their dietary diversity. Disasters create poverty traps that increase the prevalence of food insecurity and malnutrition.

For these reasons, resilient livelihoods are critical to the efforts of the Food and Agriculture Organization of the United Nations (FAO) to help the world's most vulnerable people achieve food security and freedom from hunger — one of the most basic human rights. At FAO, disaster risk reduction is about protecting people's livelihoods from shocks, and strengthening their capacity to absorb the impact of, and recover from, disruptive events. Disaster risk reduction is a necessary ingredient for food and nutrition security, and for the achievement of the Millennium Development Goal 1.

FAO responded to the recommendations made by its governing bodies by developing a Disaster Risk Reduction for Food and Nutrition Security Framework Programme. It expresses FAO's corporate commitment to reducing risks and building livelihood resilience thus protecting development gains. It aims to scale-up and accelerate disaster risk reduction actions at local, country, regional and global levels, building on FAO's existing technical capacities as well as disaster risk reduction initiatives and good practices worldwide.

The FAO Disaster Risk Reduction for Food and Nutrition Security Framework Programme aims to provide strategic direction to the implementation of disaster risk reduction measures in member countries across the agricultural-related sectors — in line with the Hyogo Framework for Action and its five priorities for action. In addition, it promotes an inter-disciplinary and programmatic approach to disaster risk reduction for food and nutrition security, by integrating the agriculture, livestock, fisheries, forestry and natural resource management sectors, to respond more effectively to the diverse livelihoods of small-scale farmers and to the complex set of factors which contribute to disaster risks.

Our intent is that this Framework Programme will help generate greater understanding, commitment and action in disaster risk reduction for food and nutrition security.



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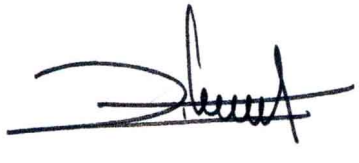

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This **Disaster Risk Reduction for Food and Nutrition Security Framework Programme** of the Food and Agriculture Organization of the United Nations (FAO) is the result of a joint effort led by the FAO Natural Resources Management and Environment Department and the FAO Technical Cooperation Department. In addition, it has been made possible by the inter-disciplinary effort and cross departmental collaboration of the Economic and Social Development Department, Agriculture and Consumer Protection Department, Fisheries and Aquaculture Department, Forestry Department and the Office of Knowledge Exchange, Research and Extension as well as FAO decentralized offices and emergency and rehabilitation teams.

FAO's Technical Team for Strategic Objective I – Organizational Result 1 on disaster risk reduction played an instrumental role in, and provided strategic guidance and technical contributions to, the development of this Framework Programme. In particular, we wish to thank Shukri Ahmed, Cristina Amaral, Philippe Ankers, Stephan Baas, David Brown, Mona Chaya, Peter Kenmore, Thomas Muenzel, Lucia Palombi, Christian Pantenius, Florence Poulain, Pieter VanLierop and Sylvie Wabbes-Candotti for their direct contributions and extensive participation in technical discussions.

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The development of the Disaster Risk Reduction for Food and Nutrition Security Framework Programme was made possible with the overall guidance, coordination and process facilitation provided by Cristina Amaral, Stephan Baas and Sylvie Wabbes-Candotti, and Monica Trujillo as coordinating lead author.

EXECUTIVE SUMMARY

The multiple threats to food and nutrition security, their negative and cumulative impact, and the clear link between shocks and hunger reveal the fragility of current food production systems and their vulnerability to disasters.

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 the 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 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.

At the core of the Disaster Risk Reduction for Food and Nutrition Security Framework Programme are four integrated 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 transboundary 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 disaster risk reduction for food and nutrition security. 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 disaster risk reduction as a whole. They are inter-dependent 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 disaster risk reduction measures for food and nutrition security 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 disaster risk reduction interventions, the Framework Programme consolidates FAO's cross-sectoral expertise on disaster risk reduction under one umbrella. It is a coherent corporate commitment for scaling-up actions for disaster risk reduction for food and nutrition security at local, country, regional and global levels.

The Framework Programme promotes an integrated modus operandi by applying an inter-disciplinary and programmatic approach that integrates the agriculture, livestock, fisheries/aquaculture, forestry and natural resource management sectors. It thereby responds to the diverse livelihoods of poor and vulnerable households and to the complex set of factors that contribute to disaster risk. Finally, it adopts a sustainable livelihoods and ecosystem perspective that includes the integrated management of land, water and living resources, promotes the conservation and sustainable use of natural resources in an equitable way, and ensures sustainable livelihood outcomes.

Disaster risk reduction for food and nutrition security programmes are implemented in countries that express an interest in, and need for support. These countries receive enhanced support in programme formulation and implementation. The implementation will expand across a greater number of countries incrementally over time while building on lessons learned and good practices. Countries considered include hunger and/or natural disaster hotspots, as well as those most vulnerable to climate change. The specific content and priorities of country programmes are designed on a modular and demand-responsive basis, tailored to national and local needs, capacities and gaps. Country programmes are context and location specific. Implementation takes into account FAO's Country Programme Framework, the United Nations Development Assistance Framework, the National Platform on Disaster Risk Reduction, and other key national strategies related to food and nutrition security and natural resources management.

The Framework Programme is implemented through FAO's existing structure – at national, regional and global levels. Outputs and actions are delivered through FAO's Strategic Framework with the appropriate technical leadership of units at headquarters and in decentralized offices. FAO decentralized offices, including emergency and rehabilitation teams, provide coordination, operational and implementation support.

At the global level, priority is given to advocacy and partnership promoting greater interest and commitment on the part of the international community to increase financial resources for disaster risk reduction for food and nutrition security in favour of member countries, and particularly for vulnerable small-scale farmers. **Knowledge management and communication** is also promoted, with products and services which, when embedded across the agricultural sectors, can substantially increase awareness and knowledge, understanding and visibility of the importance of disaster risk reduction for food and nutrition security in the fight against hunger. FAO continues to advocate for the development of global standards specific to food and nutrition security within the global agenda for disaster risk reduction, in close collaboration with strategic partners.

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INTRODUCTION

EXTERNAL SHOCKS, FOOD INSECURITY AND GLOBAL HUNGER

The alleviation of hunger and poverty is strongly correlated with disaster risk reduction (DRR). The Millennium Development Goal 1 strives to eradicate extreme poverty and hunger, and aims to halve by 2015 the proportion of people who suffer from hunger[1]. 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[2].

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[3].

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[4]. 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 provides 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 stock in

1 *Millennium Development Goal, target 1C*
2 *The State of Food Insecurity in the World. 2010. FAO, WFP.*
3 *The State of Food Insecurity in the World. 2008. FAO*
4 *Global Assessment Report on Disaster Risk Reduction. 2011. UNUNISDR.*

the Zambezi River Valley was 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 fuel wood to meet as much as 90 percent of energy requirements.

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[5]. 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[6].

5 *The State of Food Insecurity in the World. 2008. FAO*

6 *Ibid.*

THE NATURAL RESOURCE – 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[7]. 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.

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.

7 *Living with Risk: a Global Review of Disaster Reduction Initiatives. United Nations International Strategy for Disaster Reduction. 2004*

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[8]. 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 fuel wood, 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 cook stoves.

Inadequate land-use planning and tenure contributes 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.

8 *Environmental Guidance Note for Disaster Risk Reduction: Healthy Ecosystems for Human Security. IUCN, United Nations International Strategy for Disaster Reduction. 2009*

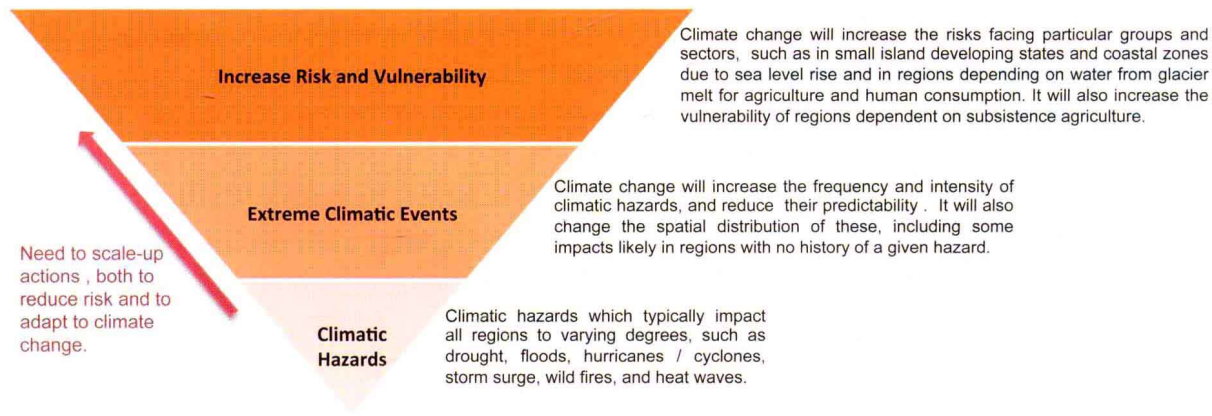
CLIMATE CHANGE AND DISASTER RISKS

Climate change will have profound and far-reaching effects on the environment, ecosystems, natural resources, economy and human life. In relation specifically to disaster risks, climate change is expected to result in more frequent and intensive climate-related hazards. It will magnify existing patterns of disaster risk and present scenarios that surpass the existing capacity of the humanitarian and development communities.

The Fourth Assessment Report of the Intergovernmental Panel on Climate Change indicates that climate change is likely to alter risk patterns in several ways[9]:

- Increase the frequency and intensity, reduce the predictability and change the spatial distribution of extreme climatic hazards, such as temperature extremes, floods and droughts, heat waves, wild-land fires and storms, with a range of effects in different regions. Some impacts will occur in regions with no history of a given hazard.
- Increase the risk and vulnerability of particular social groups and economic sectors as existing vulnerabilities are compounded by climate change-related processes, such as sea level rise, glacier melt and ecosystem stress and degradation of natural resources. The increase in vulnerability will vary by region: regions dependent on subsistence agriculture may be affected by food and water shortages; small island developing states and coastal zones will experience a rise in sea level; regions depending on water from glacier melt for agriculture and human consumption could experience water shortages.

Diagram 1: Climate Change and Disaster Risks



9 *Disaster Risk Reduction: Global Review 2007. United Nations International Strategy for Disaster Reduction.*

Projected scenarios include an increase in: areas affected by drought, such as the Sahel, southern Africa and parts of southern Asia; the frequency of heavy precipitation events over most areas; the incidence of extreme high sea levels; and intense tropical cyclone activity in the North Atlantic. Table 1 provides some examples of projected scenarios.

Table 1: Projected Scenarios for Specific Types of Hazards[10]

Drought

Drought-affected areas will likely become more widely distributed, leading to more widespread water stress, increased risk of water and food shortages and, therefore, malnutrition. Southern Africa, parts of South America, Mexico, the Mediterranean basin and northern China are highly likely to experience harsh drought conditions in the future. In Africa, the areas suitable for agriculture, as well as the length of growing seasons and yield potential, are expected to decrease, particularly along the margins of semi-arid and arid areas. By 2020 yields from rain-fed agriculture could be reduced by up to 50 percent in some African countries, severely compromising agricultural production and access to food.

Floods

It is very likely that heavy precipitation events will become more frequent as a result of climate change. Coastal areas, especially heavily populated mega-delta regions in South, East and South-East Asia, will be at the greatest risk due to increased flooding from the sea and, in some mega-deltas, flooding from the rivers.

Tropical cyclones

Higher sea temperatures are likely to lead to more intense tropical and extra-tropical cyclones. This will directly increase hazard exposure in existing cyclone hotspots, particularly if combined with an increase in the concentration of population and economic activities in these areas. At the same time, higher sea temperatures may also alter cyclone tracks, creating new hotspots exposed to tropical storms that historically have not suffered cyclones.

Glacier melt

The melting of the glaciers will produce water shortages, which are expected to be especially severe in parts of South America and Central Asia. The disappearance of glaciers in the Andes is expected to accelerate, a loss which would threaten nearly 30 million people dependent on the supply of glacial water for agriculture, human water consumption, electricity and livestock production.

10 *Disaster Risk Reduction: Global Review 2007. United Nations International Strategy for Disaster Reduction; Climate Change 2007: Synthesis Report. Intergovernmental Panel on Climate Change, 2007; Climate Change and Disaster Risk Reduction: Briefing Note 1. United Nations International Strategy for Disaster Reduction, 2008*