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ENHANCING RESILIENCE TO REDUCE VULNERABILITY IN THE CARIBBEAN (ERC) PROJECT
-FINAL EVALUATION REPORT, MARCH 2014-

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LIST OF ANNEXES:

List of Acronyms

A&B	Antigua and Barbuda
BVI	British Virgin Islands
CC	Climate Change
CEPREDENAC	Centro de Coordinación para la Prevención de los Desastres Naturales en América Central
CERT	Community Emergency Response Team
CDEMA	Caribbean Disaster Emergency Management Agency
CIMA	CIMA Research Foundation: Centro Internazionale di Monitoraggio Ambientale
CIMH	Caribbean Institute for Meteorology and Hydrology
CSA	Cost Sharing Agreement
CTIC	Caribbean Tsunami Information Centre
CZMU	Coastal Zone Management Unit
CTWP	Caribbean Tsunami Warning Program
DM	Disaster Management
DMS	Document Management System
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
ECHO	European Community Humanitarian Office
ERC	Enhancing Resilience to Reduce Vulnerability in the Caribbean
EU	European Union
EVRECA	European Volunteers for Response of Emergencies in the Caribbean
EWS	Early Warning System
GIS	Geographic Information Systems
GoB	Government of Barbados
GoI	Government of Italy
HFA	Hyogo Framework for Action
ICG	Inter-governmental Coordination Group
ICPD	Italian Civil Protection Department of the Presidency of the Council of Ministers of Italy

IFRC	International Federation of Red Cross and Red Crescent Societies
INGO	International Non-Governmental Organizations
IOC	Inter-governmental Oceanographic Commission
IPCC	Inter-governmental Panel on Climate Change
IT	Information Technology
ITIC	International Tsunami Information Center
KAP	Knowledge, Attitude, Perception
LiDAR	Laser Radar
MDG	Millennium Development Goals
M&E	Monitoring and Evaluation
MET	Meteorological
NDMA	National Disaster Management Agency
NEMO	National Emergency Management Office
NGO	Non-Governmental Organization
NIT	Red Cross National Intervention Teams
NRM	Natural Resources Management
OCT	Overseas Countries and Territories
ODI	Overseas Development Institute
OECD	Organization for Economic Co-operation and Development
OECS	Organization of Eastern Caribbean States
PAE	Public Awareness and Education
PCA	Partner Cooperation Agreement
RIT	Red Cross Regional Intervention Teams
ROMA	Rapid Outcome Mapping Approach
RRF	Results and Resources Framework
R3i	Regional Risk Reduction Initiative
SMART	Specific, Measurable, Achievable, Relevant, Time-bound
SOP	Standard Operating Procedures
SRC	Seismic Research Centre
TCI	Turks and Caicos Islands
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme

UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	U.S. Agency for International Development
UWI	University of West Indies
Youth-IN	Youth Innovation

Executive Summary

The project Enhancing Resilience to Reduce Vulnerability in the Caribbean (ERC) has been financed by the Italian Government at a rate of 3.5 million EUR (4,527,813 USD) to enhance regional and national capacities for disaster risk reduction. The United Nations Development Programme in Barbados and the OECS is the recipient of the contribution and the executing agency. UNDP works with CIMH (Caribbean Institute for Meteorology and Hydrology) and CDEMA (Caribbean Disaster Emergency Management Agency) as implementing agencies and CIMA Research Foundation as the advising and cooperating agency.

The project is highly relevant to the needs of the population in one of the regions of the world that is most exposed to natural hazards. The project is also consistent with regional and sector strategies, starting with the Hyogo Framework for Action 2005-2015 and the Comprehensive Disaster Management strategy of the Caribbean region. Furthermore, the intervention is also highly pertinent to outcome 1 “Improved governance and regulation of environmental and energy issues for more resilient economies by 2016” of the United Nations Development Assistance Framework (UNDAF) for Barbados and the Organization of East Caribbean States (OECS) 2012-2016.

The design of the intervention is articulated in a clear and sound logic, which unfortunately suffers because of the weak elaboration of indicators and targets. ERC aims at improving regional and national capacities in four macro areas of disaster risk reduction through the active collaboration and exchange of best practices between Caribbean organizations and Italian counterparts that have distinguished themselves over the years for the excellent results of their work. The four macro areas (network of real time monitoring stations, volunteerism, increasing capacities of National Emergency Management Offices and promoting awareness of tsunamis and other coastal hazards) although largely independent, together should lead to the overall strengthening of civil protection mechanisms. However, the solid vertical logic of the ERC is not supported by SMART indicators and an adequate baseline.

The implementation strategy differs substantially from the original design introducing an element of pragmatism and pursuing institutional collaborations that altered the original institutional architecture. Volunteerism has been approached from a significantly different angle and with less ambitious goals. The pursuit of collaboration with UNESCO in the tsunami component has increased the potential impact of the limited funds available while exposing the project to some unforeseen risks.

The implementing partners have managed the project with a considerable degree of efficiency. The intervention delivered a substantial number of outputs of good quality while adopting sound management practices. The three main implementing partners were able to respond with flexibility to the numerous obstacles encountered during the implementation. Delays accumulated in the early stages of the project were eventually compensated later on, although with reductions in number and type of outputs. The two-year extension approved by the Italian Government proved to be crucial for the

successful implementation of the activities. However, the ERC would have benefitted from a more solid monitoring and evaluation system and deeper collaboration with other projects, like Youth-IN and R3i.

The analysis of the outcomes of the project shows mixed results in the effectiveness of the three components. In output 1 “network of real time monitoring centres”, we can observe numerous intermediate outcomes, although unevenly distributed across the region. Dewetra is being adopted, but not quite at its full potential. The platform is mainly used for weather monitoring rather than as an impact-monitoring tool. In output 2.1 and 2.2 (“volunteerism” and “NEMOs capacity building” bundled together in the second component), the project has produced outcomes that are fragmented across several countries and areas of intervention, lacking a common denominator. Finally, even though in the third component (output 2.3) “tsunami awareness” among the population was not enhanced through the ERC, the project contributed to the establishment of CTIC (Caribbean Tsunami Information Centre), a key institution in the regional tsunami early warning system.

The outlook on the future sustainability of the results of the ERC is positive, although there are several factors that can undermine the progress made so far. The project has managed to create new institutions (CTIC) and establish a solid relationship between CIMA and CIMH, organizations that have shown the willingness to continue their successful collaboration for the improvement of human security in the region. However, it is still uncertain how CTIC will be able to raise the funds that it needs after 2014. Also, the future sustainability of the results depends on a strong collaboration between CIMH and CDEMA specifically aimed at promoting the adoption of Dewetra. The two organizations have a standing framework agreement, but a more specific document regarding this new area of collaboration has not been formalized nor tested yet. The level of capacities installed is moderately good. The trainings offered by the project were of high quality, but not all countries participated consistently in the events.

1. BACKGROUND

Small island states are generally more exposed to extreme weather events than larger countries because they rely on few economic activities. The IPCC 4th Assessment Report on Climate Change (Working Group II) explains the reality of small islands using the following example: "*In the Caribbean, hurricanes cause loss of life, property damage and destruction, and economic losses running into millions of dollars (ECLAC, 2002; OECS, 2004). The reality of island vulnerability is powerfully demonstrated by the near-total devastation experienced on the Caribbean island of Grenada when Hurricane Ivan made landfall in September 2004. Damage assessments indicate that, in real terms, the country's socio-economic development has been set back at least a decade by this single event that lasted for only a few hours*"[1].

Barbados and the 9 countries of the Organization of Eastern Caribbean States are the beneficiaries of the *Enhancing Resilience to Reduce Vulnerability in the Caribbean* (ERC) project that portends to increase national capacities in analyzing weather data, improving management of strategic assets during and immediately after events and promoting the mobilization of a volunteer force.

The region is not only vulnerable to extreme weather events like hurricanes, but also to a wide range of other hazards: earthquakes, tsunamis, floods, landslides, volcanic eruptions, oil spills, water contamination, infectious disease and progressive environmental damage. OECS countries and Barbados are characterized by high vulnerability due to high-density shoreline development and settlements in hazardous areas. They have only limited resources available and their ability to access funding from external sources for reducing the risk from disasters is inadequate to the challenge ahead. National disaster agencies operate on a modest budget, with insufficient staff and uneven capacities. Meteorological services are mainly oriented to weather forecasting for aviation purposes. Volunteers are generally poorly equipped and loosely organized, with no official recognition and protection under national legislations.

UNDP has partnered with the Government of Italy in order to strengthen regional capacities by adapting to the Caribbean context IT tools and volunteering mechanisms, well tested by the Italian Civil Protection and CIMA Research Foundation. The Government of Italy has financed the project to the tune of 4,527,813 USD. The implementation period, originally scheduled to run between 1st January 2009 and 31st December 2011, was extended until 31st December 2013 in order to make up for the initial delays in the finalization of the contractual arrangements. The Caribbean Institute for Meteorology and Hydrology (CIMH) is the main implementing partner. The Caribbean Disaster Emergency Management Agency (CDEMA) and the

[1] IPCC, 2007: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

United Nations Educational, Scientific and Cultural Organization Intergovernmental Oceanographic Commission (UNESCO/IOC) are collaborating partners.

The main objective of the ERC is to "strengthen civil protection mechanisms through capacity development for early warning systems, capacity dissemination, and institutional coordination for disaster management and response in Barbados and the Organization of Eastern Caribbean States (OECS) sub-region". Two outputs are designed to contribute to the project objective:

1. Sustainable network of real time decision support centres to facilitate early warning and post disaster recovery established and fully integrated into national and regional planning.
2. Strengthened national disaster mechanisms to incorporate best practices in volunteerism; enhanced institutional capacities and; support to Tsunami public education programmes.

2. Methodology

In the final evaluation of the project "Enhancing Resilience to Reduce Vulnerability in the Caribbean", the evaluation team adopted a customized methodology that is rooted in the OECD-DAC framework and incorporates elements of Outcome Harvesting. UNDP's "Handbook on Planning, Monitoring and Evaluation of Development Results" and "Outcome-level Evaluation, a companion guide to the handbook on planning, monitoring and evaluating for development results for programme units and evaluators" provided guidance in harmonizing the customized approach to the requirements of the client.

The evaluation team focused on the four criteria of relevance (including quality of design), efficiency, effectiveness and sustainability, seeking to answer the questions posed in the evaluation matrix annexed to the inception report (Annex XI).

After the initial literature review, the team leader conducted a field visit to Barbados for a first round of interviews with the stakeholders of the project. A second round of interviews was conducted during the 2013 CDM Conference in Jamaica, with the participation of both evaluation team members. During the conference, the evaluation team presented the objectives of the evaluation exercise at the Final Review Meeting of the ERC Project. The evaluators took the opportunity to conduct a quick survey (Annex XII) mainly focused on collecting participants' perception regarding the degree of adoption of Dewetra.

During the month of January, the evaluation team scheduled conference calls with a number of stakeholders who had not been available in person during the field visits. Also, follow-up calls were set up with DM and MET offices in all participating countries to substantiate information on outcomes, further clarify pending issues and collect information on availability of GIS skilled personnel, current usage of Dewetra and status of CERT trainings and training teams.

The qualitative information collected with face-to-face and telephone interviews was analysed to identify significant outcomes of the intervention, using an Outcome Harvesting approach. The first list of outcomes

was then refined and polished with the help of CIMH, before going through a process of triangulation with key informants. Finally, the outcomes were classified by component of the project. For each one of the three components, the evaluation team produced a map of the outcomes that visualizes their contributions, relationship to other outcomes, current status and pending issues. The maps constitute the core element in the analysis of the effectiveness of the project.

Outcome harvesting can be assimilated to forensic science in the sense that it works from the outcomes backwards to trace the activities that made it possible to produce the results. Outcome harvesting is particularly adequate to evaluate complex interventions that do not have a baseline taken at the beginning of the operations and that operate in the areas of capacity building, advocacy and policy formulation. Its focus is on the analysis and interpretations of the changes made possible by the project. Outcomes are defined as changes in behaviour, policies, practices and network of relationships of the different actors involved directly or indirectly in the intervention. While results-based approaches tend to put tangible outputs at the centre of the evaluation, OH is concerned with the behaviour and interactions of the different institutional actors. The main questions that OH deals with are: what happened? Who did it (or contributed to it)? Is there corroborating evidence? Why is this important?

Outcome harvesting does not try to attribute outcomes univocally, but it rather strives to highlight the contribution of a single actor to a particular change. As is often the case in complex programmes where a multitude of donors and implementing agencies intervene at the same time, attribution becomes impossible. Defining contribution, however, is a far more realistic goal that allows for the understanding of an organisation's participation in wide sweeping changes that often affect an entire sector.

The quantitative analysis of the results of the ERC project was mainly focused on component 1 (Dewetra) due to the relative availability of data. The evaluation team decided that a quantitative analysis of Component 2 (Volunteerism) and Component 3 (Tsunami) would not be meaningful due to the qualitative nature of the intervention in those areas. Given the lack of SMART indicators and of a performance-monitoring matrix, the evaluation team identified *ex-post* a set of indicators with the goal of substantiating the qualitative results of the evaluation and gaining a better picture of the extent of the adoption of Dewetra. With this goal in mind, three indicators were elaborated:

- Number of layers currently available for each country on the Dewetra platform
- Number of staff for each country who participated in both trainings of the Dewetra module
- Number of staff for each country who participated in both trainings in the GIS module

In order to collect data on the three indicators, the evaluation team requested the full list of layers available for each one of the beneficiary countries and the attendance lists to the different training courses from CIMH. The information was then entered in a simple database, built in Microsoft Excel (Annex III). The results are presented in four graphs in section 7.1 (figures 7 to 10).

3. RELEVANCE

The Enhancing Resilience to Reduce Vulnerability in the Caribbean (ERC) project is highly relevant to the main regional strategies for disaster management and to the needs of beneficiaries in a region that is one of the most vulnerable to cyclical and recurring natural disasters in the world.

The project is consistent with the Hyogo Framework for Action 2005-2015 (HFA). The HFA was launched in 2005, shortly after the Indian Ocean tsunami, with the support of over 168 governments who pledged to make significant investments in the following years to reduce risks, increase preparedness and improve their capacity to respond to natural disasters. There are five strategic priorities in the HFA that should inspire the actions of all the actors working in the sector. The results of the ERC feed into priority 2 "Improving Risk Information and Early Warning" and priority 5 "Strengthening preparedness for Response" of HFA.

The project is also relevant to the Comprehensive Disaster Management strategy of the Caribbean region. Specifically, output 1 of the project is consistent with output 1.5 "Improved coordination at national and regional levels for disaster management" of the strategy; output 2.1 of the ERC is relevant to output 1.3 "Governments of participating states/ territories support CDM and have integrated CDM into national policies and strategies"; output 2.2 pursues the same goal as output 1.1 of the CDM strategy "National Disaster Organizations are strengthened for supporting CDM implementation and a CDM program is developed for implementation at the national level"; finally output 2.3 can be referred to both output 2.1 "Establishment of a Regional Disaster Risk Reduction Network to include a Disaster Risk Reduction Centre and other centres of excellence for knowledge acquisition sharing and management in the region" and output 2.4 "Existing educational and training materials for Comprehensive Disaster Management are standardized in the region".

The design of the project strives to promote the UN Millennium Development Goals (MDGs). The intervention is consistent with MDG 7, target 7a, to integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources; and to target 8c of MDG 8, on addressing the special needs of landlocked developing countries and small island developing states.

Furthermore, the intervention is also highly relevant to the United Nations Development Assistance Framework (UNDAF) for Barbados and the Organization of East Caribbean States (OECS) 2012-2016. In the results matrix of the framework, this is reflected in outcome 1 "Improved governance and regulation of environmental and energy issues for more resilient economies by 2016", and specifically in the following outputs:

- output 1.1 "Knowledge and good practices disseminated and capacity development in the areas of NRM, DRR, CC, renewable energy, energy efficiency, green economy, biosafety and adherence to international standards and norms";

- output 1.2 “Subregional framework for systematic collection of environmental data and for policy analysis and national accounting developed”;
- output 1.5 “Improved integration of disaster risk reduction into development planning and disaster response and recovery”.

The ERC project is firmly embedded in the Multi-country Programme Action Plan between the Governments of Barbados and the Organization of Eastern Caribbean States (OECS) and UNDP for the period 2012-2016. The programme includes a specific component on Disaster Risk Reduction of which the ERC is a substantial contributor. The project informs result 1 “Multi-hazard risk identification and early warning systems”, result 2 “Improved National Disaster Management structures and mechanisms” and result 3 “Strengthened community resilience” of the programme component.

The goals of the ERC are also significant in regard to the OECS Secretariat’s 2012-2013 Annual Work Programme. Specifically, Strategic Objective 4 calls for the promotion of social and sustainable development through, among other activities, the implementation of a disaster risk reduction plan for the region to facilitate the adoption of a harmonized protocol for vulnerability and post-disaster impact assessment.

Finally, the ERC Project is aligned with the role and mission of the Caribbean Institute for Meteorology and Hydrology (CIMH). The role and mission of the CIMH is to improve the meteorological and hydrological services and to assist in promoting the awareness of the benefits of these services for the economic well being of the Caribbean Meteorological Organisation (CMO) countries. This is achieved through training, research and investigations, and the provision of specialised services and advice.

4. QUALITY OF DESIGN

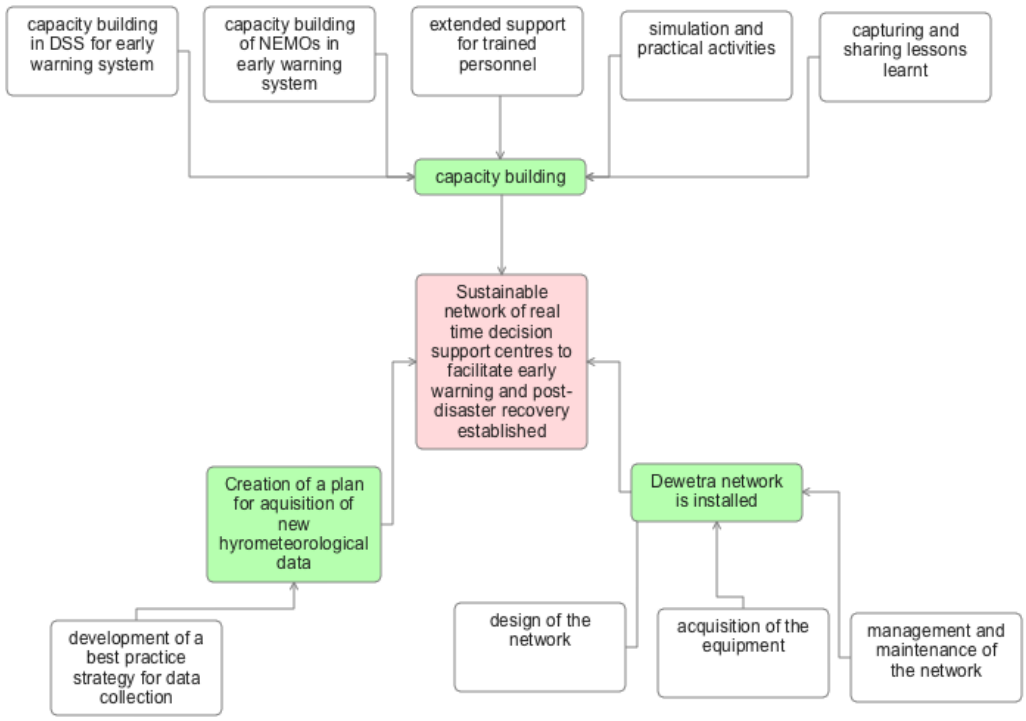
The formal design of the intervention as presented in the Results and Resources Framework (RRF) reflects the clarity of the vision that inspired the project. Unfortunately, the imprecise formulation of some formal elements like indicators, baselines and assumptions detracts from its overall quality. The vertical logic of the project is concise and clear; the links between activities and intended outputs and between these and the outcomes are logical. The planned collaboration between Italian and Caribbean organizations has the potential to bring substantial benefits to the sector through the exchange of best practices and innovations. However, the quality of the design is weakened by the lack of reliable indicators, precise targets and a baseline. Furthermore, the assumptions and risks surrounding the intervention have been only partially identified and addressed.

In the vision formulated in the higher-level section of the RRF, the ERC is expected to create a network of real-time decision support centres for early warning systems and to strengthen the national disaster mechanism with a focus on volunteerism and tsunami education. Both results would be achieved through the active collaboration and exchange of best practices between Caribbean organizations and Italian

counterparts that have distinguished themselves over the years for the excellent results of their work. The exchange of best practices between Italy and the OECS countries would be further enhanced by the collaboration with a twin-project called Youth-in. This second project was approved concurrently by the Government of Italy (GoI) to support UNDP in improving the participation of Caribbean youth in the cultural and economic life of the region. The two projects were designed to establish synergies in at least one area where the respective goals overlap: the participation of young people in volunteerism initiatives. The vision that informs the implementation of two coordinated interventions seems to be built on strong premises and clear cause-effect relationships.

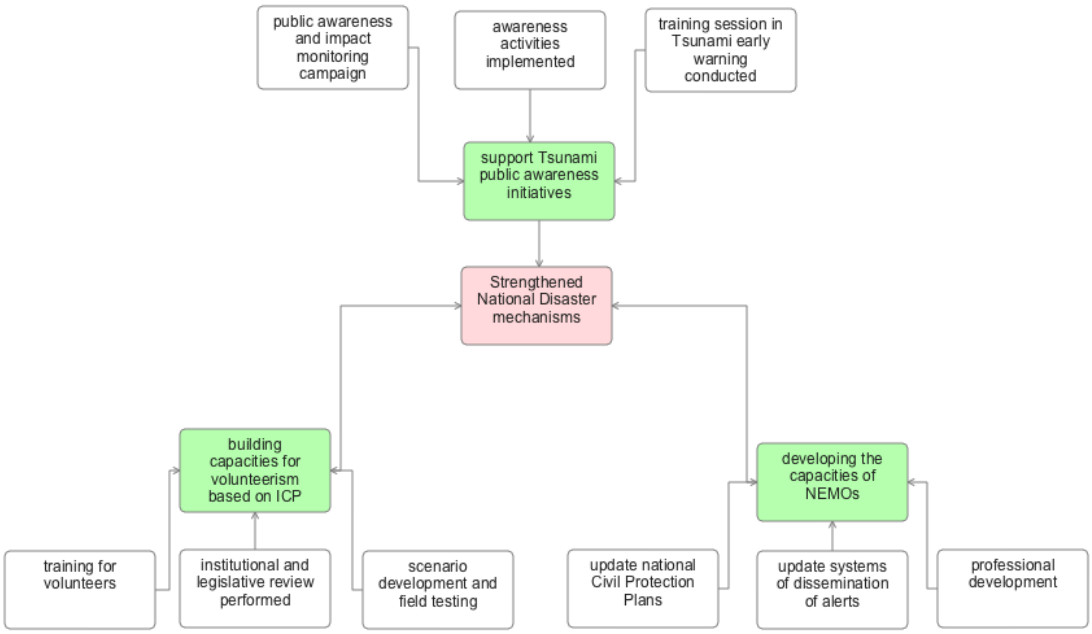
As per the lower-level of the RRF, the relationship between activities and outputs is visually presented in figure 1 and 2. Although the results chain seems to be oversimplified (ex. there is no reference to the MET offices, but only of DM agencies; the mechanism for the collection of data is not specified; the Caribbean Tsunami Information Centre is not mentioned), the fundamental logic behind it seems sound.

Figure 1 – Results chain output 1



In output 1, there are three results needed to deliver the intended outcome of establishing a network of real time decision support centres: capacity building, creation of the physical infrastructure and the population of the system with data layers.

Figure 2 - Results Chain Output 2



Output 2 is mainly oriented towards capacity building activities. The three macro areas (in green in figure 2) seem to differ mostly in their target audiences: volunteers, NEMOs and the public at large.

The overall solid vision of the project is weakened in the actual design by the limited number of indicators and their quality. According to UNDP guidelines[2] indicators should be SMART (Specific, Measurable, Achievable, Relevant and Time-bound) and, together with the different levels of results, they should allow the reader to understand what is to be achieved, when and by whom. However, in the ERC design, each one of the outputs has indicators that do not qualify as SMART. By and large, the indicators are vague (ex. “data needs effectively addressed in strategy”; “public awareness for tsunamis and other coastal hazards

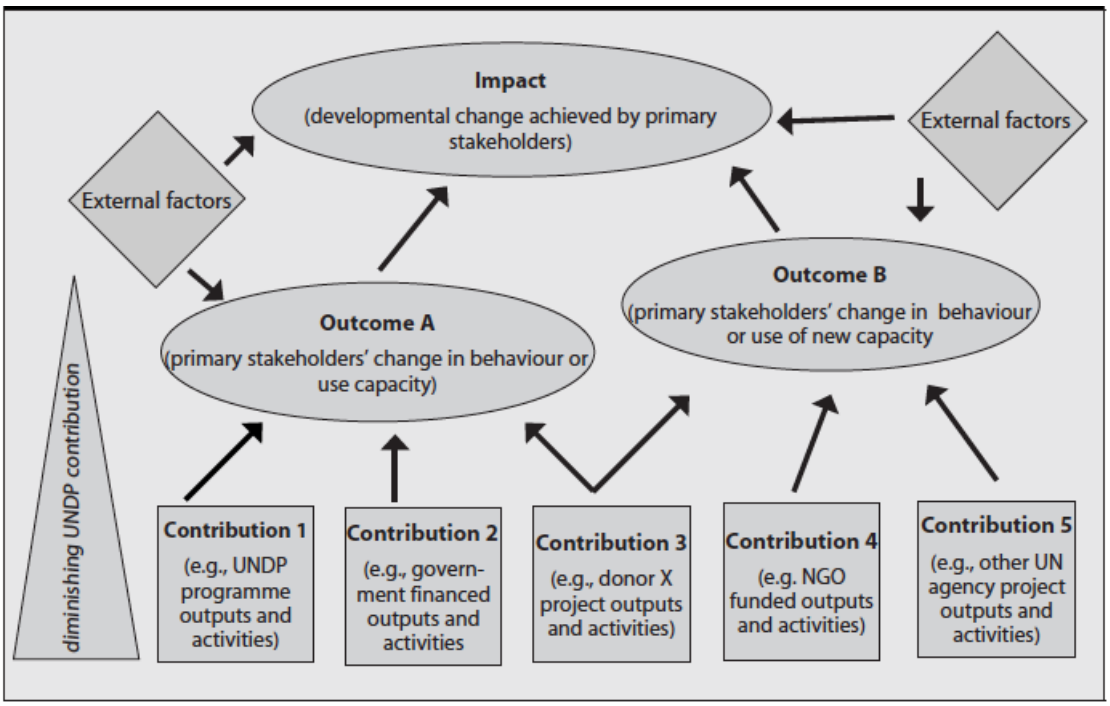
[2] UNDP, *Outcome Level Evaluation: a companion guide to the handbook of planning, monitoring and evaluating for development results for Programme Units and Evaluators*, 2011

enhanced"), hard to measure (ex. "establishment of network nodes in various countries"; "increased participation of youth in DRM") and not oriented towards results (ex. "experiences and lessons learned shared"; "continuous learning paths created for NEMO personnel"). Indicators at outcome level were formulated with similar weaknesses and hardly help in assessing the progress of the project.

The baselines and the targets established in the RRF are also rather weak. Each indicator should have a precise baseline to report against, but in this case the RRF only reports one generic baseline (ex. output 1 "a number of regional initiatives are ongoing relating to data collection, management and analysis, and capacity building" or output 2 "mixed capacities in NEMOs") that vaguely describes the situation in the entire sector in terms that cannot be used to compare the future progress of the intervention. The targets should present a precise quantitative breakdown for each indicator in each year of the project. However, in the case of the ERC, targets not always refer to the indicators and quantitative goals are often overlooked.

The analysis of risks and assumptions in the design of the project should be more detailed and include a contingency plan to address worst-case scenarios. As it appears in Figure 3, the UNDP methodology includes "external factors" in the design of projects. These external factors are commonly referred to as *assumptions* (conditions that need to be met) or *risks* (potential threats). UNDP, like any other project implementer, does not have full control over the outcomes and impacts of an intervention some of which may only emerge and be measured in a considerably longer time frame, but only over inputs, activities and outputs. The further up a project moves in the results chain (Figure 4), the less influence it exerts. The correct identification of external factors helps project managers to assess some of the circumstances in the surrounding environment that can favour or hamper the achievement of outcomes. A correct analysis of assumptions and risk can suggest changes in the implementation strategy.

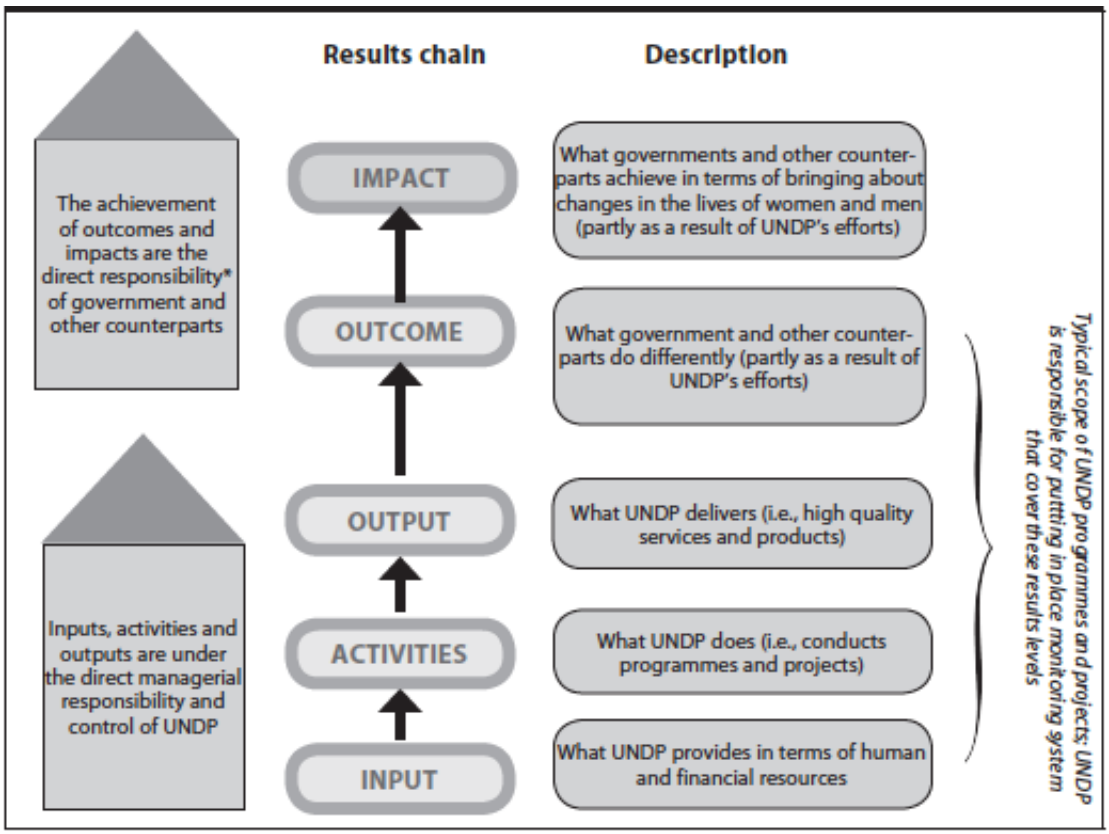
Figure 3- External Factors[3]



As we will see in the discussion on the efficiency and effectiveness of the ERC, several external factors had an important role in affecting the timely delivery of the results. The project duly tracked the main risk factors as recorded in the reports submitted to the Project Board, expanding and updating the initial risk analysis formulated during project design.

[3] UNDP, *Outcome Level Evaluation: a companion guide to the handbook of planning, monitoring and evaluating for development results for Programme Units and Evaluators*, 2011

Figure 4 – Results chain[4]



5. IMPLEMENTATION STRATEGY

The design of the project was operationalized in an implementation strategy that translated the theoretical results chain into a concrete set of actions taking into account the reality of the Caribbean context. The strategy differs substantially from the original design introducing an element of pragmatism and pursuing certain institutional collaborations while abandoning others. Volunteerism has been approached from a significantly different angle and with less ambitious goals. The pursuit of a collaboration with UNESCO in the tsunami component has increased the potential impact of the limited funds available while exposing the project to some unforeseen risks.

[4] UNDP, *Outcome Level Evaluation: a companion guide to the handbook of planning, monitoring and evaluating for development results for Programme Units and Evaluators*, 2011

The overall strategy of the project is actually the sum of the different strategies formulated for the three components in which the ERC was eventually broken down:

1. The introduction of the Dewetra platform, led by CIMA and CIMH;
2. Volunteerism and capacity building of NEMOs, led by CDEMA;
3. Support to the creation of a Caribbean Tsunami Information Centre, under the supervision of UNDP

Given the significant differences between strategies and their independence, they will be assessed separately.

The implementation strategy for the introduction of Dewetra was substantially sound. The establishment of a strong collaboration between CIMA and CIMH was regarded as the founding stone for the achievement of future results in this component. Although the initial plan quickly encountered several obstacles (difficulty in collecting data layers, degree of willingness or ability to share and transfer data, diffidence among the different countries, etc.), the two agencies demonstrated a significant level of flexibility and resourcefulness in adapting their implementation modalities on the fly in order to achieve their goals. The approach of the two partners by and large followed along the lines of the original design and changes were made only in order to overcame obstacles or exploit unforeseen opportunities.

In the second component (Volunteerism and capacity building of NEMOs), the project substantially veered off the course originally envisioned. After a few months of the implementation, the Caribbean partners considered that the Italian Civil Protection system for volunteers would not be applicable to the context of the region. At the same time, the Italian Civil Protection seemed to have imagined a smaller role for itself in the intervention, leaving CIMA to spearhead the collaboration with the Caribbean partners. Eventually, the ERC pursued a variety of different goals in this component. The consistency of this heterogeneous approach is not immediately evident. The strategy seems to be fragmented if observed through the lenses of the ERC, but it has to be observed that the activities form part of CDEMA's regional Comprehensive Disaster Management Strategy for the Caribbean. In this perspective, they can be seen as harmonic features of a wider design. However, in the new strategy the role of youth is also obfuscated. There was also an apparent inability to engage, interface and leverage existing well-established (albeit of varying levels of capacity) volunteer platform and rosters such as the Caribbean-wide Red Cross Societies trained volunteers and the Caribbean Red Cross Regional Intervention Team (RITs) rosters that are coordinated through the IFRC Americas Zone in Panama and its Caribbean Regional Office. Overall, it seems that this component counts on a number of laudable initiatives that are not always pertinent with the spirit of the project and are only loosely related with one another.

The third and final component also diverged significantly from the RRF of the project. While the original design set its goals to raising the awareness and education of the population regarding tsunamis and

coastal hazards, the actual strategy prioritized the establishment of the Caribbean Tsunami Information Centre, a new regional organization that would fill a gap in the institutional set up of the Caribbean Tsunami Early Warning System. In this vision, awareness raising and education would come only after CTIC was established. In pursuing this goal, the ERC would support the regional Tsunami programme of UNESCO. The validity of the strategy was put to the test when the tsunami programme had its budget drastically reduced and substantially left the ERC component frozen for more than a year. Eventually UNESCO managed to find alternative sources of funding for the programme; CTIC was established three months before the end of the ERC. The main goal of the new strategy was therefore achieved before the end of the project. However, the delay caused the cancellation of the original goal: raising awareness and conducting education campaigns. The tangible *outputs* of the project (public awareness and education materials and strategy) have been developed and respond to good quality criteria. However, the *outcomes* are not available yet because the public awareness campaign that was originally envisioned to reach the general public has not been conducted.

5.1 Gender

The ERC project does not have a gender strategy and did not perform a gender-disaggregated impact analysis. However, the intervention has pursued a gender balance in the participation to training events for volunteers in output 2. In the same result area, Community Emergency Response Teams (CERT) were formed with the participation of both men and women, with different responsibilities inspired by gender considerations. Given the institutional character of the intervention and the modest level of involvement of the population at large, it appears that gender considerations were appropriate.

6. EFFICIENCY

The project delivered a substantial number of outputs of good quality while adopting sound management practices. The three main implementing partners were able to respond with flexibility to the numerous obstacles encountered during the implementation. Delays accumulated in the early stages of the project were eventually compensated later on, although with changes in number and type of outputs. The two-year extension approved by the Italian Government proved to be crucial for the successful implementation of the activities. The ERC would have benefitted from a more solid monitoring and evaluation system and deeper collaboration with other projects, like Youth-IN and R3i. The opportunity for greater cross-fertilization and integration of effort with other parallel initiatives, projects, systems and platforms within other humanitarian and disaster management organizations already mentioned appears to have been possible.

6.1 Timely Delivery of Outputs

The intervention suffered several delays, frequently caused by the complex institutional architecture of the project. Eventually most of the delays were made up for, although with adjustments in the number and scope of activities.

The Enhancing Resilience in the Caribbean project was scheduled to begin in 2009 and finish at the end of 2011, with a total budget of 3.5M EUR (equivalent to 4,527,813 USD). Even though the funds were transferred in November 2008, UNDP and the Italian Government engaged in lengthy discussions before the finalization of the Cost Sharing Agreement, the main issue being the role of Italian actors in the implementation of the action. The negotiation took almost 18 months and, at times, it was feared that an agreement would not be possible. In the first ERC annual report, UNDP identified the lack of understanding with the donor as a concrete threat to the realization of the project. However, once the GoI and UNDP found an agreement and signed a Memorandum of Understanding in June 2010, the donor and the executing agency worked in close coordination to reschedule the implementation of the activities and to programme the most adequate use of the available funding. A no-cost extension was eventually negotiated to push the final implementation date to December 2013. Therefore, thanks to the flexibility of the partners, the initial delay had no serious consequences for the project.

After signing the Cost Sharing Agreement (CSA) with the GoI, UNDP quickly set in motion the intervention agreeing on a project cooperation agreement (PCA) with CIMH, signed in September 2010. The agreement marks the terms of the collaboration between UNDP, executing agency, and CIMH, implementing agency of the intervention. Under the terms of the PCA, CIMH assumes responsibility for the implementation in National Implementation modality. UNDP retained direct responsibility for the activities of output 2.3 “Support Tsunami and other coastal hazards public awareness initiatives”, while CDEMA was the leading agency in output 2.1 and 2.2.

In output 1, the Italian organization CIMA Research Foundation and CIMH signed an MoU in October 2010 to establish the terms of their collaboration. CIMH is the implementing agency while CIMA was designated by the Italian Civil Protection Department of the Presidency of the Council of Ministers of Italy as the advising and cooperating agency for CIMH. CIMA is the main technological partner of the project for output 1, while it serves as focal point to coordinate the exchange of best practices with the Italian Civil Protection in output 2.

In output 2.1 and 2.2, CIMH signed a letter of agreement with CDEMA in November 2011 for the implementation of the activities. The initial budget of CDEMA’s component was 791,584 USD, but in February 2012 an addendum to the letter of agreement ratified the budget to 543,454 USD (-32%), contextually introducing a 31,808 USD envelop for UNDP’s activities in output 2 (“updating the national civil protection plans”, for “tertiary and professional development” and, quite obscurely, 24 USD for “capacity building for sustainable data collection”). It has been reported to the evaluation team that the reduction in budget was required to account for funds already spent under this budget heading and

mistakes in the use of inconsistent exchange rates. Both the letter of agreement and the addendum lack any reference to the expected targets of the project (number of civil protection plans updated, numbers of volunteers trained, etc.), but according to the personnel interviewed during the field visits the reduction in budget was accompanied by a decrease in the numerical targets. Specifically, instead of 10 civil protection plans, CDEMA worked on updating 5 and instead of providing emergency communications equipment to 10 communities, it supplied 3.

It is not clear why there was a delay of 14 months to sign the letter of agreement with CDEMA, given that the main pre-conditions for the implementation were already in place (availability of funds, PCA agreement between CIMH and UNDP signed in September 2010, while CDEMA had already been identified as the responsible agency for output 2). However, it appears that given the substantial differences between the proposed implementation strategy and the original design, the project partners and the donor had a second round of lengthy negotiations to approve it. As a result of the delay in setting up the necessary institutional agreements, this component had only two years available for its implementation. After a slow start, during its implementation, the CDEMA component experienced a high staff turnover: 3 technical coordinators alternated in its coordination. The high turnover did not help to establish a solid project management structure and the execution of the activities suffered because of the lack of continuity. However, by the end of the project, CDEMA managed to achieve almost 100% of budget consumption in less than two years (implementation ran between November 2011 and October 2013).

In output 2.3 (“Tsunami and Coastal Hazards”), external factors severely delayed the project. Since 2009 the Government of Barbados expressed its willingness to host and support a Tsunami Information Centre, a key institution in the regional strategy for a tsunami warning system that is led by UNESCO/IOC, the go-to UN agency in respect to tsunami and coastal hazards. UNESCO coordinates similar efforts in the North Atlantic/Mediterranean, Pacific and Indian Ocean. In the Caribbean, UNESCO is leading a regional effort to create a multi-hazard Early Warning System pulling together the efforts of several different projects and agencies. UNESCO/IOC entered into discussions with the GoB to endorse the establishment of CTIC in Barbados, hosted in the headquarters of the Department of Emergency Management. However, UNESCO had to face a significant reduction in its budget for the period 2012-2014 as a result of a U.S. legislative restriction, triggered when UNESCO member states voted in 2011 to grant the Palestinians membership as a state that precluded payment of U.S. dues and contributions to UNESCO. The 30% cut in the general budget put a freeze on several commitments like the one to support CTIC. After a successful fund-raising campaign, UNESCO was able to resume talks with GoB and sign an MoU in February 2013 and an Implementation Partnership Agreement in May 2013. Although most of the preparatory work in this component had been finalized in the previous years, CTIC was officially established and its director contracted only in September 2013, leaving little time for trainings and public awareness activities. The delay clearly had an impact on the implementation of the activities that had to be rushed in the couple of months available before the end of the year.

6.2 Management of Funds

The two audits performed on 2011 and 2012 expenditures did not detect any major issue with the accounting of the project, which was found to respond to the requirements of UNDP. Procurement was based on the comparison of different quotes and results in a transparent process. Recruitment of personnel was also conducted in respect of UNDP's procedures with the request for a number of competitive bids that were reviewed and compared. Internal controls for the authorization of expenses were functioning properly during the two years audited. The auditors highlighted that the accounting systems did not allow them to compare the approved budget balances for each activity with the actual expenditures. The project officer at UNDP however set up a parallel system in Excel that performed the missing task in a somewhat cruder but effective way.

6.3 Project Management

The project management structure of the intervention had a certain degree of complexity due to the number of organizations involved in the implementation. CIMH was responsible for project coordination for the entire action, with a project manager in charge of operations and the CIMH Principal providing inter-institutional supervision. However, CIMH was directly implementing only output 1. Output 2.1 and 2.2 (volunteerism) was implemented under the supervision of CDEMA and output 2.3 (Tsunami preparedness) was managed directly by UNDP. However, CIMH was ultimately responsible for the entire action in front of the Project Board, chaired by UNDP. Although some of the stakeholders interviewed for the final evaluation expressed doubts regarding this structure, from a project management point of view the architecture worked efficiently. Credit for this result should be given to the good personal relationship established between the focal points in CIMH, UNDP and CDEMA.

Planning and reporting was coordinated between the partners and validated by the Project Board that convened every quarter with a wide participation of different stakeholders that included beneficiary countries. Although the frequency of Board meetings represented a considerable burden for project management, the support and approval of a wide constituency seems to have proved an energizing force for the ERC.

Coordination between CIMH and CIMA was extremely positive. The amount of interaction well exceeded the boundaries that could be expected from a relationship based on technical support. The relationship established by members of the two teams was characterized by a two-way exchange of information aimed at mutual learning. Coordination for the implementation of different stages of the project was smooth and punctual.

Internal project management tools (annual plans, reporting system, etc.) were of very high quality and allowed CIMH to maintain a firm control over the overall project.

6.4 Monitoring and Evaluation

The monitoring and evaluation system of the project was found to be lacking, especially in light of the complexity of the intervention. Two critical elements were missing in the M&E system: there was no consolidated view of the progress of the intervention and indicators were not correctly identified.

Project management kept records of the advances on a quarterly basis for reporting to the Project Board, but there was no consolidated picture of the results of the intervention. By and large, it is advisable to develop tools that allow project stakeholders to find all the relevant information needed to assess the advances of a project in a concise manner, i.e. table or matrix or performance monitoring framework.

Also, the absence of SMART indicators in the original design did not help the project management team to measure the progress towards the expected goals. During project execution, the implementing partners did not develop more adequate indicators. As it can be expected when good quality indicators are missing, there was no baseline and no system in place to track the performance of the project.

The quality of the available indicators is low: they are not specific and measurable and cover only some aspects of the intervention while the ERC is complex, with numerous activities in a variety of sub-areas and a fairly complicated structure. Outcome indicators are missing, but even output indicators are not specific enough: in many cases there is no numeric target.

6.5 Outputs

The project managed to deliver a significant number of outputs and their quality is generally high.

In output 1 (sustainable network of real-time support centres), the project managed to establish the network with a primary centre at CIMH in Barbados, a back-up centre in Antigua and Barbuda, and ordinary centres in Barbados, Saint Vincent and the Grenadines and the Virgin Islands. 14 robust weather stations were installed (2 in each pilot country and 1 in the other OECS countries). Open source weather stations were developed in collaboration between CIMA and CIMH. At the time of the field visit of the evaluation team to Barbados, 2 open source stations had been installed already; 8 more stations were scheduled to be installed and the remaining 4 will likely be installed after the end of the project through a specific commitment of CIMH. CIMH, in collaboration with CIMA, adapted the Dewetra platform to the needs of the Caribbean region and developed add-on functionalities to build upon the potential of the platform (added layers to analyze historic trends for climate forecasts, software to optimize the frequency of data transmission, demographic information). A multi-hazard simulation exercise was organized in Grenada in April 2013 with the involvement of all three components of the project.

Thorough trainings were conducted in the following areas:

- Specialised training programme at CIMA Research Foundation (Italy)
- Dewetra training of trainers workshop at CIMH (Barbados)
- GIS and software engineering training at CIMA Research Foundation (Italy)

- Installation, operation, calibration and maintenance training at Sutron Headquarters (Virginia, USA)
- Management and maintenance of weather stations

The quality of the outputs in this component is high. CIMH and CIMA established a productive partnership firmly rooted in their shared technical background. The adaptation of the platform to the needs of the Caribbean was very successful, according to all the stakeholders interviewed. Technical issues were resolved satisfactorily thanks to the capacities installed at both agencies and their common desire to collaborate towards the main goal of the intervention. The open source stations are a perfect example of this collaboration. CIMA shared its analysis of the blueprint of commercial weather stations and their expertise in designing a system that could perform at similar levels using components assembled from different suppliers. CIMH contributed with parts of the software needed to control the station and coordinating the logistics of the supply of motherboards (custom-built) and of the other components. The final result is a rain-gauge station, optimized for the Caribbean region, which costs a fraction of the price of a commercial model (approximately 1000 USD instead of 9000 USD).

According to the analysis of the education materials and curricula, it appears that the trainings offered by the project were of very high quality level. The duration, level of detail and balance between theoretical and hands-on sessions are appropriate to the goals of the project to create a strong base for the active use of the Dewetra platform. However, there are doubts regarding the selection criteria of the participants. Implementing partners did not have full control over the selection of the trainees, but made recommendations and suggested specific pre-requisites for participants. In some cases, this resulted in the participation of personnel that was not the most critical in performing the specific function being addressed by the capacity building exercises. In other cases, different staff participated in follow-up sessions. Finally, it also led to an imprecise targeting of the local institution. For example, each country sent participants to GIS trainings, but it was either MET or DM people (or in the case of Barbados, participants were selected from other agencies not involved in the use of Dewetra). Rarely representatives from both institutions completed the full training cycle. As a consequence, while the capacities were increased, the potential contribution of the trainings remained limited to one institution instead of benefitting the system as a whole.

In output 2.1 and 2.2 (Strengthened national disaster mechanisms to incorporate best practices), CDEMA in collaboration with CIMA managed to deliver a number of products in several different areas:

- Model legislation was drafted and a legislation adaptation guide was elaborated. In Barbados, the project has also started the process of adapting the model to the needs of the countries and recommendations from different stakeholders have been included in the Disaster Management Legislation.
- A database of volunteers was developed in BVI. The database constitutes a national register for volunteers, not just for the NDMA, but also for other organizations like Rotary, Red Cross, etc. The

database includes names and contact information of volunteers and also a registry of shelters and equipment available for the response to natural hazards. Although the information stored in the system is not available to the project, the structure of the database is.

- Targeted training of volunteers: training of trainers sessions were organized for the establishment of CERT training teams in Dominica, Saint Kitts and Saint Vincent. 160 community members trained.
- Four national civil protection plans (or parts of them) were revised: Saint Kitts (Multi-hazard contingency plan), Montserrat (Multi-hazard contingency plan and Hurricane Response Plan), BVI (Damage Assessment and Needs Analysis SoPs; Cruise ship plan) and Saint Lucia (Recovery annex).
- 3 communities receive emergency communications equipment and training
- A 14-day training session on open source GIS software

In output 2.3 (Enhanced awareness for tsunamis and coastal hazards), notwithstanding the delays in the establishment of CTIC, the ERC managed to produce most of the expected outputs. Relevant products of the component are a five-year plan for CTIC; two workshops on the elaboration of Standard Operating Procedures; the drafting of partnership agreements with several governments and other organizations; the revision of the public awareness and education strategy; and the adaptation of public information materials (originally developed by CDEMA in the framework of Tsunami awareness initiative funded by USAID and the Caribbean Tsunami Warning Program). The quality of the training was very high: the participants spent an entire week working with highly qualified instructors from the Tsunami Warning Program (CTWP) based in Puerto Rico, the International Tsunami Information Center and the Pacific Tsunami Warning Centre based in Hawaii, with a good mix of lectures and hands-on exercises. The 5-year business plan although fairly exhaustive lacks a pivotal element: the estimated annual funding needed to deliver the expected services. The budget presented in annex 2 shows the operational costs of the institution for 2014-2019, which will cover the salary of the director and running costs of the office. However, the funding needed to actually perform outreach activities to support the regional implementation of an early warning system is not forecasted, nor is there a comprehensive resource mobilization plan. As it is, this product is only partially complete.

6.6 Missed Outputs

In some cases, the project did not achieve the numeric goals or geographic scope envisioned. The ERC project board revised CDEMA's component of the project, reducing the number of countries with revised national civil protection plans from 10 to 4 and the number of communities supplied with emergency communications kits from 10 to 3. These reductions were agreed by project partners in order to adjust the work plan to the available resources, but clearly reduce the coverage of the intervention.

The project also missed the goal of establishing a regional database of volunteers and/or integrating the database created in the British Virgin Islands with other existing databases in organizations with volunteer rosters. The BVI registry was supposed to be a pilot database to be later expanded to the entire region.

However, during the implementation it became clear that OECS countries are not willing to share the contact information of their volunteers with other countries or regional organizations because they are concerned with the possibility of losing their volunteers in case of a multi-country emergency. The ERC retains the overall structure of the database set up in the BVI, but does not have access to the names and contact information of the volunteers. So far the database has not been replicated in other countries. The concerns of volunteer "brain drain" are not entirely unreasonable and this manifests itself in other regions (The Pacific is just one example). However, one way of mitigating this is in fact to ensure a transparent and inclusive cross-regional approach to volunteer training and mentoring where the common opportunities and threat of this issue are debated and addressed.

Opportunities were missed in identifying, engaging and harnessing the complementary skills of other potential trainees for the ERC project. These were available from Caribbean-based institutions that already have trainings in a wide range of DRM disciplines compatible with the objectives of the ERC that, given limited capacity depth in many counties could have enriched the training outputs both for the ERC project and those partner agencies. Trained Caribbean members from the UNDAC system, the IFRC RITs teams, CERT and other rosters could have both contributed to and benefited from greater inclusion.

The institutional and legislative review of the project was supposed to take place in all participating countries, while eventually one general model of legislation was elaborated and only Barbados started the process of revising its legislation to include appropriate consideration for the role of volunteers. Even if the model legislation is now available to all countries to use as they see fit, it seems that a more forceful effort was expected by the project to include legal provisions that incentivize the participation of volunteers in disaster management activities.

6.7 Unexpected Outputs

The project managed to deliver a considerable number of unexpected outputs. Some of the unplanned outputs came to light because the project simply changed its implementation strategy and decided to invest funds in activities that were not initially included in the design. In other cases, the unexpected products are the result of stakeholders enthusiastically embracing the project and making exceptional use of the available inputs to pursue goals that went beyond their terms of reference. All of these initiatives expand the scope and reach of the project into wider DRM issues that go beyond early warning and address opportunities to contribute to the "preparedness for response" element within the DRM cycle. Some examples of unexpected outputs are:

- Output 1:
    - New layers added to Dewetra for climate analysis, crowd-sourcing and dissemination of information
    - Open source weather stations were designed for use in the Caribbean

  - In Antigua and Barbuda, the stir produced by the introduction of the Dewetra platform and its need for data provoked an inter-agency debate on the type and availability of data at national level and the identification of data gaps.
- Output 2:
  - An adaptation guide for model legislation was not originally planned, but CDEMA detected the need for a "how to" document.
  - A certified search and rescue facility was built in Antigua and Barbuda for continuous training in search and rescue operations. It will be showcased during the 2014 Trade Wind exercise that Antigua and Barbuda is scheduled to host.
  - A knowledge, attitude and perception (KAP) study was conducted in BVI to assess the impact of the DRR public awareness and education (PAE) campaign. The results of the study informed the elaboration of the new Public Awareness and Education campaign 2014-2018 and they will be used as baseline for the next phase of the PAE strategy. The data collected by the KAP study will also be used by the Statistics Department for their national planning exercise.

6.8 Synergies with Other Projects

The UNDP office for Barbados and the OECS countries has implemented two other projects with potential links to ERC. The GoI financed a twin project called Youth Innovation (Youth-IN), running in parallel to ERC between 2011 and 2013 with a budget of 3.5M USD. Youth-IN has among its outputs the advocacy and mainstreaming of volunteerism among adolescents and youth. It seems clear that the two projects were meant to coordinate in the area of volunteerism, integrating younger generations in DRR activities involving the population. The collaboration that eventually took place was commendable, but limited to two specific activities: a music context whose winners produced a CD with songs inspired by preparedness messages and the participation of some representatives of the youth movement in training activities of the ERC project. As remarked earlier, the design of two interventions with a significant area of common interest was not casual. A deeper collaboration was expected between the two projects.

The Regional Risk Reduction Initiative (R3i) was funded by the European Union to the tune of 7M USD during between 2008-2011, later extended until 2012. Beneficiary countries were the Overseas Countries and Territories (OCTs – Anguilla, Aruba, British Virgin Islands, Cayman Islands, Montserrat, Netherland Antilles, Turks and Caicos). The R3i had three countries in common with ERC (Anguilla, BVI and Montserrat) and it covered some areas of DRR that presented obvious potential for collaboration with ERC. The main output areas of R3i were: capacity building in hazard mapping and vulnerability assessment, establishment of early warning systems and capacity building in response, rescue and recovery. According to the R3i final report, in Anguilla "A LiDAR aerial survey was completed for the island. A geodetic survey was also conducted, and a new reference network established. Data was used to produce a high-resolution terrain model (3D with buildings), orthophotography and GIS layers. The data produced would be used by Anguilla to produce flood hazard maps and models, select warning areas, conduct hazard, risk and vulnerability assessments, and provide a damage assessment baseline". However, the information

currently available on Dewetra is missing several important layers (see annex 1 – data layers) that should have been easily obtainable through the activities of R3i. Similarly in Montserrat, "data on critical infrastructure was collected and low resolution hazard maps were produced. In Aruba, Curacao, Cayman Islands, TCI and Montserrat, a hazard database was put in place, including a document management system (DMS), and a geoportal". Such information was eventually transferred by the R3i project to the countries, but it currently is missing in Dewetra. It is hard at this point to assess where and how the chain of communications broke down, but in light of these missed opportunities, it appears that in at least in the specific aspect of the collection and sharing of geospatial information, the two projects could have pursued a closer coordination.

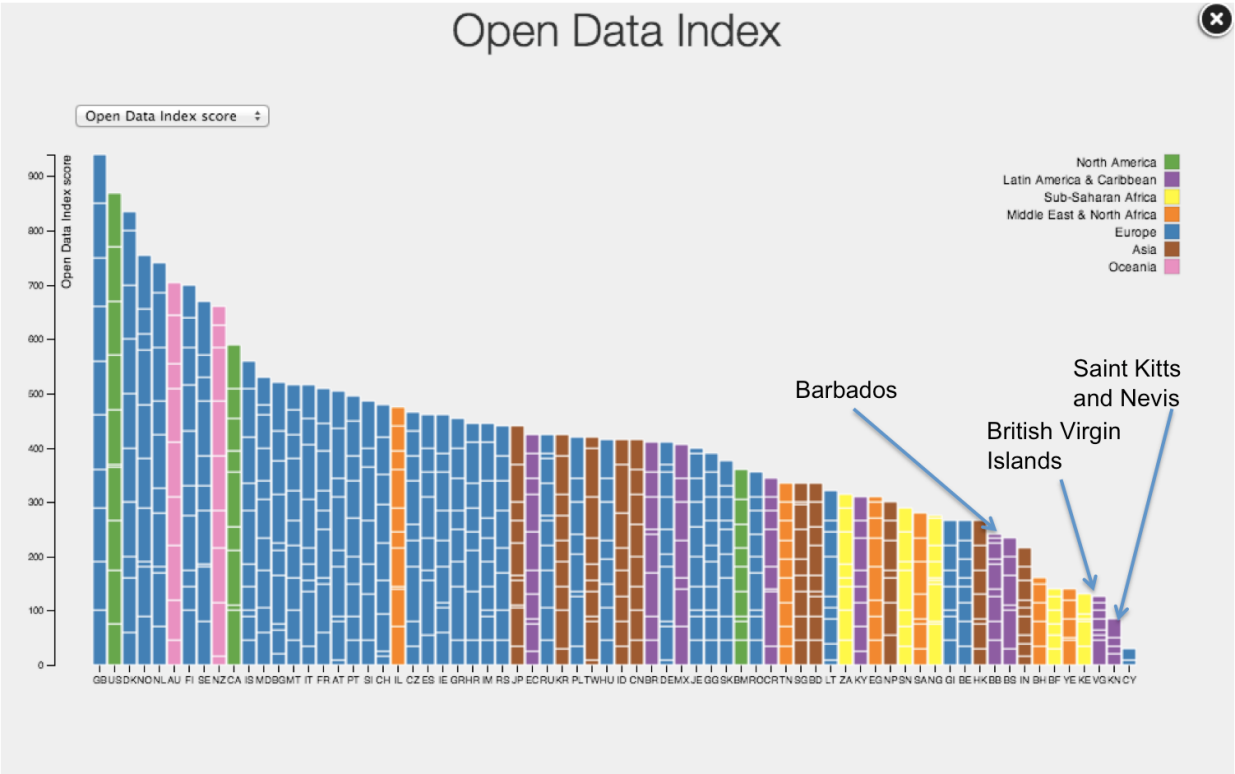
Other initiatives outside of the ERC are being implemented in the region for sharing geospatial information. The World Bank, for instance, has launched its GeoNode platform for the management and sharing of geospatial data. Saint Lucia, Grenada and Saint Vincent and the Grenadines are currently using the platform for land management and risk assessment[5]. The evaluation team was made aware of the GeoNode initiative only towards the end of the evaluation exercise and there were little opportunities to investigate the degree of adoption in the region. However, a web search showed that the World Bank and the three implementing countries had to deal with many of the challenges faced by the ERC to retrieve and upload data. With the limited information currently available, it appears that the two projects did not engage in opportunities for collaboration.

[5] Shared Data Helps Caribbean Islands to Be Better Prepared for Disasters, the World Bank, http://www.worldbank.org/en/news/feature/2013/02/27/caribbean-disaster-preparation-data-sharing last accessed March 18, 2014.

The Value of Data

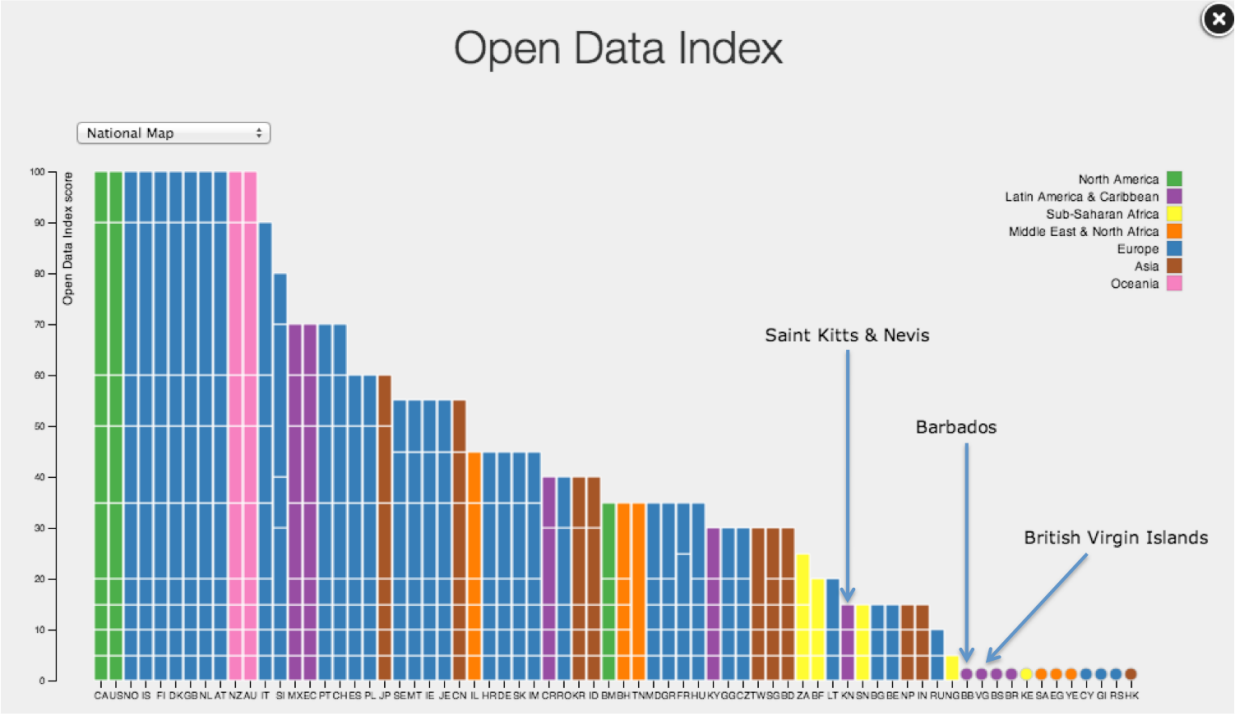
At several junctures the project had to face the issue of ownership of data and uneasiness to share it with other organizations and/or countries. Data layers were hard to find and even harder to share via the Dewetra platform. On several occasions, the ERC had to come up with solutions to assuage the concerns of participating countries while ensuring the availability of information for the project. For example, CIMA created password-protected user profiles on Dewetra with different levels of access: countries can only access their own data, while international organizations (CIMH, CDEMA) have access to all the data sets. Although all these solutions should be commended for allowing the project to move forward, it seems that the issue of the availability of data in the Caribbean should be addressed adopting a wider perspective. Compared to other regions of the world, the Caribbean fares significantly worse in terms of data openness (see figure 5 and 6). The 2013 Open Data Index is an initiative of the non-partisan Open Knowledge Foundation and it provides an independent peer-reviewed assessment of openness in a range of key areas in 70 countries around the world. The three Caribbean countries participating in the ERC and included in the Index occupy the last positions overall and specifically in the national maps sector. However, the current trends in the DRM sector point unequivocally towards a bigger relevance of data for the planning of mitigation and response activities. The Haiti earthquake showed to the entire DRM community the importance of geospatial information for coordinating the response to complex emergencies. In a region like the Caribbean where the scale of catastrophic events often exceeds the capacity of response of national authorities, it is crucial to plan in advance how information has to be disseminated beyond country borders without infringing upon the rights of its legal owners. Some further consideration should be given in the future as to how the management of data that is of overarching benefit can be allowed within a legal context that preserves the right to genuinely restrict sensitive or commercially valuable information.

Figure 5 – Open data Index – all sectors[6]



[6] "Open Data Index", *Open Knowledge Foundation*, last accessed March 18, 2014, http://geography.oii.ox.ac.uk/#open-data-index,

Figure 6 – Open Data Index – national map sector data sets[7]



[7] "Open Data Index", *Open Knowledge Foundation*, last accessed March 18, 2014, http://geography.oii.ox.ac.uk/#open-data-index,

7. EFFECTIVENESS

The analysis of the outcomes of the project shows substantial difference between the three components. In output 1, we can observe numerous intermediate outcomes, although unevenly distributed across the region. Dewetra is being adopted, but not quite at its full potential. In output 2.1 and 2.2, the project has produced outcomes that are fragmented across several countries and areas of intervention, lacking a common denominator. Finally, even though tsunami awareness among the population was not influenced by the ERC, the project managed to contribute to the establishment of CTIC, a key institution in the regional tsunami early warning system.

A project is more than just a list of activities to check off. A project should have a clear vision of the type of change that it is trying to engender through its activities. The vision should be supported by a concise but logical explanation of how the inputs and activities will contribute to the production of outputs and how these will cause a change in behaviour even if the longer-term of the social actors involved (the tool that expresses the vision can take different names: logical framework, theory of change, results chain, realist matrix, etc.). The ERC clearly spells out its vision in the Results and Resources Framework. For the purposes of this evaluation, the theory of change of the ERC has been represented graphically in Figure 1 and 2. According to the design of the original proposal, there are four components in the project: adoption of a platform for real-time monitoring of weather events, creation of capacities for volunteerism based on the experience of the Italian Civil Protection, development of the capacities of National Emergency Management Offices and support to Tsunami public awareness initiatives. The four components are largely independent from one another, but for a few common activities. Namely, capacity building of NEMOs is geared towards the adoption of the Dewetra platform and the scenario development includes the simultaneous field-testing of all the different components.

7.1 Outcomes in Output 1

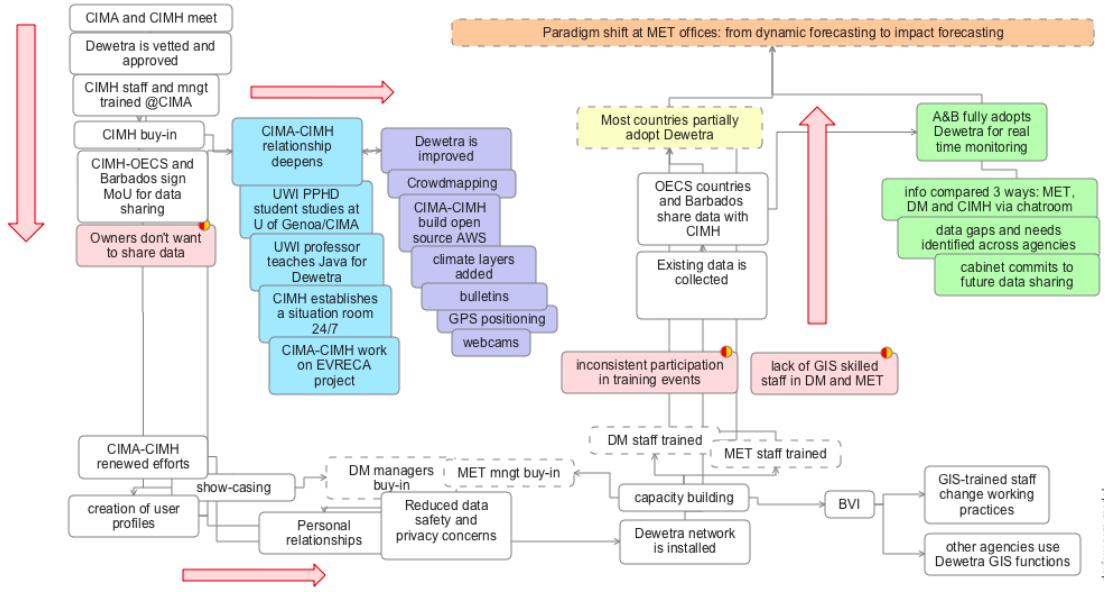
In the first component that corresponds to output 1 of the Results and Resources Framework “Network of real-time decision support centres for early warning systems created”, the project has made considerable advances towards the achievement of long-term outcomes (in orange in figure 7 – outcomes of output 1). However, the goal of this component goes far beyond the adoption of the software. Using Dewetra requires a change in mentality and business practices, a process that necessarily will take many years to be fully completed. This intervention has shown stakeholders that the adoption of Dewetra requires a change in both the way people work and in the type of relationship between MET and DM offices. MET offices have to make the transition from dynamic forecasting to impact forecasting. Although this is a trend supported by the World Meteorological Organization, its implementation will likely be gradual. In the second place, MET and DM people need to develop a closer relationship based on a better understanding of the work of their counterparts and to appreciate the “force-multiplier” benefits of such an enhanced collaboration. This also takes time. The progress made so far by this intervention is substantial, but it is also clear that the change process exceeds the lifecycle of the project and further

work is needed. The evaluation team detected that the strong collaboration established between CIMA and CIMH is one of the most significant results of this component. However, the degree of adoption is still far from ideal, as it appeared evident through the measurement of data sets available for each country, the inconsistent participation to training sessions, and the commentaries of stakeholders interviewed during the evaluation exercise.

7.1.1 Progress in the adoption of Dewetra

The Dewetra platform, originally developed by the Italian Civil Protection, has been adapted to the needs of the region and is in the process of being adopted by beneficiary countries. For the first time, the platform has tackled the complexity of a regional implementation, where several independent countries are required to share their data with a regional organization. Before the ERC project, Dewetra had been successfully implemented in several occasions, but always within the borders of one individual country (Italy, Albania and Bolivia). In all previous instances, the geo-spatial information required to populate the platform was produced and utilized by national agencies. During the course of ERC instead the issue of the treatment and ownership of sensitive data was raised and the project had to adapt its strategy in order to accommodate the scepticism of participating countries. Eventually, data were painstakingly collected in the majority of cases. Also, the implementing partners had to deal with an initial tepid response to the platform by disaster management agencies and meteorological offices. Most of the actors involved at national level have now bought into the project, but there are still significant differences among the 10 countries involved. Antigua and Barbuda (in green) is leading the adoption of Dewetra as an impact-monitoring tool. NODS (National Office of Disaster Services), Meteorological Services and the government of the island seem to be sincerely committed to the utilization and improvement of the platform. On the other extreme of the spectrum, Montserrat has less than 20% of data layers available and neither the Disaster Management Coordination Agency (DMCA) nor the airport authority use Dewetra. In between these two outliers stand the other countries where Dewetra is being gradually introduced. Some of them lack data, some other do not have sufficiently trained personnel and in some other few cases the level of interest of either MET or DM management is modest. By and large, Dewetra is being used as a weather monitoring tool and it has improved the coordination between MET and DM offices. The intermediate outcomes have been achieved and there is a reasonable expectation that those will lead to the full adoption of Dewetra in the region and eventually to a change in business practices, if the process will receive adequate support.

Figure 7 – Outcomes of Output 1

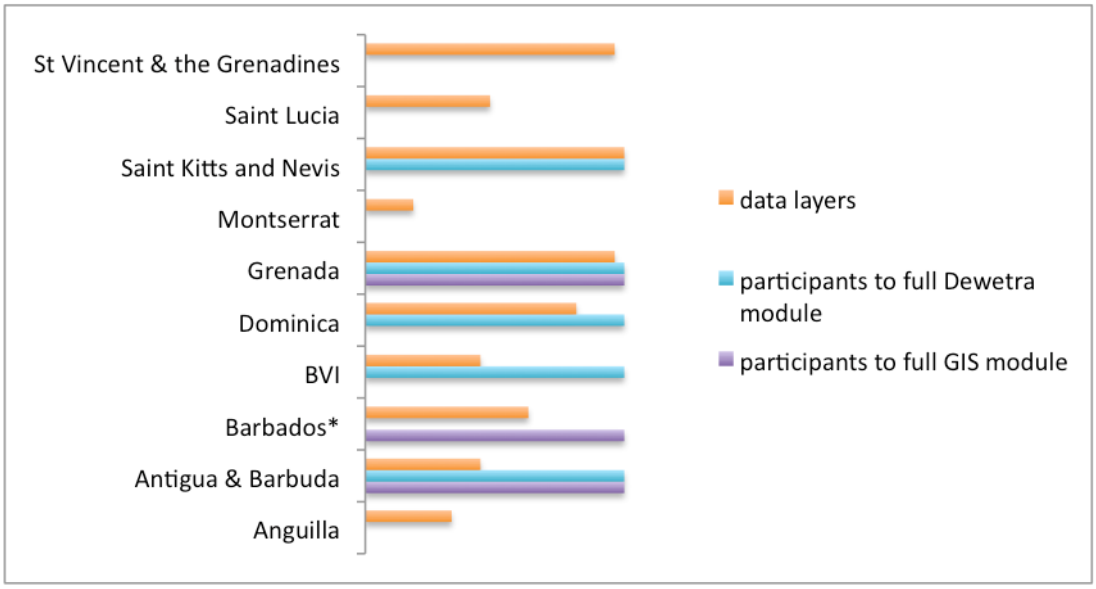


In order to identify objectively verifiable indicators to measure the adoption of Dewetra, the evaluation team has collected information on the availability of data layers and attendance to training events. Figure 6 presents: data sets currently loaded on Dewetra for each individual country, participation to the full Dewetra training module and participation to the full GIS training module. All parameters are expressed as percentages. Availability of data layers is indicated as the proportion of layers available over the ideal full set of 27 data sets. Participation to full Dewetra use training module and participation to full GIS training measure the percentage of participants who concluded the entire training programme (two courses per programme). Countries with at least one trainee finishing the entire module score 100%; countries with no trainee finishing the module score 0%. Although the use of percentages is far from ideal, the graph has the merit of combining the three parameters in one single visual representation.

From this table, it is possible to appreciate how only Antigua and Barbuda and Grenada made significant progress in all of the three areas deemed necessary for setting up Dewetra. The other countries lag far behind, with Anguilla, Saint Lucia and Montserrat scoring the lowest scores.

Qualitative information harvested by the evaluation team during interviews with DM and MET managers further reinforces the point. Only Antigua and Barbuda confirms using Dewetra for impact monitoring, while the great majority of the other countries claim to be using it for weather monitoring although with important caveats. Barbados reports that MET officers prefer using other software because the interface is less user-friendly. Saint Vincent NEMO has not had access to Dewetra for the last two months due to unspecified technical issues. Anguilla and Montserrat are not currently utilizing the platform at all.

Figure 8 – Dewetra adoption



**Barbados participants to GIS trainings were not personnel of MET or DEM, they worked instead for Town and Country Planning Department and Land and Surveys Department*

7.1.2 CIMA-CIMH relationship

One of the most significant achievements of the ERC is the strong collaboration that has been established between CIMA and CIMH. This fertile partnership has been one of the main factors behind the successful pursue of the outcomes of this component of the project and it also led to some unexpected positive results, like the customization of Dewetra with added features and the development of open-source weather stations. Furthermore, CIMA and CIMH widened the scope of their collaboration to other areas and are currently implementing a different project with EU funding.

Until the kick-off of the ERC initiative, CIMA and CIMH had no previous institutional contact. The project first put the two organizations in contact through UNDP and the Italian Civil Protection. CIMH management was invited to visit CIMA facilities in Italy and in that occasion, Dr. Farrell, CIMH Principal, had the opportunity to assist to a demo of Dewetra. At the time, CIMH was actively looking for an impact monitoring software and Dewetra fit the description. After the first encounter, the two organizations established a dialogue at technical level that over the years have extended far and beyond the initial scope of the collaboration. Dewetra in the Caribbean is now a platform with several added features and layers compared the original version currently in use in Italy. CIMH suggested the features according to the needs of the region and CIMA developed the tools. Currently, Dewetra can monitor climate events, like drought,

and it can be used to quickly broadcast communications to all members via a bulletin. Also, the platform has integrated live feeds from webcams and a crowd-mapping tool that allows registered users to upload reports and pictures on weather events. Furthermore, emergency communications devices are now tracked through their GPS signal.

The collaboration between the two institutions has further progressed in other areas. Through CIMH, CIMA has established collaboration with the University of West Indies. Currently, a Phd student from UWI is studying at the University of Genoa while also collaborating with CIMA. A professor at UWI has added a Java module to its programming course specifically geared towards coding for Dewetra. Finally, CIMA and CIMH have agreed to partner in EVRECA (European Volunteers for Response of Emergencies in the Caribbean), a EU-funded project for defining guidelines and standards for the recruiting and training of volunteers. The initiative also involves the Italian Civil Protection and the Disaster Management Agencies of the British Virgin Islands and Grenada. All these collaborations were not part of the original design of the intervention and clearly reflect the strength and depth of the relationship between CIMA and CIMH.

7.1.3 Availability of Data Layers

Once the initiative got under way, CIMH approached the different countries involved and signed agreements for the sharing of data pertinent to the functioning of Dewetra. CIMA and CIMH agreed that there was no need to produce new data, because sufficient data layers were already available having been produced by previous projects. However, contrary to expectations geospatial data were hard to find because dispersed among a variety of different agencies (and even forgotten in hardly ever used hard disks) and even harder to collect because the owners reluctantly shared the information. Several factors affected the smooth transfer of data, the principal ones being:

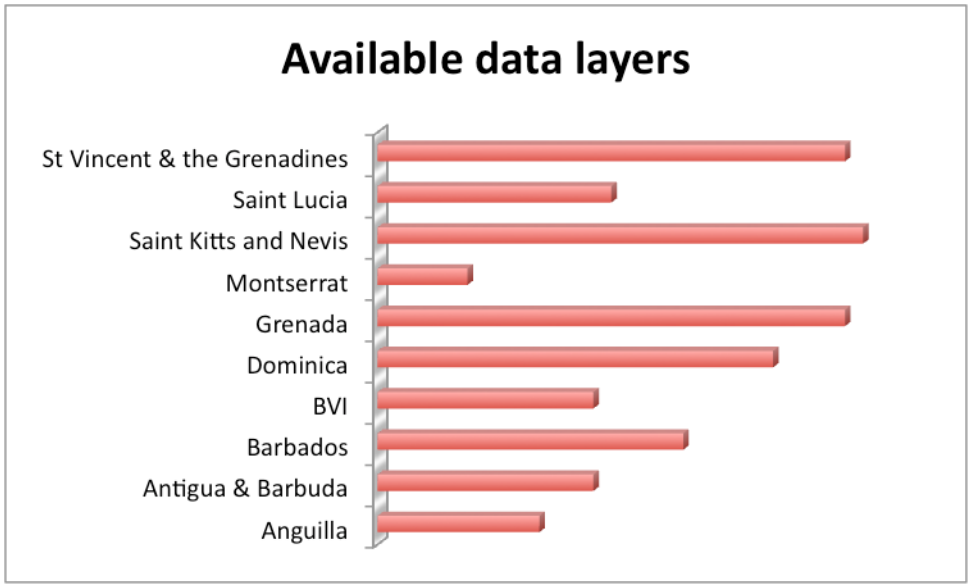
- Difficulty in identifying data repositories among the multiple agencies that work with geospatial information
- Concern about the security of the data (who can access the data?)
- Lack of clarity regarding ownership of data (does it belong to the agency that holds it or to the government?)
- Commercial value vs. public good (who can benefit from it?)
- Poor quality of data sets or missing data

The collection of data turned out to be one of the main obstacles to the adoption of Dewetra. The ERC had to resort to an articulate and flexible strategy in order to overcome the obstacles. In the first place, CIMA set up user profiles for the countries involved so that each participant could only access its own national data on Dewetra. Secondly, an energetic outreach effort was planned to win over the acceptance of the DM agencies. Personal visits and showcasing of the platform were performed across the region. Once the DM agencies got fully on board, together with CIMH, they assumed the responsibility to contact

and persuade the owners of data in the different government agencies. This piecemeal effort relied mostly on personal connections and *quid pro quo* deals, in the form of trainings and access to the use of aggregate data, as mentioned by several of the stakeholders interviewed.

Availability of data is still not adequate to the needs of a tool like Dewetra to be fully operational and relevant, nor to test its possible wider applications and benefits to broader aspects of DRM. Dewetra is a platform that allows for the analysis of risk, vulnerability and hazards under a real-time monitoring of weather conditions. Lacking data on risks, vulnerabilities and hazards, it is virtually impossible to fully take advantage of the platform. As we can see in figure 8 (and in more detail in Annex 1), three countries have all scenario layers available and three more have partial information. However, four countries simply do not have any hazard maps. A similar situation is evident for other data layers: 50% of the countries have geospatial information on their emergency resources (shelter, police and fire stations) or on their territorial elements (population, hotels, health, religious buildings, education facilities). In these cases, the potential use of Dewetra for impact monitoring is extremely limited.

Figure 9 – available data layers



The introduction of Dewetra and the effort to collect and organize data layers from the 10 countries involved had substantial spill-over effects in at least two the OECS states. In the British Virgin Islands, the disaster management agency reports that as a consequence of the work realized in this component, other state agencies have requested to access the GIS data available through Dewetra, given that it is the only tool where comprehensive geo-referenced information is available for the entire country. Also, the advanced GIS trainings have substantially improved the skill sets of the two GIS experts in the disaster management staff. In Antigua and Barbuda, the introduction of Dewetra inspired a nation-wide reflection

over the strategic importance of geo-referenced data. The cabinet formally decided to facilitate the future sharing of data among agencies. Furthermore, a national workshop was organized to identify data needs and existing gaps across the different agencies. Finally, the disaster management agency has been adamant in confirming that Dewetra is already used for impact monitoring purposes in the country. This is so far, the only instance of full adoption of the platform in the region. Among the benefits of the incorporation of Dewetra in the disaster management work, the stakeholders interviewed for the final evaluation reported that it is now possible to perform a thorough analysis of the situation with the involvement of three actors (National Office of Disaster Services, Meteorological Services and CIMH) that can interact online while monitoring the same information through the web-based interface of Dewetra.

In the great majority of the countries, however, Dewetra is not yet used to its full potential (i.e. as an impact monitoring tool and as an added-value instrument in damage and needs assessment), but it is mainly utilized for monitoring meteorological updates. As a weather-monitoring tool, Dewetra is also in competition with other tools available to the MET agencies and although some of the functions are widely appreciated, it does not satisfy all the requirements of meteorological and airport authorities.

7.1.4 Capacity building

There are several causes for the partial adoption of Dewetra. The incomplete availability of data layers has certainly hampered the full roll-out of the platform. Once a country can count on full demographics, geomorphologic and hazard layers, Dewetra shows all its potential. However, with insufficient data availability, impact monitoring is limited, at best. Furthermore, a certain level of GIS proficiency is required both to update the data layers on the platform and to use it. However, none of the MET offices has staff with GIS background and only in three countries out of ten, DM agencies have a GIS person on staff. To compound that, the ERC has struggled at times to have the key persons participating in the trainings. According to our review of training records, only five countries out of ten sent the same person to participate in both courses of the Dewetra module and just two countries sent the same person to complete the GIS training module (figure 10 and 11).

Figure 10 – Participation to Dewetra module

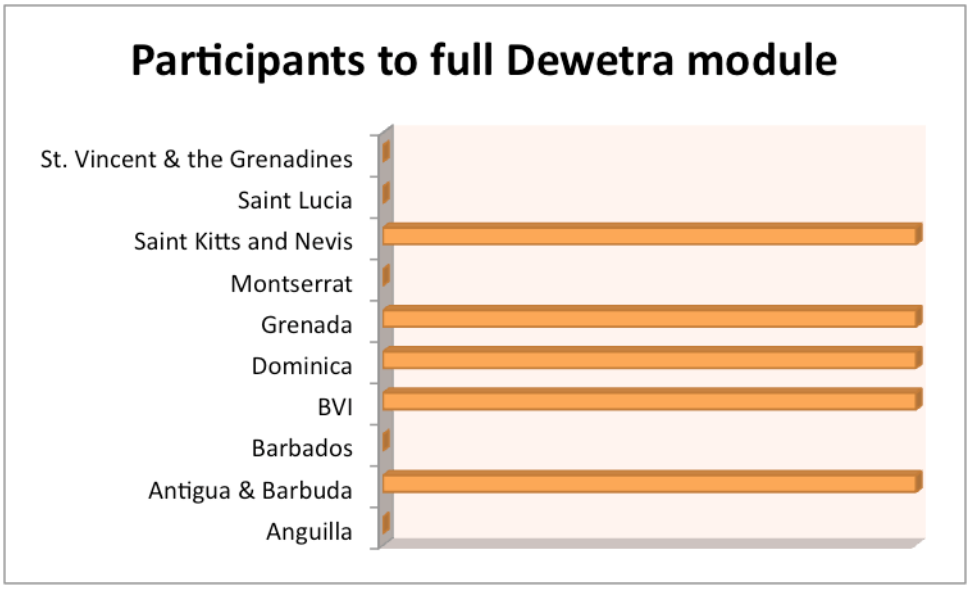
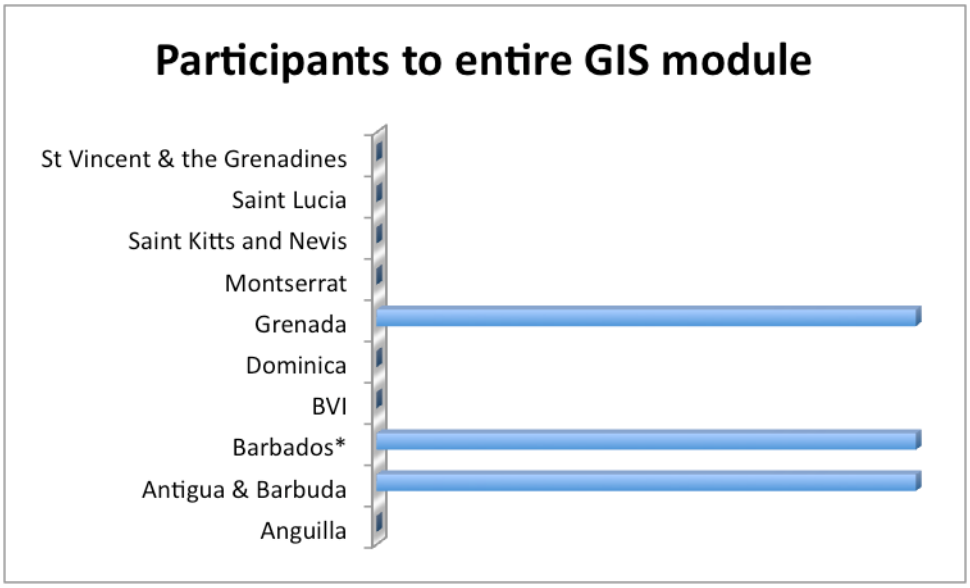


Figure 10 shows that only the representatives of Antigua and Barbuda, British Virgin Islands, Dominica, Grenada and St. Kitts and Nevis participated in both courses of the Dewetra module. The other five countries had a different person participating in the second course of the module. Montserrat sent no participant to the first course.

Figure 11 – Participation to GIS module

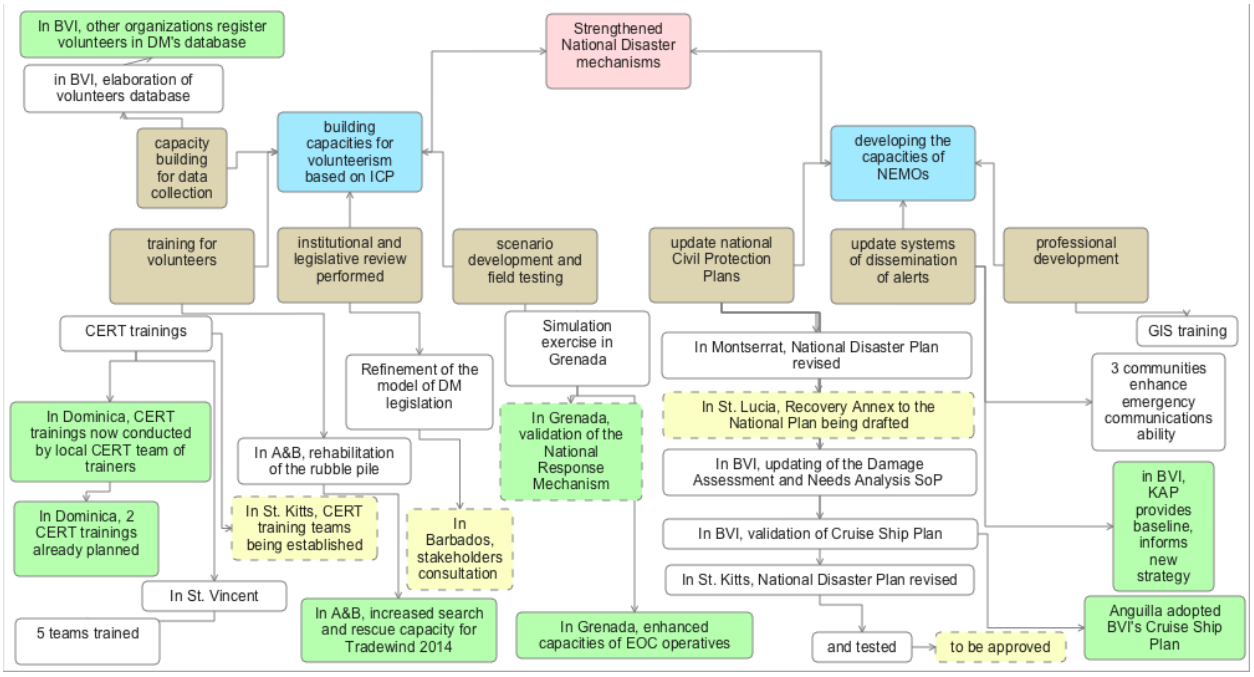


The level of attendance to GIS trainings is lower than the participation to Dewetra's module. Only two countries (Antigua and Barbuda and Grenada) out of ten sent the same person to participate to both courses. Figure 11 shows that Barbados sent representatives to both courses, however the trainees were selected from other departments of the public sector, not from the Department of Emergency Management or the Meteorological Office that were the primary targets of this project.

7.2 Outcomes in Output 2

The second and third components of the project, creation of capacities for volunteerism based on the experience of the Italian Civil Protection and the development of the capacities of National Emergency Management Offices, were virtually merged into one macro-area under the responsibility of CDEMA. In this component, the evaluation team observed profound changes from the original design of the intervention. The transfer of best practices from the Italian experience about Civil Protection legislation and the integration of volunteerism into the response mechanisms did not happen. After the exchange visit to Italy of the Caribbean delegation, the decision was made to pursue a different strategy since the stakeholders detected that the reality of civil protection in Italy is too different from that of the OECS countries. In light of this strategic decision, the project articulated its implementation in a number of country interventions. Eventually the ERC managed to achieve significant intermediate outcomes, but highly fragmented among participating countries and across different areas of disaster management. The overarching objective of strengthening the civil protection mechanisms through the transfer of knowledge North-South (Italy-Caribbean) was at this point scaled down to include only the Dewetra platform. As it appears evident from figure 12, the intermediate outcomes (in green) achieved in the second component are only loosely related and do not lead to one overall goal like in the first component of the project, but only contribute to lower level results (in blue). The volunteerism and capacity building macro area, once it abandoned the original vision, identified a set of activities consistent with the Comprehensive Disaster Management Strategy for the Caribbean.

Figure 12 - Outcomes in Output 2.1 and 2.2



A misunderstanding over payment of volunteers

The decision not to pursue further the potential collaboration with the Italian Civil Protection is a perfectly legitimate one, but the evaluation team noticed that several stakeholders mentioned an incorrect reason for the inapplicability of the Italian mechanisms in the Caribbean. In several occasions, both country representatives and staff of regional organizations mentioned that the Italian volunteers get paid for their services. This statement is incorrect and misleading. The Italian legislation makes provisions for the employer to receive a compensation for the salary of the volunteer, when the volunteer is called up to serve in civil protection activities. In this way, the volunteer does not lose the corresponding part of his day-job salary. This arrangement is fairly standard in highly formalized labour market. Considering this compensation a payment for services is an over-simplification that clearly misleads into thinking that volunteers have a financial incentive that motivates them. The motivations for the high participation of the population in disaster management activities are rather rooted in the social networks to which the volunteers belong and the high-level of trainings, equipment and organization that is offered to them to become effective resources in time of emergency. These lessons seem to have been missed by the project.

The **training of volunteers** in Community Emergency Response Teams involved Dominica, Saint Kitts and Nevis and Saint Vincent and the Grenadines. The trainings achieved substantial outcomes in Dominica, where a CERT team of trainers has already been established through the efforts of the project and new training sessions have already been planned for the first months of 2014, independently of the ERC. The establishment of a national CERT team that has already taken over the replication of the trainings is a clear sign of the success of the project in influencing a change in behaviour in local authorities. It also sets solid basis for the future sustainability of the capacity building effort in the island. In Saint Kitts and Nevis and Saint Vincent and the Grenadines, the creation of the team of trainers has not been finalized yet. In Saint Vincent the trainings received have been considered insufficient for local volunteers to set up a local training team.

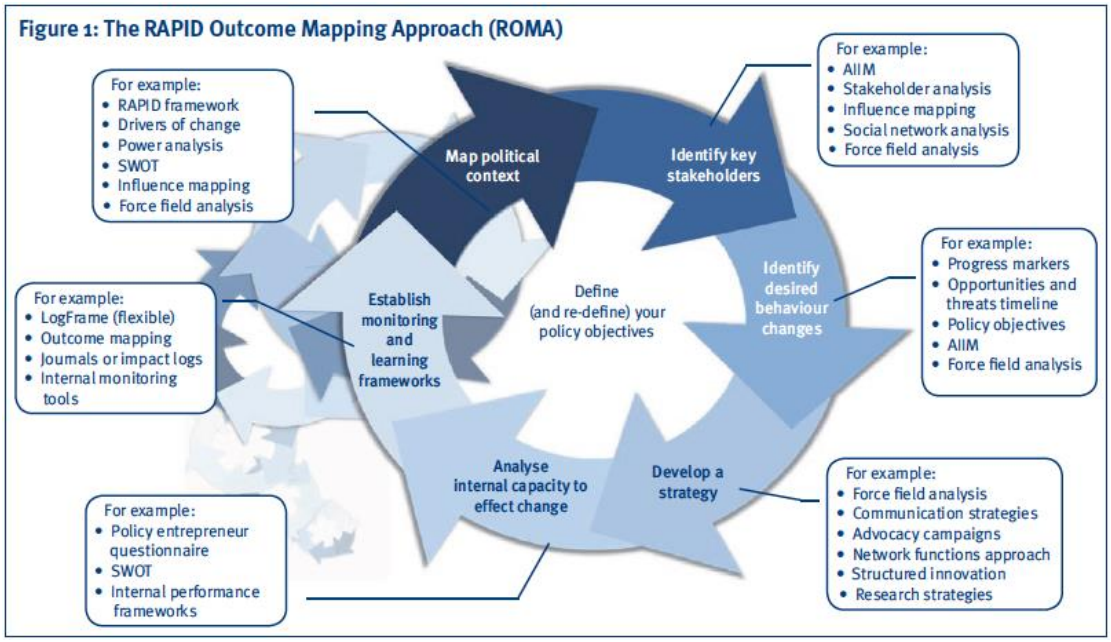
In the framework of the capacity building of volunteers, the ERC also rehabilitated a Search & Rescue facility in Antigua (a “rubble pile” built according to specifications). The facility will be used for future

trainings of Search & Rescue teams and it will allow Antigua to host the Search & Rescue activities during the TRADEWIND 2014 simulation exercise.

The **institutional and legislative review** activity originally planned in the ERC delivered an output of a model legislation for the Caribbean, that includes a section on volunteerism. There are no outcomes readily available in this area. However, in Barbados the project has started the process of validation of the model legislation through the consultation of stakeholders. In BVI, with the support of CDEMA's HIP project the model legislation has been used as a reference in revising the national legislative framework. Although the quality of the proposed legislation is certainly good and the availability of such a tool could turn out to be a great advantage for the region in the future as demonstrated in the case of BVI, the evaluation team feels that this is an opportunity to reflect on the merits of this approach.

The original design of the project includes an "Institutional and legislative review" as part of the activities needed for "building capacity for volunteerism based on the best practices of the Italian Civil Protection Agency". However, there is no reference to the indicators of success or eventual outcomes of this activity. A simple stand-alone review, without any follow-up activity or adoption of the results of the action seems to be hardly relevant to the goals of strengthening civil protection mechanisms. It is true, though, that framing the legislative review in a more ambitious context that leads to the passing of a new legislation can easily exceed the timeframe of a development project. Legislative processes are usually long, complex, multi-factoral and non-linear. Furthermore, this project adds the complication of working in 10 different countries. In these cases, projects struggle to find the balance between delivering mere outputs and achieving long-term outcomes. One possible solution is to accept the limitations of the project-approach, while formulating a long-term strategy with short-term intermediate outcomes and indicators. Among the numerous methodologies available for influencing policy-making, there is the Rapid Outcome Mapping Approach (ROMA – see Figure 13), developed by the Overseas Development Institute. ROMA helps to elaborate a strategy for influencing new policies and break it down into 8 steps that can be easily managed and the progress measured in the framework of a project.

Figure 13 – The RAPID Approach



Rapid Outcome Mapping Approach

Rapid Outcome Mapping Approach was developed by ODI in order to provide guiding principles to influence policy-making processes. There are 8 main steps to ROMA:

- *Define a clear policy objective*
- *Map the policy context*
- *Identify the key influential stakeholders*
- *Develop a theory of change*
- *Develop a strategy*
- *Ensure that the engagement team has the competencies required to operationalise the strategy*
- *Establish an action plan*
- *Develop a monitoring and learning system*

The **exercise** in Grenada was hailed as a success by all participants. The event offered the opportunity to validate the National Response Mechanism (final revision is still being processed though) with the lessons identified leading to lessons learned from the multi-hazard simulation. Also, it is reported that Emergency Operation Centre's staff were able to enhance their capacities to manage complex emergency situations.

The creation of **database of volunteers** in the British Virgin Islands produced substantial outcomes but also highlighted the need for a regional procedural on the mobilization and use of volunteers. In its original design the intervention was planning to create a regional database of volunteers. BVI was chosen as a pilot country for the database. However, while BVI has a clear set of procedures for mobilizing volunteers, other countries do not. A regional database cannot work without clear rules that regulate who and how can mobilize volunteers and who is responsible for their indemnification. Under the present conditions a regional database was not viable and the project decided to postpone plans for a wider initiative. Currently, the database is up and running in BVI, with registered volunteers plus shelters and emergency equipment and its structure is available to other countries that could manifest an interest in using it. In a clear sign of its successful adoption in the country, the database has been fully endorsed by the disaster management agency, but also by other national organizations that adopted it to register their own volunteers.

The **update of National Civil Protection Plans** was performed for entire plans or parts of plans in selected countries. The outputs of this activity were already described in the “efficiency section”. The outcomes, intermediate and long-term, of this set of activities are not apparent yet in the majority of cases. However, BVI is once again the exception. The Cruise Ship Plan has been validated and tested, and even though it has not been approved yet by the cabinet, it has already been adapted by Anguilla to develop their own procedures. Furthermore, the Knowledge, Attitude and Perceptions study on the entire Territory’s disaster management programme has also produced significant outcomes. Namely, the recommendations were considered during the development of the new disaster management strategy 2014-2018 while also providing a baseline to assess the achievements of the next planning phase. It is remarkable to observe how the work of the project in the BVI has not been limited to the disaster management agency, but it has been spread to a wide range of government agencies that are using its results to improve their work. A similar situation has been observed in Antigua and Barbuda, where the project has managed to involve a variety of agencies in the discussion about data needs and gaps. In both countries, the intervention has found highly responsive national partners that helped to mainstream disaster management lessons and best practices across a number of sectors.

Finally, the **updating of systems of dissemination of alerts** benefitted three communities in Dominica, Grenada and Saint Lucia. There are plans to integrate the communities in weekly testing of the equipment, but they have not started as yet.

7.3 Outcomes in Output 2.3

The main outcome of output 2.3 of the project "Support Tsunami and other coastal hazard initiatives" is the establishment of the Caribbean Tsunami Information Centre (CTIC), a new organization that provides a missing piece in the establishment of a Tsunami Early Warning System in the Caribbean. The institutional structure of the educational and outreach component of the programme in the region now mirrors that of the Tsunami programmes in the Indian Ocean, North-Eastern Atlantic and Mediterranean and the Pacific Ocean. To achieve the establishment of CTIC the project had to follow a long and tortuous path. Substantial delays affected the implementation of the action and threatened to derail the process. Most of the difficulties encountered were not under the influence of the project, which could only exert modest pressure on the other actors involved. The Tsunami Early Warning System in the Caribbean is a programme led by the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/Caribe EWS). The ERC, like other similar projects, contributed only in a small measure to its implementation. Eventually, the creation of CTIC in September 2013 was the culmination of the efforts of many different actors. This outcome is extremely relevant because of the intrinsic difficulty of creating a new international organization and also because of the relatively minor role of the ERC in the regional tsunami programme. However, due to the delays in its establishment, CTIC is also the only outcome of this component. The project managed to deliver several good quality products (public awareness materials adapted and translated, public awareness and education strategy, CTIC business strategy, etc.), but these outputs were not yet converted into outcomes, e.g. enhanced public awareness. Only specialized audiences were exposed to PAE activities.

7.3.1 A Little History

The Caribbean Tsunami Information Centre was established in September 2013 in Barbados through an agreement between the Government of Barbados and IOC/UNESCO. The Government of Barbados hosts the centre in the Department of Emergency Management and provides secretarial services. CTIC board reports to the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/Caribe EWS). The Intergovernmental Oceanographic Commission (IOC) of UNESCO acts as the secretariat of the ICG for the implementation of the Caribbean Tsunami and Coastal Hazards Early Warning System. Similar country-driven programmes have been established in the Indian and Pacific Ocean and the North-Eastern Atlantic and Mediterranean. The main difference between the Caribbean and the other regions is that in the Caribbean IOC assumed a prominent role, technically and financially.

Table 14 - CTIC Timeline

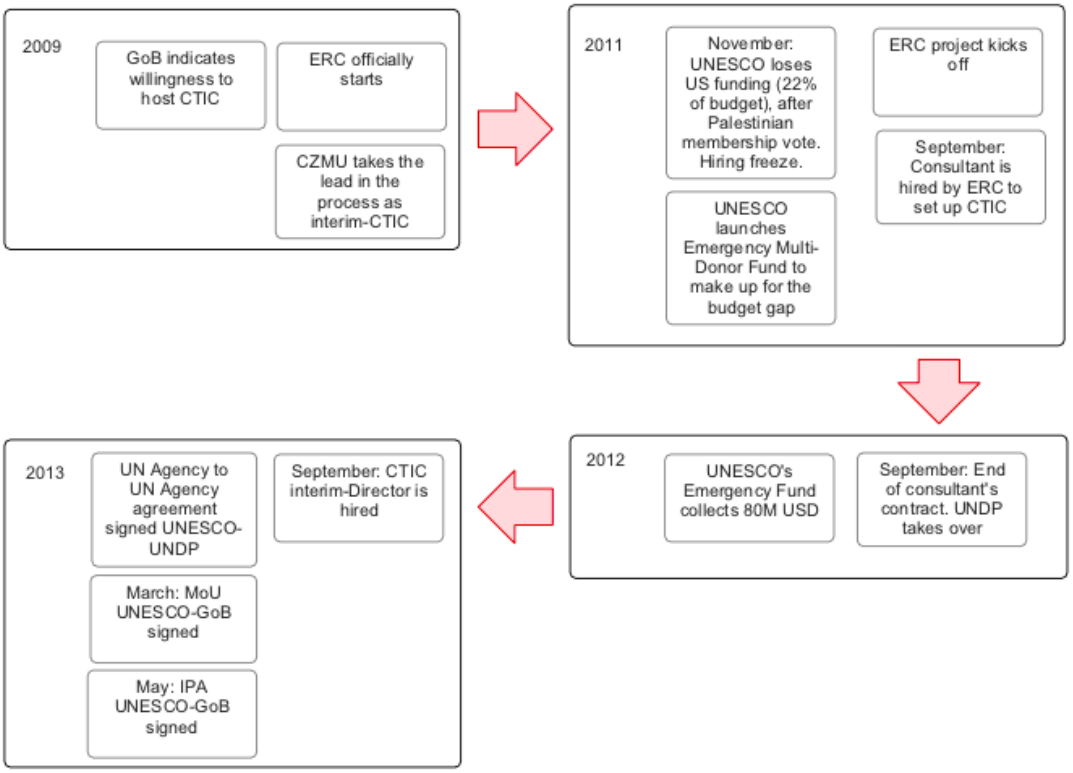


Figure 9 shows a timeline of the process that led to the establishment of CTIC. In 2009, the GoB manifested its willingness to host CTIC and contextually appointed its own Coastal Zone Management Unit (CZMU) as interim Tsunami Information Centre. Around the same time, discussions started on the institutional and financial arrangements for the establishment of the new organization. Initially, it was envisioned that CTIC would become a permanent body of the United Nations and its director would be a UN staff. However, in 2011 UNESCO suffered a 22% cut in its general budget after the US withdrew its support following the vote to extend membership status to Palestine. The dramatic reduction in funds availability for the following biennium, forced UNESCO to revise its financial commitments and impose a hiring freeze. As a consequence, UNESCO's plan to support CTIC had to be put on hold while the Director-General launched an Emergency Multi-Donor Fund to raise contributions to reduce the gap. Meanwhile, in 2011 the ERC project effectively started operations. In September, a consultant was hired by the project to pave the way for the establishment of the organization. With the participation of the consultant and two external companies the project produced the main outputs of the component: formulation of a 5-year business plan and adaptation of public awareness and education materials.

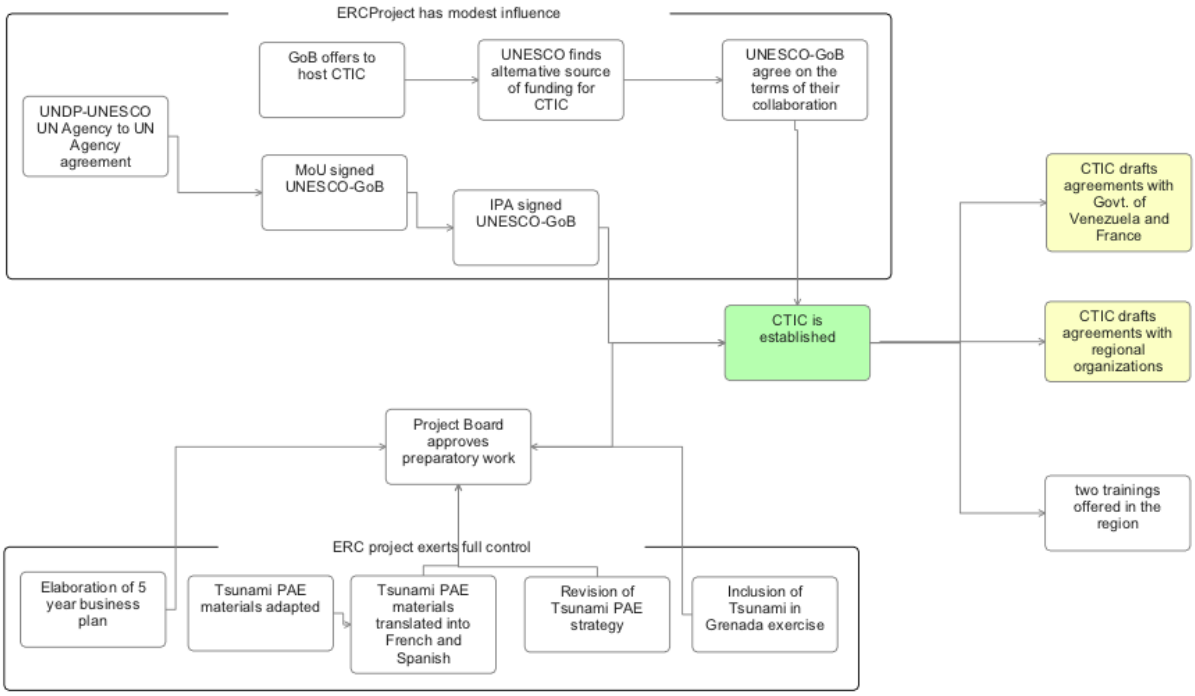
Towards the end of 2012, UNESCO announced that the fund-raising campaign had permitted the organization to successfully raise 80 Million USD. The money would be used to reinstate some of the programmes previously frozen, like the tsunami early warning system one. However, the hiring freeze would not be lifted and CTIC Director could not be hired as UNESCO staff. News of the fund-raising success led to renewed talks with the GoB and UNDP for the establishment of CTIC.

In early 2013, UNESCO signed a UN Agency to UN Agency agreement with UNDP, an MoU and an Implementation Partners Agreement with GoB to set up CTIC. The interim Director was hired in September 2013 and she quickly proceeded to organize two workshops on "Strengthening Standard Operating Procedures for Tsunami Warning and Emergency Response".

7.3.2 Extent of the Outcomes

Figure 15 maps the results of the project in supporting Tsunami initiatives. Comparing this map with figure 2 (theory of chain), it becomes immediately apparent that the project has only partially achieved the results originally envisioned for this component. Only the trainings on Tsunami Early Warning were punctually conducted, while the public awareness campaign and other awareness activities were not performed due to the limited time available after the long-delayed process of establishing CTIC. The PAE materials will be available for future use, but unfortunately this project will not improve the population's understanding of coastal hazards. Even though the extent of the results produced by the project is far from ideal, the evaluation team values the establishment of CTIC as a highly positive outcome that represents an important milestone in the efforts to create an effective tsunami early warning system in the region. The organization is still in its infancy and it is still to be seen if it can rally the concrete support of Caribbean countries. However, important steps have been taken (although not finalized) to broker agreements with the Government of Venezuela and the General Council of Martinique not least to enhance tsunami and other early warning communication and information sharing in Spanish and French. In perspective, having a tsunami information centre seems to be more strategic for the long-term prospect of tsunami public awareness than the mere implementation of an awareness campaign.

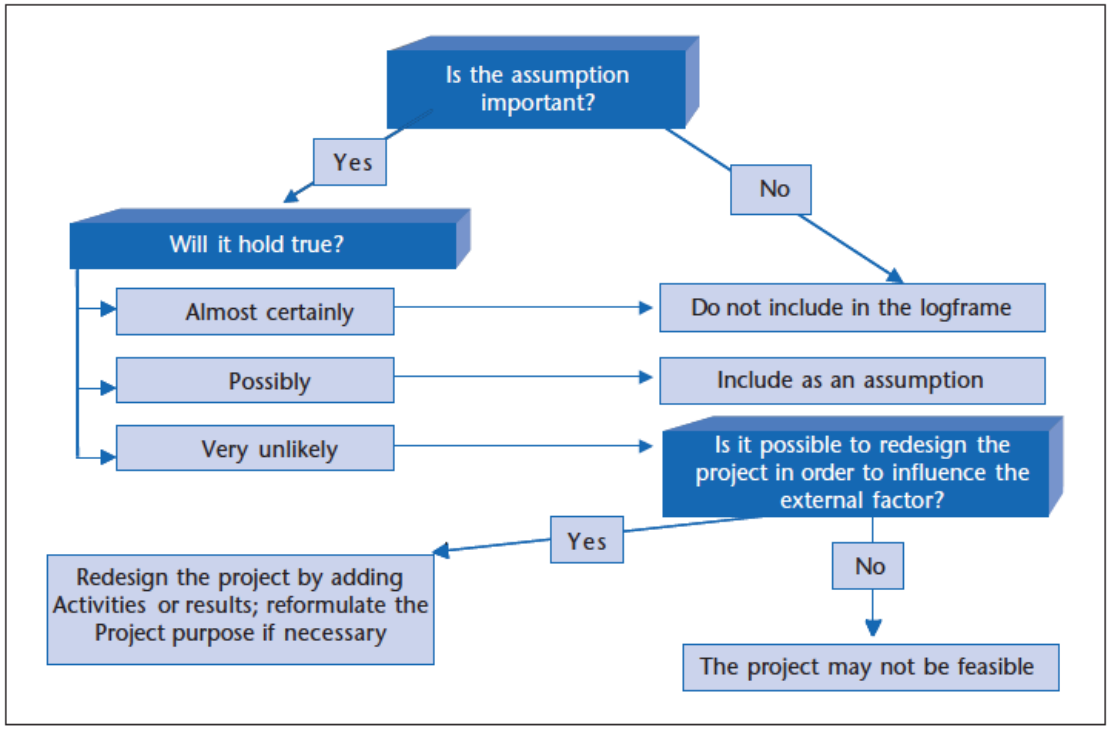
Table 15 – CTIC Outcome



Managing risks and assumptions

The evaluation team feels that this section of the project offers a good opportunity to promote a reflection among project stakeholders about the identification of risks and subsequent contingency planning during project implementation. As presented in figure 15, the establishment of CTIC depended on a complex series of factors that lay outside the sphere of control of the project. The Tsunami Early Warning System in the Caribbean is a programme that far exceeds the duration and geographic limits of the ERC. The Caribbean countries (and countries from the adjacent region) run the programme with the support of UNESCO. ERC made a significant financial contribution to the programme (approximately 500.000 USD), but it had no control over the process. It was almost impotent when UNESCO had to suspend its support to the initiative or when UNESCO and GoB got involved in prolonged discussions about the legal status of the new organization (quite significantly, this lack of influence is reflected in the absence of a formal role in the Tsunami EWS process: neither ERC nor CIMH or UNDP had a formally recognized role in the programme). Eventually, UNESCO overcame its financial constraints and found an agreement with GoB. However, neither one of these positive outcomes could have been foreseen. What would have happened if, for any reason, CTIC establishment had been postponed a few extra months? This risk was not factored in the project strategy, but the consequences would have seriously limited the efficiency (results per money) and effectiveness (outcomes) of the ERC. Although ERC project management identified this risk and closely monitored the situation on behalf of the Project Board, no contingency plan was formulated to propose alternative courses of action in case the assumptions were not met (see figure 16). Contingency planning is an integral part of risk analysis and as such it should always be included in a project implementation strategy.

Figure 16[8] - Formulating and Testing Assumptions



8. SUSTAINABILITY

The outlook on the future sustainability of the results of the ERC is positive, although there are several factors that can undermine the progress made so far. The project has managed to create new institutions (CTIC) and establish a solid relationship between CIMA and CIMH, organizations that have shown the willingness to continue their successful collaboration for the improvement of human security in the region. However, it is still uncertain how CTIC will be able to raise the funds that it needs after 2014. Also, the future sustainability of the results depends on a strong collaboration between CIMH and CDEMA that has not been formalized nor tested yet. Consideration should be given to enhancing the DEWETRA initiatives through integration with present and future activities for the enhancement of NEMOs capacities already underway or planned through parallel funding sources such as the ACP-EU Facilities and other donor DRM earmarked funding streams. Going forward, closer liaison with other partner DM agencies in the Caribbean on these initiatives from ERC will foster enhanced cooperation, coordination and mutual benefit that in turn must reinforce sustainability. The level of capacities installed is moderately good. The

[8] European Commission, *AID Delivery Methods – Volume Project Cycle Management Guidelines*, 2004

trainings offered by the project were of high quality, but not all countries or potential agencies that may have, participated consistently in the events.

8.1 Capacity Building

The quality of the trainings offered by the project has been generally high. The trainings were extensive and well structured. Theoretical sessions came accompanied by practical exercises and simulations that had the participants find a concrete use for the recently learnt notions. However, there are still significant gaps in the level of capacity of national MET and DM offices or indeed in most other DRM regional agencies and governments. It was observed that there is no GIS trained staff in most DM and MET offices, which severely limit the potential for taking full advantage of the functionalities of Dewetra. The platform has been defined by several informants as an "impact-monitoring tool". This functionality requires a human analyst to process, update and interpret data to provide support to decision-makers in order to make the best use of the information. Most countries do not have this capacity, but have to rely on the remote support of CIMH.

CIMH plans to increase the adoption rate of Dewetra by MET offices through the future trainings of MET staff, for which CIMH is responsible. This strategy appears to be sound, in principle. Future training courses will be a good opportunity to increase loyalty to the software and keep users abreast of new developments and add-ons. However, in the current training programme, only MET officers would be exposed to Dewetra, while during the interviews with stakeholders the evaluation team has observed the importance of involving both officers and management at both MET and DM offices and the added value of inclusion of lateral DRM partners.

Inconsistent participation in trainings has had a negative effect on the creation of capacities. Countries sent different personnel to participate in successive modules or did not send anybody at all. In output 1, the capacity building programme was divided in three areas:

1. Maintenance of hardware (weather stations)
2. Creation and update of data layers
3. Use of Dewetra.

Area 2 "Creation and update of data layers" was divided in two modules: "GIS software engineering" and "GIS and Dewetra upgrade". Only Antigua and Barbuda (2 participants) and Grenada (1 participant) completed both modules. BVI and Saint Vincent and the Grenadines participated in one module. Barbados' representatives belonged to institutions not directly involved in the use of Dewetra (Land and Surveys Department and Town and Country Planning Department). The other countries did not participate.

Area 3 "Use of Dewetra" was composed of two modules: "programme for civil protection managers" and "training of trainers workshop on Dewetra platform". Of the 16 participants in the first module, only 7

assisted to the second one. Four countries (Anguilla, Barbados, Saint Lucia and Saint Vincent and the Grenadines) did not send participants to complete the full training cycle.

It would be advisable given the often limited staffing capacity and the frequent reality that individuals often have to multi task and do double duty on occasions, to ensure cross-fertilization and awareness in future initiatives that the same group of trainees participate to all the capacity building events included in the curriculum. Having new participants at every stage of the process causes trainers to waste time going over issues that were already addressed in previous modules and does affects the achievement of the learning goals. Also, the project should make a greater effort to involve all participating countries in the trainings and to at least investigate the potential to engage DM agencies such as UN OCHA, the IFRC, National Red Cross societies, and faith-based groups with volunteer capacity. Without a consistent participation, the level of capacities installed by the project does not guarantee the future sustainability of the intervention.

CERT trainings of trainers have achieved mixed results. In at least one country (Saint Vincent and the Grenadines), the NEMO office considers that the training was not thorough enough to allow national trainers to replicate the capacity building sessions.

8.2 Institutional Structure

The collaborations between CIMH and CDEMA on one side and CIMH and CIMA on the other are pivotal in ensuring further adoption of Dewetra by OECS countries. CIMH and CDEMA are aware of the importance of establishing a strong coordination to strengthen their respective contribution to the introduction of an impact monitoring approach to the disaster management arena. CIMH will be responsible for the technical aspect of the platform (hosting, maintenance, development, training and data analysis) and for liaising with meteorological agencies. CDEMA would spearhead the effort to bring on board, train and support the disaster managers. Both organizations are seen as leaders in their respective sectors. If DM and MET services are to collaborate in the future, the regional institutions have to set the tone for the integration of dynamic weather forecasting and real-time impact monitoring. It is important that the strategy for the collaboration between the two institutions is formulated and formally adapted sooner rather than later in order to avoid losing momentum.

CIMA and CIMH have established a strong partnership over the course of the intervention. This is one of the most impressive results of the project. As discussed earlier, the two organizations have built strong ties above and beyond the ERC. The two organizations are currently planning to continue their collaboration in the future with Dewetra and in other areas of mutual interest. A tangible example of the strong institutional relationship is the participation of both agencies in the EVRECA project, an EU-funded initiative for the transfer of capacities between Europe and developing countries in the disaster preparedness arena. Plans are also being discussed to continue supporting Dewetra after the end of the ERC. The two organizations are currently in the process of formulating a MoU to formally agree on the terms of their continuous collaboration.

CTIC is still in its infancy. The organization was formally established only in September 2013, it is therefore too early to assess its institutional solidity. The main threats to its future sustainability are both financial and institutional. Funding has been assured only for 2014. The 5-year business plan included a resources mobilization strategy, but as remarked earlier this covers only the operational needs of the organization, not its programmes. Similarly to what happened in the other regions where a Tsunami preparedness system already exists with the possible exception of ITIC in Hawaii, in the Caribbean no country has the financial resources and political willingness to support the process single-handedly. The support of the Government of Barbados is a key element in the initial stages of the establishment of CTIC, but rallying further support from both other governments and international donors agencies such as the EuropeAid, DFID and others that are known to provide DRM/DRR, Early Warning and Climate Change Adaptation (CCA), as well as the private sector seems to be necessary to ensure the future sustainability at adequate operational levels.

From an institutional point of view, CTIC can already count with preliminary draft agreements with the Government of Venezuela and the General Council of Martinique. Furthermore, agreements have been drafted and discussed (but not signed yet) with CDEMA, the Caribbean Tsunami Warning Programme, the Seismic Research Centre (SRC) and the Centro de Coordinación para la Prevención de los Desastres Naturales en América Central (CEPREDENAC).

The creation of CERT training teams in four countries is an important step towards the institutionalization of community volunteerism that ensures the replication of trainings at national level and the progressive increase of the base of volunteers. Although the process has not finalized in all the countries involved, steps have been taken in the right direction to ensure that the replication of results of the ERC will now rest on the shoulders of local authorities and institutions.

8.3 Policy

At the policy level, there are no significant changes that could affect the results of the project, either in a positive or negative way. Barbados is the only country that has started the process of adapting its legislation to include specific provisions regarding volunteerism. However, even in Bridgetown the approval of the new legislation is not imminent.

By and large, the legislative process is slow in the region. It is unlikely that development projects can accompany the entire course of elaborating, validating and getting new pieces of legislation approved in their relatively short timeframe. This intervention is no exception. It is fair to assume that no country will approve new legislation before the end of the ERC. Is this a failure of the intervention? Not necessarily if the project manages to kick-start the legislative process and leaves in place the tools to bring it forward. In this case, CDEMA has developed a draft model of a volunteerism act and an adaptation guide to help the different countries to convert the draft model into actual legislation. This constitutes a solid base for the future. However, the future adoption of the newly available tools is far from certain. The legislative process is complex and often dependant on political calculations more than on the quality of the bills

themselves. The active involvement of several stakeholders from civil society, to political parties and sector institutions is crucial to ensure that prospective bills become law. Without a leading force to guide the process and negotiate with the different actors involved, it is unlikely that new legislation will be passed. The ERC has created the tools, but at present there is no major actor willing to become the driving force in the process of getting the new legislation approved.

8.4 Threats

The results of the Enhancing Resilience to Reduce Vulnerability in the Caribbean project are impressive, but still in the early stages of their consolidation. Many of the outcomes of the project are intermediate and further work, leadership and funding is required to build upon them to achieve long-term results.

In output 1, the project envisioned a profound change in mentality that involved both MET offices and DM agencies. MET offices are required to move from dynamic forecasting to impact forecasting. DM agencies need to improve their understanding of the territory and the capacity to develop strategic planning for the use of resources. At the same time, and in step with initiatives globally, Caribbean Government DM agencies are also tasked with the challenges of a change process, moving their National DM policies, strategies and national plans from the tradition Disaster Preparedness (DP) and Response (DR) based platforms to that of a DRM/DRR model. Both organizations are also expected to develop a closer collaboration between them and with CIMH. The number and extent of the changes required are challenging. Without further support, there is a significant risk that the transition to impact monitoring will be slow and its results will be uncertain in some countries.

Furthermore, not all countries have a complete set of data layers loaded on Dewetra (Annex 1). Countries like Anguilla and Montserrat have only basic information available on the platform. CIMH and its partners are now posed with the challenge of formulating a strategy to compile the missing data sets.

CIMH and CDEMA agree that further adoption and utilization of Dewetra requires the commitment of both institutions to promote the platform with their respective constituencies. CIMH has standing collaboration agreements with meteorological offices in the region, while CDEMA mostly interacts with national disaster management agencies and also with other DRM agencies such as the UN and Red Cross. As highlighted in previous sections of this report, the full rollout of Dewetra needs the support of both MET and DM offices. At the moment (January 2014) CIMH and CDEMA have expressed their willingness to collaborate, but have not signed a formal MoU that regulates the terms of their relationship. Moreover, the collaboration between the two institutions would have the character of a novelty, since during ERC implementation CDEMA reported to CIMH for the activities of output 2.1 and 2.2, but there was no interaction on output 1. The nature and extent of this partnership is still to be tested.

In output 2.1 and 2.2, the results of the project have not been consolidated yet. Most of the outcomes still require further support to be fully adopted by the intended beneficiaries. CERT teams have been formally established only in Dominica, while Saint Kitts and Saint Vincent are still in the process of setting

up the teams and organize the replication of the trainings. The model disaster management legislation is being validated and adapted in Barbados, but there is no clear actor that assumed responsibility to lead the process after the end of the project. The same lack of a clear candidate with the resources and the willingness to support the process, threatens the future replication of BVI's database of volunteers to other countries of the region.

In output 2.3, lack of funding for CTIC seems to be the most concrete threat to the results of the project. CTIC has funds guaranteed for 2014, but after that the current commitments will not be enough to finance the salary of the Director, let alone to pay for concrete public awareness and education activities. All the main stakeholders are aware of the need to find further resources and the current 5-year business plan includes a section on resources mobilization with a draft strategy to pursue public and private partners. However, at the time of the field visit of the evaluation team to Barbados, no other institution had committed funds to the Tsunami Information Centre.

9. COMMUNICATIONS STRATEGY

CIMH and UNDP formulated a communications strategy for the project. The key components of the strategy are the participation to the annual CDM conferences, the organization of two kick-off workshops (in 2009 and again in 2011 when the project actually started) and the creation of a website.

The communications strategy is aimed at building awareness among project stakeholders and the general public. The communication with project stakeholders was planned and implemented with a clear vision in mind. The project updates and reports were produced frequently and widely distributed. The reports to the board were exhaustive although only reflected the progress made during the last reporting period. It is hard to obtain from them a comprehensive understanding of the project without reading them all. Participation in the CDM conferences was certainly important to give visibility to the project with a specialized audience in the early stages of its implementation when it was important to bring the participating countries on board. However, the impact of repeated participations decreased in time. A more nuanced strategy could have tracked the needs of the project in a more flexible manner in order to maximize the impact with its intended targets.

Communications to the wider public were inadequate to promote a greater awareness of the project and its goals. The public area of the project website is a fairly basic window on the activities of the intervention. It appears to be a mere appendix to the private area where users get access to Dewetra. The lack of an appealing domain name (http://63.175.159.26/erc/home/) highlights the limited importance attributed to the interaction with the public at large. Unfortunately, the webpage has not been updated since 2011. The Facebook page has more recent news, but the frequency of the updates does not encourage an active following.

A Google search for "ERC" does not lead to the project website or Facebook page (or any other page related to it) in the first 300 results. In order to obtain a link in the first 10 results, the user has to search for the entire name of the project "Enhancing Resilience to Reduce Vulnerability in the Caribbean". Only CIMH links its website to ERC's site. UNDP's and CDEMA's websites have no link to the homepage of the project.

10. RECOMMENDATIONS:

1. In future projects, SMART indicators should be elaborated once the implementation strategy has been approved. A baseline should then be captured in order to assess future progress. In the next stages of the process to promote the use of Dewetra, SMART indicators can be formulated using data tracking access and behaviour of users while logged on the platform.

   WHO: Project coordinators at CDEMA, CIMH and UNDP
   WHAT: developing SMART indicators that are relevant to the results is relatively easier after a project has formulated its implementation strategy rather than at the design stage. Examples of SMART indicators are: 80% of relevant data layers available on Dewetra for each participating country by December 2013; one CERT training team formally established in each of the participating countries counting on a training schedule for 2014.

2. The analysis of risks and assumptions should be an ongoing activity of projects. Project management would then need to formulate contingency planning in case assumptions are not met or risks become real.

   WHO: CDEMA, CIMH and UNDP
   WHAT: at the beginning of each year of implementation, project partners should identify assumptions and risks for each one of the components and for the project as a whole. For example, at the beginning of 2012 UNDP was aware of the considerable risk of UNESCO not having enough funds to support the establishment of CTIC. A contingency plan should formulate an alternative strategy to be implemented in the eventuality that funding would not be available by a certain deadline. The contingency plan would identify other partners to conduct the public awareness and education activities, a new timeline and a revised budget.

3. Although model legislation can be a useful benchmark for the elaboration of future laws and regulations, without adequate follow-up the potential outcomes are very uncertain. It would be advisable that project partners start an internal reflection on the relevance of such activities and which strategies could be implemented to make them more effective.

   WHO: CDEMA, CIMH and UNDP

WHAT: Legislative processes are usually long, complex, multi-factoral and non-linear. Single projects struggle to have an impact on the approval of new legislation. One possible solution is to accept the limitations of the project-approach, while formulating a long-term strategy with short-term intermediate outcomes and indicators. Among the numerous methodologies available for influencing policy-making, there is the Rapid Outcome Mapping Approach (ROMA – see Figure 8), developed by the ODI.

4. Implementing agencies and participating national institutions (MET and DM agencies) should agree on a specific commitment to ensure that the same trainees participate in the entire training cycle.

   WHO: CDEMA, CIMH, DM and MET agencies
   WHAT: MoUs should establish the mutual intention of participating institutions to ensure that trainees attend all the capacity building events that make up a training module to ensure that every country/institution counts on at least one fully-trained personnel.

5. The participation of both DM and MET people from each participating country in the trainings helps to achieve a more homogenous buy-in.

   WHO: CDEMA and CIMH
   WHAT: during the evaluation exercise it has become evident that in several countries there is a gap in the level of buy-in by DM and MET offices. Although there is no doubt that several factors affect the adoption of Dewetra, poor understanding of the potential of the platform is certainly one of the major obstacles. Achieving consistent participation to all training modules by staff from both agencies could help to increase the appropriation levels.

6. Involve both officers and management from MET and DM personnel offices in future trainings on the use of Dewetra.

   WHO: CIMH
   WHAT: even though the project has made a considerable effort to showcase Dewetra to decision-makers in both DM and MET offices, the evaluation team has detected that in many countries the platform is seen as a mere technical tool for officers, not as game-changer for the entire sector. Involving management in special sessions of trainings seems to be very relevant to improve the ability of decision-makers to grasp the potential of Dewetra.

7. Where possible consider the value of inclusion in trainings and development of partner agencies who have both a prescribed role under existing government DM legislation such as the National Red Cross Society, and key partners such as the UN operational agencies such as OCHA.

WHO: CDEMA, CIMH and UNDP
WHAT: ERC implementing partners should ensure that the improved capacities and technologies introduced by the project are incorporated in sector-wide dynamics. In this respect, it seems relevant to suggest a stronger coordination with other national and international organizations working in DRR to raise awareness about the results delivered by the project and to seek synergies with similar initiatives.

8. Consider the potential harmonisation or at least collaboration and coordination of volunteer networks with existing Caribbean emergency team rosters such UNOCHA, UNDAC and Red Cross NITS and RITS

   WHO: CDEMA and CIMH
   WHAT: volunteer groups are already present in the region and should be involved in future training and coordination activities to avoid overlaps and take advantage of best practices.

9. Elaborate an organogram of the Tsunami Regional Coordination mechanism.

   WHO: CTIC, UNESCO/IOC, ICG Working Group IV, Caribbean Tsunami Warning Program
   WHAT: UNESCO/IOC and the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS) have elaborated a document on the organizational structure and governance of the tsuami early warning system. However, there is no organogram available that shows graphically the network of actors involved and the distribution of responsibilities. Given the complexity of the institutional architecture, the evaluation team feels that an organogram would help create a better awareness and understanding among the stakeholders.

10. An MoU for the sustainability strategy should be signed soon between CDEMA and CIMH

    WHO: CDEMA and CIMH
    WHAT: CDEMA and CIMH have started a dialogue on their future collaboration aimed at increasing the rate of adoption of Dewetra. As the draft evaluation is being finalized, there is still no final agreement on the terms of the memorandum of understanding. The evaluation team considers that an agreement should be formalized before the official end of the project in order to keep the momentum going.

11. Member states' representatives to the Project Board should do the reporting to the other countries instead of leaving the task to the project manager. This would improve accountability and ownership by participating countries.

WHO: representatives of participating countries to the ERC Project Board
WHAT: ERC project manager had the responsibility of writing a report on the workings of the Project Board. However, the evaluation team considers that representatives from participating countries should take over this task in future interventions. It seems that beneficiary countries deserve to receive updates on the project from their own representatives, rather than from somebody who is involved in the coordination of the intervention. This would increase both transparency and accountability. Furthermore, it would empower country representatives to have a more active participation in Board meetings.

12. Improve CTIC business plan with a comprehensive resources mobilization plan that includes an approximate budget for public awareness activities.

    WHO: CTIC
    WHAT: the current 5-year business plan only covers running costs of CTIC, but does not foresee a budget for the operations that the organization is planning to conduct. It seems that there is the need for a more detailed implementation strategy of future public awareness and education activities complemented by a budget breakdown. The improved version of the business plan would benefit the organization both internally and externally. Internally, it would provide a better understanding of the cost of implementing programmes and therefore it would help to prioritize actions. Externally, it would provide potential partners with a menu of options to choose from for funding or for supporting with expertise.

13. Perform a thorough assessment of the other weather forecasting and incident management platforms in the region to identify opportunities for harmonization and/or integration

    WHO: CDEMA and CIMH
    WHAT: a variety of different software platforms for weather forecasting and incident management have been introduced in the region in the last few years. Duplications and overlapping do not help DRR organizations to improve the quality of their work. However, there is the potential for integrating parts of the software or of the information managed by the different platforms into the work routine of disaster managers at country level.

14. Assess the results of CERT trainings and schedule follow-up sessions with CERT teams that are not yet able to replicate the trainings independently.

    WHO: CDEMA
    WHAT: Saint Kitts and Saint Vincent still have not established their own CERT training teams. In at least one of these countries, the trainings received so far have been considered insufficient. There

is a clear need for reinforcing the capacities installed so far and support the process of establishing teams of local trainers.

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