

DOMINICA

Lessons Learned from Tropical Storm Erika



The lessons learned below are a result of the analysis of main findings and lessons from the impact and response to Tropical Storm Erika in August 2015 in Dominica, and hurricanes tropical storms that impacted locations with similar characteristics to Dominica. The aim of this product is to improve the performance of humanitarian actors responding to Hurricane Maria, assist agencies working in the response, and encourage positive action by decision makers.

Impact of Tropical Storm Erika

Scope and scale on Tropical Storm Erika

Tropical Storm (TS) Erika hit Dominica on 27 August 2015. It resulted in 13 deaths and directly affecting about 15,900 people (about 23% of the national population). Torrential rain triggered massive landslides and flooding. Rivers and streams surged, carrying boulders and debris, destroying villages, homes, roads, bridges, and land. Over 800 households were left homeless. TS Erika caused damages and losses of about USD 483 million, approximately 90% of the country's GDP.

Key priorities immediately after Tropical Storm Erika

- Greatest effects were felt in the Transport, Housing and Agriculture Sectors.
- Per geographic area: Petite Savanne, Pichelin, Good Hope, Bath Estate (Paradise Valley), Dubique, Coulibistrie, San Sauveur, Petite Soufriere and Campbell. The entire villages of Petite Savanne and Dubique were left uninhabitable.

Long Term Effects from Tropical Storm Erika

TS Erika greatly affected Dominica's economy. Flooding and landslides severely damaged transport infrastructure, tourism, and substantially diminished agricultural production capacity. The main airports maintained limited operations for months. Roads and bridges were destroyed and remained unusable for months. It was not until January 2016 that the water and sewage network was in full capacity.

Vulnerability to Disasters

Dominica is very vulnerable to multiple hazards, like most of its Caribbean neighbours. The country has nine volcanoes and experiences frequent seismic and geothermal activity. Aside from hurricanes and volcanic eruptions, Dominica is prone to earthquakes, landslides, river floods, and heavy seas that cause damage to the transportation network and environmental degradation. Dominica ranks 12th out of 111 in the Composite Vulnerability Index (Commonwealth Library).

Name of Event	Year	Affected	Deaths
Erika	2015	15,951	13
Ophelia	2011	240	0
Dean	2007	7530	2
Marilyn and Luis	1995	5001	2
Hugo	1989	710	0
David and Frederick	1979	72,100	40

Immediate Response to Tropical Storm Erika

Immediately following TS Erika, the government of Dominica coordinated an interagency team with the following purposes (GFDRR 2016).

- To take stock of the damage and impact: National government authorities and representatives from the World Bank, EU, UNICEF, WFP, FAO, CDEMA, PAHO, UN-Women, University of West Indies, and the Caribbean Development Bank.
- Tabulate damage and loss, visit affected areas, gather information and analyse the results to inform the recovery strategy.
- The Contingency Emergency Response Component (CERC) was triggered, under the Disaster Vulnerability Reduction Project (DVRP), which provided the government with USD 1 million for immediate response needs.

Lessons learned from the initial phases of the response include:

- Weather forecasting and modelling have improved tremendously over the past years, yet forecasting for small island states is a major challenge. The primary need is to improve regional and national weather forecasting, focusing on the impact of specific weather forecasts rather than generalised forecasts (World Bank 10/05/2017).
- Post Disaster Needs Assessment needs to be conducted through collaboration with international agencies. This is crucial to ensure that efforts are not duplicated and that the single assessment is accepted by all agencies (PAHO). Government experts expressed that the most important lesson TS Erika taught the island, and the rest of

the region, is that the science and management of natural and weather-related events must be synchronized. Government, regional agencies and disaster management offices must collaborate and exchange information (Local News 27/09/2016).

- Monitoring and reporting needs to be done on short, medium, and long-term recommendations made in the Disaster Needs Assessment (GFDRR 2016).
- Access to finance mechanisms for implementing recommendations should be identified, considering economic challenges facing the country (GFDRR 2016).
- A resilient approach to development needs to be adopted. This is best done through the integration of sectoral recommendations into national planning (GFDRR 2016).

Livelihoods

TS Erika deeply affected the livelihoods of Dominicans. Many who were classified as vulnerable later fell into poverty. Many who were food secure became at risk of food insecurity. The Social Protection Measures, which were absorbed by the affected population, safeguarded many from indigence. Many of the working poor were later without an avenue for economic activity, through displacement, land loss, or destruction of other means of livelihoods. Women who headed households were particularly vulnerable due to large family size, low skill sets and loss of asset base. Social capital was strong, but under threat due to dislocation (UNDP 2015).

- **Diversification of means of livelihoods:** For most of the affected population, who were mostly the working poor and vulnerable, one means of livelihood was not an option following TS Erika. Affected women reported that they worked their farms or backyard gardens and then sought a day's pay (doing domestic work, weeding a garden or in the tourism sector, etc). Men undertook their fishing or farming and then worked construction, carpentry, or security (UNDP 2015).
- **Capacity development:** Strengthen the adult education programmes for small farmers, fisher folk and small manufacturers particularly in the agro-industrial production of coconut oil, bay oil, cocoa sticks and castor oil. Improve the skills base needed for participation in tourism livelihoods activities. Train women in the non-traditional skills, such as tiling, masonry and electrical works to facilitate their employment in the construction sector. (UNDP 2016).
- **Consider developing community services:** For example, community care for children of single mothers and the elderly, as a source of employment and to facilitate women's mobility into the labour market. (UNDP 2016).

Social Protection Methods

The Government of Dominica put in place several social protection measures in January 2016, geared to restoring the livelihoods of affected populations. These included:

- Fiscal allocations to meet the livelihoods needs of fishermen.
- Payments to support home-based businesses, particularly relevant to women, which addressed stock and equipment damage, and structural repairs to damaged houses.
- Waiving of import duties for vehicle owners for a period of 6 months to improve those involved in the tourism and transport services industry (UNDP 2015).

The results from these measures have not been reported, although it was found that social protection measures safeguarded some of the affected population from indigence (UNDP 2015).

- **Collaboration:** In TS Erika's Post-Disaster Needs Assessment (PDNA), the government of Dominica clearly stated that climate change will cause more events such as Erika. Consequently, education and social protection sector planning needs to fully collaborate and work together to ensure safe environments for children and women (Government of Dominica 2015).
- Social protection analysis and reform is required, in the wake of natural disasters, in order to meet the needs of the population. This includes an impact assessment on National Employment Programme support to ensure equal opportunities for women and men, a Gender Aware Beneficiary Analysis, and a Costing and Budgeting Framework (Government of Dominica 2015).
- Vulnerable groups need to be tracked, to better understand their increased risks and vulnerabilities and how further risks can be mitigated. These groups include affected single women headed households, children, pregnant women, breastfeeding mothers, young men, disabled people, and the elderly (Government of Dominica 2015).

Participation of Affected Population

Building a greater level of participatory processes into the programmes would ensure greater success and effectiveness (UNDP 2015).

- **Participatory decision-making process:** Participatory decision-making processes can improve the diversification of coping strategies for disasters and help address the causes of different vulnerabilities, rather than just their consequences. Greater inclusion of the poor in governance and in the decision-making process, around recovery and livelihood options, would strengthen the implementation process and result in a timely delivery of initiatives (UNDP 2015).

- **Building capacity of the population:** Every community that is faced with a disaster can be considered the 'first responder' in a disaster. Building the capacity of communities for being prepared, trained and organised goes a long way in helping communities be part of the response (World Bank 10/05/2017)
- **Safeguard social capital:** Strengthen local government mechanisms and efforts at participatory approaches during resettlement programmes (UNDP 2015).

Tourism

In 2015, tourism was the largest income generator in Dominica's economy. One in eight people worked in tourism and related activities. The sudden decline in tourists after TS Erika significantly impacted the community (UNDP 2015). The government implemented a three-phase recovery plan for tourism:

- **Short-term (0-12 months):** Repair Douglas-Charles airport to be fully operational, ensuring access to main tourist sites before the season starts, and invest more in promoting tourism to make up for potential losses.
- **Medium term (12-24 months):** Assess the location and zoning of hotel sites and preparing a comprehensive plan for evacuation of hotels.
- **Long term plans (24-48 months):** Create an economic environment to increase the profile of small/medium enterprise insurance and develop a business continuity plan to ensure that service interruptions don't have long term effects on the economy of the country (UNDP 2015).

The results from these measures have not been reported.

UNDP has recommended keeping in mind the following:

- **Invest in community tourism:** Community tourism has long been recognised as an important part of the tourism industry in Dominica, and has received external funding in the past. This has shown to afford the best opportunities for sustainable livelihoods. Studies have concluded that in the recovery and reconstruction period prioritising tourism was the most sustainable initiative to reduce the livelihood impacts of TS Erika (UNDP 2015).
- **Ensure a gendered approach to tourism:** In the tourism sector women are mostly employed as housekeepers and waitresses, while more men tended to hold technical and managerial posts. In coping with post-disaster stress, the tourism sector has often maintained managerial and ground staff such as gardeners while laying off housekeepers, therefore affecting women's economic opportunities more significantly (UNDP 2015).

Agriculture

TS Erika affected around 4,500 farmers. Although agriculture only makes up 10.4% of Dominica's GDP, it significantly contributes to the livelihoods of about 40% of the population engaged in various levels of farming and related activities (UNDP 2015).

- **Encourage social cohesion:** Social cohesion in farming and fishing communities appears to be strong, with frequent support given by the community to people who may be in need. Some households receive support (remittances, barrels, etc.) from relatives living abroad, although this has declined significantly in recent years following the recession in the developed countries (UNDP 2015).
- **Discourage over-reliance:** Studies suggest that over-reliance on certain assets, particularly natural and physical livelihood assets as often occurs in agriculture, can mean greater vulnerability to shocks (UNDP 2015).
- **Encourage capacity development:** The 1995 Agricultural Census shows that 13% of all farmers achieved secondary school and higher educational levels. Older farmers and fisher folk generally completed primary education, while some of younger ones completed secondary education and beyond. Farmers generally have good skills in farming and are in good health (UNDP 2015).
- **Introduce improved watershed management systems:** These include crop rotation, construction of terraces, contour strip cropping, selective planting, and reforestation.
- **Establish an agricultural health and food safety agency:** With sufficient capacity and capability, it could guide small and medium size food processors, anxious to reach markets.
- **Use the potential for expansion in the Fisheries sub sector of Agriculture.**

Risk Financing

The Caribbean Catastrophe Risk Insurance Facility (CCRIF) is a non-profit risk pooling facility, designed as a regional catastrophe fund for Caribbean government to limit financial impact. CCRIF offers earthquake, tropical cyclone and excess rainfall policies to Caribbean and Central American governments. Its pay-outs help mitigate short-term cash flow problems, and its parametric mechanism allows it to provide rapid pay-outs to finance initial disaster response and maintain basic government functions (CCRIF).

CCRIF provided additional financial assistance under its Technical Assistance Programme for specific rebuilding projects on the island to help recovery efforts (Artemis 11/11/2015). Dominica has received more than USD 23 million through CCRIF in pay-outs since 2007: First in 2007 earthquake for USD 500,000, followed by Excess Rainfall

(Tropical Storm Erika) in 2015 for USD 2.4 million, and most recently a Tropical Cyclone pay-out (Hurricane Maria) for USD 19.2 million in conjunction with an excess rainfall (Hurricane Maria) for USD 1.05 million.

According to the World Bank, there are a number of alternative risk financing options that Dominica could consider to manage natural disasters:

- **Sovereign disaster risk financing:** Development of financial strategies to increase the financial response capacity of governments in the aftermath of natural disasters, while protecting long-term fiscal balances (World Bank 09/2015).
- **Property catastrophe risk insurance:** Development of competitive catastrophe insurance markets to increase property catastrophe insurance penetration among homeowners and small/medium enterprises (World Bank 09/2015).
- **Agricultural insurance:** Development of agricultural insurance programs for farmers and agricultural financing institutions to increase their financial resilience to adverse natural hazards (World Bank 09/2015). Although insurance schemes are seen as an alternative strategy for risk reduction, for many who are unable to afford insurance, the strategy of choice is livelihood diversification (UNDP 2015).
- **Disaster micro-insurance:** Facilitate access to disaster insurance products to protect the livelihood of the poor against extreme weather events and promote disaster risk reduction, in conjunction with social programs such as conditional cash transfer programs (World Bank 09/2015).

Cash assistance

Prior to TS Erika challenges were highlighted regarding the need for additional cash to support the programmes, the lack of a cash based response, and the lack of a gender and child responsive approaches. These were exacerbated in the aftermath of TS Erika, as more persons were in need of social protection.

Local supply chains were impacted by TS Erika, but markets and financial systems in Roseau remained functional.

Given the displacement of population from Petite Savanne and Dubique, Cash Transfer Programming (CTP) was suggested as an appropriate mechanism to support the displaced population. IFRC provided unconditional cash transfer through debit cards: USD 225 were initially given to meet basic household needs through the cost of a one-month food basket. A later distribution of USD 209 helped replace lost household items once the displaced population had returned home. An evaluation of this program received general positive feedback, with the bulk of the cash being used to pay for basic household items and some recipients keeping it as savings (IFRC 01/03/2016).

The Ministry of Agriculture launched another programme which provided assistance to the agriculture sector through cash support for farm/fisher families; cash for work in community clearing (farmers and fishers); cash for work in community for removal of trees/logs in rivers, ravines, and beaches; and cash for tools and equipment to facilitate work at the community level (UNDP 2015). Additionally, another cash intervention was launched for rapid food crop production by small farmers. The programme provided support through the supply of inputs (fertilizer, soil ameliorants, herbicides, etc), cash for work incentive for crop establishment, cash incentive for inclusion of disaster risk reduction practices on farm (UNDP 2015). Evaluation on results has not been carried out.

Lessons learned from TS Erika and other hurricanes in the Caribbean include:

- **Communicate with beneficiaries:** Beneficiary feedback was generally very positive about the CTP programmes, as they felt many organisations were giving the same non-food items (NFIs) and CTP gave them the opportunity to determine their own priorities. They expressed the need for greater clarity on beneficiary selection and a better hotline to document and address issues (IFRC 01/03/2016).
- **Weighting cash amounts to family sizes:** Needs can be gender or age-specific and vary among populations of different demographic population subgroups. Depending on the program objectives, different sets of households/potential beneficiaries might face a different set of needs to meet these objectives. Family sizes differ greatly throughout Dominica; necessary measures need to be taken to reflect the actual family size of beneficiaries and their needs.
- **Ensure interventions meet local authorities' standards but don't affect the local population:** More analysis is required to evaluate the cost/benefit of using different financial partners to facilitate cash payments. This analysis must consider not only the financial cost but also the indirect economic cost that each modality of payments could bring, such as security breaches. After TS Erika, it was shown that local banks were charging high fees for financial transactions and so recipients were advised to take out large withdrawals to bypass these. Better customer support on the use of the debit card system is necessary (UNDP 2016).

Effective market analysis: International evidence has shown that cash transfers are relevant whenever beneficiaries of the cash intervention are able to buy what they need in the local markets, at reasonable prices. Yet there is a lack of consensus about what constitutes a 'good enough' market analysis in the trade-off between quality of information and speed. Market analysis tools generally require significant financial investment, are time-consuming to implement, require skilled human resources and take time to produce results. Consequently, many actors are considering new one-day market assessment tools. While these tools may be adequate for small-scale programmes, they may not provide enough information to satisfy organisational or

donor requirements for larger-scale or longer-term programmes that require greater financial commitment (CALP 2012). Following TS Erika, some items were over supplied or deemed unnecessary and the supply of items when markets were already restored caused some issues, particularly as it adversely affected local private sector supplies (including supermarkets).

- **Cash and voucher programmes should not be seen in isolation:** In the Red Cross response to Hurricane Mitch, cash was provided as part of a rehabilitation package which included seeds and fertiliser. The Red Cross found that including a range of items in the overall package, including cash, increased the likelihood that the assistance provided would be resilient (ODI 2005).
- **Combination of cash and in-kind assistance:** Cash payments by the Red Cross in Guatemala and Nicaragua following Hurricane Mitch were provided as part of an agricultural inputs package. An evaluation on the programme found that the combination of assistance was particularly effective, with cash complementing agricultural inputs and food. It also found that cash had supported immediate subsistence and reinforced investment in production; that it was responsibly spent; and that there was no evidence of arguments within households over the control of the money (ODI 2005).
- **Utilise a gender perspective:** A gender perspective could be implemented when operationalizing cash transfer programs. For instance, cash for work programs could have been seen unfavourable to women because they take time from other household activities making real access to the program difficult. Some of the work activities could also be seen as dissonant with gender stereotypes of work. Following Hurricane Matthew in Haiti, all intervening municipalities were encouraged to enrol women in the list of beneficiaries, with a suggested desirable quota of 40% female workers. Additionally, in specific communities, agencies targeted 100% of the beneficiaries of the program as women. These two types of experiences showed promising expected impacts with regards to women's empowerment and breaking gender stereotypes.
- **Targeting:** Targeting has proved to be a fundamental factor that could boost the humanitarian coordination of cash actions, maximizing the impact on the beneficiaries most in need. In the case of Haiti, following Hurricane Matthew, the post-disaster assessment helped the local authorities to identify the sites to intervene. Tailoring the intervention to the size of the municipality, and focusing in particular section communes where the impact of the hurricane was the greatest, could maximize the impact of the program (UNDP 2016).

- **Collaboration:** Cash transfers force organisations to work with new partners. Humanitarian agencies should collaborate with governments, donors and long-term market actors to deepen their knowledge of existing market information frameworks, establish baseline data to support emergency programming and increase preparedness to engage with markets from the early stages of a disaster response through to the recovery phase (CALP 2012).

Reconstruction of Infrastructure

- **Building resilient infrastructure:** The functionality of utility networks, such as electricity, water and telecommunications, can be a major factor in helping communities recover faster. Underground electrical cabling helps protect vital infrastructure. While it is much more expensive compared to overhead electrical networks, longer term economic and social benefits of having a reliable network far outweigh the cost (World Bank 10/05/2017).
- **Designing disaster infrastructure for everyday use:** When reconstructing a hospital, it would be important to design the structure as a hurricane shelter for the community to take safe refuge in. A case in point is the community centre in Barbuda. The structure was strong and survived the storm. However, the front door was blown away within the first hour and most of the large glass windows were shattered leaving community members looking for an alternative shelter in the middle of the storm. The same principle should apply for all public infrastructure being reconstructed on Barbuda (World Bank 10/05/2017).
- **Multi-hazard structures:** For areas that are also vulnerable to earthquakes and flooding, such as Dominica and Barbuda, structures constructed should be designed considering all of these hazards, and not only hurricanes (World Bank 10/05/2017).
- **Adopting policy frameworks:** Following TS Erika, the government of Dominica was encouraged to consider adopting a policy framework to guide sector reconstruction strategies and development of reconstruction and recovery projects and investments. Based on international experience, prioritisation methodologies recommended to the government of Dominica following TS Erika included: Potential for direct and widest humanitarian impact; restoration and rebuilding of critical infrastructure and services; potential to generate sustainable livelihoods; balance between public and private sector recovery; balance between physical infrastructure reconstruction and less visible recovery (such as capacity building and governance); pro-poor, pro-vulnerable, and gender-sensitive agendas (GFDRR 2015).

Following Hurricane Mathew in 2016, ACAPS published a Lessons Learned Document on the Haiti response.