



Food and Agriculture Organization
of the United Nations

Building resilience to natural hazards and climate-related disasters in the Caribbean

Webinar - 26 June 2018

SUMMARY POINTS, QUESTIONS AND ANSWERS



Speakers:

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Moderator:

Sylvie Wabbes, Emergency and Rehabilitation Officer, FAO

Background

This is the fourth webinar on [disaster risk reduction and management](#) was presented as part of a series of webinars organized by **KORE** - the Knowledge sharing platform on resilience- within the INFORMED programme and dedicated to sharing knowledge on resilience building.

Rationale

While another active and likely severe hurricane season is approaching, different countries in the Latin America and Caribbean (LAC) region, particularly in the Caribbean, continue to slowly recover from the impacts caused by the catastrophic Irma and Maria events of last year.

At the same time, more countries remain highly exposed to natural disasters – of different nature – whose frequency and severity is worsened by the effect of climate change and the limited application of measures for Disaster Risk Reduction (DRR) in the region.

According to the results of Post-Disaster Needs Assessments (PDNAs) conducted in Dominica and Antigua and Barbuda, the overall amount of damage and losses that occurred in the agriculture sector and sub-sectors (crops, livestock, fisheries and forestry) in these two countries, after the last hurricane season, are: USD 211 million and USD 0.5 million respectively. These figures show how severely natural disasters can affect the economy and food security and nutrition of countries and people largely relying on the agriculture sector and sub-sectors.

Introduction

It is increasingly acknowledged that investing in preparedness and early action contributes to saving lives and livelihoods, and lowering the costs of humanitarian response. Early action consists of activities that can be implemented before anticipated hazards to mitigate and to prepare to respond to their impacts. Acting early in the face of the upcoming hurricane season has the potential to significantly reduce the impact on agricultural livelihoods. Additionally, studies continue to show that for every USD 1 invested in preparedness, USD 3-5 are saved in response and that on average one preparedness activity can save up to one week of response time. However, investments in early actions and preparedness are still very limited and the tendency is to continue spending billions of dollars on responses to humanitarian emergencies without successfully preparing for these or mitigating/preventing their impact.

Summary points

1. Overview of the effects of natural disaster in LAC

Presented by Daniele Barelli, Subregional Emergency Focal Point and DRR Specialist, FAO

This presentation provided a general overview of the impact caused by natural hazards related disasters on the agricultural sector in the Caribbean and Small Island Developing States (SIDS) using the findings of a recent FAO study called: The impact of disaster and crises on agriculture and food security 2017. The study found that in between 2005 and 2015 about USD 22 billion were lost in Latin America and Caribbean and that most of these losses were attributed to storm/hurricane (92 percent) followed by floods (6 percent) and other hazards such as pest and disease and earthquake, especially in SIDS. The presentation also showed that in SIDS countries, a total population of 440 000 people (18 percent) of the total population was affected by natural disasters with equivalent damage and loss of USD 50 million, representing 19 percent of agriculture value added. The presentation also highlighted the impact of hurricane season 2017 on agriculture sector in the Caribbean. According to the results of the PDNA conducted in Antigua and Barbuda and Dominica, the total damage and loss experienced by these two countries - in the agriculture sector - are equivalent to USD 0.5 million and USD 212 million, respectively. Finally, a short forecast of the upcoming hurricane season was presented indicating that a below average season is expected, with an expected total of 10-16 storms, 5-9 hurricane and 1-4 major hurricane according to the National Hurricane Center (NOAA) and the World Meteorological Organization. The season will therefore look less active than the previous one.

2. Preparedness in the frame of FAO resilience work

Presented by Sylvie Wabbes, Emergency and Rehabilitation Officer, FAO

This presentation provided an overview of FAO's resilience strategy. FAO defines resilience as "The ability to prevent disasters and crises as well as to anticipate, absorb, accommodate or recover and adapt from them in a timely, efficient and sustainable manner. This includes protecting, restoring and improving food and agricultural systems under threats that impact agriculture, food and nutrition security, and food safety (and related public health)."

Therefore, enhancing resilience is a key element for the overall achievement of the 2030 Agenda for the Sustainable Development Goals (SDGs), informed by the following global dialogues; climate change governed by the United Nations Framework Convention on Climate Change (UNFCCC) and the 2015 Paris Agreement, DRR framed by the Sendai Framework on Disaster Risk Reduction, discussions on the humanitarian-development nexus and resilience building

broadly addressed in the 2016 World Humanitarian Summit, the Global Health Security Agenda and the Prevention Agenda for Sustaining Peace.

In FAO, resilience work is guided by three questions:

- i. **Resilience of whom?** The 2.5 billion smallholders worldwide who rely on renewable natural resources for their livelihoods, income, food and wellbeing (farmers, herders, fishers and forest-dependent communities).
- ii. **Resilience of what?** The agricultural livelihood and food systems, including individual small-scale farmers, herders, fishers and forest-dependent communities, institutions and the agro-ecosystems, and related food value chain.
- iii. **Resilience to what?** Three types of man-made and natural hazards related disasters or crises affecting the agricultural livelihoods of smallholders.

Working on addressing natural hazards, food chain crises and conflict and protracted crises.

FAO's resilience framework is built around four priorities of interventions (please see picture below), in line with Sendai Framework for Disaster Risk Reduction.



Figure 1. FAO's resilience framework

Resilience is not done through one type of intervention, but through a series of interventions that complement one another, across the four priorities of work, therefore, also including risk governance and vulnerability reduction measures.

There are a set of preparatory elements, such as the risk profile and risk baseline data for understanding the risks and understanding the types of livelihoods that are more at risk, to inform the work FAO does on resilience building.

The focus of the webinar is on emergency preparedness, early warning early actions and post disaster impact and needs assessments which fall under the priorities on "Monitor crisis and disaster risk with early warning" and "Prepare for and respond to crises and disasters".

3. Emergency Preparedness

Presented by Laura Tiberi, Liaison and Operations Officer, FAO

This presentation introduced us to emergency preparedness for the agriculture sector. The agriculture sector absorbs 26 percent of all damage and loss due to climate related disasters. In a situation (but not only) where such events are also quite predictable, it makes economic sense to invest in preparing for such disasters. Every USD 1 spent in preparedness saves at least double that amount in response operations, as well as precious response time. Most importantly, effective preparedness lessens the overall burden on human suffering and the loss of livelihoods. Yet, for various reasons, investment in preparedness is far too low. For every USD 100 spent on development, just 40 cents has gone into preparedness.

For a good level of preparedness, understanding disaster risk is fundamental, so that time and resources can be used to put in place effective and efficient preparedness mechanisms. It also allows to put in place monitoring mechanisms for the most context relevant hazards.

Understanding the risk environment is crucial to identify:

- i) agriculture sector preparedness interventions that are context-, sector- and hazard-specific
- ii) the capacities, knowledge and resources required to implement these interventions.

Understanding risk and preparing for it involves collaboration and coordination between local, sub-national, national, sub-regional and regional institutions (for example the Caribbean Disaster Emergency Management Agency, CDEMA) in addition to international partners and donors.

An important first step in scaling up emergency preparedness is mapping and assessing capacities and gaps of all stakeholders involved. This means looking at institutions' mandates, decision-making processes, coordination, staff and financial resources. Such processes will provide an analysis of the gaps and mechanisms that need strengthening, avoiding duplication of efforts. Some of these mechanisms are listed in the blue boxes in figure below (Figure 2: Scaling up emergency preparedness).

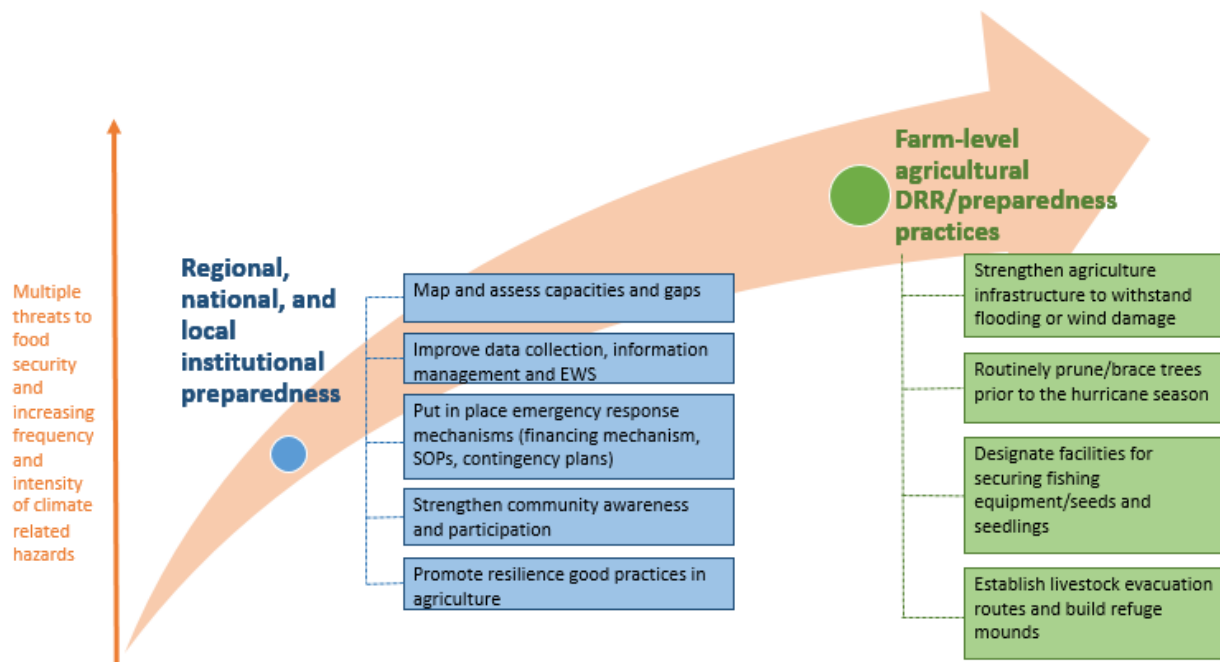


Figure 2. Scaling up emergency preparedness

There may be the need to foster interconnectivity and interoperability between and within different information management and early warning systems, remembering that such systems need themselves to be resilient – in other words continue to function and be accessible during an emergency and also be cost-effective.

Another area that often needs strengthening is disaster response capacity. This may involve setting up (or better coordinating) finance mechanisms, standard operating procedures and threat specific contingency plans. Much of the loss of life in a disaster occurs in the first 24-48 hours hence maximizing the speed and efficiency of a response is critical. On average the time spent in preparing a contingency plan equals the time saved in responding. Information about previous responses should be built into such plans so that “lessons are learned”.

Education and awareness programmes are an important element in developing a culture of preparedness as is the promotion of resilience good practices in agriculture. Legislative, policy and institutional support coupled with effective communication is conducive to these practices being put in place at farm level.

A few practical examples for preparedness activities (eg: Securing infrastructure, Banana tree bracing, use of livestock refuge mounds) are explained during the webinar.

Importantly, a community may have in place good preparedness practices, which it has even successfully tested through disaster simulation exercises. Sometimes all that is needed is timely warning.

4. Early Warning Early Action (EWEA)

Presented by Niccolò Lombardi, Early Warning Early Action Specialist, FAO

This presentation introduced us to FAO’s Early Warning Early Action (EWEA) approach, and provided specific examples of how EWEA could be adopted in the Caribbean to anticipate, prevent and mitigate the impact of natural hazards on agricultural livelihoods.

FAO’s EWEA approach translates warnings into anticipatory actions to reduce the impact of specific disaster events. As shown in the figure below, the key prerequisite for EWEA is risk monitoring through early warning systems, which consolidate available forecasting information. Early warning systems can detect an increasing risk of disaster through the monitoring of a set of indicators. When a pre-determined risk threshold is exceeded, a trigger is issued for a specific disaster risk.

Early warning triggers lead to the release of funds for the implementation of early actions to safeguard agricultural livelihoods against the forecasted hazard.

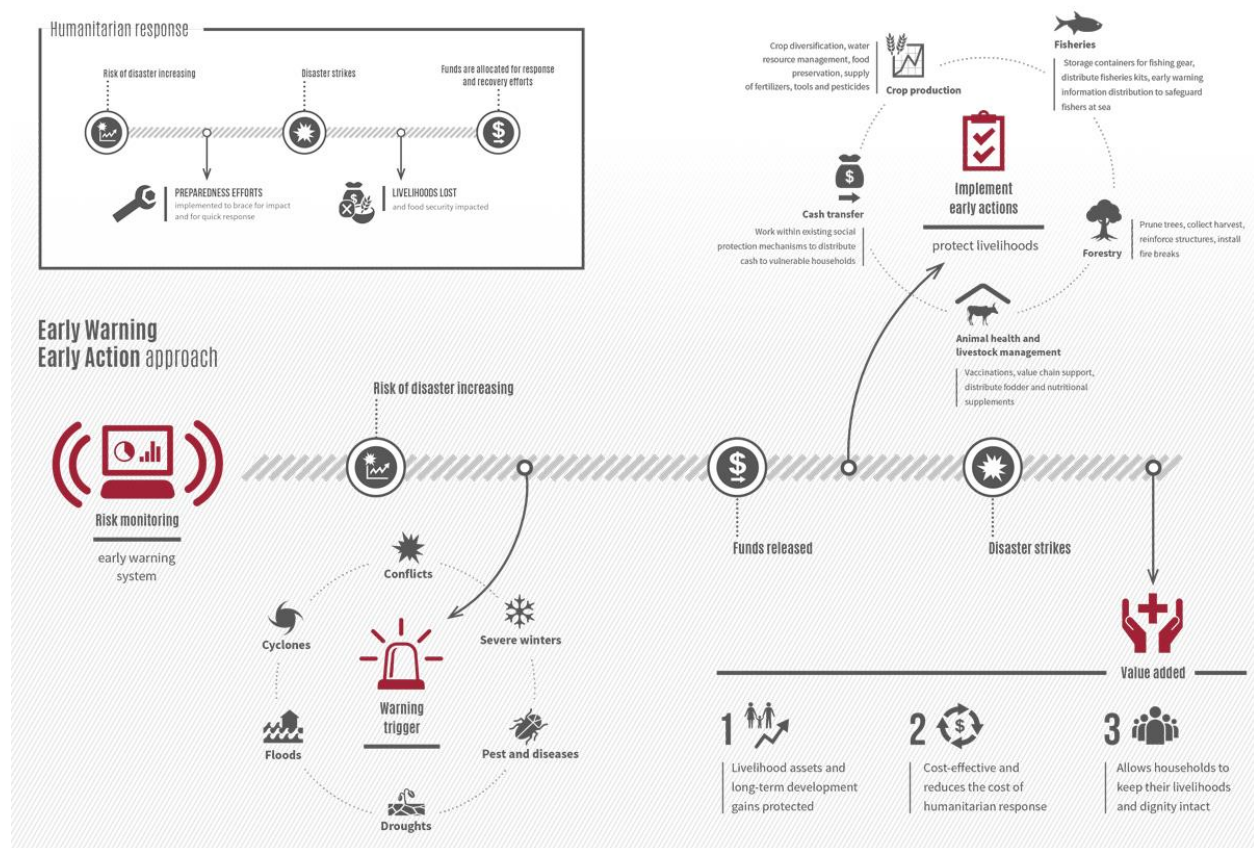


Figure 3. Schematic representation of FAO’s EWEA approach

Acting early before a disaster has actually happened or reached its peak is critical for three main reasons:

1. It can save lives and protect livelihoods from the immediate shocks, as well as protect longer term development gains.
2. It can reduce the cost of humanitarian response.
3. It allows households to keep not only their livelihoods but also their dignity intact.

Early actions are defined by the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and FAO as “activities that can be implemented before the imminent impact of an anticipated hazard to lessen the extent of its impacts”. Early actions are ‘triggered’ by a change in the risk level which is signaled through a specific early warning alert and early warning indicator thresholds. FAO implements early actions in a defined timeframe preceding a specific disaster event (anticipatory window) within which it is possible to lessen the impact of the event on agriculture based livelihoods.

There are several examples of synergies and complementarities between preparedness activities and early actions. Table 1 provides some examples of preparedness activities and early actions that can be implemented to prepare for, anticipate and mitigate the impact of hurricanes on agriculture. Importantly, the applicability of the listed actions would depend on country context and priority agricultural sectors, as well as on the specific hazard.

Table 1. Examples of preparedness activities and early actions relevant to hurricanes

Preparedness (before early warning trigger)	Early Action (after early warning trigger)
Communication and Planning	
Establishment of communication and outreach plans	Provide alerts (via text) to fishers or farmers working in remote locations
Community training on asset protection, including equipment and infrastructure (e.g. securing animal shelter roofs)	Asset protection upon early warning emission
Fisheries	
Pre-allocation and distribution of containers to keep fishing gear safe and solar-powered refrigerated storage facilities	Storage of fishing gear in safe havens
Designation of facilities for securing fishing equipment and gear	Moving boats and fishing gear to safe havens
Agriculture	
	Preservation of seeds and seedlings
	Pre-harvesting of staple crops
Food processing and preservation practices	
Pre-positioning of tools and clearing equipment	

Selection and agreement on storage facilities (in case of flooding these should be about 1.5 m of height)	Transportation of tools, irrigation equipment, mobile garden beds, vertical farming, etc., to safe havens or crop silos
Triangular Bracing Mechanism for bananas	
Forestry	
Routine tree-canopy management	Pruning tree-canopy and harvesting fruits (e.g. coconuts, papayas)
Livestock (poultry, sheep, goats, bees)	
Selection and agreement on livestock evacuation sites and safe areas	Evacuation of livestock to pre-identified sites
Pre-positioning of feed, health treatments, milk stabilizers and diesel plants to ensure continuity of milking at dairy farms	Distribution of tools for continued milking after the hurricane
Cash and Vouchers	
Develop capacity of staff to use cash and vouchers, assess and monitor market functioning, map and assess the capacity of potential service providers	Cash transfers (via Social Protection systems) alongside a messaging system of 'best-practices' on how to protect livelihoods with a forthcoming hurricane early warning

The release of cash transfers before the occurrence of a forecasted hurricane, for instance, could allow fishers to cover the cost of safeguarding their equipment (including boats) inland, possibly following information advisories issued by designated authorities such as the Ministry of Agriculture or the National Disaster Management Authority.

Another example of early action is the reinforcement of banks and built barriers following an early warning trigger on upcoming floods (which are often a harmful secondary effect of hurricanes). By doing so, FAO Somalia was able to save 9 000 ha of farmland from the impact of forecasted heavy rainfall driven by El Niño. Avoided crop losses corresponded to over USD 6.7 million in maize production, about 4 times the initial investment.

Timing is particularly critical for early action. The figure below is an example of an early action timeline for the hurricane season in the Caribbean.

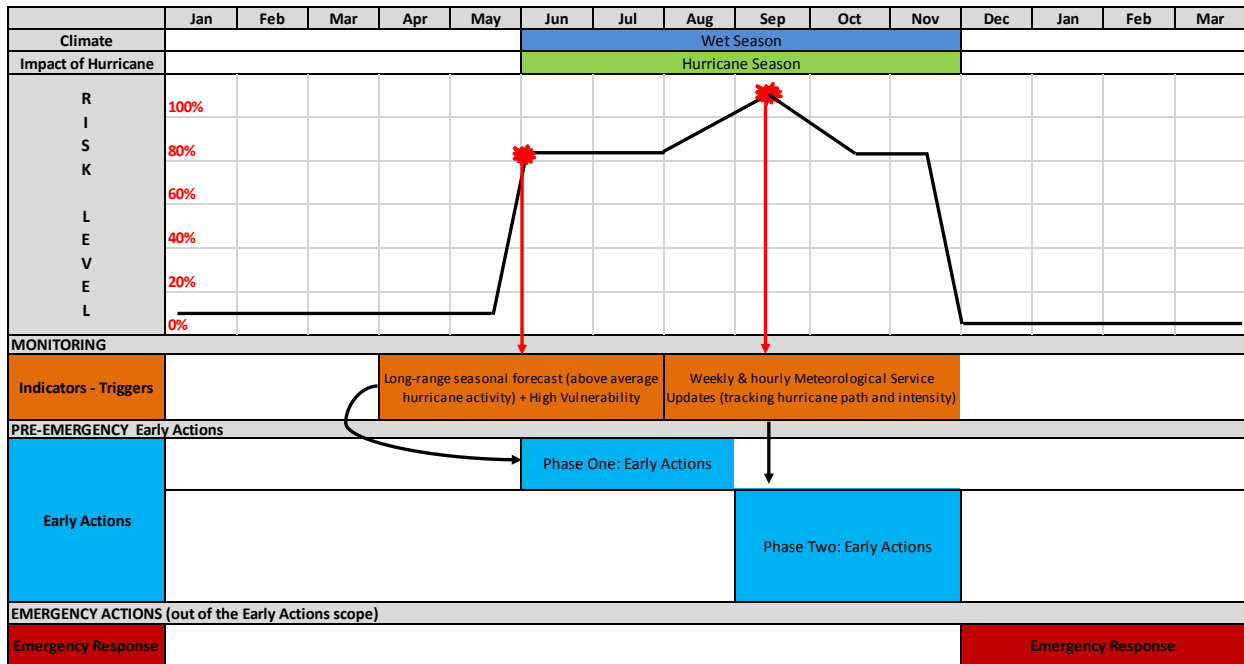


Figure 4. Example of Early Action timeline for the hurricane season in the Caribbean

Starting from the month of April, long-range seasonal forecasts on hurricane activity are closely monitored and layered with vulnerability indicators. The first early actions may be triggered already in June, when the risk level increases.

From August, when the risk level further increases, weekly and hourly meteorological service updates are closely monitored, including the tracking of hurricane path and intensity. If thresholds are exceeded, specific early actions may be implemented to mitigate the impact of hurricanes on agricultural livelihoods in the area where the hurricane is expected to hit, targeting the most vulnerable communities.

After the hurricane hits, emergency response starts. Importantly, the emergency response phase should be guided by post disaster needs assessments and damage and loss assessments.

5. Needs Assessment

Presented by Oriane Turot, Emergency Food Security and Agriculture Assessment Specialist, FAO

This presentation presented the phased approach for post-disaster impact and needs assessments. Following the previous presentation, after an early warning has been launched and early actions have been implemented, if the disaster does strike, like for example a hurricane, the first thing to do is to assess the impact and related needs of affected people in order to inform response. FAO has developed a phased approach for post disaster needs assessments for sudden onset disasters, along five phases, as per Figure 5 below. The timeline is indicative, and not all types of assessments have to be conducted, depending on the context and type of disaster.

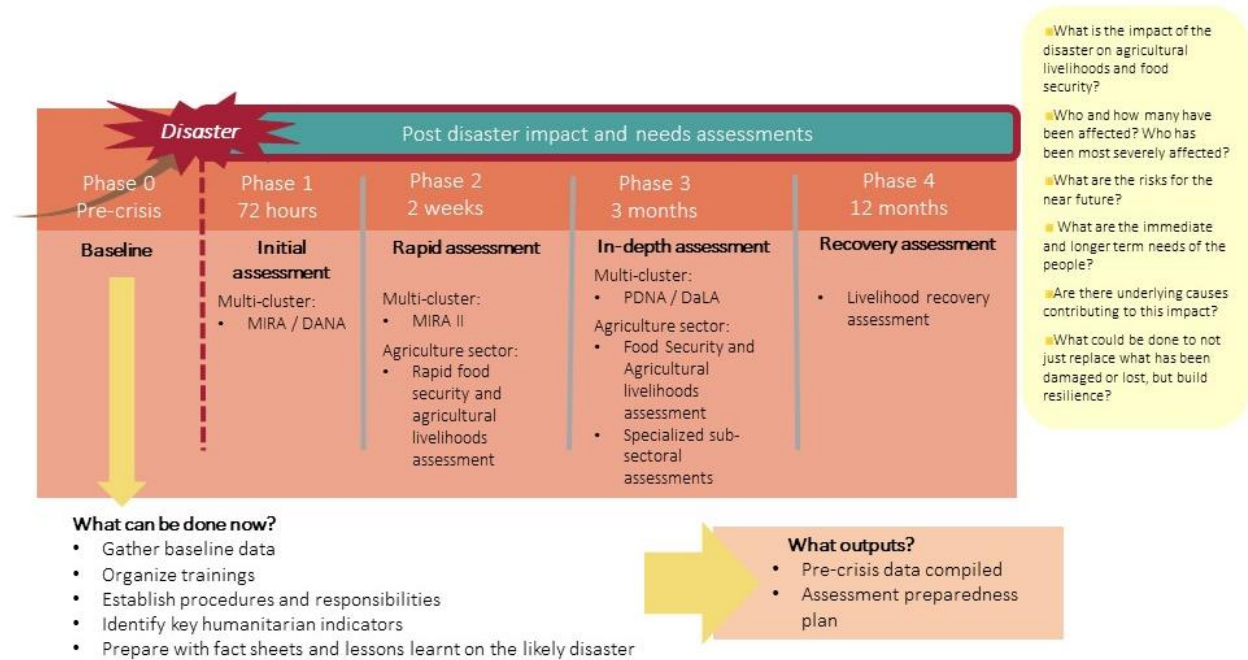


Figure 5. Needs assessments: Post-disaster impact and needs assessments

- **Phase 0: Pre-crisis:** Develop a preparedness plan, collect baseline data.
- **Phase 1: Initial assessment:** Situation analysis focusing on the extent of the damage and severity of the crisis. Short process relying mostly on secondary and mostly qualitative data.
- **Phase 2: Rapid assessment:** Collection of primary data but mostly qualitative data through field visits, focus group discussions (FGD) and/or key informant interviews (KII)

to identify population affected, priority needs and likely evolution of the crisis. The Multi-Cluster-Sector Initial Rapid Assessment (MIRA) is a well know methodology for multi-sector rapid assessment, can be complementary of sector-specific rapid assessments, usually conducted by the Food Security Cluster (FSC) where it is activated.

- **Phase 3: In-depth assessment:** First assessment with collection of primary quantitative data, usually through household interviews based on a sample design to give a statistically representative picture of the effects of the disaster on livelihoods and assets, coping capacity and needs for the medium and longer terms. Joint assessment on food security and agricultural livelihoods can be conducted under the FSC umbrella. Specialized assessments can be conducted focusing on different agriculture sub-sectors depending on the situation: on crops, livestock, fisheries, forestry, seed security etc. At that stage we get the information to address the questions in the yellow box on the right.
- **Phase 4: Recovery assessment:** Assess recovery of affected populations, effectiveness of interventions, remaining or new issues, adjust and prioritize subsequent interventions. For the agriculture sector, FAO has developed the Livelihood Recovery Appraisal (LRA) tool.

These are the four phases following a sudden onset disaster, however it is important to remember that post-disaster impact and needs assessments are not stand-alone, but fit within a broader information system, as per Figure 6 below.

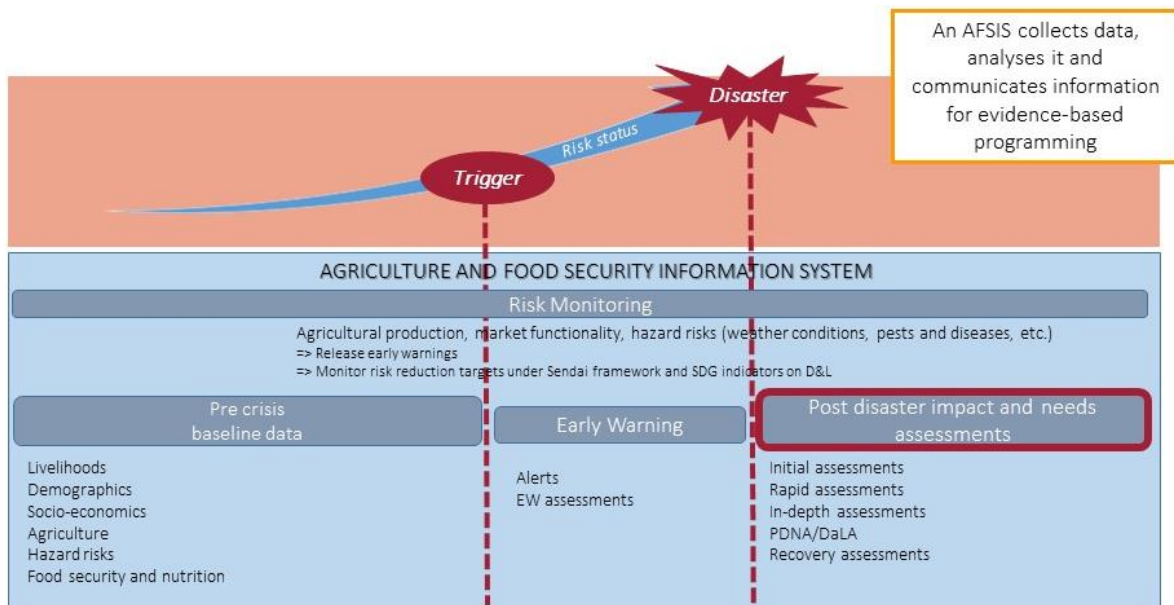


Figure 6. Needs assessments: Within an agriculture and food security information system

Baseline data is crucial to be able to measure the impact of a disaster. Baseline data for the agriculture sector includes some datasets specific to agriculture, but not only:

- Agricultural baseline (agricultural census, agro-ecological zones, seasonal calendar)
- Livelihood baseline (livelihood profiles)
- Food security and nutrition baseline (Demographic and Health Survey [DHS], Comprehensive Food Security and Vulnerability Analysis [CFSVA])
- Risk profile to different hazards
- Demographic statistics (census data)
- Socio-economic baseline (Household Economy Analysis [HEA], poverty, household budget, vulnerability profiles)

Risk monitoring includes early warning systems monitoring the risk of a disaster occurring, but also the monitoring of DRR, in particular against the targets set by the Sendai Framework for DRR and the 2030 Sustainable Development Agenda. FAO has been working with the Commonwealth of Dominica and developed a methodology for calculation of damages of losses, to be used both for post-disaster assessments and for monitoring against Sendai Framework and SDGs.

Integrated information systems ensure a good coordination to avoid wastes of time and resources, guarantees the quality of the data and provides clear messages. They require an investment around three pillars:

- Technical: Methodologies for data collection, data management, use of technologies including remote sensing
- Human resources: People with skills for data collection and management, analysis, and communication
- Institutional: Good coordination, clear responsibilities and processes, funding secured, and integration within programming cycle

When we think of Post disaster needs however, we tend to think short term. How can needs assessment contribute to building resilience?

First, by **informing resilience interventions**. FAO through its strategic programme to increase resilience of livelihoods to threats and crises adopts a livelihoods approach and puts the resilience at the core of its interventions in post disaster and crisis situations. It advocates in particular that post-disaster damage and loss assessment need to look at the impact on people's lives and livelihoods and not only macroeconomic level.

The **Building Back Better (BBB)** approach, which is used in particular in PDNAs, also ensures that we do not just take things back to the way they were before the disaster. BBB includes replacing destroyed assets with more performant ones, but also making strategic changes and adjustments to increase resilience, including climate resilience.

Finally, like with all information, the most crucial step is the linking with decision-making. There is a need to have a strategic planning process of disaster response and recovery, including DRR for resilient and sustainable development. One good example of such process is the Disaster Recovery Framework (DRF) that is developed after the PDNA. But even in the absence of a formal PDNA and DRF exercises, some type of strategic response analysis and strategic planning process needs to take place as an ongoing process, allowing to bridge over disasters, especially in contexts of frequent disasters.

Questions and answers

- 1. Is there any economic study in the Caribbean that has measured the economic cost of agricultural loss due to crop pest and animal diseases?**

The most up-to-date information on this can be found in the FAO study called [*The impact of disaster and crises on agriculture and food security 2017*](#)

- 2. The use of forecast information and vulnerability information in the EWEA approach seems very similar to the impact-based forecasting approach. Are you looking into this?**

There are clear synergies between the impact-based forecasting approach and the EWEA approach.

The main objective of impact-based forecasting approach is to improve early warning systems by strengthening the analysis of the expected impact of forecasted hazards on lives, assets and livelihoods, in order to better guide actions on the ground.

FAO's EWEA approach aims at consolidating and analysing early warning information on both the likelihood of hazards and their expected impacts on agricultural livelihoods and food security of the most vulnerable people. The timeliness and effectiveness of FAO's early actions largely depends on the quality of early warning systems and their capacity to direct action towards the potentially most affected people.

In this sense, FAO-EWEA works in close collaboration with other organizations, research institutes and relevant stakeholders involved in Impact-based Forecasting.

- 3. Is there any economic study in the Caribbean that has measured the effect of climate change on food security?**

The [*Food and nutrition security and the eradication of hunger CELAC 2025: Furthering discussion and regional cooperation*](#) study aims to provide the region's countries with up-to-date and timely information on the status of food and nutrition security; on the role in eradicating hunger played by the different areas such as agriculture, agrifood trade and natural resources management; and on the possibility of successfully addressing the twin burden of malnutrition, in a context where the effects of climate change could threaten the progress achieved in the LAC region thus far.

The CELAC plan for food and nutrition security and the eradication of hunger 2025 is a cross-cutting tool for achieving the SDGs of the 2030 Agenda for Sustainable Development; and it thus encourages the countries of LAC to redouble their efforts to identify key policy areas that will make it possible to speed up and consolidate the process of eradicating hunger and tackle the twin burden of malnutrition in the region, in which overweight and obesity are increasingly adding to that scourge.

4. All these assessments assume the Government has capacity and can cope in the aftermath of a disaster. In the Caribbean we focus mainly on the PDNA, while CDEMA use the DANA. Please elaborate.

Unfortunately not all countries/governments in the Caribbean have the capacity to cope with emergencies soon after disasters. This depends on the magnitude of the disaster, the structure in place to respond, etc.

Soon after the disaster (48/72 hours), CDEMA conduct Damage and Loss Assessment and Needs Assessment (DANA) with support from other partners including FAO. After 2/3 weeks after a major event requiring external assistance, PDNA/ Damage and Loss Assessment (DaLa) are conducted under the leadership of the Government.

While designing data collection systems it should be taken into account that authorities especially at local level may be affected by the disaster itself. Data collection systems have to be resilient in times of crisis as they may be put out of action by a hurricane or another disaster.

A lessons learned study by the World Meteorological Organization (WMO) on the [2017 Caribbean Hurricane Season](#) report that national meteorological services operational capabilities were compromised by the impact of the hurricanes and this rendered national early warning systems virtually inoperable. Key findings of this study indicate the need for greater investment in national meteorological services to strengthen their physical and communications infrastructure, data collection networks, human and technical capacity as well as interactions with the public.

5. Baseline information, particularly for agriculture, is generally lacking in the Caribbean. Support with methodologies, tools and expertise in collecting baseline data is needed. Could you please elaborate on FAO's work in collecting baseline data in the Caribbean and how other countries may benefit from lessons learned?

FAO has assisted different Caribbean countries in the past with the execution of agricultural census. However, most of these census are now outdated and a lot of discussion is currently taking place to update the Agricultural Census in 2020. FAO is also doing some diagnostic analysis on information system management related to damage and loss data. Dominica was the first island where the analysis took place and the report produced is currently being revised by the Ministry of Agriculture Fishery and Forestry (MoAFF). The preliminary results of the study show that there is not a systematic way of collecting damage and loss data and/or an institutionalized methodology for doing so. Most of the data are collected ad-hoc following a disaster with limited baseline information available.

Additionally, in the Caribbean various studies have indicated the need to promote record keeping at farm level. Presently this is generally happening only if farmers need to provide data for asking loans or credit. Almost 81% of farms in LAC are family farms. It is important

that farmers keep adequate record of land use and production, which will inter-alia help to accurately measure post-disaster production loss. Record keeping should be simple and resilient, not over cumbersome and unsustainable for a farmer to manage.

For more information

- [Disaster recovery frameworks](#)
- [FAO Phased Agricultural Livelihoods Needs Assessments](#)
- [The Impact of Disasters on Agriculture and Food Security](#)
- [The State of Food Security and Nutrition in the World. Building Climate Resilience for Food Security and Nutrition](#)
- [The Impact of disasters and crises on agriculture and food security](#)
- [Lessons Learnt from 2017 Caribbean Hurricane Season](#)
- [Post-Disaster Needs Assessment Hurricane Maria September 18, 2017](#)
- [Food and Nutrition Security and the Eradication of Hunger CELAC 2025: Furthering Discussion and Regional Cooperation](#)



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