Food and Agriculture Organization of the United Nations

Guidelines and recommendations for the implementation of the Sendai Framework for Disaster Risk Reduction in the Agriculture and Food Security and Nutrition Sector

Latin America and the Caribbean

With the technical collaboration of:

UNISDR

The United Nations Office for Disaster Risk Reduction

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This publication is the result of a consultation process led by FAO and UNISDR during 2016 in light of the release of the 2015-2030 Sendai Action Framework for Risk Reduction. It sought the identification of key elements for its implementation in the agriculture sector (crops, livestock, forests, fisheries and aquiculture), as a recognition of the responsibility held by the sector to contribute to disaster risk reduction.

It is based on the experience of a wide range of people from the public sector that face on a daily basis the consequences of disaster risk and climate change in agriculture of Latin American and Caribbean countries. Most of them are dedicated to risk management and to increase the resilience of agriculture, and men and women who depend on it. FAO and UNISDR recognize and value the immense contribution of all these people (to many to be mentioned herein), since this publication was made possible due to their experience.

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This publication is expected to be a source of inspiration towards the formulation and implementation of policies that increase the resilience of agricultural livelihoods and, specially, of the most vulnerable producers to threats and disasters within the climate change context.

ACRONYMS

ACF	Action Against Hunger
AECID	Spanish Agency for International Development Cooperation
LAC	Latin America and the Caribbean
IADB	Inter-American Development Bank
CAC	Central America Agriculture Council
CAS	Agriculture Council of the South
CDEMA	Caribbean Disaster Emergency Management Agency
CCAD	Central American Commission on Environment and Development
CELAC	Community of Latin American and Caribbean States
ECLAC	Economic Commission for Latin America and the Caribbean
CEPREDENAC	Coordination Centre for Natural Disasters Prevention in Central America
CIAT	International Center for Tropical Agriculture
SDC	Swiss Agency for Development and Cooperation
FAO	United Nations Food and Agriculture Organization
GHG	Greenhouse Gases
IRM	Integral Risk Management
DRM	Disaster Risk Management
GTANGRD	High Standard Working Group for the Integral Management of Disaster Risk
HDI	PNUD Human Development Report
IICA	Inter-American Institute for Cooperation on Agriculture
IFPRI	International Food Policy Research Institute
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
LULUCF	Sector Land use, land-use change and forestry
MAH	Hyogo Framework for Action
OEIWG	Open Ended Intergovernmental Working Group on Indicators and Terminology Relating to Disaster Risk Reduction
NGO	Non-Governmental Organization
WFP	World Food Programme
PNUD	United Nations Development Programme
DRR	Disaster Risk Reduction
FSN	Food Security and Nutrition
EWS	Early Warning System
UNASUR	Union of South American Nations
UNISDR	United Nations Office for Disaster Risk Reduction
USAID	United States Agency for International Development

1 Background and Introduction

In March 2015, the Third UN World Conference on Disaster Risk Reduction was held in Sendai, Japan. In it, the United Nations Member States agreed and adopted the **Sendai Framework for Disaster Risk Reduction 2015-2030.** This framework is the main guiding instrument for Disaster Risk Management (DRM) in the countries and has a renewed sense of urgency within the scope of sustainable development and the eradication of poverty.

Its expected outcome is the "substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries".

As a result of the "First Meeting of Ministers and High-Level Authorities on the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in the Americas" held on June 8 and 9, 2016, in Asuncion, national representatives adopted the **Asuncion Declaration "Guidelines for a Regional Action Plan on the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030"**[1].

In it, countries in the region emphasize that, in order to progress towards eradicating poverty, reducing inequality and achieving sustainable and inclusive development, it is necessary to assess progress and challenges in implementing DRM policies at all territorial and sectoral levels. At the same time, the declaration sets the bases for the development of the Regional Action Plan on the Implementation of the Sendai Framework 2015-2030, as well as its integration at national policy level. This way, the purpose is to make progress in the construction of more resilient societies, adapted to climate change; and to contribute to the achievement of the 2030 Agenda for Sustainable Development.

Along with this, the Food and Agriculture Organization of the United Nations (FAO) and the United Nations Office for Disaster Risk Reduction (UNISDR), carried out a side event during the Asuncion Meeting of Ministers. Its purpose was to discuss the main challenges and opportunities for DRM through the application of the Sendai Framework for Disaster Risk Reduction - particularly in agriculture, farming, forests, fisheries and aquaculture- for the Food Security and Nutrition in the Latin America and the Caribbean (LAC) region.

In order to enrich the debate, a virtual survey was carried out on the focal points of the Sendai Framework for Disaster Risk Reduction of the countries and representatives of the national DRM systems; the DRM focal points among the ministries of agriculture; and other key sources of the environmental sector, intergovernmental organisms and different institutions working on the subject.

These initiatives respond to the request made by the Community of Latin American and Caribbean States (CELAC) to FAO within the framework of its Action Plan 2014, reiterated in 2015, for the performance of a high level meeting in order to identify "proposals for disaster risk reduction and humanitarian aid for the preparation of a Regional Strategic Agenda for Comprehensive Disaster Risk Management".

Providing continuity to this process, the current document has the purpose of developing a series of **Guidelines and Recommendations for the Implementation of the Sendai Framework in the agriculture**[2] **and Food Security and Nutrition (FSN) sector,** to guide their member states in the integration of DRM and climate change adaptation in the planning and execution of actions for the sustainable development of the sector.

This way, this document is conceived as a support instrument for the implementation of the fourth pillar of the "CELAC Plan for Food Security, Nutrition and Hunger Eradication 2025": "Stability of production and timely response to natural and man-made disasters that might affect food availability."

At the same time, this process is a direct response to the concerns expressed by the countries in the 34th FAO Regional Conference for Latin America and the Caribbean held in Mexico in 2016, regarding the need to increase efforts for disaster risk reduction in the sector.

1 Available at: http://www.eird.org/ran-sendai-2016/docs/declaracion-sendai-americas.pdf

2 The agricultural sector will be considered throughout this document in its most extensive sense, including the agriculture, livestock, forestry, fisheries and aquaculture subsectors.

With this purpose, chapter two presents the regional context of the agriculture and FSN sector in terms of the impact of disasters, poverty, climate change and the degradation of natural resources.

Then, chapter three briefly describes the Sendai Framework, which provides the conceptual framework based on which the current document has been structured, and analyzes its innovations as per their relevance for the agriculture and FSN sector. Likewise, the sectoral progress is presented within the scope of disaster risk reduction and management, based on the diagnostic performed by FAO in 2015 for the Third UN World Conference on Disaster Risk Reduction.

Chapter four presents the perceptions of the national and regional stakeholders regarding disaster risk management in the Agriculture and FSN sector. It was gathered through a consultation with government representatives and key informants from the sector in the whole region, and in the side event regarding the agriculture and FSN sector carried out on June 9 during the Asuncion Ministerial Meeting (see general information in the Annex).

Finally, the last chapter presents the creation of the general guidelines for DRM in the sector and the outline of specific recommendations based on the four action priorities of the Sendai Framework for Disaster Risk Reduction. This last chapter summarizes the input obtained in the previously mentioned processes, the review of secondary sources and the prioritized demands by the countries within the framework of the FAO fifth strategic objective "Increasing the resilience of livelihoods to threats and crises" in the Country Programme Frameworks (CPF)[3].

3 The Country Programming Framework is the instrument FAO uses to gather the needs in the countries and to establish a consensus Programming Framework by both parties.

2 Context of the agriculture and FSN sector in the region: incidence of disasters, poverty, climate change and deterioration of natural resources

Since the adoption of the Hyogo Framework for Action (HFA) in 2005, and as documented in the national and regional monitoring reports on the progress made in its application at a global level through the Monitoring system of the Hyogo Framework for Action, known as "HFA Monitor"[4], among others, important progresses are observed over the last few years towards disaster risk reduction. However, disaster trends in the Americas show that the region continues to be one of the most vulnerable to natural threats and that presents, among its main gaps, the need to integrate disaster risk reduction to the development planning process and the sectoral efforts that comprise them.

Between 2003 and 2014, the costs of disasters caused by natural phenomena in the LAC region was estimated in approximately USD$ 34.3 billion (representing one fourth of global losses), affecting 67 million people[5]. It has been estimated that one third of the population in the region lives in zones that are highly exposed to geological and, particularly, hydro-meteorological threats.

Over the last few years, an increase has been observed in the region regarding losses, mainly related to extensive risks[6] that commonly go unnoticed at national and international level because they don't receive much media coverage. They are mainly triggered by climate and hydrometeorological phenomena, to which the agriculture sector is particularly sensitive. For every intensive record, there were 177 extensive records that, in aggregate, accounted for more than half of the losses in lives 822,424) and 90% of the people affected (115 million)[7]. The following figure shows the increasing trend of disasters in the region:

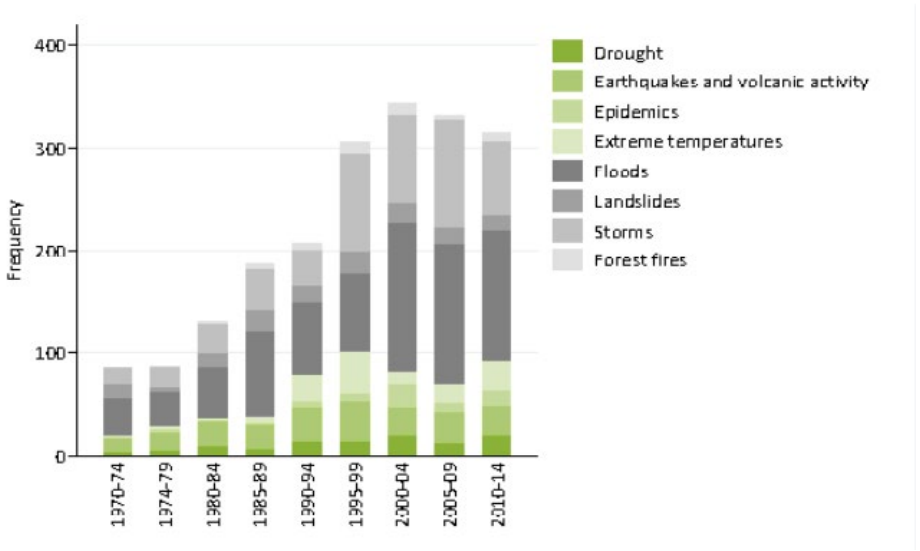
4 HFA Monitor is an online tool of the UNISDR and EIRD used to closely follow, review and inform regarding the progress achieved and the challenges identified in the Implementation of the disaster risk reduction and the recovery actions carried out within the national scope, according to Hyogo Framework for Action priorities.

5 UNISDR 2016, *Nota Conceptual - Primera Reunión Ministerial y de Autoridades de Alto Nivel sobre la Implementación del Marco de Sendai para la Reducción del Riesgo de Desastres 2015-2030 en las Américas.*

6 Extensive phenomena are those small-scale phenomena, with high frequency, that generate the loss of less than 25 people and the destruction of less than 300 households. Intensive phenomena are those that cause an impact above such threshold and usually cause media attention and the reaction of the humanitarian community. Today, it has been acknowledged that this type of disasters often have equal or more important effects than intensive ones because, although they are less costly and extensive in the surface, they have impacts of equal or greater level due to their important recurrence through time, which further undermines the recovery capacity of people and systems, increasing their vulnerability with each hit.

7 UNISDR 2016. Op Cit.

Chart 1: Frequency of disasters generated by selected natural phenomena in Latin America and the Caribbean, 1970-2014



Source: FAO 2015 – Overview of Food Insecurity in LAC

Climate-related disasters are those that currently affect the region the most, totalling 70% of the total events[8]. The global climate risk index for 2015 points out that 5 of the 10 countries with the highest index are in Latin America and the Caribbean[9]. As indicated by the Intergovernmental Panel on Climate Change (IPCC), this situation is expected to get worse due to climate change and climate variability, as well as the frequency and magnitude of extreme events.

On the other hand, evidence from the last few years shows that disasters have a disproportionate effect on people living in poverty. Between 1975 and year 2000, the population living in extreme poverty accounted for 68% of the mortality due to disasters[10].

Latin America and the Caribbean show an important progress in the reduction of poverty over the last few decades, going from 43% to 28% of the poor population between 2003 and 2014. However, the latest Human Development Report (HDI) for the region[11] mentions that 2015 is the first year since 2003 where a negative index is observed in poverty reduction. The report also warns regarding the fact that, if no measures are adopted to solve the structural causes of inequality and exclusion, out of the 73 million people that left poverty behind between 2003 and 2013, 25 to 30 million are at risk of sliding back into poverty. The report notes that, according to the perception of Latin American people, disasters caused by natural phenomena are among the three main causes for sliding back into poverty[12].

In regards to the rural situation of the region, the scenario is more complex because almost half of the rural population (47.9%) continues to live in poverty conditions and 30% in extreme poverty conditions, subject to greater vulnerability upon disasters. The rural poverty percentage, in fact, is twice as that of urban areas.

HDI indicates that, in 2013, if the rural poor population (income-based) was added to the population in economic vulnerable situation, it would reach 80%, showing the extreme precariousness in which most of the rural population in LAC subsists. Additionally, agricultural producers in general depend more directly on natural resources for their livelihoods and, therefore, are much more sensitive to risks resulting from extreme or unusual natural events.

8 Ibid.
9 Germanwatch Climate Risk Index, estimated based on information of the 1994 to 2014 period. Guatemala, Honduras, Haiti, Nicaragua and Dominican Republic.
10 UNISDR 2016. Op cit.
11 PNUD 2016, *Informe Regional sobre Desarrollo Humano para América Latina y el Caribe - Progreso Multidimensional: bienestar más allá del ingreso.*
12 PNUD 2016: According to the qualitative investigation carried out within the HDI 2016 framework to collect the perception of the population in 20 countries, the three causes, in order of importance, are job losses, natural disasters and the lack of state attention during crises.

This way, the agriculture sector is traditionally one of the sectors most vulnerable to disasters and, particularly, climate events. It has been estimated that, between 2003 and 2013, 22% of losses and damages caused by disasters in developing countries affected the agriculture sector[13]. On the other hand, 80% of damages and losses related to drought events concentrate on the sector.

In the case of Hurricane Mitch, in 1998, with great effects in Central America, 49% of damages and losses were ascribed to the agriculture sector (USD 2.947 billion), it being the most affected among all sectors. Additionally, big surfaces of farmable land were loss, due to silting or damages in the functionality of ecosystems, which implied additional economic losses in the 2 to 4 following years; until achieving a new productive structure and stability.

In recent years, economic losses in the Colombian agriculture sector after the 2010 and 2011 winter wave stand out - with a total of USD $824 million - as well as the 2007 floods in Tabasco, Mexico - with a total of USD $816 million - and Hurricane Felix in Nicaragua, in 2007, with a total of US$ 608 million[14].

According to FAO data[15], between 2003 and 2013 in LAC, most of the agriculture production losses due to medium to big scale disasters, take place due to floods (55%), drought (27%) and storms (10%). After this type of events, in average, a 25% increase is observed in food imports in the region as well as a loss of 2.7% in the expected growth of the sector.

This situation gathers special importance in a food producing region such as Latin America and the Caribbean, where an extensive sector employs practically one third of the active population (9% of women and 20% of men)[16], and contributes 23% of total exports in the region[17]. In fact, the agriculture sector in LAC has consolidated itself as a relevant food supplier at a global level and its performance can influence commercial exchange and international food prices[18].

Another fundamental element in LAC is the predominance of small-scale family farming. This amounts to 81% of the farms in the region on an average 23% of the regional farming surface and is particularly vulnerable to disasters. This situation is particularly critical when the role of farming is considered, in terms of food security and nutrition. Its production is essentially destined to the domestic market, representing approximately 50% of the total. It is the main employer industry in rural zones, and gathers most of the subsistence agriculture operations, as well as operations led by women and/or indigenous peoples[19].

Currently, in LAC, 34.4 million people still suffer from hunger. Most of them are in the rural area and, in many cases, they are subsistence farmers. It should be noted that family farming, in the region, occupies millions of producers in the poorest rural zones[20] and is at very high risk conditions, because the impact of disasters on production goes beyond the simple momentarily loss of revenues or opportunities, and is directly related to their food security and survival.

On the other hand, IPCC[21] warns that, in addition to the increase in climate variability and the intensity and frequency of extreme events, the change in climate patterns will affect agriculture productivity levels in the whole region. Based on ECLAC studies[22], in the north east of Brazil, the Andean Region and

13 The impact of disasters on agriculture and food security (FAO, 2015),www.fao.org/3/a-i5128e.pdf

14 Calculations by FAO based on 37 post-disaster needs assessment carried out in the region for the publication "The Impact of disasters on agriculture and Food Security"

15 FAO calculations based on FAOSTAT and World Bank data taking into account 25 medium and big scale disasters in LAC for the publication "The Impact of disasters on agriculture and Food Security"

16 Alan Lavell and Kelly Witowski. 2016. *Gestión del riesgo y adaptación de la agricultura y el medio rural al cambio climático:* "For the Latin America and the Caribbean (LAC) aggregate, calculated by the World Bank aggregating all countries in the region, in 2011 (last year with information available), 9% of employed women and 20% of employed men worked in the agriculture sector, respectively". (free translation)

17 IICA 2015, *Género, agricultura y cambio climático: Estado y perspectivas desde la institucionalidad en Latinoamérica*. San José, Costa Rica.

18 Currently, the region provides 55% of global soy exports, 45% of sugar exports, 39% of coffee exports, 27% of poultry, and close to one fifth of the global sales of corn and meat, in addition to contributing approximately 10% of the rice and wheat global exports. FAO 2015a, Panorama de la Inseguridad Alimentaria en América Latina y el Caribe. The region achieves international targets on hunger. www.fao.org/publications

19 Family farming gathers approximately 81% of the agriculture operations in LAC; it provides, at a country level, between 27% and 67% of the total food production; it occupies between 12% and 67% of the agriculture and livestock surface, and generates between 57% and 77% of agriculture jobs in the Region (FAO-IADB, 2007; FAO, 2012, FAO 2014b). In the region, operation leader women represent, in average, approximately 16%, figures that range between 6% and 30%, depending on the countries.

20 There is a positive correlation of 65% between extreme poverty and infant chronic malnutrition and 83% with underfeeding. FAO 2015, *Programa de Fortalecimiento de la resiliencia ante el riesgo de desastres en el Corredor Seco Centroamericano. El Salvador – Guatemala – Honduras – Nicaragua. 2015-2018.*

21 Quoted in UNISDR, 2016. Op cit.

22 CEPAL 2015, *Adaptación al cambio climático en América Latina y el Caribe.* Santiago, Chile.

Central America[23], climate change is expected to affect the performance of crops, local economies and would compromise food security in these zones that already present important vulnerability indexes. Displacements in altitude and latitude of the optimal zones for the plantation of relevant species, such as coffee, sugar cane, potatoes and corn, among others, are expected. Additionally, an increase in the stress imposed by diseases and a probable increase in the price of food, that would benefit some countries but harm others, particularly the poorest sectors of populations, are expected.

In this sense, the challenges imposed by climate change and its evident link to disaster risk (both in terms of the characteristics of threats as for its negative impact in the degree of vulnerability of the population) constitute a major threat to food systems, and the actions to adapt them upon the occurrence of climate events are key to guarantee the sustainability of food production and access. ECLAC forecasts annual costs of approximately 2.2% of the regional GDP[24] to face disasters, if there were no actions implemented for climate change adaptation and risk management.

LAC is one of the most privileged regions in the world in terms of natural resources, with 12% of the farmable land in the planet, one third of the freshwater resources, one fifth of the global forest surface and one of the greatest biological diversities in the world; all of them, factors that contribute significantly to the feeding of its population.

However, the consistent deterioration of natural resources observed in the region, in all scopes[25], is a critical factor to be considered in terms of disaster risk in the agriculture and livestock sector, and of the capacity of ecosystems to adapt to climate change and continue providing the indispensable services for the well-being of society and the population.

Current productive systems generate multiple stresses on ecosystems due to the type of practices and technologies that have been favoured within the scope of agricultural expansion in the region. These have resulted in a reduction in biodiversity and the vegetation cover, as well as the degradation of land and water[26]. LAC presents a deforestation rate 3 times higher than the global average, mostly ascribable to the expansion of the agricultural border, and the sector is responsible for 72% of the water extraction and use. This situation has endangered the availability and quality of natural resources and increased the vulnerability of productive systems and more disadvantaged populations.

Another important factor to consider is the crises in the food chain due to epidemics and cross-border diseases in animals and plants. Currently, pests, pathogens and weeds cause more than 40% of the losses in the global food supply. Recently, the coffee rust crisis in Guatemala, Honduras, El Salvador and Nicaragua, where 1.5 million people depend on the coffee sector, affected 55% of the crop area and reduced employment by approximately 40% during the harvest[27].

As previously mentioned, climate change could, at the same time, increase the incidence and extension of pests and diseases, both in agriculture as in livestock, and could establish epidemiology scenarios favourable for the emergence of infectious, vectorial and zoonotic diseases that could endanger both agricultural production, as well as food safety and public health in the region.[28]

23 It has been estimated that potential losses in production in Central American could represent up to 22% of the agricultural GDP by the end of the XXI century. CEPAL 2010a, *Istmo Centroamericano: Efectos del cambio climático.* Mexico subregional headquarters.

24 CEPAL 2010b, *La economía del cambio climático en América latina y el Caribe.* Síntesis 2010. Santiago, Chile.

25 Between 2005 and 2010, the conversion of forests due to the expansion of the agricultural frontier in the region amounted to 3.95 million hectares per year, reaching a rate in land use change three times higher than the global rate, and representing the sector with the most GHG emissions in the region; The great monoculture extensions pursuant to the market, as well as extensive livestock production, generate the greatest risks for biodiversity and land degradation; Currently, the region has 200 million hectares of land degraded due to the effects of mining and agriculture with unsustainable practices; Between 2005 and 2010, fishing in LAC went from 20 to 12 million tons, allegedly due to overexploitation. FAO 2016e, *Directrices Voluntarias para Políticas Agroambientales en América Latina y el Caribe. Santiago, Chile.*

26 FAO 2014a. *Desafíos para el desarrollo sostenible y la adaptación al cambio climático en América Latina y el Caribe.* Regional Conference from FAO Latin America and the Caribbean, Thirty-third session. Santiago, Chile, May 6-9, 2014.

27 CEPAL 2015, Op. cit.

28 70 % of emerging diseases that have affected humans have sprung from livestock and wildlife. FAO 2016f, *Increasing the resilience of agricultural livelihoods*. Available at: www.fao.org/resilience

Due to the above, the agriculture sector is subject to multiple threats and, although it is a key sector for regional economy, it still gathers an important tier of the vulnerable and poor population, often in conditions of food and nutrition insecurity. Therefore, the effect of disasters in the sector, and the consequences of climate change, does not just endanger or revert the achievements in the development of rural territories of Latin America and the Caribbean, but the food security and nutrition of the whole population itself, as well as the capacity the region will have to face a growing global population and food demand that will have to be increased by 60% by 2050[29].

On the other hand, agricultural producers are the main managers of natural resources, and as such, they represent important stakeholders for the preservation of natural heritage and the sustainable supply of environmental services to society.

However, the sector is facing today an important and complex challenge which is achieving more resilient productive systems, that are at the same time more productive and efficient, preserve the productive base of natural resources and the eco-systemic services, and that have the capacity to stand risks, shocks and climate variability and change in the long term.

This transition cannot be achieved without the development of specific measures for DRR, involving technologies, productive practices, a more sustainable use of natural resources, as well as considerable changes in terms of governance, laws, policies, and private and public investment.

29 It has been considered that an estimated 60% increase in global production will be required to feed the 9 billion people existing by 2050. FAO 2016f, Op. cit.

3 The Sendai Framework and DRM in the Agriculture and FSN Sector

3.1 The Sendai Framework for Disaster Risk Reduction

The Sendai Framework for Disaster Risk Reduction 2015-2030 was approved in the Third UN World Conference on Disaster Risk Reduction, held on March 14-18, 2015, in Sendai, Japan. This conference allowed the countries to:

a) Approve a framework for Disaster Risk Reduction after 2015, that is concise, specific, prepared with a vision of future and action-focused;

b) Conclude the assessment and examination of the implementation of the Hyogo Framework for Action 2005-2015;

c) Examine the experience acquired through national and regional strategies, institutions and plans for Disaster Risk Reduction and their recommendations, as well as the pertinent regional agreements for the implementation of the Hyogo Framework for Action;

d) Determine cooperation modalities based on commitments for the implementation of a disaster risk reduction framework after 2015;

e) Determine the modalities for the regular examination of the implementation of the Sendai Framework for Disaster Risk Reduction.

During the Global Conference, States reiterated their commitment to approach disaster risk reduction and the increase in resilience upon disasters with a renewed sense of urgency within the scope of sustainable development and the eradication of poverty, and to integrate as applicable both disaster risk reduction and the increase of resilience into the policies, plans, programs and budgets, at all levels. The structure of this new Framework thus proposes to achieve the following outcome in the upcoming 15 years:

"The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries".

The achievement of this result requires political leaders at all levels from all countries to firmly commit and dedicate themselves to the implementation and follow-up of this Framework and the creation of the necessary suitable environment. To achieve the projected result, the Framework states that the following outcome should be pursued:

"Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience."

In order to support the assessment of the global progresses in the achievement of the result and the Sendai Framework objective, seven global targets[30] were agreed, which will be measured at a global

30 The seven global targets are:

a) Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020-2030 compared to the period 2005-2015;

b) Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020-2030 compared to the period 2005-2015xxx9xxx;

c) Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030;

d) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030;

e) Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020;

f) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of the present Framework by 2030;

g) Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030.

level and will be supplemented with targets and indicators at a national level.

The implementation of the Sendai Framework shall also be guided based on thirteen guiding principles taken from the Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation of its Effects and the Hyogo Framework for Action[31].

Considering the experience gained with the implementation of the Hyogo Framework for Action, and with a view towards the expected result and objective, States are expected to adopt specific measures in all sectors, at a local, national, regional and global level, in regards to the four priority areas:

- **Priority 1:** Understanding disaster risk.
- **Priority 2:** Strengthening disaster risk governance to manage disaster risk.
- **Priority 3:** Investing in disaster risk reduction for resilience.
- **Priority 4:** Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction.

The Sendai Framework thus provides the structure that will hereinafter rule the coordination and measurement of actions and progresses towards DRM of the countries, in the different sectors and scopes of development. In this sense, the decision was made to structure both the consultation process and the development of guidelines and recommendations prepared in this document, based on the four action priorities of the Sendai Framework.

Relevance of the Sendai Framework innovations in the agriculture and FSN sector

Despite the important progresses towards disaster risk reduction observed since the adoption of the Hyogo Framework for Action in 2005, the Sendai Framework acknowledges that, in the last 10 years, the cost of disasters has continued to reach a high price: the number of threats and disasters has increased, and the exposure of people and their assets has increased faster than the reduction of vulnerability.

In this sense, the new conceptual position developed within the Sendai Framework tries to consolidate the achievements to date, and to introduce, at the same time, a series of innovations to achieve a more effective action. Several of these elements are of particular interest for the agriculture and FSN sector.

In the first place, a change of focus is observed from disaster management towards an integrated and anticipative disaster risk management. That is, going from managing an emergency or disaster to managing the process that leads to this situation. This reinforces the concept that DRM is not a sector by itself, but a set of inter-related practices that must be included in all sectors in an integral and continuous manner, and that are a fundamental condition to achieve sustainable development. This change is embodied in the outcome of the Sendai Framework where both a disaster risk reduction and a disaster reduction itself (losses and damages) are expected.

On the other hand, the scope of the Sendai Framework gets considerably extended to focus on threats of both natural and human origin, as well as on related environmental, technological and biological risks and threats. This innovation is important for the agriculture and FSN sector, because it includes the risks regarding the food chain under the same framework. For instance, vegetable pests or animal disease that could get to have a devastating effect on agriculture. Likewise, this element includes technological risks, which are a central element in the sector, particularly in terms of contamination of foods (food safety), and the degradation of natural resources (due to inappropriate use of agrochemicals, for instance).

Additionally, the Sendai Framework strongly emphasizes the consideration of small-scale and slow-evolution extensive disasters which, by being recurrent, lock communities in a vicious circle of impoverishment. It mentions that these particularly affect communities, families and small or medium-sized companies, and constitute a high percentage of all losses. This change in position is particularly important for the agriculture and FSN sector, because it allows duly covering the impacts of hydrometeorological variability and drought, that year after year erode the livelihoods of smallholders.

Another fundamental element in the Sendai Framework is the specific acknowledgement of climate change, of the unsustainable use of natural resources, and of the weakening of ecosystems, as causes that increase risk. This acknowledgement is core for the sector as it is not possible to think of a resilient

31 http://www.unisdr.org/files/43291_spanishsendaiframeworkfordisasterri.pdf

agriculture sector without considering the interaction of production with natural resources and climate change adaptation. Likewise, agriculture can be one of the main causes for the deterioration of ecosystems and can therefore be considered, at the same time, a risk factor.

It also indicates that, although the State has a primordial role, risk reduction is everybody's task, and acknowledges the role and responsibility of all stakeholders in society (public and private, national and local), in the development of risk reduction policies and their implementation.

The local level takes on much relevance in the Sendai Framework. It stresses its importance in terms of skill development and empowerment of the institutions at a local level and of communities; of the appreciation of ancestral knowledge and technology transfer; of the involvement of the population in the assessment of needs, strategies, plans and monitoring systems; and of the sensitization and political incidence tasks. This is a factor that is also key for the agriculture sector, as local producers are those that are in first line for the effective transformation of their agricultural practices towards more resilient productive systems, and most of the work pending to be done is at this level.

Another relevant element introduced by the Sendai Framework is the acknowledgement that deficient institutional arrangements become underlying risk factors. Likewise, it reinforces the role of informed and risk-sensitive decision making for the *ex ante* assessment of both public and private investments.

In this regard, it is interesting to mention that the Sendai Framework acknowledges the political nature of risk management, so it requires greater transparency, a clear definition of responsibilities among sectors, and the participation of the different stakeholders to thus guarantee accountability in the creation of new risks.

At the same time, it introduces *ex ante* planning of recovery and rehabilitation, in order to better integrate these stages in the sustainable development process and to guarantee that risk reduction criteria are being included.

Finally, it is important to mention that, to continue with the achievement of the identified targets, an open ended intergovernmental working group on indicators and terminology (OEIWG) was formed. Within this framework, differential sectoral indicators are being developed (including environment and agriculture) to be able to better guide and monitor the DRM progress in the different scopes of society. These indicators should be ready by the end of November 2016.

3.2 Progresses in DRM in the Agriculture Sector

The measurement of the progresses made by the Hyogo Framework for Action 2005-2015 through the HFA Monitor tool, showed throughout these 10 years that countries achieved a significantly smaller progress in approaching underlying risk32 factors (priority 4 of the MAH) than in the other priority areas such as institutional strengthening, early warning systems, sensitization and education, or preparedness and response. The analysis of this lack of progress in factors that lead to risk, indicates the limitation that many governments have had to sufficiently influence the different development sectors to duly integrate the disaster risk considerations into sectoral plans, programs and policies.

The Sendai Framework calls once again to progress with this integration, and underlines the importance of having a firm political commitment and leadership in all sectors of public administration and society, to create a risk-sensitive development.

Specifically in regards to the agriculture sector, and as contribution to the consultations previous to the Third UN World Conference on Disaster Risk Reduction in which the Sendai Framework was adopted, FAO prepared a specific assessment regarding the inclusion of risk reduction in the sector at a global level[33]. The results of this study presented as follows are very relevant for the region.

- More awareness, understanding and inclusion of DRM in the agriculture sector was observed. Practically all ministries of agriculture in the region actually have a unit dedicated to disaster risk reduction or management and climate change. Some countries even have a disaster risk reduction or manage-

32 Underlying factors that make reference to the primary causes that build risk, can be of natural, human, institutional, social-economic nature, etc.
33 FAO 2014c, *Mainstreaming disaster risk reduction in agriculture: an assessment of progress made against the Hyogo Framework for Action*. Available at: https://www.unisdr.org/2014/docs/un-drr/FAO-GAR15-InputPaper.pdf

ment plan specific for the agriculture sector[34], or with national plans to face drought.

- Early warning systems (EWS) and response preparedness systems are the most developed tools and account for the importance they have in the sector. Now, it is important to organize them with a better understanding of the risk and within a more integral DRM context, since currently they are mainly focused on activating response protocols.

A series of gaps were also observed, among which are the following:

- The focus of the work and the allocation of resources is still mostly concentrated on disaster management and emergency response, leaving risk reduction and management itself, both corrective as prospective, in second place.
- Laws, policies and public planning tools, in general, both in the agriculture sector as in the other sectors that are intrinsically linked to it (environment, territorial planning, health, etc.), do not provide a clear and systematic guideline yet for disaster risk reduction in their corresponding areas of competence.
- Another important gap frequently observed is that the different DRM actions of Ministries of Agriculture, whether those that have been always carried out (such as the foment of drought-resistant species or pest monitoring) or the new initiatives, are not always acknowledged as DRM actions. This makes it difficult for the sector to organize its offer and clarify its technical expertise for DRM, take on clear responsibilities, and explicitly foment the generation of the necessary local skills to achieve a proactive, effective and efficient DRM.
- The units of the Ministries of Agriculture that lead DRM are generally weak at different levels:
    - They do not have the human resources and the due training, or sufficient financial resources. Generally, most resources allocated to DRM are channelled through national multisectoral and cross-institutional instantiations (National DRM systems; civil protection, etc.) and do not manage to reach or have any incidence on the different sectors.
    - This weakness is added to the fact that these units do not have the necessary political power to have incidence on and coordinate the agendas and actions, both within the ministries themselves and out of them, in the coordination mechanisms corresponding to climate change, DRM, and the planning and creation of policies at a national level.
- Post-disaster recovery assessments for the agriculture and FSN sector are still limited in many countries of the region, and do not account for the actual losses of the sector. In many cases, there are no suitable skills to properly assess and quantify the losses of extensive disasters such as drought or hydrometeorological variability, and neither the losses related to connections generated by the agriculture sector (post-harvest and/or transformation sectors, transportation and distribution of agricultural products, etc.).
- Another very important factor is that emergency response and recovery planning actions are carried out with a very short term vision and do not include DRM aspects, often maintaining or rebuilding the risk.
- Although there is progress in terms of incorporating DRM into the planning of the sector, this has not been reflected yet in the actual implementation of measures at a local level where progress is very limited. This situation suffers from the lack of human and financial resources allocated to DRM, but also the strong weakness of outreach services of the Ministries of Agriculture in the region. This is a key topic in the responsibility that currently Ministries of Agriculture should take in the effective promotion of good practices and the transfer of DRM technologies, climate change adaptation and management of natural resources, without which the sector will not be able to take on the function and challenge it has ahead.

34 Commonwealth of Dominica, Jamaica, Guyana, Peru.

To support these challenges, the reflection of the countries will be necessary, in light of the interpretation of the Sendai Framework for Disaster Risk Reduction, on how to continue making progress in the core inclusion of disaster risk management into laws, policies, planning tools and implementation for the development of the agriculture sector and the other relevant sectors that are directly related to its activity.

As previously seen, the agriculture sector plays a key role in the fight against poverty, food and nutrition insecurity, in the stability of the food offer in general and in the status of natural resources. These dimensions go far beyond the sector itself and turn it into a core stakeholder for the present and future sustainable development and well-being of Latin American and Caribbean societies.

In this sense, it is mandatory for the different government levels and the sectors involved, such as environment, territorial order and planning, economy and finances, health and social development, to coordinate actions and get involved in the transformation of the agriculture sector into a more equitable and resilient productive model.

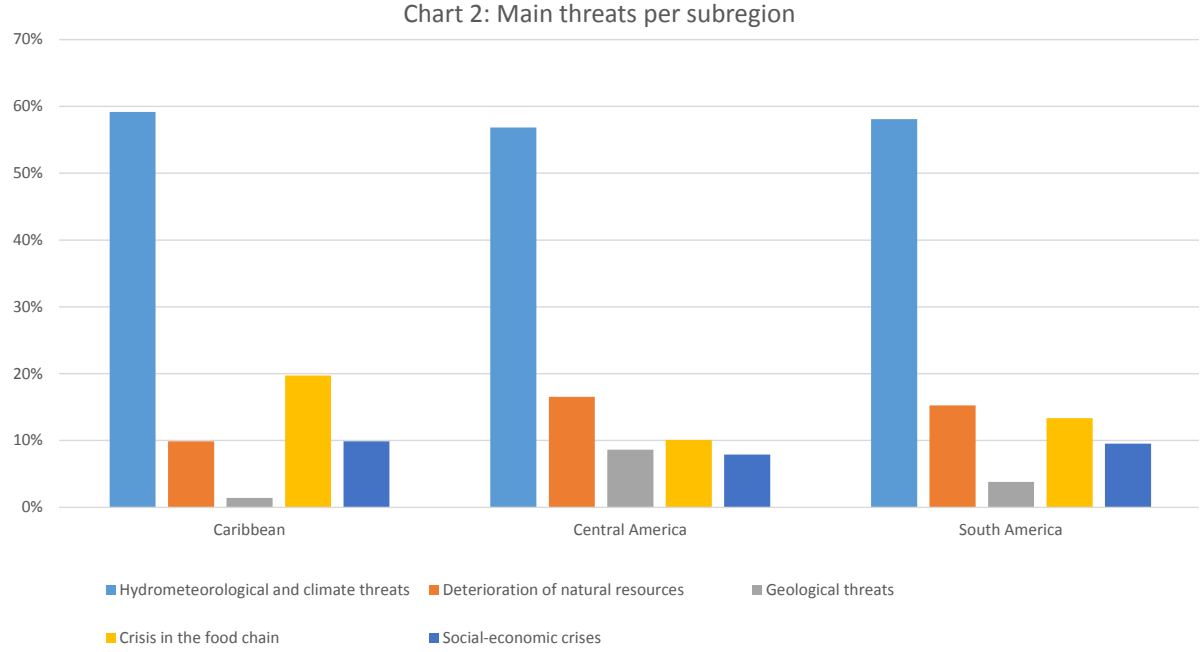
4 Perceptions on Disaster Risk Reduction in the Agricultural Sector and FSN

The following is a perception analysis on different aspects related to DRM in agriculture and FSN, which was carried out based on the information obtained from a virtual survey with stakeholders related to risk management in the countries and regional institutions (see annex). Section 4.6 specifically approaches the perception of Government stakeholders from countries in the region.

4.1 Perceptions on main threats in the region

Hydro-meteorological and climate threats appear to be the most important for all subregions. However, the deterioration of natural resources is also considered an important threat in all subregions, it being the second most important for Central America and South America, and the third one for the Caribbean.

Chart 2: Main threats per subregion



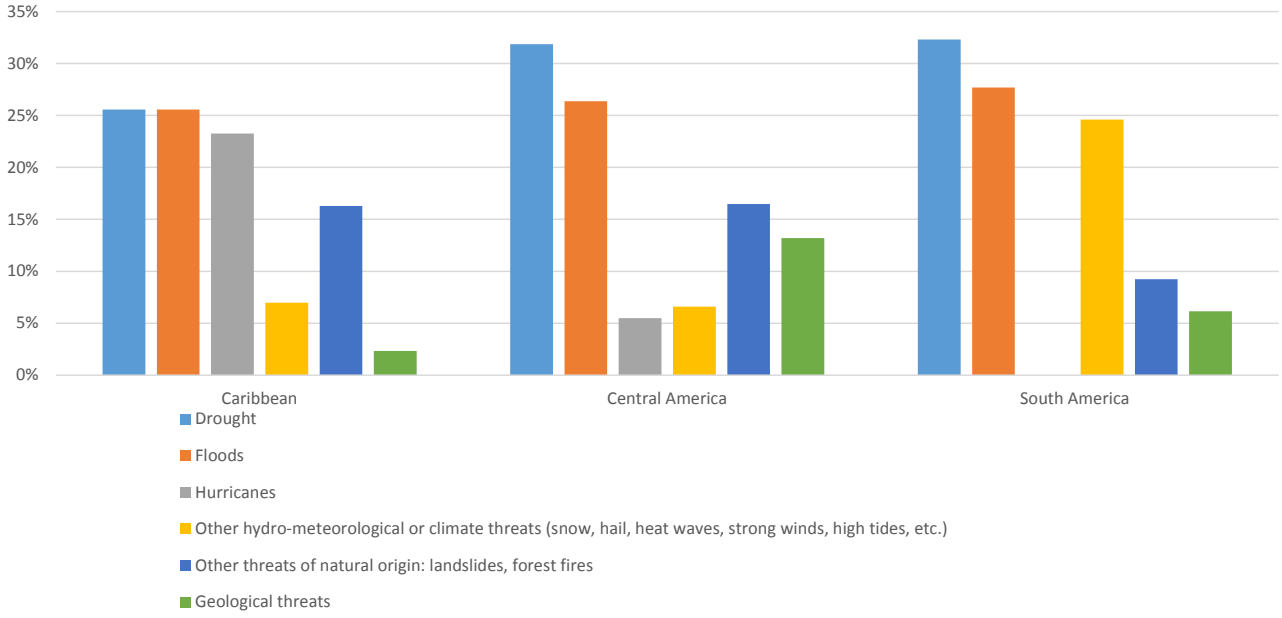
Crises in the food chain (vegetation pests, cross-border animal diseases and food contamination) are the third most important source of threats. Among them, phyto-vegetable threats are the most important concern in all subregions. In South America, animal diseases and vegetation pests are considered practically with the same level of importance.

Social-economic crises are the threats that come in fourth place of importance. In the case of Central America, insecurity and threats against physical integrity is the situation that generates the greatest concern, and the rising prices of food is the most important concern for the Caribbean and South America.

Geological threats come in last order of importance for all subregions, while in Central America they are given greater relevance.

Chart 3 presents the distribution breakdown per subregion of the perception of natural origin threats.

Chart 3: Breakdown by natural threats



In regard to natural threats in the case of the Caribbean, a relatively even importance is observed between drought, floods, hurricanes, and slides and forest fires.

However, in Central and South America droughts in the first place, and floods in the second place, are those with the highest importance.

4.2 Perceptions on the functioning of national risk management systems

Charts 4, 5 and 6 present the perception on how governmental systems are achieving a DRM in the agriculture and FSN sector, considering the following actions:

- Preventing and mitigating disaster risk at a local level,
- Properly responding to emergencies in the sector, and
- Rehabilitating livelihoods without rebuilding or generating new risks.

Chart 4: Preventing and mitigating disaster risk at a local level

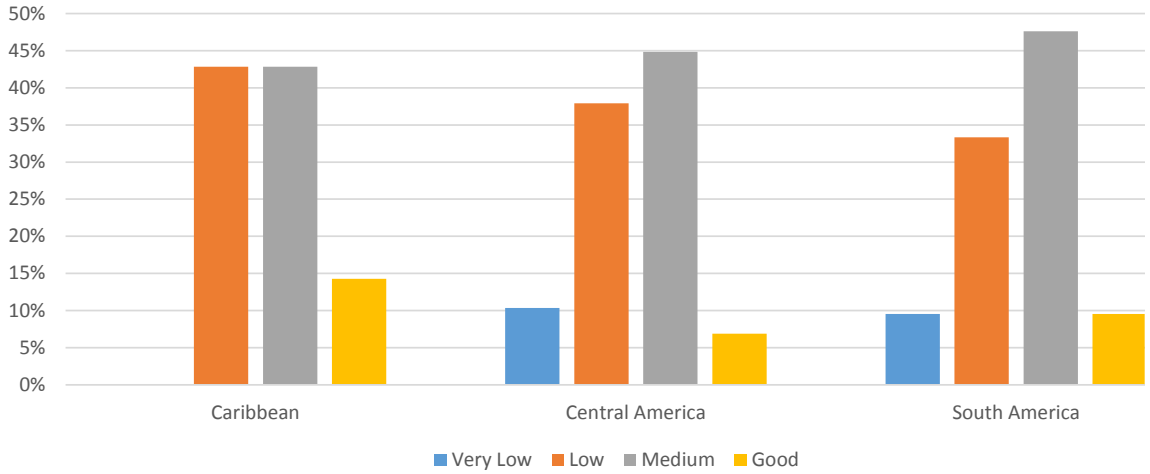


Chart 5: Properly responding to emergencies in the sector

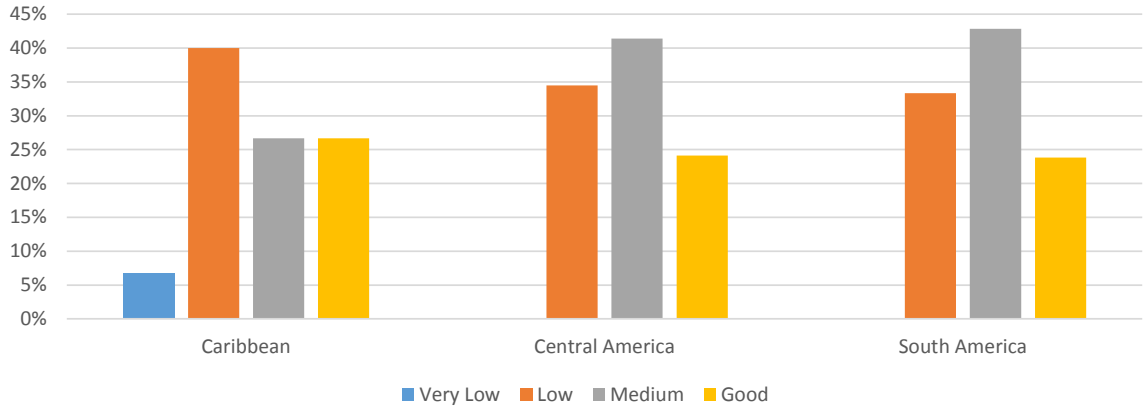
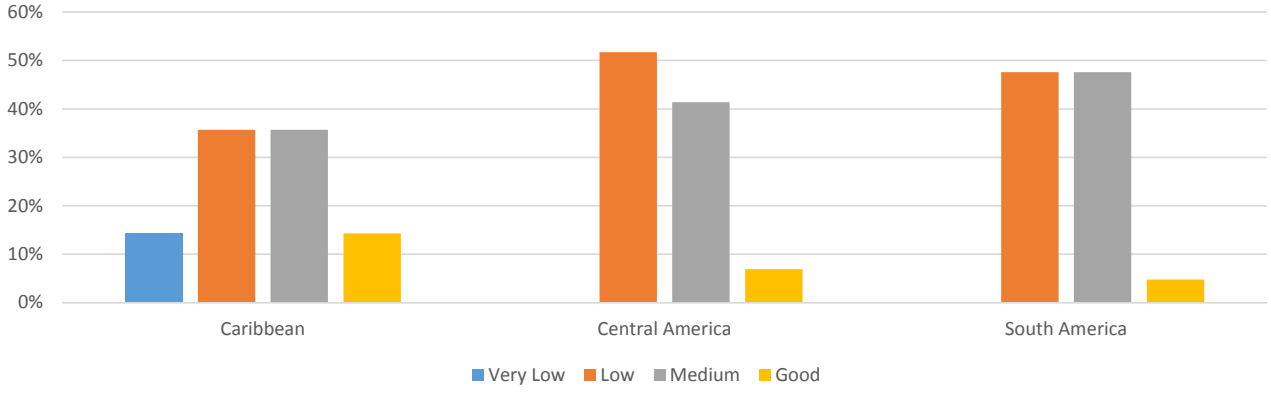


Chart 6: Rehabilitating livelihoods without rebuilding or generating new risks



According to this data, the aspect in which DRM has the best performance level perception is emergency response, with 25% of those surveyed considering it presents a good level. This situation is in accordance with what was expected, as it is the aspect showing the greatest progress in the Humanitarian Aid Framework. However, one third of those surveyed in South and Central America, and half of those in the Caribbean, deem the level is still deficient.

In the case of preventing and mitigating risk, and rehabilitating "building back better", the perception is that the situation is deficient in all subregions, with just between 5% and 14% of those surveyed considering there is a good achievement level.

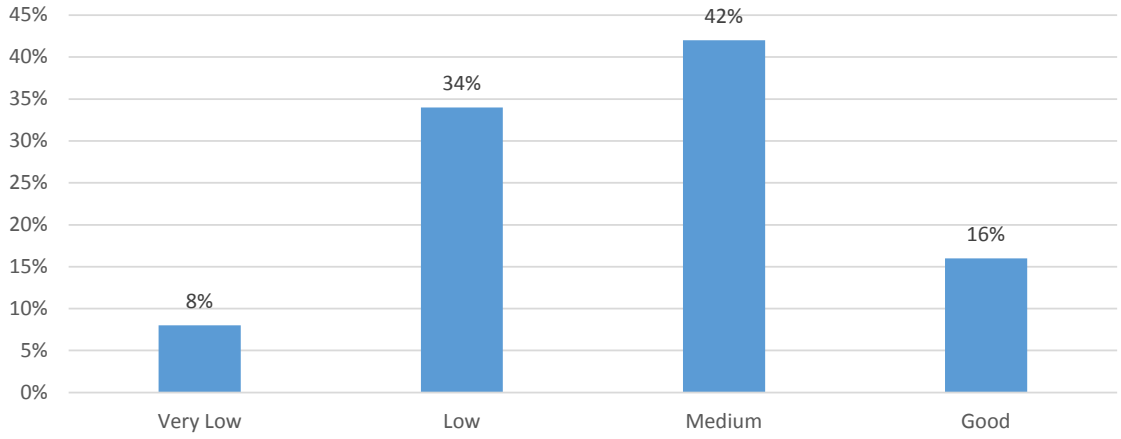
The fact that in three subregions, half of those surveyed deems rehabilitation is not "building back better", stands out. It is possible for this to be due to the fact that the Ministries of Agriculture are one of the main ways for the government to reach the rural population, through social protection or support schemes. Therefore, short-term criteria often prevail in the distribution of aid for recovery and rehabilitation, without the introduction of the necessary changes for the sustainability and resilience of production in the medium or long term.

In regard to the implementation of prevention and mitigation measures in the sector, between 43% and 48% of those surveyed perceive that the goal is not being achieved. This makes evident the difficulty that Ministries of Agriculture in the region have to effectively reach smallholders in terms of risk prevention and mitigation practices, although they are the first beneficiaries and *raison d'être* of such ministries.

4.3 Perceptions on the transversalization degree of DRM in the sector

Chart 7 shows the perception regarding to which degree DRM is actually transversal in the agriculture and FSN sector. Following the same line as in previous analyses, this task is still deemed to be insufficient (42%) or halfway there (42%).

Chart 7: Mainstreaming degree of DRM in the sector



4.4 Priorities for DRM in agriculture and FSN within the national scope

The following sections describes DRM priorities in the sector according to the findings of the consultation process.

Priority 1: Understanding disaster risk in the agriculture and FSN sector

The three main work areas identified, that should be approached within the framework of the programming of activities regarding priority 1 of the Sendai Framework, better understanding disaster risk in the agriculture and FSN sector, are:

- Capacities for the multi-threat assessment of risks and vulnerabilities in the agriculture and FSN sector.
- Information systems that gather, monitor and share, periodically, information on disaster risk for the agriculture and FSN sector.
- DRM training and sensitization of extension workers, field technicians and professionals working in direct assistance to producers in the agriculture and FSN sector.

Within this same scope, in regard to whether public decisions are made in an informed way, sensitive to risk in the sector, 44% considers that the consultation level is medium and 38% that it is still deficient.

Priority 2: Strengthening risk governance in the agriculture and FSN sector

Within this scope, five main work areas are identified that should be approached within the framework of the programming of DRM priority activities in terms of risk governance in the agriculture and FSN sector:

- National legal frameworks, policies, strategies and plans for DRM include the different sub-sectors of the agriculture and FSN sector.
- Transversalization of DRM in the legal frameworks, policies, strategies and plans of the agriculture and FSN sector.
- Participation of the agriculture and FSN sector in the governmental mechanisms for inter-sectoral coordination for DRM.
- Multi-stakeholder and multi-sectoral coordination mechanisms in DRM, that connect the public sector with stakeholders of the civil society, stakeholders at community level, academia and other specialized entities.
- Human skills and financial resources of the agriculture and FSN sector specifically dedicated to DRM.

In regard to the perception of the degree of involvement and coordination the agriculture and FSN sector has with other sectors within the DRM framework, 40% is observed to perceive that its connection to the Environment and Social Protection sectors is still deficient.

The two sectors that appear with the worst connection to the agriculture and FSN sector, are education, research and academia, as well as the sector that gathers the non-state stakeholders of civil society, private parties and communities. This, although to effectively reach producers - key target public of the Ministries of Agriculture - it is key to manage to reach communities, civil society and the private sector. On the other hand, the deficient connection to the educational, research and academia sector is key for informed decision-making and for the transformation and productive innovation towards more resilient systems.

Both the territorial order and planning sector, as the social and poverty-fighting sector, appear equally with perceptions of deficient levels due to the connection to the agriculture sector.

It should be noted that between 15% and 18% of those consulted, considers that each of the following sectors must be connected to the agriculture and FSN sector, within the framework of DRM: environment, civil protection, social development, territorial order and planning, education, academia and research, and other stakeholders from civil society, private parties and community stakeholders.

Priority 3: Investment in disaster risk reduction for the resilience of the agriculture and FSN sector

The three main work areas that should be approached within the framework of the programming of DRM priority activities regarding priority 3 of the Sendai Framework, are the following:

- Systematic planning of the use of natural resources and promotion of sustainable productive systems in all government interventions in the agriculture and FSN sector.

- Implementation, distribution and systematization of technologies and good practices that increase the resilience of the livelihoods of men and women upon disaster risk and, particularly, that favour climate change adaptation.
- Availability of formal mechanisms for risk retention and transfer (funds, insurance and social protection) adapted to the needs of the different types of smallholders.

Priority 4: Response preparedness and "build back better" in the agriculture and FSN sector

The three main work areas that should be approached in the programming of priority activities regarding response preparedness and rehabilitation in the agriculture and FSN sector, are the following:

- Risk monitoring systems and multi-threat early warning systems adapted to the different sub-sectors: agriculture, livestock, forestry, fisheries and FSN.
- Inclusion of the different sub-sectors of the agriculture and FSN sector (agriculture, livestock, forestry production and fisheries) in the processes of disaster preparedness and contingency plans at a national level (cross-sectoral).
- Inclusion of risk prevention and mitigation aspects in programs and plans for the rehabilitation of livelihoods and development, as well as for sustainable development programs.

4.5 DRM priorities in agriculture and FSN within the regional scope

The main work areas prioritized at a regional level within the framework of a Regional Strategy on DRM for the agriculture and FSN sector are:

- Integrated regional systems to capitalize on innovation, technical, scientific knowledge.
- Development of sub-regional DRM strategies as mechanism for the "leverage of resources".
- Updated legal frameworks for mutual assistance in case of emergency and, particularly, in the case of cross-border threats.
- South-South and Triangular Cooperation Mechanisms.

In terms of identification of relevant intergovernmental organisms for DRM in the agriculture and FSN sector, the following actors per subregion stand out:

- The Caribbean. - It is interesting to note that, practically in all cases, the Caribbean Disaster Emergency Management Agency (CDEMA) was identified as the Caribbean Community Climate Change Center (CCCCC), which stresses the high convergence there is in the Caribbean between DRM and the climate change agenda.
- Central America. - The main identified stakeholders were the Coordination Centre for Natural Disasters Prevention in Central America (CEPREDENAC) and Central America Agriculture Council (CAC). Likewise, approximately 50% identified the Central American Commission on Environment and Development (CCAD).
- South America. - Almost everyone named the High Standard Working Group for the Integral Management of Disaster Risk (GTANGIRD) of the Union of South American Nations (UNASUR), and half identified the Agriculture Council of the South (CAS).

In all cases, sub-regional organizations were pointed out as relevant for DRM. In the case of the organizations covering the whole region, the instantiation that was most frequently named was the Community of Latin American and Caribbean States (CELAC).

In regards to the most important and/or dynamic technical or financial stakeholders of international cooperation in the DRM field for the agriculture and FSN sector, the relevance of the United Nations was confirmed, mentioned by 35%; and special relevance was given to FAO with 17%, PNUD with 5%, WFP with 4%, UNISDR and ECLAC, each of them with 2%.

International financial institutions and, particularly, the World Bank and the Inter-American Development Bank (IADB), are considered to be important stakeholders and gathered 19% of references.

Bilateral cooperation received 19% of references, with the European Union standing out with 6%, USAID with 4% and AECID with 3%. Other bilateral cooperation agencies often mentioned were SDC and JICA. IICA received 11% of references.

International NGOs also have an important role, with a total of 11% references, specifically noting OXFAM, Save the Children, and Action Against Hunger (AAH).

Despite their potential for DRM funding, only 2% of those surveyed mentioned the "green funds" for environmental initiatives such as the Green Climate Fund, the Adaptation Fund and the Global Environment Fund (GEF).

Research entities such as CIAT and IFPRI were mentioned only twice, which could be related to lack of connection of research to DRM policy and implementation actions in the countries in the region.

Conclusions highlighted in the virtual survey and interviews to key reporters

The process showed that the perception is that there still is an important road ahead in terms of the inclusion of disaster risk management into the agriculture and FSN sector. Emergency response appears as the most advanced component, while risk prevention and mitigation at a local level, as well as the "build back better" rehabilitation, appear as the scopes of action in which less progress has been made.

A highlighted element is the importance given to the degrading of natural resources in the perception of the main threats for the agriculture and FSN sector. Likewise, threats to the food chain and, particularly, phyto and zoosanitary threats that have a cross-border component, showed to have much relevance for those surveyed.

In the case of the first priority of action in the Sendai Framework, **understanding disaster risk,** the fields highlighted by those consulted within the framework of prioritization were information management (multi-threat systems, timely generation, production of bulletins in a regular manner, etc.), and training for personnel in the sector.

In the case of the second action priority of the Sendai Framework, **risk governance,** priorities were focused towards the deepening of DRM regulations, both within political and planning tools of the agriculture and FSN sector, as well as the inclusion of the specifics of the agriculture and FSN sector in the instruments of the other sectors relevant to sectoral DRM. Likewise, the reinforcement of coordination mechanisms within the public sector (at a horizontal and vertical level) was identified as a priority, as well as those regarding the involvement of stakeholders from civil society, private parties and local communities.

Another highlighted important element was the importance of developing skills and allocating more human and financial resources to the structures dedicated to DRM at the Ministries of Agriculture. Finally, the fact that participants consider the involvement with the sectors of environment, civil protection, territorial order and planning, education and academia, and social development, to have the same level of importance, is highlighted. This reminds us of the multifunctional character of agriculture and the importance of keeping this characteristic in mind when it comes to working on DRM.

Within the framework of the third action priority of the Sendai Framework**, investing in risk reduction to increase resilience among producers**, priorities were focused once again on the promotion of practices and technologies for the sustainable use of natural resources and climate change adaptation. Risk transfer schemes through insurance were also an important prioritization element.

In regards to the fourth action priority of the Sendai Framework, **disaster preparedness for effective response, and to "build back better" in recovery, rehabilitation and reconstruction**, identified priorities focused on the development of early warning systems (EWS), the consideration of the specifics of different subsectors (agriculture, livestock, forestry production and fisheries) in response preparedness, and the inclusion of risk management since the planning of the recovery and rehabilitation of livelihoods.

Finally, within the framework of work of the priorities at the regional level, the capitalization of research and technology, the leverage of financial resources, mutual aid frameworks and cross-border threats, and South-South cooperation, were highlighted. In terms of the stakeholders, the role of intergovernmental organizations of subregional level, such as agriculture and climate change, was noted.

4.6 Priorities identified by governmental stakeholders

In the side event on the agriculture and FSN sector, held within the framework of the "First Meeting of

Ministers and High-Level Authorities on the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in the Americas" (Asuncion, June 8 and 9, 2016), participants identified the following four priorities that are being mostly approached, with great emphasis, by the agriculture and FSN sector, and that should continue to be strengthened at a regional level:

Priority 1: Understanding disaster risk in the agriculture and FSN sector

- The emphasis placed by the Ministries of Agriculture on the development of information systems for an informed decision-making process, both at an institutional and producer level, was pointed out. Main progresses are based on:
    - The development of risk characterization and mapping instruments.
    - Agrometeorological information regular distribution and generation systems, with special emphasis on the development of mechanisms to reach the producer (through the use of mobile phones, alliances with producer associations and/or industries).
    - Early warning systems, particularly for climate events, but also as in the case of Paraguay, for phytosanitary epidemiological incidents. Regarding this point, efforts made for the direct involvement and participation of the communities are noted.
- Within the scope of information development, the importance that technology and scientific research has achieved (particularly in Paraguay and Guatemala), was noted, both for the characterization of risks (soil sciences, hydrology, agrometeorology, geographic information systems, projection models, etc.), as well as to make this information available to producers through innovating and accessible systems (mobile phones used in Paraguay). Within this context, Peru has early forecasts of threats (for instance, for the El Niño Phenomenon), and has the characterization of the risks so as to guide prevention and preparation actions, and thus efficiently mitigate the impact.
- The importance of capitalizing and promoting ancestral or traditional knowledge regarding agrobiodiversity techniques existing at family farming level.
- One of the issues identified was the insufficient availability of institutional capacities of some ministries of agriculture to generate quality information regarding damages and losses in the sector (including consequential losses) both in the case of intensive disasters, as in the case of small-scale slow-evolution recurrent disasters. This results in a weakness of the sectors to influence the political agenda of countries to achieve the allocation of the necessary resources to prioritize risk prevention and mitigation.
- Training and updating needs of personnel in the ministries of agriculture in terms of good practices and technologies to achieve more resilient productive systems are evident. In fact, the Technical Group on Climate Change and Integrated Risk Management Central America Agriculture Council mentioned the huge success of all virtual meetings organized on relevant DRM and climate change adaptation topics. FAO is supporting Mesoamerica through DRM online training for officials at the Ministries of Agriculture of that region.

Priority 2: Strengthening risk governance in the agriculture and FSN sector

- A significant effort of all Ministries of agriculture was made evident in the development of governance mechanisms for risk management, along two lines:
    - The development of instruments of the agriculture sector itself. The creation of different multi-stakeholder commissions led by the sector and the fact that, for instance, the Guyana Ministry of Agriculture already has a DRM sectoral plan, is to be noted as well as the fact that the Paraguay Ministry of Agriculture developed a DRM specific sectoral plan.
    - The articulation of efforts with intersectoral mechanisms that already exist in terms of disaster attention and response, and integral risk management, climate change adaptation, and plans or programs for food security and nutrition.
- Preventive efforts for the El Niño Phenomenon and the achievements that can be made in terms of impact reduction through a coordinated multi-sectoral action and of the different government levels, were observed in Peru's experience.

- The Technical Group of Integral Risk Management and Climate Change of the Central America Agriculture Council, showed the role of the regional political processes upon common threats (the recurring drought in the Central American Dry Corridor or the coffee rust crisis in 2013) in terms of incidence on the national political agendas and their impact for the evolution of the national mechanisms and regulations for DRM.
- Lessons learned after the implementation of the DRM sectoral plan and, of particular importance, can be found in Guyana, for instance, by:
    - achieving a DRM action sustained through time, because it is a permanent and dynamic task due to the context of the risks the sector faces.
    - carrying out actions that inform or supplement the other instances of the Ministry, but that do not replace them.
    - A limitation that was observed was the weakness in terms of skilled human and financial resources allocated to the DRR instantiations, mechanisms or tasks at Ministries of Agriculture in a regular and structured manner. The DRM approach seems to be still dominated by a project focus (limited time and coverage), reactive upon emerging disasters. The importance of allocating sufficient and consistent resources for prevention tasks does not seem to have sufficiently permeated decision-makers.
- The effective arrival of State services (mainly in terms of technical assistance and information) to communities, particularly indigenous peoples, Afro-descendant communities and women, as well as their involvement in development actions, is deemed a priority, but it still appears as a pending task. The main limitations evoked regarding this situation were the lack of resources and institutional weakness at local level.

Priority 3: Investment in disaster risk reduction for the resilience of the agriculture and FSN sector

- The need to foment the use of appropriate technology and good practices was emphasized, as well as the development of adaptation infrastructure (storage, water regulation, irrigation, agrometeorological stations, etc.). However, the examples provided allowed seeing that this type of action is mostly being carried out through a project approach and in a very localized manner, not reaching the scale that is really necessary to generate a substantial change in the field and have an incidence at public policy level.
- The importance of taking into account the status of natural resources, and of carrying out rehabilitation actions and the promotion of more environmentally-friendly productive practices with fundamental elements of climate risk mitigation, were recurring elements in the discussion. The need to have functional hydrographic basins and ecosystems was mentioned, for which an appropriate planning of land use and occupation is needed. Although the Ministries of Agriculture are taking on this kind of tasks, it was pointed out that, in order to achieve an actual change, the coordinated participation of other sectoral stakeholders is required, as the issue exceeds their influence capacity and scope of action.
- The need to have insurance alternatives adapted to the agriculture sector and, particularly, for small-scale producers, was one of the priorities discussed. Guatemala indicated it has an innovative scheme of community contingency funds that could be replicated in similar contexts. The importance of having indexed and/or catastrophic insurance schemes, managed directly by the State, was also mentioned as an alternative to reduce the burden of the public attention cost to the affected population and, thus deviate the least possible amount of resources that, under normal circumstances, would be invested in development actions.
- The high financial profitability of investing in prevention vs. response and recovery, was noted by Peru, with information regarding the impacts of the El Niño Phenomenon this year, as compared to those of past episodes. Likewise, it was mentioned that regular activities, paid with current expense resources that are granted every year (for desiltation of riverbeds or agricultural and livestock health surveillance and control), but this time coordinated towards a common strategic goal, hugely contributed to mitigate the impact of the El Niño Phenomenon.

Priority 4: Response preparedness and "build back better" in the agriculture and FSN sector

- The Ministries of Agriculture are making several efforts in the development and implementation of specific EWS for different types of threats, which could be verified by Guatemala, Guyana and Peru.
- Within this context, the importance of developing programs and/or mechanisms specific to the sector was mentioned, for response and rehabilitation of the livelihoods of producers.
- The inclusion of DRM and the concept of "build back better", for instance, through the promotion of construction codes for rural infrastructure, is a pending task. This has been advanced in some countries like, for instance, Guatemala, although there is still much space for the strengthening of this scope.

5 Guidelines and recommendations towards a DRM Strategy for the Agriculture and FSN Sector

The outcomes presented in this chapter are the result of an extensive review of secondary sources and of the analysis and prioritization carried out as per:

- Action priorities presented in the Country Programme Frameworks negotiated for each of the Governments in the region with FAO, within the framework of the fifth strategic target of FAO "Increasing the resilience of livelihoods to threats and crises".
- The virtual survey with stakeholders on risk management in agriculture, which allowed gathering the input from officials or professionals working directly in DRM in the sector in the region; and
- the side event on the agriculture and FSN sector during the Ministerial Meeting held in Asuncion, which allowed researching the vision and priorities of the participating authorities or decision makers.

Firstly, a series of general guidelines are described, presenting the basic principles or structure on which the specific recommendations must be supported.

Then, a series of specific recommendations are detailed, which are organized based on the four priorities of the Sendai Framework, and which resume the elements noted and prioritized through the virtual and in-person consultations, as well as interviews with key sources for Disaster Risk Reduction.

5.1 General guidelines

Articulate the climate change efforts with Disaster Risk Management

Due to the nature of agricultural activity, the articulation of climate change and DRM at a local level can be carried out most naturally. In fact, at a producer level, this difference does not exist because, regardless of the sector or approach of the innovation or information, for the farmer it is simply a strategy to reduce vulnerability upon climate threats and increase resilience.

In fact, both approaches go towards the same purpose, they seek to become cross-sectional in sustainable development processes and are independent. To be sustainable in the long term, risk management strategies must include climate change adaptation, while climate change adaptation must be built on initiatives of disaster risk management[35].

Many of the future impacts that climate change will have are magnifications of the challenges that climate change and variability already pose on agriculture today. In this sense, disaster risk management is the first line of action to approach climate change adaptation: actions taken today to face climate variability are fundamentally to establish the work bases for the future.

In fact, DRM could be seen as a promising scenario to integrate adaptation to sustainable development planning. The chapter on South America and Central America in the latest IPCC report, notes that in several countries in the region, a first step for future climate change adaptation consists on reducing vulnerability to the present climate[36], while at the same time strengthening the adaptive capacity of the population and the resilience of the systems is strengthened.

Climate change mitigation is often considered a secondary factor when it comes to increasing resilience among producers and food production to guarantee FSN. However, from a holistic point of view, it is not

35 IICA-EUROCLIMA 2015: *Risk management and adaptation of agriculture to climate change.* Available at: http://euroclima.iica.int/sites/default/files/Aporte%20tecnico%20EUROCLIMA-IICA%20GdR.pdf
36 ECLAC 2015: CC Adaptation in Latin America and the Caribbean

possible to forget that agriculture in the region is the main source of Greenhouse Gases (GHG) due to the combined effect of its direct emissions and the extension of the agricultural boundary and its weight in the LULUCF37 sector. Therefore, as far as possible, technological options shall have to be prioritized, to foment both adaptation and mitigation.

In this sense, the focus on climatically intelligent agriculture (or sustainable agriculture adapted to climate) portrays its importance by proposing a transformation conceptual framework for agriculture, using the opportunities to create synergies among the multiple production objectives for food security and climate change adaptation and mitigation.

As previously seen within the agricultural institutionalism, structures that hold the DRM and climate change portfolio are, generally, the same ones. Integration difficulties essentially arise from the sectoral separation between the Ministry of the Environment and the Ministry of Agriculture. These shall have to be overcome, particularly for the mobilization of financial resources at par with the needs and the importance that the agriculture sector has in terms of climate change adaptation and mitigation, food security and the fight against poverty.

Paying special attention to Family Farming

As previously seen, family farming plays a fundamental role for food security and the eradication of hunger and poverty in the region. However, due to its own characteristics, the sector faces important limitations that make it much more vulnerable and lead it to have considerably less risk management and adaptation capacities.

Family farming generally presents less access to productive assets, financial and technological resources, agroclimate information and technical assistance. In many cases it is located in marginal agriculture lands and present a greater environmental degradation. It is interesting to mention that, in LAC, only 10% of agriculture lands have irrigation systems. In Central America, this ratio is just 2.4% of the total. Generally, lands under irrigation are occupied by agroindustrial exploitations and do not benefit family farming.

Due to these reasons, it is a priority to focus the attention on this category of producers and reinforce its capacity in terms of access to knowledge, tools and financial resources for risk management. To achieve this, it will be necessary to first distinguish among the characteristics of the different smallholder groups, and to better understand the vulnerabilities, needs and differentiated capacities of men and women and of the different age and ethnic groups, as well as the roles they play in agriculture. It is necessary to understand how to reach these different types of producers and persons who depend on agriculture, to work towards the acknowledgement and promotion of good practices, and supporting the adoption of the management and technological innovations needed to protect their activities and their food security, within the framework of the sustainable development of natural resources.

A fundamental factor will be the design of the extension programs and the translation of the scientific and climate information into terms that facilitate their understanding, and rescuing local practices that contribute to reduce risk. Family farming constitutes an extremely important repository of agrobiodiversity and native or ancestral knowledge. Traditional agriculture systems have adapted over the centuries to climate variations and have developed a series of strategies that, within the current context of increasing climate variability and climate change, are key to recovery and appreciating.

Fomenting Integral Risk Management

According to the Sendai Framework, for risk management to be efficient and effective, it is important to consider a work approach that acts on all its areas: from the advanced assessment of potential risks and generation of pertinent information for the producer; the implementation of prevention and mitigation measures (transfer of technology and good practices) to reduce risk as well as losses and damages; the transfer of residual risk through insurance or financial mechanisms, and preparedness for emergency response and the planning and integration of risk reduction in the response and rehabilitation phases. Thus, DRM is not an end in itself, but an integral and continuous process, intrinsically linked to the different sustainable development processes.

37 Land use, land-use change and forestry sector (LULUCF)

This way, the adoption of measures comprising the three risk variables is fomented: the degree of exposure to threats; the vulnerability of people, assets and systems exposed to them, and the existing capacities to face risk. This work approach contributes to the achievement of the Sendai Framework objective structured on three pillars: preventing the creation of new risks, reducing the existing risk, and reinforcing the resilience of people to reduce the losses associated to disasters that, even having applied all of the above, cannot be avoided.

Within this context, it should be mentioned that risk transfer instruments, such as for instance agriculture and livestock insurance in high demand in the sector, are just one more tool for risk management, and unless part of an integral strategy, they can generate inefficiencies and important costs for governments.

Fomenting the sustainable use of natural resources

As the Sendai Framework states, the deterioration of natural resources is a factor that increases risk and a particularly important element in the region, due to the deterioration status of natural resources and the role of agriculture in this situation.

In LAC, unsustainable consumption and production patterns are maintained, the production model not having been yet transformed. Countries have invested considerably since 1992 in the creation of institutions and the enactment of environmental laws. However, insufficient coordination of public action, low visibility of the effects of environmental degradation, the little appreciation of ecosystemic services, and the lack of technological options for the conversion to more sustainable production systems, constitute barriers to the efforts made[38].

The management of natural resources, particularly the restoration of degraded lands and forests, favour erosion control and water regulation in case of drought or floods among other benefits, thus contributing to reduce the impact of climate events.

Due to this, as well as based on the previously analyzed elements related to climate change, the involvement of the environmental and the land use and territorial planning institutions acquire a core importance in the scope of DRM in the agriculture sector.

Likewise, fomenting actions for the recovery of degraded natural resources and fomenting a sustainable agriculture model, adapted to climate, shall have to be the base to increase resilience among agricultural producers.

Scientific knowledge and technological innovation

Science and technology are fundamental for the understanding and monitoring of risks, informed decision making (both in the political and the production scope), for climate forecasts and for agriculture innovation. However, a series of limitations in information distribution is observed, particularly in the knowledge chain between those producing and those using the knowledge (governments, producers, etc.) that shall have to be overcome.

Today, it is evident that science and technology play a key role in the understanding, monitoring and approach of the underlying risk factors, mainly climate and sanitary, that weigh on the agriculture sector. Likewise, the understanding of climate change effects and the alternatives for the adaptation and mitigation of the agriculture sector are closely related to science and technological innovation.

Fomenting technological research and innovation, adjusted to the realities and needs of the region, becomes therefore a fundamental element for sustainable development processes. Along the same line, political decision making and implementation in the public sector shall have to be done in an informed manner based on information generated with scientific support.

Another important element in the region is the deficiency in the systematization, capitalization and use of technical knowledge and scientific information. There is a series of good practices and technologies that

38 FAO 2016: Voluntary guidelines for Agro-Environmental Policies in LAC

have been developed in the different countries and through different initiatives for DRM and climate change adaptation, and they need to be exchanged and used.

Likewise, an important gap is observed for timely information and technology to reach the producer, particularly within the scope of family agriculture. This is a fundamental element that will have to be solved because informed decision making, the adoption of new agricultural practices and access to technological innovation are fundamental elements to increase the resilience of current productive systems.

On the other hand, many of the most resilient production techniques are traditional techniques that see for the biodiversity and sustainable management of natural resources. Science and innovation can supplement local knowledge and project it towards the future.

Inclusive institutionalism

The agriculture sector in LAC plays a role in the fight against poverty, in food security and nutrition, in regional exports and global agricultural trade, the status of natural resources and climate change. Due to all these reasons, the sector has an impact that extensively transcends the sector itself.

Goals for agriculture policies are, therefore, versatile. However, in many cases, there is a trend to particularly prioritize social elements (food security and fight against poverty) and the macroeconomic health of countries (exporter role).

In this sense, although DRM and climate change adaptation are critical factors for agriculture to continue fulfilling, in a sustainable manner, all roles it has today, important efforts and additional resources will be needed in the short term. This will lead to a series of imbalances and inter-sectoral compensations that will have to be solved.

On the other hand, agriculture is extremely site and context specific. The different economic, climate, cultural and social-organizational conditions of each territory strongly determine agricultural practices and systems. Therefore, it is hard to think of the effective transformation of productive systems not duly considering the different stakeholders - public, private, and organizations that represent the different groups that form the communities that participate in the territory.

Due to all these reasons, work will need to be based on an inclusive horizontal and vertical institutionalism, among the public sector, private sector, and civil society.

To achieve this, the capacity of States to perform a guiding role in the grid of public and private agents participating in agricultural development, shall have to be fomented through a thorough exercise of communication, coordination and coherence in public action and extensive participation in decision making at all levels.

Particularly, work will have to be done on participation channels, coordination and synergy generation among the different entities of national, territorial, local and community order, to generate policies, plans and actions fed locally and nationally.

5.2 Specific recommendations per priority of the Sendai Framework for DRR

Priority 1: Understanding disaster risk in the agriculture and FSN sector

Generating information and knowledge regarding the relevant risk for the agriculture sector

1. Generate information with scientific grounds for the characterization and understanding of the multiple risks affecting the agriculture sector, through:
    a. Vulnerability mapping: trends on climate change, poverty, food insecurity, etc.
    b. Characterization of risk determining factors: types of soil, agroecological zoning, land use, water regimes, agrometeorology, etc.
    a. Generate information at a scale that allows accounting for the local contexts and territorial variations, and breaking it down per vulnerable group and being gender-sensitive.

2. Develop or strengthen threat monitoring systems and, particularly, climate information systems, through:
    a. The improvement in accuracy of analyses and forecasts, replacing, as far as possible, meteorology data extrapolation and, instead, develop meteorology networks starting from primary climate data observation stations.
    b. Establish connections among meteorology networks and the existing early warning systems at local and sectoral level.
3. Have, in the agriculture sector, trained personnel and structures focused on the generation, compilation, interpretation and publication of information relevant to risk monitoring, noting levels of exposure, vulnerability and capacity upon threats according to gender, age, ethnic group and other social-demographic variables.
4. Strengthen the agriculture, environmental and climate scientific knowledge chain, through:
    a. Development of national systems for innovation or capitalization, local knowledge use and distribution, technological and scientific information to strengthen resilience of productive systems (good practices, agriculture technology, genetic material, etc.).
    b. Development of joint research programs and agendas for DRM and climate change, between the agriculture sector and academia (universities and research institutions).
    c. Development or strengthening of knowledge exchange platforms relevant to DRM and climate change among countries in the region.
    d. Strengthening of all stakeholders in the agriculture and livestock value chain, for technological innovations to be present on site and effectively used (production supplies and equipment, price information systems, etc.)
5. Develop skills for damage and loss assessment specific to the agriculture and livestock, forestry and fisheries sectors, that allow duly characterizing the degree of direct and consequential losses and damages in the sector; either due to intensive disasters, or due to small-scale slow-start recurring disasters.

Using this information in a strategic manner

6. Establish mechanisms for the use of this information by decision-makers in the agriculture sector, planning entities, other pertinent sectoral entities, and decentralized government organizations, for them to translate into public actions and policies to duly include risk and effectively contribute to its reduction.
7. Offer to producers focused, local and timely agroclimate information, from reliable sources, to allow them a better productive decision making (seeding, varieties, use of supplies, crop management, etc.). This shall have to be done through easily accessible means such as mobile phones, radio, industry networks, etc.

Training and sensitizing change agents

8. Develop DRM systems and training packages that include the understanding of the risk and the way to manage it, as well as technological alternatives to increase resilience among producers. These systems and packages shall have to be adapted and destined to:
    a. Extension systems personnel in Ministries of Agriculture, decentralized governments and other pertinent instantiations to improve and focus their interventions and contribution to the DRR of producers.
    b. Formal and informal education system, particularly in the rural area, and in the agriculture and environment field, including school, technical and higher education.
9. Developing awareness campaigns among producers to increase the level of knowledge about their surroundings, the risks they face and the ways to mitigate them, with detailed strategies according

to the characteristics and empowerment of each group. This shall have to allow the strengthening of its resilience and the promotion of more DRM local initiatives, with a proactive approach.

Priority 2: Strengthening risk governance in the agriculture and FSN sector

Governance in the agriculture sector

1. Going further in the development of DRM regulations in the agriculture sector in particular, through the development of DRM and climate change adaptation plans for the agriculture sector, with a territorial, participative and inclusive approach.
2. Institutionalize DRM and climate change adaptation within the Ministries of Agriculture and equip them with the financial and human resources, as well as with the mechanisms required to:
    a. Proactively promote the topic among the regular programs and projects of the sector, as well as to give coherence to the sectoral activities that point towards DRM and climate change adaptation (whether earmarked as DRM or not).
    b. Develop an assessment and monitoring system regarding DRM and the increase of resilience in productive systems. Provide them the due follow-up, as well as the sectoral indicators corresponding to the Sendai Framework.

Inter-sectoral coordination mechanisms

3. Promote the development of agriculture and related sectors policies and legal framework (particularly environment, territorial order and planning), to provide specific guidelines for the development of a sustainable agricultural production, adapted to climate and that does not generate negative external factors.
4. Develop or strengthen coordination mechanisms that define clear responsibilities and accountability mechanisms regarding both the reduction of current risks, as well as the creation/prevention of new risks. This shall have to be done at:
    a. inter-sectoral level, effectively linking the agriculture sector with the national systems for risk management, climate change, FSN, territorial planning and public treasury.
    b. Among the national, territorial and local governments.
    c. Among the public sector, the private sector and civil society.
5. Develop multi-stakeholder spaces for the discussion and assessment of the performance of DRM plans, to increase transparency regarding risks and the risk management process, with accountability mechanisms in relation to the roles that the different stakeholders (public and private) must take on in the process of building more resilient societies.

Participation at community level

6. Strengthen social participation, particularly in communities, producer associations and groups related to agriculture and FSN, especially the most vulnerable ones, with an equitable participation of men and women in access to information, aid and resources, and in decision-making processes regarding the planning and implementation of DRM and climate change adaptation. This can be done through:
    a. Development of organizational skills of local associative structures (community, productive and others).
    b. Development of implementation capacities (resources and work tools) and technical capacities (methodologies and materials) in DRM and climate change adaptation of decentralized sectoral structures and local governments to work with community stakeholders.
    c. Foment risk studies, considering gender, age, ethnic group and any other social-demogra-

phic factor pertinent to the analysis of vulnerabilities and exposure, and the development of community DRM plans to respond to such diversity with specific strategies.

Priority 3: Investment in disaster risk reduction for the resilience of the agriculture and FSN sector

Approach the underlying causes linked to productive systems

1. Ministries of Agriculture must take on the responsibility of leading proactively the transformation of the current productive systems towards sustainable productive systems, resilient to threats of multiple nature, and with capacity to adapt to climate evolution to guarantee the resilience of livelihoods.
2. With this purpose, Ministries of Agriculture must equip themselves with solid extension systems with capacity to reach and influence a sufficient critical mass of producers to begin transformation. For this, they shall have to:
    a. Having extension mechanisms and methodologies adapted to family farming to achieve an effective adoption, transmission (such as farm schools, pilot farms, etc.) and multiplication of production technologies and innovations (through alliances with producer associations and industries, community leadership programs, etc.)
    b. Propose validated technological options (crop management, genetic improvement, water harvest and efficiency in the use of water), that are adapted to the different territorial contexts and types of users, and to train extension personnel for their promotion with suitable strategies for all different groups.
3. Develop activities for the recovery of natural resources, to contribute to the good functioning of agro-systems (soil recovery, reforestation, etc.).
4. Develop accessible loan schemes, adapted to smallholders for the funding of the necessary innovations in their production systems.

Mobilization of resources for DRM

5. Foment the change of paradigm from the current reactive culture (focused on emergency response) towards a prevention culture that allows increasing the allocation of public resources for risk reduction and resilience increase tasks.
6. Channelling DRM public resources through the corresponding different sectors instead of through vertical funds or the related governmental instances. This should allow DRM to become part of the regular activities and sectoral planning and investment, instead of being isolated and project-based.
7. Develop a resource mobilization strategy at a national level for DRM in the agriculture and FSN sector, that includes different cooperation alternatives such as International Financial Institutions, multi- and bilateral cooperation, and green climate funds.

Economic and financial transfer of risk

8. Based on a strategic inter-sectoral action, combine control and command tools with appropriate economic incentives (public subsidies, payments for environmental services, loan facilities, etc.) to discourage investments towards practices that are unsustainable and harmful for the environment, and to promote the adoption of sustainable productive systems, adapted to climate.
9. Institutionalize and enforce the use of disaster risk assessment tools in public investment planning processes, to guarantee that the newly invested resources do not create new risks.
    a. Develop economic and financial instruments to assess the risk arising from investments, particularly in scenarios of climate change, and to make them mandatory.
    b. Assess the risk resulting from investment, in the same way as environmental (and sometimes social) impact assessments are produced for all public investment projects.

c. Foment the use of this type of risk analysis tools also for private investments, through different suitable channels (such as financial institutions from the agriculture and livestock, forestry and fisheries sectors).

10. Encourage territorial zoning and ordering to constitute a DRM element. For this, the following will be necessary:
    a. Include climate change impact and trends in criteria, legal frameworks and territorial order and planning policies.
    b. Improve coordination levels among sectoral organisms involved in territorial planning and land use, and the agriculture sector.
11. Foment the development of productive infrastructure construction codes and land use directives, and strengthen their due application and enforcement in the rural area.
12. Foment, at different government levels, a culture to maintain rural infrastructure and agroecosystems for resilience, and thus contribute to them continue providing the essential services they offer to the population and producers.
13. Foment the development of insurance schemes adapted to the traditional agriculture smallholder, indexed through:
    a. The development of detailed databases, risk probability assessments and other information regarding the main threats to the agriculture sector for the support of the indexed insurance and/or to achieve premiums according to the actual conditions of each country.
    b. Foment to innovative technological solutions to reach producers in remote zones.
    c. Development of alternative schemes such as community contingency funds of inclusive access.
14. Develop, at ministry of agriculture level, systems for catastrophic insurance, contingency funds and other social protection mechanisms for the aid of people affected by disasters in the sector.

Priority 4: Improve effective preparation to respond and to "build back better" within the scope of recovery, rehabilitation and reconstruction in the Agriculture and FSN Sector

Early warning and response preparedness systems

15. Develop EWS with specific indicators for the different subsectors (agriculture, livestock, forestry production and fisheries), that cover different types of threats (climate, epidemiological - phyto and zoosanitary plagues and pests - agrochemical contamination, etc.).
16. Implement EWS and its response protocols, with sufficient territorial coverage (reaching marginal groups or zones) and organized among the different stakeholders and government levels and related to Contingency Plans.
17. Include the technical specifics and needs of the agriculture sector in the contingency plans, and guarantee they reflect the priority needs of rural communities.
18. Develop adapted response protocols for zones where there is weak State presence, particularly in the north triangle of Central America and remote areas of different countries.

Rehabilitation of livelihoods and "build back better"

19. Public mechanisms for rehabilitation and post-disaster compensation consider territorial productive specifics, consider men and women, and reach all affected persons.
20. Include civil society organizations and community groups in the development of livelihood rehabilitation plans.

21. Assess livelihood rehabilitation mechanisms that perpetuate or rebuild the risk.
22. Include risk prevention and mitigation aspects in development and livelihood restoration plans and programs, as well as in resilience-construction programs upon future threats.
23. Guarantee that the rehabilitation and reconstruction of productive infrastructure meets "build back better" standards in regards to current and future risks.

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Annex. Information from consultation regarding disaster risk reduction in the Agricultural Sector and FSN

In order to gather the perception on the progress level and priorities of DRR in the agriculture and FSN sector, of stakeholders working directly on these issues at a national and regional level, consultations were held at two levels. The first one was a survey and a series of interviews carried out virtually, and the second one was the side event carried out during the Asuncion Ministerial Meeting, when it was possible to interact and discuss directly with decision-makers in the region.

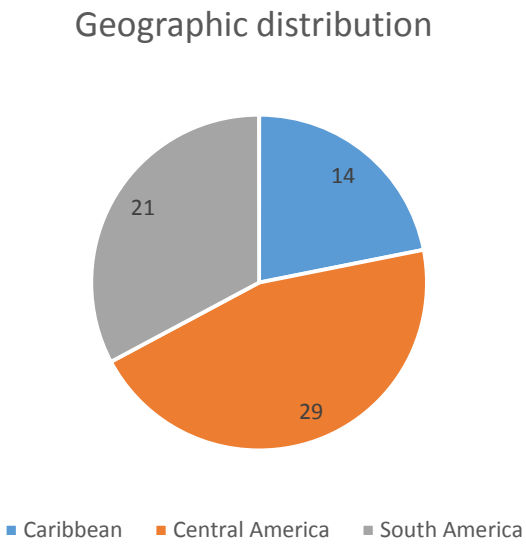
Virtual survey and interviews

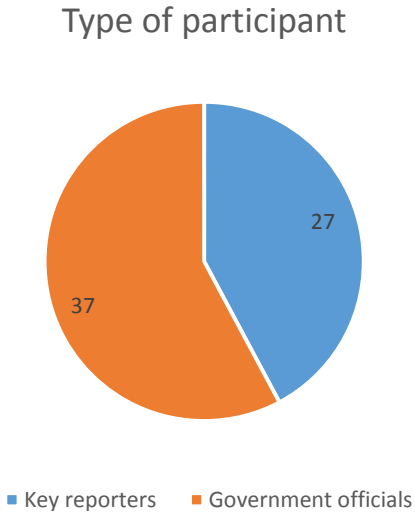
The voluntary and anonymous survey was structured based on six blocks. The first one approached the general identification of the threats to the agriculture and FSN sector and the general national capacities to manage them; the 4 following blocks made reference to each of the four priorities of Sendai; and the last block, dealt with elements of regional scope. It was distributed to:

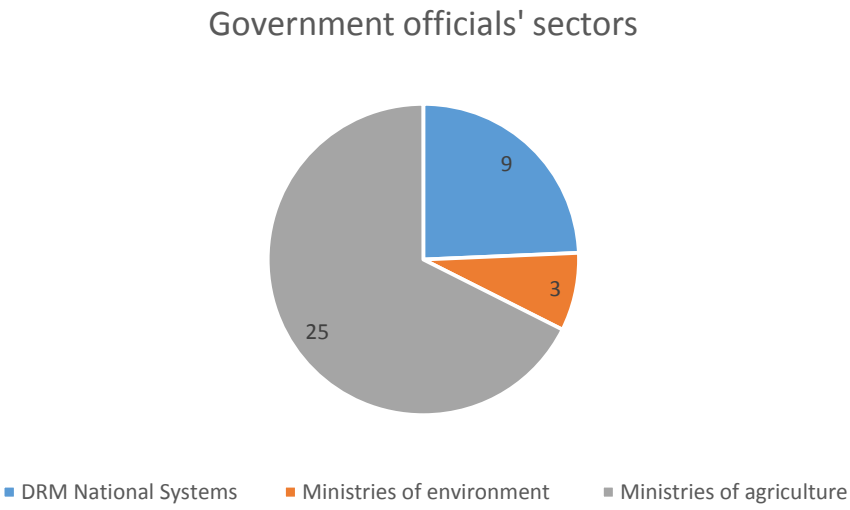
- The focal points of the Sendai Framework and/or national representatives of the DRM National Systems from countries in the region, and was channelled through UNISDR.
- Officials in charge of DRM from the Ministries of Agriculture and/or of the Environment from the countries in the region. In this case, the survey was channelled through FAO field offices.
- National focal points of the Technical Group on Integral Risk Management (IRM) and Climate Change of the Central America Agriculture Council (CAC).
- The national focal points of the FAO project for the strengthening of the national systems for agriculture and for food security and nutrition within the framework of the Southern Cone Agriculture Council (CAS).
- Officials representatives of Caribbean countries attending the regional workshop for the framing of the Caribbean Livelihood Resilience Program of the Caribbean Disaster Emergency Management Agency (CDEMA) and FAO.
- Key reporters: professionals from non-governmental institutions that work on DRM in the agriculture and FSN sector (FAO, IICA, WFP, etc.).

Likewise, individual interviews were carried out with key selected reporters (particularly with representatives from intergovernmental organizations and United Nations agencies).

The structure of the answers received for the online survey in regards to the subregion and sector is detailed as follows:







The survey was sent to approximately 100 persons and a good participation level was achieved, with a total of 64 responses. This allowed identifying a series of trends and general conclusions detailed here according to the six blocks mentioned.

Side event on the Agriculture and FSN Sector - Meeting of Ministers and High-Level Authorities on the Implementation of the Sendai Framework for DRR 2015-2030 in the Americas

Within the framework of the "First Meeting of Ministers and High-Level Authorities on the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in the Americas", held on June 8 and 9, 2016, in Asuncion, FAO and UNISDR sponsored a side event in order to discuss the main challenges and opportunities for the application of the Sendai Framework for Disaster Risk Reduction 2015-2030 in the agriculture, livestock, forestry, fisheries and aquaculture sector for food security and nutrition in the LAC region.

The event took place on June 9, with the attendance of more than 40 persons. The group was comprised of representatives from governments, intergovernmental organizations, donors, United Nations agencies, and civil society representatives.

The main challenges and opportunities for the implementation of the Sendai Framework in the Agriculture and FSN sector were discussed during the side event[39], based on the presentation of highlighted cases of the inclusion of disaster risk reduction and management within the framework of the corresponding ministries of Guatemala, Guyana, Paraguay and Peru, to illustrate the realities of the different subregions that comprise LAC, respectively Central America, the Caribbean, the Southern Cone and the Andean Region[40].

Likewise, the Technical Group on Climate Change and Integrated Risk Management of CAC made a presentation to explore the work dimensions from a regional point of view.

Through the different presentations and discussions held with the participants, the four action priorities of the Sendai Framework were approached, and the lines of action that are being mostly implemented were noted, with much emphasis in the agriculture sector. Likewise, other areas were identified which, despite their great relevance, have not yet achieved a consistent approach.

Further information regarding the side event can be found at:

http://eird.org/ran-sendai-2016/evento-paralelo.html

39 The agricultural sector will be considered throughout this document in its most extensive sense, including the agriculture, livestock, forestry, fisheries and aquaculture subsectors.

40 Presentations can be found at http://eird.org/ran-sendai-2016/evento-paralelo.html

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