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STRENGTHENING EARLY WARNING SYSTEMS IN THE CARIBBEAN

EARLY WARNING SYSTEMS NATIONAL ASSESSMENTS & ROADMAPS



PRIOR KNOWLEDGE
AND IDENTIFICATION
OF RISK



MONITORING AND
WARNING SYSTEMS



DISSEMINATION AND
COMMUNICATION



RESPONSE
CAPACITY





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STRENGTHENING EARLY WARNING SYSTEMS IN THE CARIBBEAN

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ACRONYMS

CARICOM » Caribbean Community

CDEMA » Caribbean Disaster Emergency Management Agency

CDM » Comprehensive Disaster Management

DIPECHO » Disaster Preparedness Program of the European Civil Protection and Humanitarian Aid Operations

DRR » Disaster Risk Reduction

EOC » Emergency Operations Centre

EU » European Union

EWS » Early Warning System

HIP » Humanitarian Implementation Plan

IFRC » International Federation of Red Cross and Red Crescent Societies

IN-MHEWS » International Network for Multi-Hazard Early Warning Systems

LAC » Latin America and the Caribbean

NEMO » National Emergency Management Organizations

NEPO » National Emergency Planning Organization

NODS » National Office of Disaster Services (Antigua and Barbuda)

ODM » Office of Disaster Management (Dominica)

SSC » South-South Cooperation

SVG » Saint Vincent and the Grenadines

TAC » Technical Advisory Committee

UNDP » United National Development Programme



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1. INTRODUCTION

The Caribbean region is highly prone to natural hazards such as hurricanes, floods, volcanic and seismic activities, droughts and forest fires. The increasing impact of global climate change and the risk posed by a range of natural, environmental and technological hazards are among the Caribbean's most critical development problems. The past decades have been marked by an intensification of the impact of disasters, such as destruction of livelihoods and communities, as well as a setback in development gains.

Due to the high levels of vulnerability, there is a broad recognition of the need to strengthen capacity for preparedness, response, and recovery, and integrate risk reduction measures into development paths to create safe, resilient and sustainable communities and states in the Caribbean. As one component to reducing risk, the Caribbean Comprehensive Disaster Management (CDM) Strategy 2014 – 2024 prioritizes integrated, improved and expanded community early warning systems.¹ This focus is reinforced by the Sendai Framework for Action which calls for enhanced disaster preparedness.² Likewise, UNDP's Strategic Plan 2018 – 2021 aims to strengthen resilience to crisis and shocks and support countries with assessments, planning tools and mechanisms so that gender-sensitive and risk-informed prevention and preparedness solutions are available to limit the impact of natural hazards.³ Reducing risk and building resilience is a theme that cuts across the Sustainable Development Goals.

As identified in the ECHO Humanitarian Implementation Plan (HIP) 2017, preparation and response capacities in the Caribbean have improved. However, the need for further action to address preparedness capacities, reinforce Early Warning Systems (EWS) and foster exchanges between countries and linkages with regional institutions is crucial. The HIP specifically highlighted that “collaboration between countries on Early Warning Systems to exchange on good practices should be fostered” and stressed that the “compilation of DRR tools and processes endorsed

1. Priority Area 4, Outcome 3, Regional CDM Strategy 2014 – 2024 <https://www.cdema.org/cdm>

2. Priority Area 4, Sendai Framework for Disaster Risk Reduction 2015 – 2030. <https://www.unisdr.org/we/coordinate/sendai-framework>

3. Outcome 3, Signature Solution 6, UNDP Strategic Plan 2018 – 2021 <https://strategicplan.undp.org/>



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at national and regional level, led by national systems in coordination with the CDEMA, EU Delegations and other development actors” are priority areas for action.

Thus, Antigua and Barbuda, Dominica, Dominican Republic, Saint Lucia and Saint Vincent and the Grenadines (SVG) set out to improve their Early Warning Systems (EWS) through an 18-month project financed by European Civil Protection and Humanitarian Aid Operations (ECHO). The “*Strengthen Integrated Early Warning Systems for more effective disaster risk reduction in the Caribbean through knowledge and tool transfer*” project sought to strengthen EWS components and close priority gaps at a national level, contributing to the integration of national and community EWS, and addressing sustainability and national ownership of EWS.

The country level actions were supported by UNDP, International Federation of the Red Cross and Red Crescent Societies (IFRC), and the Caribbean Disaster Emergency Management Agency (CDEMA), who embraced a partnership approach and helped reinforce the efforts to realize a more integrated EWS and enhance disaster risk reduction at the national and community level.

The project also aimed to increase access to tools and knowledge of EWS at a national and regional level, through development of, improvement to, and translation of models, methodologies and toolkits. An emphasis was placed on ensuring knowledge transfer, documentation and communication. As part of this commitment, two key processes - EWS National Assessments and South-South Cooperation - and five country case studies have been systematized.

This document provides an overview of the results and lessons of the national assessment and planning processes to strengthen Early Warning Systems in each country. Five countries were supported in carrying out a national assessment to identify the gaps in their early warning systems. These assessments were guided by the **Multi-Hazard Early Warning System (MHEWS) Checklist** which contains the main components and actions to which national governments can refer when developing or evaluating early warning systems. Each target country produced a national **EWS Gap Report**, based on the assessments and analysed the findings to identify priority actions. The formulation of a national **EWS Roadmap** provides a blueprint for further improvement and investment in early warning systems and disaster risk reduction efforts.





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2. NATIONAL ASSESSMENTS & ROADMAPS

An early warning system (EWS) is understood as an “integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities, systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.”⁴ Increasing EWS availability and access to people is one of the seven global targets of the Sendai Framework for Disaster Risk Reduction 2015–2030: Target G aims to “substantially increase the availability of and access to multi hazard early warning systems and disaster risk information and assessments to the people by 2030”.

Thus, a people-centred multi-hazard early warning system empowers individuals and communities threatened by hazards to act with sufficient time and in an appropriate manner to reduce the possibility of personal injury and illness, loss of life and damage to property, assets and the environment. It is a fundamental part of the disaster risk reduction approach and plays a recognized role in the Sustainable Development Goals (SDG). Sendai Target G on early warning systems and disaster risk management complements SDG 13 on addressing climate change.

Prior to the 2000’s, there was no systematic or clear framework to guide the Caribbean region in assessing its early warning systems. In 2003, the first attempt to analyse the status of EWS and delineate key principles and standards was undertaken, resulting in the *Early Warning Systems in the Caribbean: A Desk Review* report for the Second International Conference on Early Warning in Bonn.

In line with those efforts, the first Early Warning Checklist was produced as a key outcome of the Third International Conference on Early Warning: From Concept to

4. United Nations. 2016. *Report of the Open-ended Intergovernmental Expert Working Group on Indicators and Terminology Related to Disaster Risk Reduction* (OIEWG) (A/71/644), adopted by the General Assembly on 2 February 2017 (A/RES/71/276)



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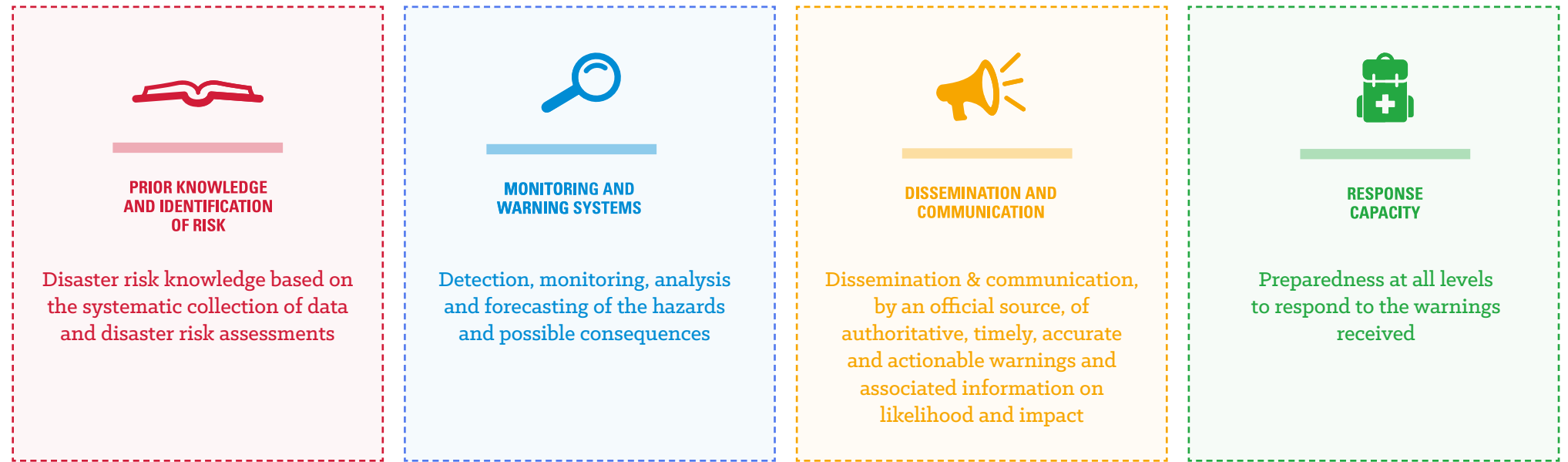
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FIGURE 1: THE FOUR PILLARS OF EARLY WARNING SYSTEMS



Action, held in 2006. Its objective was to provide countries with a practical guide that outlined standards, actions and initiatives to be considered when developing or assessing early warning systems.

This tool was revised by the International Network for Multi-Hazard Early Warning Systems (IN-MHEWS) partners during the Multi-hazard Early Warning Conference in Mexico in 2017, to incorporate a multi-hazard perspective⁵ and reflect the Sendai Framework for Disaster Risk Reduction 2015-2030. Several cross-cutting issues that were considered critical to the development and sustainability of effective early warning systems were also integrated, including effective governance and institutional arrangements, involvement of local communities, gender, age and disability, and cultural diversity.

In 2018, within the framework of the *Strengthen integrated early warning systems for more effective disaster risk reduction in the Caribbean through knowledge and tool transfer* project, the Checklist underwent another process of adjustment led by CARICOM’s Caribbean Disaster Emergency Management Agency (CDEMA); this included a review by members states of the Technical Advisory Committee (TAC), subsequent endorsement of the Checklist in the 9th TAC Meeting in April of 2018 in Barbados, and the recommendation for its implementation elevated to the CDEMA Council of Ministers. The Checklist also received feedback from the United Nations Development Programme (UNDP), the International Federation of the Red Cross and the Red Crescent Societies (IFRC), the Cuban Multidisciplinary EWS team, and the focal points from the Dominican Republic’s Centre for Emergency Operations (COE), as partners and stakeholders in the project.

5. World Meteorological Organization. 2018. Multi-Hazard Early Warning Systems: A Checklist.



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2.1 MHEWS Checklist

Based on these revisions, the [Multi-Hazard Early Warning System Checklist](#) is structured with the following components:

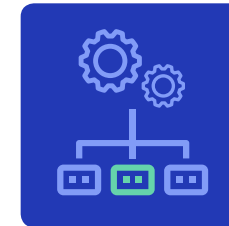
- It conceptualizes early warning systems and the four pillars of an efficient, people-centred early warning system;
- It contains an individual checklist for each pillar with guiding questions and a series of standards, end points or key actions that would need to be assessed and/or put in place to build a robust EWS;
- Each standard or endpoint has four possible attainment levels that can be assigned by the respondents of the checklist – minimal, moderate, major or complete, with a definition of each of those levels – providing metrics against which to measure progress;
- Each standard or endpoint has a column for sources of verification to be included, where the supporting or related documentation can be indicated or listed, and ideally sent in with the answered checklist. The purpose is to provide evidence related to the level of attainment perceived by the respondent;
- The inclusion of gender considerations across the four pillars of the checklist has been further strengthened, as well as minimal amendments of language to improve the clarity of the Checklist;
- It contains a description of key actors that are involved in EWS, including their roles and responsibilities, as well as a list of key actors specific to each EWS pillar. This also serves as a guide to select the relevant actors to invite for the completion of each checklist and the assessment process.

The lessons learned from the application of the Checklist in five countries will provide input into the tool and improve its use by CDEMA and participating states in the Caribbean.

2.2 MHEWS Gap Assessment

Five countries in the Caribbean region tested the MHEWS Checklist. Antigua and Barbuda, Dominica, Dominican Republic, St. Lucia, and Saint Vincent and the Grenadines applied the tool, conducted a national assessment process to identify gaps in their early warning systems, and produced a national [EWS Gap Report](#).

Though there were some variations in each country, the general process of carrying out a national EWS assessment and report followed the following general steps and methods:



Step 1.
Preparation

To prepare for the process of assessing the EWS gaps in the country, the following steps and decision were taken:

Convener: To ensure full national ownership of the process and engagement of the actors, the coordinating disaster management authority in each country undertook the responsibility of leading the process. These were the National Office of Disaster Services (NODS) in Antigua and Barbuda, the Office of Disaster Management (ODM) in Dominica, the Centre for Emergency Operations (COE, Spanish acronym) in the Dominican Republic, and the National Emergency Management Organizations (NEMO) in both St. Lucia and Saint Vincent and the Grenadines. These are also the agencies participating in the Technical Advisory Committee (TAC), the technical and programmatic advisory arm of the CDEMA, who report annually to CDEMA under the Comprehensive Disaster Management (CDM) 2012-2024 Strategy and CDM Country Work Programmes. These institutions officially promoted the process in their countries and invited and engaged the other key national actors to bring them on board.



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Implementing Partner Support: Each country had a specific project implementing partner providing the lead national institution with direct support, guidance and follow-up for the MHEWS Gap Report and Roadmap process:

- Antigua and Barbuda was supported by the IFRC
- Dominica was supported by UNDP (Barbados and the Organization of the Eastern Caribbean States Multi-Country Office)
- Dominican Republic was supported by UNDP (Dominican Republic Country Office)
- St. Lucia was supported by CDEMA
- Saint Vincent & the Grenadines was supported by UNDP (Barbados and the Organization of the Eastern Caribbean States Multi-Country Office)
- Regional coordination was provided by UNDP (Regional Centre for Latin America & the Caribbean)

Dedicated Human Resource: In several cases, given the limited number of staff in the national disaster offices, a local disaster specialist was hired as a dedicated human resource to support the implementation of the process, particularly the processing and analysis of the data collected on EWS gaps. One full-time consultant was hired in Dominica, the Dominican Republic, Saint Lucia, and - to some extent - in Saint Vincent and the Grenadines. The consultant in Dominica was placed in the ODM to ensure full and constant coordination with the ODM team; the consultant in SVG was hired as permanent staff by NEMO during the process. Antigua and Barbuda primarily used its own staff (Director, Deputy and Communication's Officer at NODS); IFRC, who assisted in facilitating the consultation meetings and drafting the report, provided more direct, hands-on support.

Identification of Actors: Using the Checklist's guide of key actors for each pillar, the convening national agency carried out the identification of all specific and relevant actors to include in the assessment process. These primarily included the following:

- *Central Government Agencies:* disaster management authority; civil protection (fire departments, ambulance services); police departments; meteorological, seismological and geological services; health, education, environment, agriculture, planning, housing and urban works, energy and telecommunications, air and port authorities, water and sanitation management agencies, and in a few instances, local government departments;
- *District Disaster Coordinators:* the umbrella bodies through which Community Disaster Management Committees liaise between communities and the national disaster management authorities;
- *International and national NGOs' and entities:* such as the National Red Cross, Caritas, OXFAM, Plan International, Doctors of the World, and Adventist Development and Relief Agency, in addition to UNDP, CDEMA and IFRC;
- *Other stakeholder groups:* chambers of commerce, radio stations, councils for persons with disabilities, youth and for older persons, and newspapers, among others.





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Step 2. Checklist Application

Online Survey: The entire Checklist is comprised of 88 questions, divided into 4 separate shorter online surveys, one for each EWS pillar. Using the SurveyMonkey platform, each pillar survey was sent out by email to a specific sub-set of actors. The recipients were given between two to three weeks to answer. Most processes were carried out in April and May of 2018.

Convening institutions received the [MHEWS Checklist Guidance Document](#) to help them understand how to fill in the survey and orient other relevant agencies.

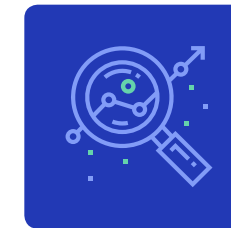
Launch – Presentation of the Survey: In some cases, an overview of the process and a presentation of the Checklist and the online surveys was provided in a meeting with key actors, as part of the launch and engagement of stakeholders. This allowed respondents to have a prior understanding of the purpose of the surveys, as well as agree on the deadlines to complete them.

Follow-up with Respondents: Considerable efforts were made by the convening institution to follow-up with each respondent to ensure the survey would be completed on time, to answer queries, and make clarifications. This included follow-up phone calls, emails and visits to each institution, and - in multiple instances - assisting the individual respondents with filling out the survey on the online platform or using the survey as an interview questionnaire so that the data could then be easily uploaded. Dominica, St. Lucia, and Saint Vincent and the Grenadines (SVG) made concerted follow-up efforts. This support helped determine the level of response achieved in each country.

Institutional Group Sessions: In some cases, institutions organized workshops and sessions with their entire staff or a specific department to fill out the survey together, to ensure an institutional perspective rather than an individual one, and to capture the information that each might only partially have (e.g. MET in

Dominica, Min. of Health and WRMA in St. Lucia, INDOTEL in Dominican Republic). This approach also served to eliminate doubts about what was being asked and helped create a common understanding among these groups.

Citing Sources: Although the survey asked respondents to assign a level of achievement to each question, with reference to the relevant policies, plans and other sources, most respondents did not include the verification sources. Many cited a lack of time, not knowing they had to, or not remembering if there was a section in the online format for them to do so, though most assured that they had consulted available sources in order to answer.



Step 3. Processing Data, Verification of Evidence & Additional Complementary Assessments

Compiling and Processing Data: In most cases, the compilation of the data from the surveys was done at regional level, since the implementing partner agencies had the access to the SurveyMonkey platform. This information was then sent to convening agencies and their consultants to process the data into preliminary findings for the subsequent National Validation Workshops.

Verification of Evidence & Complementary Assessments: Although this was not a step taken by all, some countries carried out additional verification of the evidence, consulting with different agencies to map existing legal frameworks, policies, plans, organizational mechanisms, and physical equipment and other assets, to check the answers against the evidence and to add more analysis to the Report. The National Consultation Workshops in those countries informed this step, allowing for evidence-based analysis and richer reports with more precise data and specific references to existing capacities and assets and their location, strengthening the measurability of the Gap Report. In some cases, additional assessment tools were applied. This was done both before and after the National Validation Workshops in Dominica, Dominican Republic, and St. Lucia.



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Examples of Additional Sections and Information in the Gap Reports		
DOMINICA	DOMINICAN REPUBLIC	ST. LUCIA
<ul style="list-style-type: none"> Disaster History Inventory EWS Capacities and Assets: <ul style="list-style-type: none"> National Emergency Planning Organization structures mandates & human resources DRR Document Inventory Alert Level Actions EWS Tools & Equipment Inventory Regional Early Warning Systems Support by type of Hazard Organizational Culture and Readiness Survey (additional questionnaire was applied) 	<ul style="list-style-type: none"> Disaster History Inventory (eliminated in final version) Mapping of Disaster Mechanisms and Structures Mapping of EWS Policy Documents, Protocols, Procedures and Studies 	<ul style="list-style-type: none"> Current status of EWS tables detailing locations and amount of equipment, range coverage and operational status, funds and specific existing policies and systems



Step 4.
Validation

All countries held a [National Validation Workshop](#) to review and validate the answers to the Checklist. This served to build a common consensus between actors on each of the gaps and their level of achievement, to review the information supporting the finding, and - in most cases - to start defining proposed actions to address these gaps for the Roadmap. The Workshops typically lasted between half a day or a full day, although a couple of countries had two workshops.

In all cases, the workshops assigned each actor to a working group relevant to their respective pillar. Some further divided working groups into types of hazard to achieve more precision. In at least one case, all participants worked on all four pillars, which contributed to a more holistic understanding of the entire early warning system.

These workshops were led by the convening national institution and facilitated with the support of the hired consultant and the implementing partner assigned to the country. At this stage, preliminary findings from the surveys were processed into presentations and matrixes to make the deliberations and work of the groups easier.

The Validation Workshops also helped address concerns about potential skewing of the identified gaps, given that some actors with no direct knowledge about a question or gap might have provided an inaccurate answer.

“I would encourage every country to do go through this process, because we are a disaster-prone region, we are highly vulnerable to a number of disasters, to a number of emergencies, and we can’t afford for any country in the regional system to lag behind.

Every country needs to have their gaps identified so they can work on them and have a Roadmap. It would help with synchronization as well. It would bring countries together when we find common areas of work, common weaknesses and collaborate on ways to solve of these issues. That would be really important in building resilience in the region.”

- Kenson Stoddard, Deputy Director of NEMO-SVG



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Step 5. Drafting Report

With the results of the validation, and additional research and data gathering on the disaster risk reduction context, countries formulated a **MHEWS Gap Report**. Countries were provided with a general outline of the report and presented the gaps found in all four pillars for their national early warning systems. Some reports went further and presented recommendations for the gaps found, as well as additional assessment and inventories.

The reports provided a point of reference for the development of the Roadmap and will serve as a baseline tool to measure the progress achieved in EWS, considering the CDEMA recommendation that the Checklist be applied once every three years together with the CDM Audit tool.

There are some differences in the way the gaps are presented in the reports. Attainment levels of the various components of EWS were rated as % of completion in two of the Gap Reports. Other reports used narrative and qualitative statements without citing one of the four attainment levels. Therefore, the metrics that were introduced to the Checklist were used mostly to gauge the perception of actors for each gap during the survey phase and guide the validation discussions but didn't always translate into the presentation of the findings in the Report. If the Gap Report was used as a measurable baseline, it is not clear which attainment level, percentage or another metric, it would be measured against.



TOOLBOX



- [MHEWS Checklist and Guidance Document](#)
- [EWS Organizational Culture complementary Survey](#)
- [Validation Workshop Concept Note & Methodological Agenda Example 1 & Example 2](#)
- [Roadmap Priority-Setting Exercise Example & Survey](#)
- [Country Gap Reports and Roadmaps](#)

2.3 MHEWS Roadmap

The findings of the gap assessment were then transformed into priority actions to address concrete gaps and to guide national and local efforts and investments, towards improving and strengthening integrated multi-hazard early warning systems, through the formulation of a national **MHEWS Roadmap**.



Step 6. Drafting Roadmap

In most cases, the proposed actions for the MHEWS Roadmap were a result of the National Validation Workshops, whereby a session was typically included to put forward solutions for the identified gaps. In Saint Lucia, Antigua and Barbuda, and the Dominican Republic, an additional session was added to inform stakeholders on the development of the Roadmap. In SVG, the Sustainability Dialogue on EWS was also used to gather inputs for the Roadmap. In Dominica, an ODM internal session produced a short-term improvement plan to outline these actions.

All Roadmaps contain:

- a) Actions linked to the identified priorities
- b) General Timeframe
- c) Responsible lead agency/supporting agencies for each action

The differences in the timeframe of the Roadmaps are noteworthy. Antigua and Barbuda, Dominican Republic, and Saint Vincent and the Grenadines have a three-year Roadmap timeframe, while the St. Lucia Roadmap timeframe is two years, and Dominica's timeframe is six months.



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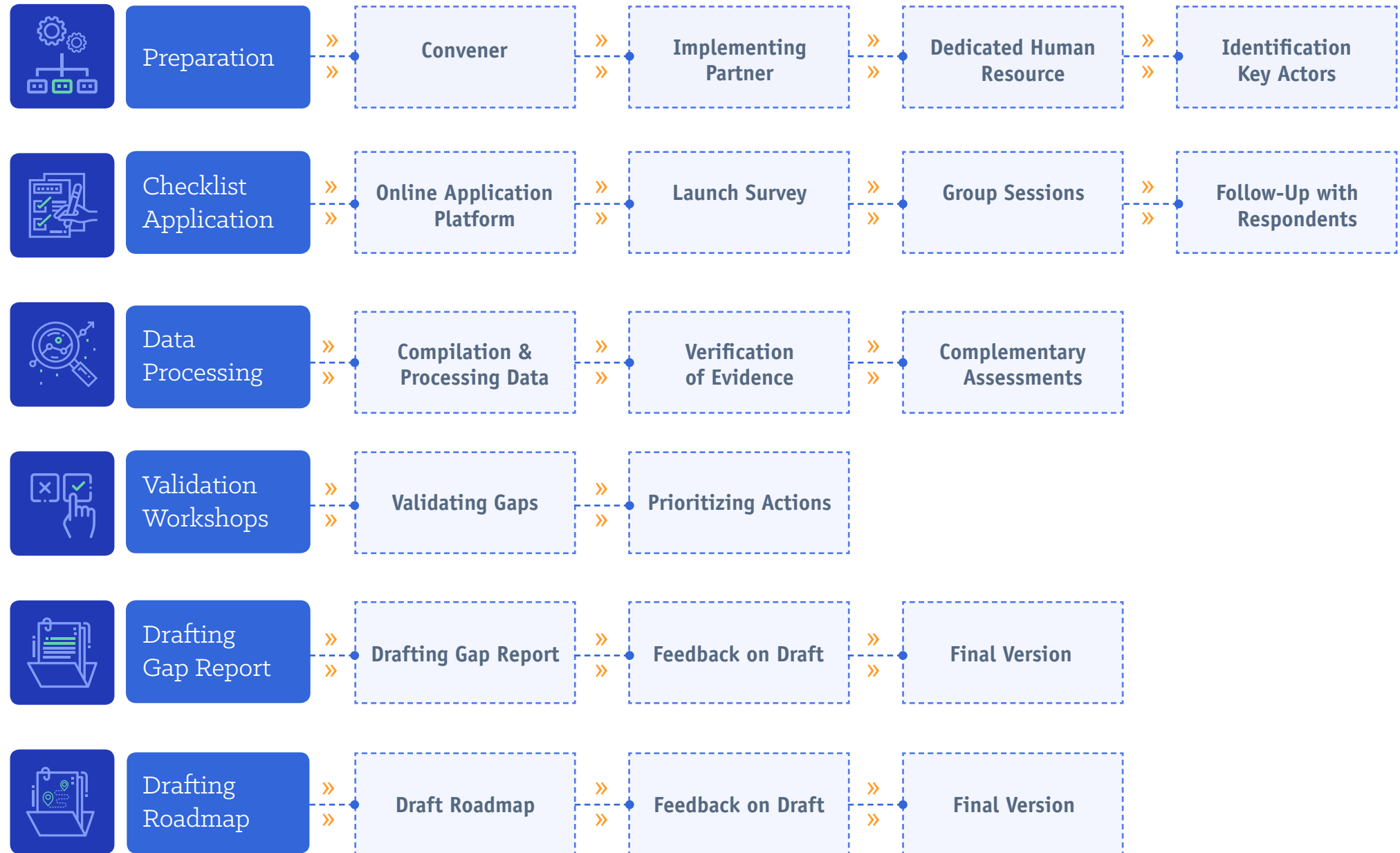
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FIGURE 2: SUMMARY OF THE GAP REPORT & ROADMAP PROCESS





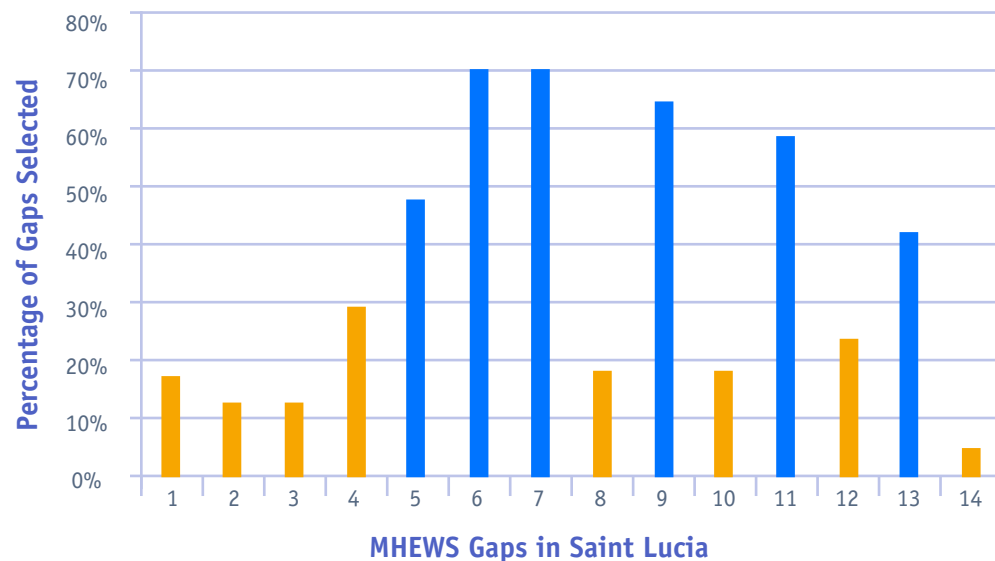
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Some of the Roadmaps are costed, specifically those by Antigua and Barbuda and the Saint Vincent and the Grenadines. Likewise, some of the Roadmaps propose indicators, although not always formulated with a quantifiable metrics, such as those of Dominican Republic and Antigua and Barbuda.













There was not a written guidance document for the Roadmap process, as was the case with the Checklist; a matrix format was shared with some of the countries, and others chose to adapt the process to their context, accounting for some of the differences observed in the Roadmaps. The time available to complete the process as well as the caution to commit to only feasible actions were other cited causes for the different types of Roadmaps formulated.

Although there was not a specific methodology to set priorities, at least two countries carried out an exercise to do so. The Dominican Republic used the Validation Workshop sessions to establish a level of priority for each gap which – in turn - informed the definition of actions to include in the Roadmap. St. Lucia, on the other hand, used an electronic excel survey asking the key actors to select the top five priority gaps of each pillar and assign a priority level to these five, which helped define the gaps/priority actions included in the Roadmap.

Priority Gaps: Warning, Dissemination & Communication



As a result of this process, five countries in the Caribbean now have a National Multi-Hazard Gap Report and a National Multi-Hazard Roadmap.

 <p>Multi-Hazard Gap Report</p>	<p>Antigua & Barbuda</p> 	<p>Dominica</p> 
<p>República Dominicana</p> 	<p>Saint Lucia</p> 	<p>St. Vincent & The Grenadines</p> 
 <p>Multi-Hazard Roadmap</p>	<p>Antigua & Barbuda</p> 	<p>Dominica</p> 
<p>República Dominicana</p> 	<p>Saint Lucia</p> 	<p>St. Vincent & The Grenadines</p> 

3. LESSONS LEARNED AND RECOMMENDATIONS



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LESSONS LEARNED	RECOMMENDATIONS
Launch and Coordination of the EWS Gap Assessment	
<p>The success of the entire process relied on the level of national ownership of the Gap Report. The role of the national disaster system coordinator was critical in terms of being the convener, leader and coordinator of the process, and ensuring awareness, involvement and support of the disaster coordinating structures in the country.</p> <p>Another key factor in the success of the process was having at least one full-time dedicated human resource to collect data, process it and conduct additional analysis to draft the Gap Report. Given the stretched human resources in national institutions, the task could prove overwhelming without an additional designated person.</p>	<p>A national MHEWS Gap Assessment process should include the following elements:</p> <p><i>Convener:</i> Confirm the role of the disaster system coordinating authority as convener and emit all official communications, invitations and documentation on the process to the EWS actors.</p> <p><i>Coordinating Committee:</i> The convener should identify, preferably among the already existing structures and committees of the disaster system, a committee who will have the responsibility to lead the process at decision-making level and define a brief work plan to carry out the process. The committee should designate a technical team to manage the process on a day-to-day basis.</p> <p><i>Technical Team:</i> Establish a multi-disciplinary technical team to carry out the process in full, including the data collection and in-depth analyses, the planning and priority setting and the consultation processes. The three ideal technical profiles would include:</p> <ul style="list-style-type: none"> • Expertise in EWS and disaster-related assessments and baseline studies • Expertise in results-based management and strategic planning • Expertise in multi-sector, multi-level participatory consultation processes <p><i>Sensitization of Decision-makers:</i> The instalment of the committees should include awareness sessions on the importance of EWS to the decision-makers, to ensure their future commitments on the solutions and priorities that the process generates.</p>
<p>A key factor for the success of the EWS gap assessment process was holding a launch and work session with national actors and stakeholders, where the entire process was explained, questions were discussed, and the desired end results were highlighted.</p>	<p><i>Launch Event:</i> Begin the process with a launch event inviting all key actors. It should be a launch not in protocolary sense, but as a workshop to explain:</p> <ul style="list-style-type: none"> • The Gap Report and Roadmap process and expected results as a whole • The stages (application of the Checklist, verification of evidence, validation and consultation, roadmap, etc.), the timeframe with milestones, and tools that will be used throughout the process • The Checklist with an overview and explanation of the questions • Information and documentation requirements <p><i>Concept Note with a Work Plan:</i> Prepare a concept note with work plan and schedule communicating the above-mentioned information and share it with all actors, so actors and institutions can prepare, organize themselves internally, and know what the deadlines and information requirements are for both the Gap Report and Roadmap.</p>



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LESSONS LEARNED	RECOMMENDATIONS
Awareness-Raising, Preparation and Training of Participants on EWS	
<p>The MHEWS Gap Report and Roadmap addressed several issues that have often been overlooked, such as gender-sensitive EWS, vulnerability and risk assessments of hazard-prone areas, hazard mapping at community level, the importance and usefulness of considering the local and specific knowledge of vulnerable groups, and the need for more investment in EWS from local governments.</p>	<p><i>Sensitization and Training Session:</i> Include the training and preparation of participants in the national assessment process. This allows participants to provide better and more precise inputs and allows countries to build a common language on the issues they are seeking to analyse and address. It is useful to hold a session at the beginning of the process that includes:</p> <ul style="list-style-type: none"> • The conceptual framework of EWS and the links between pillars; • The multi-hazard approach and the importance of incorporating other types of hazards (anthropogenic, epidemic, etc.); • Their link to CDEMA’s CDM Strategy, Sendai and the SGDs commitments; • The existing national legislation and disaster system organization related to EWS; • A closer examination of the Checklist questions and explanation of each; • The added value of exercise to promote greater engagement of participants.
<p>A key lesson from the MHEWS Gap report was that early warning cannot be so predominantly focused on hurricanes and hydro-meteorological hazards, without ensuring the appropriate attention is given to and systems are in place for other hazards.</p>	
<p>Exposure to the Checklist and subsequent involvement of stakeholders in the Validation Workshops contributed to educating the participants on EWS. The process itself served as a learning tool for most.</p>	
<p>During the validation discussions, actors gained a better understanding of the work and mandates that other agencies played in the system; in some cases, it allowed them to identify duplications or overlap in mandates.</p>	
<p>However, despite the process, there were actors that still didn’t completely perceive how the four EWS pillars were integrated and tended to focus more on the warnings/alert components and the emergency response phase.</p>	
Application of the Checklist	
<p>The Checklist provided a comprehensive set of the standards that countries need to aim for and can follow to strengthen their early warning systems across every pillar.</p>	<p><i>Mandatory Application:</i> Given the importance of the process, many suggested it should be mandatory for public agencies to fill out the application. In addition, they should provide periodic updates and send it to the NEMO/COE/NEPO/NODS committee that is set up to follow up EWS gaps and priority actions of the Roadmap</p>



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<p>There was a recurring perception that the Checklist questions were confusing and what was being asked wasn't understood by respondents, creating delays and difficulties in getting the surveys answered in sufficient numbers and within the timeframe. Some of the specific reasons included:</p> <ul style="list-style-type: none"> • Many questions were compound questions (i.e. asking about multiple separate elements), which made assigning one single level of attainment difficult. • Some questions were vague; it wasn't readily obvious what it referred to or what information needed to be checked to determine the attainment level. <p>This was significantly mitigated or solved when countries held face-to-face sessions to go over the questions and built a common understanding about each question.</p>	<p><i>Visual Aids for Guidance Document and Checklist:</i> Reinforce the Guidance Document with visual diagrams.</p> <p><i>Revise Compound Questions:</i> Revise the Checklist to eliminate compound questions.</p> <p><i>Timeframe:</i> Give adequate time to the application of the Checklist to allow more in-depth analysis, consultation and feedback.</p> <p><i>Follow-up Rounds:</i> Schedule follow-ups with those who haven't responded, offer assistance, and go over the Checklist with them if necessary.</p>
<p>There was a general reticence about using an online platform to complete the Checklist surveys. It was cited as one of the reasons for delay in the responses, in addition to the following.</p> <ul style="list-style-type: none"> • If the Checklist is only sent electronically without previous groundwork (such as a launch), respondents will be less inclined to answer. Its purpose was not understood; it was seen as another task to complete or another survey they will never get the results back on. • It was a cumbersome and long exercise to conduct, because it was available as an online individual survey. • Using the online platform reduced the discussion or socialization of the answers within the institution. • Not everyone was fully computer-literate and didn't feel comfortable using an online format. • The length of the surveys and poor internet connection caused some to lose the answers, obliging them to restart. This was problematic for those who had to answer more than one of the Pillar surveys due to the broad mandate of their institution. 	<p><i>Digital but not necessarily Online Checklist:</i> Use an easier, more open and manageable digital format (including word or pdf) instead of the online platform, to allow for sharing, group discussion, and adjustments. The final version could be uploaded on the online platform.</p> <p><i>Application through Work Sessions:</i> Rather than sending the survey out to be completed online, design the application process to start with work sessions to review and discuss the Checklist as group, check the data, fill it out in a presence-based manner, and then fill it online. This step could be added in the Guidance Document. The Gap Report technical team could guide or help facilitate these sessions to address any doubts and queries about the Checklist.</p>



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<p>The surveys didn't allow respondents to proceed to the next question without providing a response. Answering questions that are not known and/or fall outside the mandate of the responding organization can skew the results.</p>	<p><i>N/A Option:</i> Include instructions in the Checklist and Guidance Document to clarify when a "not applicable" answer would be appropriate.</p>
<p>Verification of Sources & Supporting Evidence</p>	
<p>The information required to complete the survey was often fragmented throughout several units inside an institution or across institutions; individual respondents were not always familiar with the key policy documents and tools available at their ministries or related to their mandate. Questions would often be answered in a manner that didn't necessarily reflect a gap but rather a lack of knowledge from the respondent about existing instruments.</p> <p>Furthermore, the individual respondent-based characteristic assumed knowledgeable actors, which was not always the case, and left the onus of verification of sources on time-constrained individuals. This might not be a reliable method. In contrast, agencies that held group sessions to answer the Checklist surveys together as an institution, were more successful at ensuring the exercise was completed, there was evidence for the questions, and a common understanding of the issues at hand.</p>	<p><i>Institution-based:</i> Confirm that the Checklist be applied and answered as an institution or as units within an institution, rather than individually. Reflect this instruction in the guidelines, as this allows for a more comprehensive institutional outlook in the answers and provides an opportunity to collect all the different sources of verification dispersed among different units.</p> <p><i>Addressed at Managers:</i> The Checklist should be officially addressed at specific institutional management level (directors, unit managers), not at individual technicians, so it can be carried out as an institution, ensure compliance, and encourage a sense of responsibility by management to organize their staff and allocate time to complete it.</p> <p><i>Space for Comments and Evidence References:</i> Add more space to allow for comments qualifying the answer as well as references (titles, links, attachments) and supporting evidence. This would allow the technical team to then cross-check this evidence and verify the levels of attainment selected.</p>



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LESSONS LEARNED	RECOMMENDATIONS
Measurability: Checklist and Gap Report as an EWS Baseline	
<p>The inclusion of attainment levels (minimal, moderate, major, complete) in the Checklist as an effort to have metrics was considered a positive step. However, many considered that the attainment levels measured perception or overall sense of completion in one standard, as it wasn't supplemented with actual quantitative metrics.</p> <p>The determination of an attainment level as minimal, moderate, or high level seemed subjective at times; it was less clear how progress would be tracked in a measurable, quantitative way. This was of even greater concern for the countries who had not included the quantitative results of the surveys/attainment levels in the Report, as the comparison in future replications of the Checklist would have to be against more narrative, qualitative information.</p>	<p><i>Attainment Levels Agreed and Reported:</i> Ensure agreement on the attainment level that will be assigned to each question. Include this level system in all Gap Reports by adding a colour symbol or label next to each gap reported. Discussions and review of the evidence should lead to this determination.</p> <p><i>Additional Supporting Indicators:</i> Each gap question and attainment level should have 1-2 concrete indicators that can be verified and measured against quantitatively and concretely (e.g. indicators of existing equipment and operation-status; degree and range of coverage of EWS; percentage of groups or regions with access to them; level of knowledge or proportion of certified/trained staff in specific topics, etc.). Sendai, national disaster plans and other strategies could be reviewed to capture already existing indicators.</p> <p><i>Specialist Revision:</i> Promote better engagement of CARICOM's regional technical institutions, such as Caribbean Institute for Meteorology and Hydrology (CIMH) and the Scientific Research Council (SRC) to further refine the Checklist, provide guidance and support on EWS baseline standards and tools, and generate suggestions for the achievement levels/potential indicators.</p>
<p>The way the Checklist survey questions are formulated didn't necessarily lead to identifying <i>measurable gaps by specific institutions, specific geographic regions or vulnerable groups</i>; it allowed for a national-level assessment of the system. Additional research and assessment tools could be used to complement the Checklist to attain greater specificity.</p>	<p>A more in-depth analysis would result in a more comprehensive assessment, making the Gaps Report closer to a baseline study rather than a report on survey results. Rather than only applied as a survey, the Checklist could instead guide the elements of assessment and add complementary assessment exercises for specific areas of EWS, such as:</p> <ul style="list-style-type: none"> • <i>EWS Equipment/Assets Inventory:</i> To be able to fully answer some of the questions in the Checklist, add an equipment and assets inventory to the Gap Assessment process. It should include number and type of equipment (stations, sirens, etc.), institutional ownership, location, operational status, and geographic coverage, and which systems and where tailored alerts are generated for vulnerable groups. It could also map human resource assets in EWS. • <i>EWS Knowledge & Awareness:</i> Include an assessment that measures the level of knowledge and awareness of the staff in key institutions as a basis for developing and reinforcing education, training, and institutional strengthening programs. This could also include knowledge of concepts and existing legislation, policy, and protocols. Dominica's Organizational Culture short survey could be used as a model for this. • <i>Mapping of Legal & Policy Framework:</i> A mapping exercise should be organized before the Validation Workshops, by the technical team, to inform the discussions and include this information in the report. This was done in many cases by the countries that had the support of a consultant.
<p>The Checklist didn't assess the level of knowledge that actors have on their regulatory framework, existing policies and other tools, but only assessed if these mechanisms exist.</p>	
<p>The Checklist revealed that many laws, policies, protocols and tools for early warning had already being drafted but had been abandoned midway, had not been approved, or existed but were not known or put into practice; a key challenge would be to ensure greater coherence, reordering, and adequate use of the existing instruments.</p>	



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LESSONS LEARNED	RECOMMENDATIONS
Formulation of the Roadmap	
<p>The priorities in the Roadmap should take into account the level of feasibility of the actions, in the context of installed capacities of SIDS countries, with small institutions, limited staff, competing priorities, and budget constraints. The way the Roadmap formulation process is guided and conducted given this context will be key for its success and quality.</p>	<p><i>Guidance Document for Roadmap:</i> Ensure there is clear written methodological guidance on how to develop a Roadmap, as this ensures its quality as a planning tool. This guidance should include:</p> <ul style="list-style-type: none"> • All the contents of the Roadmap • A flow chart or steps to formulate the Roadmap • A suggested methodology to set priorities • A template to present the Roadmap, including costing and budget sources • An outline of how the outcomes, outputs and indicators can contribute to the CDM Country Work Programme <p><i>Adjustment of Existing Roadmaps:</i> Revise and adjust the Roadmap to ensure the timeframe is feasible, detail how the actions feed into the Country Programs, cost the investment needs and identify budget sources, and double-check if all the necessary actors have been included in the process.</p>
Measurability of The Roadmap	
<p>The Roadmap was an important effort to address EWS gaps in a coherent manner at a country level and has contributed to putting preparedness on the national agenda. There is a need to incorporate the basic principles of results-based planning and further adapt the tool.</p>	<p><i>Baseline/Indicators/Targets:</i> Any planning tool should include a measurable baseline, indicators, and targets, each component expressed in the exact same metric form (#, %, ratio or proportion). For example: Baseline year 0 (60% of territory is covered by an alert system), Indicator (% of territory covered by an alert system), Target final year (80% of territory covered by an alert system).</p> <p><i>Targets for vulnerable groups:</i> Try to include specific targets and priorities for vulnerable groups and regions in the Roadmap. That said, it is important to keep targets realistic and feasible.</p> <p><i>Budgets:</i> To ensure the Roadmap exercise will translate into the implementation of actions, ensure the Roadmap contains estimated costs with the potential budgetary or funding sources identified.</p> <p><i>Monitoring Plan:</i> Include a monitoring and evaluation plan in the Roadmap. This would establish who is responsible for monitoring the indicators, with what frequency, and what verification sources. An allocation of 4% of the budget to the M&E plan is a recommended best practice. The Roadmap could be included as a part of a larger evaluation exercise (DRR sector wide evaluation) or be evaluated itself at the end of its implementation.</p> <p><i>Annual operational work:</i> Include an annual work plan for a multi-year Roadmap to increase the likelihood of implementation and ease of monitoring.</p>



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Management and Implementation of the Roadmap	
<p>There is an understanding that each institution is a key part of the EWS system. However, the institutional arrangements for the implementation of EWS Roadmap is not yet clear for many actors; most agree that the Secretariats of NEMO/NEPO/COE structures would be the most appropriate given their coordinating role.</p>	<p><i>Roadmap Coordinating Entity:</i> Establish a single entity to coordinate the implementation of the Roadmap as a whole, with the understanding that specific actions and outputs are the responsibilities of specific institutions. The coordinating entity could track progress, promote synergies, and monitor the implementation, as well as periodically convene all responsible institutions to discuss advances and progress. This entity could be the Secretariat of a NEMO/NEPO/NODS/COE type of institution. If so, establish a dedicated human resource and/or unit to coordinate and monitor implementation. An alternative could be to host the coordinating mechanisms in one of the existing committees. In either case, the coordinating mechanisms should be clearly stated and included in the designated entity's mandate and work plan.</p> <p><i>Roadmap Implementing Institutions:</i> Identify all the institutions that would be responsible for implementing each action/output in the Roadmap.</p> <p><i>Investment:</i> A key responsibility of the Roadmap coordinating mechanisms would be to advocate for budgetary inclusion and prioritization, analyse external funding sources, and align resource mobilization efforts with the identified priorities.</p>
Integration, Harmonization & Alignment	
<p>The process promoted a harmonization of approaches, the standardization of tools, and coordination of actions to strengthen EWS in countries, guided by the CDM Strategy. The Roadmap will provide countries with a single plan to guide the efforts of all actors in EWS, justifying investment from national budgets and development partner funding.</p>	<p><i>Country Programme:</i> Provide specific discussion and practical guidance on how to incorporate and integrate the Roadmap with the CDM Country Work Programme.</p> <p><i>Disaster National Plans:</i> Aside from the Country Work Programmes, National Disaster Risk or Disaster Management Plans should incorporate the Roadmap priorities.</p> <p><i>Donor Roundtables and Mechanisms:</i> Maximize the use of the EWS Roadmap to mobilize funds with donors and align cooperation in EWS efforts. Seek opportunities to present the Roadmap to donors and development partners, as well explore partnerships with the private sector.</p>



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Engagement of Actors, Participation, Consultation and Validation	
<p>A lesson all countries highlighted was the need to ensure the participation of those with sufficient <i>decision-making power</i> and the relevant technical knowledge to provide feedback in all stages of the Gap Assessment and Roadmap process. Changes in representatives or inconsistent participation in the process makes continuity difficult.</p>	<p><i>High-level Commitment:</i> Secure strong commitment from the Permanent Secretaries and heads of agencies and ministries to ensure the relevant decision-makers participate when commitments and decisions are needed, such as prioritizing gaps, actions, or funding. Assign technical staff for the entirety of the process.</p> <p><i>Broader Consultation Process:</i> With more time, a broader consultation process could be promoted to engage stakeholders and allow for more in-depth discussions with different levels and sectors; this would ensure more feedback on the finding and different stages of the Report and Roadmap. Another recommendation is to include a strategy to incentivize public debate on the importance of early warning, discuss findings at large, create awareness through the process, and influence the public agenda.</p> <p><i>Methodology for Validation Workshops:</i> Develop a standardized methodology to organize the working groups of the National Validation workshops (with key guiding questions, exercises, products for each session, etc.). Countries could use this methodology as a basis and adapt as necessary.</p>
<p>Involving a broad scope of governmental actors from a range of sectors was considered to be critical in the achievement of a comprehensive analysis and planning exercise. Some countries included representatives and entities for people with disabilities and senior citizens. This inclusive approach could have been promoted more evenly across all countries and extended to groups related to gender equality or women empowerment.</p> <p>Another element to be reinforced is participation at the local level, given that some gaps are related to the lack of integration between national and local levels. The same applies to the private sector, as they have very strong incentives to be involved in early warning to protect their economic assets.</p>	<p><i>Mapping Strategic Actors and Stakeholders:</i> Map all key actors, including those who are users of EWS, in order to include a wider range of stakeholders in the Gap Assessment and Roadmap process. Consider the following actors and stakeholders:</p> <ul style="list-style-type: none"> • Actors related to epidemic or anthropogenic hazards, moving beyond hydrometeorological/seismological hazards • Gender equality and women empowerment organizations • Organizations representing people with disabilities, senior citizens, children and youth • Local government and self-governed local structures • Private sector
Dissemination	
<p>After the Validation Workshops and other feedback processes, the final versions were not as widely shared with participants as they could have been.</p>	<p><i>Sharing and officially presenting the Gap Report and Roadmap:</i> Include dissemination of the Gap Report and Roadmap as a planned step in the process to ensure it serves its purpose as an input for agenda-setting, for policy and decision-making, and awareness-raising. This could include a presentation, as well as distributing it among institutions.</p>



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4. CONCLUSION

This systematization aims to make a fruitful contribution to the upscaling and replication of processes to strengthen EWS. Tools such as the Checklist are now available for countries to measure the progress of their early warning systems. National Gap Reports and Roadmaps will serve as examples for other countries working to improve their planning. Engagement and partnership with agencies such as UNDP, IFRC, and CDEMA illustrates the support available to support preparedness and disaster risk reduction in the region.

Each of the four pillars of a robust early warning system – risk information, monitoring and forecasting, dissemination and communication, and response capacity – play a significant role in preparedness and early action. Five countries in the Caribbean have advanced in policymaking and programming for early warning systems, through national EWS gap assessments and national Roadmaps. Multiple stakeholders, including community members and vulnerable groups, were involved in the process, broadening the understanding and ownership of early warning and preparedness, and integrating national and community levels. This process has reinforced countries’ understanding and identification of the strengths and gaps in their early warning systems, the standards for people-centred multi-hazard systems, and promoted their commitment to addressing potential hazards with prioritized actions plans. An effective early warning system contributes to resilience, reduces vulnerability, and minimizes the loss of life and economic impact of a hazardous event, playing a major role in disaster risk reduction in the Caribbean region.