THE COMMONWEALTH OF DOMINICA: SOCIAL AND LIVELIHOOD ASSESSMENT FOLLOWING TROPICAL STORM ERIKA

Government of the Commonwealth of Dominica with the Technical Assistance of the UNDP, Barbados and the OECS

ABSTRACT

The Social and Livelihoods Assessment following the Impact of TS Erika situates itself within the framework of social vulnerability and disaster risk reduction. In keeping with the PDNA methodology which undertakes assessments using both a sectoral approach and a bottom up approach, this Social and Livelihoods Assessment, used as its point of departure the data sets and outputs of the Rapid Damage and Impact Assessment (September 2015). Its analysis occurs through a focus on the affected population, the social sector – housing, education, health with specific examination of the social protection measures; and the productive sector, particularly agriculture, tourism and commerce.

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COMMONWEALTH OF DOMINICA

Empowered lives.
Resilient nations.

Acronyms and Abbreviations

CARICOM	**Caribbean Community**
CBO	**Community-Based Organization**
CCA	**Climate Change Adaptation**
CEDAW	**Convention on the Elimination of All Forms of Discrimination against Women**
CPA	**Country Poverty Assessment**
CSO	**Central Statistical Office**
DFID	**Department for International Development, United Kingdom**
DRR/DRM	**Disaster Risk Reduction/Disaster Risk Management**
EC	**Eastern Caribbean**
EU	**European Union**
FY	**Fiscal Year**
GDP	**Gross Domestic Product**
GFP	**Gender Focal Point**
GOCD	**Government of the Commonwealth of Dominica**
GSPS	**Growth and Social Protection Strategy**
IADB	**Inter-American Development Bank**
IICA	**Inter-American Institute for Cooperation on Agriculture**
ILO	**International Labour Organization**
MDGs	**Millennium Development Goals**
MSMEs	**Micro Small and medium Enterprises**
NGO	**Non-Governmental Organization**
OECS	**Organization of Eastern Caribbean States**
PAHO	**Pan American Health Organization**
PDNA	**Post Disaster Needs Assessment**
TSE	**Tropical Storm Erika/ TS Erika**
UN	**United Nations**
UNDP	**United Nations Development Programme**
UNECLAC	**United Nations Economic Commission for Latin America and the Caribbean**
UN Women	**United Nations Entity for Gender Equality and the Empowerment of Women**
WB	**The World Bank – The International Bank for Reconstruction and Development**

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Executive Summary

On the morning of Thursday August 27th, 2015, Dominica was hit by Tropical Storm Erika (TS Erika), which bombarded the island with rainfall for approximately nine hours.

Torrential rain triggered massive landslides and flooding. Rivers and streams surged carrying boulders and debris destroying villages, homes, roads, bridges and land. Lives were lost and many people continue to be displaced due to loss of property, personal effects and livelihoods. TS Erika has been regarded as the most devastating weather event since Hurricane David in 1979.

A team of Assessors was commissioned by the UNDP on behalf of the Government of the Commonwealth of Dominica (GCOD), in January 2016, to undertake a Social and Livelihoods assessment of the impact of TS Erika. The team arrived in Dominica for a two week period (January 18-29) in order to conduct its investigations and presents its findings through this report. A preliminary report of findings was presented before the team left island to senior Government officials.

The social and livelihoods assessment in the Commonwealth of Dominica situates itself within the framework of Social Vulnerability and Disaster Risk Reduction. In keeping with the PDNA (Post Disaster Needs Assessment) methodology which undertakes assessments using both a sectoral approach and a bottom up approach, this Social and Livelihoods Assessment, used as its point of departure the data sets collected as part of the Rapid Damage and Impact Assessment.

Sector experts undertook the social and livelihoods analysis through a focus on the affected population; the social sector – housing, health and education, with a specific examination of the social protection measures; the productive sector, particularly agriculture, tourism and commerce. Infrastructure had been thoroughly examined by the Rapid Assessment undertaken earlier, and so was not included as part of this examination.

Like most of its Caribbean neighbours, Dominica is very vulnerable to multiple hazards, some of which could occur simultaneously. The country has nine live volcanoes and experiences frequent seismic and geothermal activity. Dominica's terrain renders damage to physical infrastructure greater than in other countries of the Region and the cost of rehabilitation higher.

In light of Dominica's vulnerabilities, there is an expectation that the economic impact of disasters would be large, resulting in the disruption of economic activity, loss of income, fiscal and external account imbalances and increased poverty. And indeed the effects of TS Erika were in keeping with those expectations. TS Erika resulted in damage and loss of EC 1.3billion (US$483 million), equivalent to approximately 90% of the Dominica's Gross Domestic Product (GDP). It has been estimated that as a result of TS Erika, some 15,900 persons or 23% of the national population was directly affected. Of the population that resided in the Affected Parishes, some 32% were affected. Almost 43% of the affected population were among the primary affected, experiencing, death, injury, psycho-social trauma, loss of material assets, livelihoods and income. Another 46% were among the secondary affected who suffered losses in production, and income and access to services.

It was evident that despite the very localised nature of the effects of TSE, the entire population of Dominica was affected if not directly by having family or friends affected, then indirectly by the ensuing disruption caused by the effects to the island's infrastructure. Still yet others experienced the psycho-social trauma. Dominicans together, will have to face the direct and indirect challenges of recovery presented by TS Erika.

The data analysed for this Report, suggested that the poorest Parish, St Joseph was also among the Parishes that were severely affected by TS Erika with the loss of over 200 houses. The Parishes of St. Patrick and St David which contained between 40 and 42 percent poor, and over 50 percent of its population deemed

vulnerable had by far (41%), the largest proportion of households affected including destroyed, partially destroyed and at risk. The highest number of homes totally destroyed were found in St Patrick (250) followed by St. Joseph (50). The data further suggests that the Parish of St. George, which was among those Parishes identified with the second highest level of vulnerable households, had the largest number of affected communities, as a result of TS Erika.

The Report noted that one would expect that a significant portion of the population which had been living above the poverty line but below the vulnerability line, may now have succumbed to their vulnerability and have been pushed into poverty. The Report also notes that the quality of life of the affected population has changed for the worse.

The key findings are presented in Box 1 and the key recommendations in Box 2.

Box 1. Key Findings

Key Findings: Within the Affected population -

1. Many who would have been classified as vulnerable, have fallen into poverty as a result of TS Erika
2. Many who were food secure are at risk of food insecurity.
3. The Social Protection Measures which have absorbed the affected population, are safeguarding many from outright indigence.
4. Many of the 'working poor' are now without an avenue for economic activity, through displacement, land loss, or destruction of other means of livelihoods.
5. Women who head households are particularly vulnerable due to large family size, low skills set and loss of asset base.
6. Social capital is strong but under threat due to dislocation.

Building Blocks for Sustainable Livelihoods

The Report notes that there are two key building blocks to sustainable livelihoods. One is diversification of livelihoods and the other is people's participation in the decision making processes regarding their livelihoods.

The literature suggests that over reliance on certain assets, particularly natural and physical livelihood assets, as often occurs in agriculture, can mean greater vulnerability to shocks. Insurance is seen as an alternative strategy for coping with risk. But for many who are unable to afford insurance, the strategy of choice is livelihood diversification. The greater the diversity of income, the greater is the resilience of livelihoods to disruption from particular shocks.

For most of the Affected population, who were among the working poor and vulnerable, one means of livelihoods was not an option. Affected persons, if they were women reported that they worked their farms or backyard gardens and then sought a day's pay, bundling bay leaves to make a 'batch' or doing a little domestic work, weeding a garden or providing services in the tourism sector or elsewhere. Men undertook their fishing or farming and then worked construction, carpentry or security.

The World Bank suggests that 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. The Assessors, were of the view that 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.

Box 2. Key Recommendations

Key Recommendations:

1. Introduce improved watershed management systems – crop rotation, construction of terrace, contour strip cropping, selective planting and reforestation.
2. Improve the skills base needed for participation in tourism livelihoods activities.
3. ***Train women in*** the non-traditional skills, such as tiling, masonry and electrical works to facilitate their employment in the construction sector
4. Prioritise community tourism initiatives to reduce the livelihood impacts of TS Erika
5. Utilise the potential for expansion which exists in the Fisheries sub sector of Agriculture
6. Develop community services i.e. community care for children of single mothers and community care for elderly, as a source of employment and ***to facilitate women's mobility*** into the labour market.
7. Strengthen the adult education programmes for small farmers, fisher folk, small manufacturers particularly in the agro-industrial production of coconut oil and bay oil, cocoa sticks, castor oil, etc.
8. Establish within the State College a "Centre of Excellence for Agro-Eco Tourism"
9. Establish an Agricultural Health and Food Safety Agency with related capacity and capability, to guide small and medium size food processors anxious to reach markets.
10. Safeguard social capital through strengthened local government mechanisms and efforts at participatory approaches during resettlement programmes.

Social Protection Measures

The Report noted that Government's response to the effects of TS Erika had been immediate and comprehensive.

The early social protection measures put in place by the Government and delivered through its various inter-Ministerial clusters have been effective in halting the transition of many families living in states of transient poverty, from descending into indigence.

The more recent initiatives which are seeking to scale up Social Protection Measures for livelihoods support approved by Cabinet in early January 2016, are geared to get people back up on their feet and enable some restoration of livelihoods. It is still too early to ascertain the livelihood outcomes of these measures. They include fiscal allocations to meet the needs of the livelihoods of fisher folk; payments to address stock and equipment damage, which may impact on the livelihood of self-employed/ business owners; support for repair of structural damage to houses which should impact positively on home-based business particularly relevant to women; and the waiver of import duties for vehicle owners for a period of 6 months which should impact favourably on business persons, mainly males, involved in the tourism and transport services industry.

Building in greater participatory processes into the programmes would ensure greater success and effectiveness.

Agriculture

The Assessment concluded that the working poor (wage and salary workers) constitute a livelihood in Dominica that is vulnerable to food insecurity.

These included farmers, fisher folk and those engaged in non-agricultural economic activities. Despite accounting for only about 10.4% in real terms of Dominica's GDP, agriculture makes a significant contribution to the livelihoods of about 40% of the population who are engaged in varying degrees of farming and related activities. Approximately 4,343 farmers and fisher-folk and related inter-sectoral linked livelihoods were impacted by Tropical Storm Erika, representing household membership of 13,593 persons. This affected food and agriculture sector population represents approximately 46.8% of the population vulnerable to food insecurity.

The Report noted that human capital among farmers and fisher folk in Dominica is variable. The level of education of the farmers based on the 1995 Agricultural Census, shows that only 13.1% of all farmers have achieved the secondary school and higher educational levels. Older farmers and fisher folk generally completed primary education while some of their younger counterparts have completed some secondary education and beyond. However, farmers generally have good skills in farming and are in fair health. Both farmers and fisher folk nevertheless, are being threatened by the nutrition-related/life-style chronic diseases (mainly diabetes and hypertension) and obesity.

Social cohesion within this livelihood appears to be strong with frequent support given by the community to persons who may be in need. Some households in this livelihood do receive support (remittances, barrels, etc.) from relatives living abroad, although this has declined significantly in recent years following the recession in the developed countries.

Tourism

Tourism and related services are the largest income earners in the economy of the Commonwealth of Dominica to date. At an average of $275 million over the last three years, tourism revenues now account for an increasing percentage of annual GDP. The Report indicates that one out of every eight employed persons in the country work in tourism and related activities and concludes that decline of the sector would significantly impact the economy, as witnessed by the sudden visitor arrival down turn after the passage of Tropical Storm Erika in August of 2015. A little over 250 persons lost employment in the sector as a result of the effects of TS Erika. The projected decline of 5.6% in tourism activity was estimated at $45.9million or 3.3% of GDP. Signs of recovery were expected as early as 2016, but not all those who lost jobs would regain them in the recovery efforts.

The Report is well aware that the private sector will take advantage of the opportunities to participate in the development of the Tourism Sector, initiatives which should be encouraged, and as such the sector will absorb some persons from the labour market. However, it will be left for Government initiatives to ensure that the working poor of Dominica, have opportunities to participate in the sector and reap benefits from the expected growth.

The Report concluded that Community tourism affords the best opportunities for sustainable livelihoods in the industry. Community Tourism has long been recognised as an important part of the tourism industry in Dominica and as a programme has received external funding in the past. Additionally, the Tourism Master Plan has articulated a clear subsector development strategy. The report concludes that in the recovery and reconstruction period prioritising community tourism initiatives remain the most sustainable initiative to reduce the livelihood impacts of TS Erika.

Commerce and Non-Agricultural Economic Activities

The Report explored economic activities in the formal and informal sectors.

In the Formal labour market, the Report noted that 5 large manufacturing establishments were severely affected and some 196 Micro, Small and Medium Sized Enterprises (MSME) were hard hit as a result of TS Erika. Of the MSMEs many had limited or no insurance coverage, some suffered temporary or permanent closure of business due to damage to structures, flooding of premises and loss of stock and equipment. Others suffered total loss of income and livelihood. Significant damage was done to the small manufacturing sector. Five of the 71 manufacturers contacted by the Ministry reported damage resulting in the loss of livelihoods amounting to over 500 workers who were displaced.

Data on the informal sector was scarce however, some preliminary data collected suggested that there were a wide range of informal economic activities being undertaken in the affected communities prior to Tropical Storm Erika. As was expected, many of the activities were home based or formed the 'backyard economy'. The data suggested that some 40% of those existing informal economic activities had been disrupted and that women were engaged in approximately 55% of those activities.

Women predominated in the wholesale and retail trade sub-sector but there were a few in the manufacturing subsector producing agro industrial products such as cocoa sticks and castor oil. Others could be found manufacturing clothing. The services sector which is captured in the 'Other' category found a number of women involved in provision of services for the tourism industry. Men predominated in the repair of motor vehicles and motor cycles and the manufacturing of agro industrial products particularly with regard to the Bay Oil (essential oils) industry.

Of significance, the Report noted that in addition to engaging in formal or informal economic activities, almost all affected households reported being engaged to some degree in agricultural activity.

Financing for Recovery – Sustainable Livelihoods

Although lying outside of the remit of the Team, the Assessors were of the view that in light of the public debt burden of the country which as of end-FY 2014/15, was estimated to be around 80 percent of GDP[1], financing of the recovery would be better serviced if in addition to Government's fiscal and budgetary allocations, debt relief could be obtained, grant aid be provided and low interest loans be facilitated.

Report Structure

Following the Executive Summary, the Report provides a justification for undertaking the Social and Livelihoods Assessment and a description of its Methodology. It is then divided into three sections, the first, provides information about the Affected Population, the second a detailed social and livelihoods analysis by four areas of focus: The Productive Sectors of Agriculture, Tourism and Commerce and non-agricultural economic activities; and the Social sectors (of Housing, Education and Health) and Social Protection Measures. Section three of the report presents the Recommendations for Sustainable Livelihoods with detailed matrices for each area of focus. The Report is followed by Annexes containing references, lists of persons consulted and tables.

[1] Dominica: Request for disbursement under the Rapid Credit Facility. 2015

Justification for the Study and its Methodology

a. Justification

The Justification for undertaking the Social and livelihood Assessment is threefold: (a) Dominica's vulnerability to disasters, the effects of TS Erika on its infrastructure and its underlying economic fundamentals , its high degree of vulnerability which puts Dominica at risk for future events of a similar or greater magnitude in light of its own hazards and the expectations of climate change and variability; (b) the Government's desire to have the best information necessary to meet the social needs of the population , increase the resilience of existing livelihoods, strengthen livelihood possibilities and reduce the burden of the state; and (c) the Rapid Damage and Impact Assessment which in the main had as its focus the effects of the event on the island's infrastructure.

The assessment of livelihoods in the Commonwealth of Dominica situates itself within the framework of Social Vulnerability and Disaster Risk Reduction. Vulnerability is defined as "the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard".[2] Although DIFID[3] notes that vulnerability is not the same as poverty and should not be equated with marginalization, or other notions that identify sections of the population who are deemed to be disadvantaged, at risk, or in other ways in need, poverty and vulnerability are closely linked.

The CPA of 2008/9, [4] sought to addresses vulnerability by setting a vulnerability line at 25% above the poverty line. It argued that households consuming at levels below the vulnerability line are deemed to be 'vulnerable' and at risk of falling into poverty should any adverse economic shock or natural disaster occur.[5] It concluded that 11% of the population was vulnerable.

St. Bernard (2007) argued that social vulnerability is the "inability of human units (individuals, households or families) or communities to cope with and recover from stresses and shocks, their inability to adopt to and exploit changes in physical, social and economic environments and their inability to maintain and enhance future generations".[6] The opposite of social vulnerability is sustainability. Important to the notion Social sustainability is the ability to maintain desired social values, traditions, institutions, cultures and other social characteristics.

The difference between poverty and vulnerability it has been argued is that poverty is a measure of current status while *vulnerability* should involve a *predictive* quality. Vulnerability should assist us in conceptualising what may happen to an identifiable population under conditions of particular risks and hazards.

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[2] UNSIRD. https://www.unisdr.org/we/inform/terminology

[3] Social Vulnerability, Sustainable Livelihoods and Disasters. Report to DFID Conflict and Humanitarian Assistance Department (CHAD) and Sustainable Livelihoods Support Office
Source 22/01/2016: ipcc-wg2.gov/njlite_download.php? id=6377

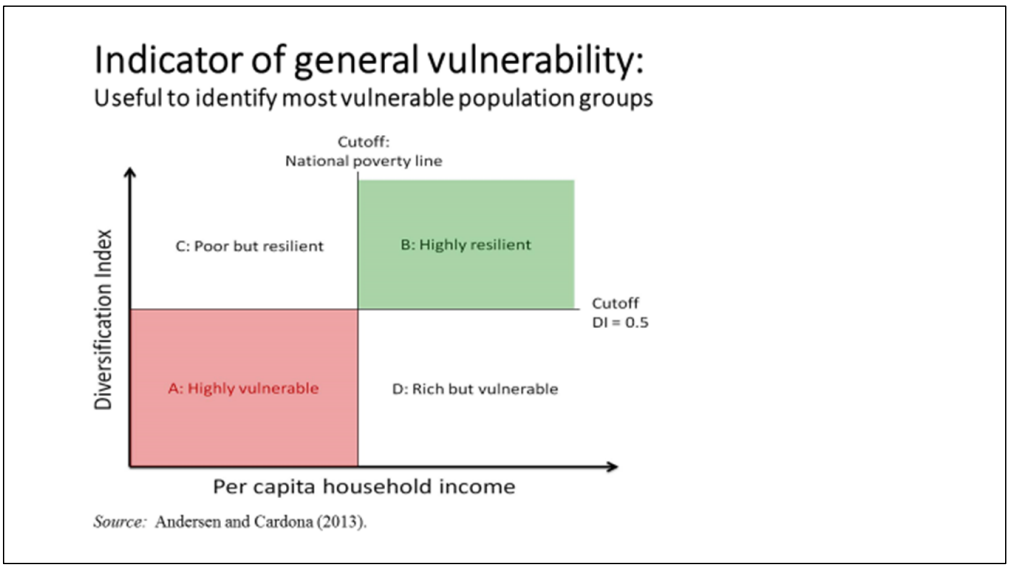
[4] Country Poverty Assessment – Dominica. Final Report Vol.1 Main Report Section 1.2 pg 2

[5] CPA pg 42

[6] MEASURING SOCIAL VULNERABILITY IN CARIBBEAN STATES. A Paper prepared by Dr Godfrey St. Bernard, ISER, U.W.I. March, 2007
Source: https://sta.uwi.edu/conferences/salises/documents/St%20Bernard%20%20G.pdf

A fresh approach which links vulnerability to livelihoods analysis[7] is one which investigates the extent to which livelihood diversification could reduce vulnerability. The investigation concludes that resilience improves with the increased diversification of the livelihoods of the poor. It further notes that the factors which improves the chances for livelihood diversification are the educational attainment of the head of the household, the dependency ratio of the household i.e. the house hold size commensurate with the number of working age members and the age of the head of the household, suggesting where the heads of households are young their capacity for diversification of their livelihoods may be weak. Figure 1 illustrates the manner in which livelihoods diversification responds to vulnerability.

Figure 1. Indicator of vulnerability



Vulnerability is usually explored in its three dimensions: environmental (physical), economic and social. Although this paper has as its focus the issue of social vulnerability and its converse social sustainability, it will touch on the other two dimensions of vulnerability as the notion is a tightly integrated concept.

[7] Gender, Ethnicity and Climate Change in Mexico: An analysis of vulnerability and resilience based on household surveys. Lykke E. Andersen, Anna Sophia Doyle, Dorte Verner and Manfred Wiebelt http://www.inesad.edu.bo/pdf/wp2014/wp07_2014.pdf

b. Methodology

In keeping with the PDNA methodology which undertakes assessments using both a sectoral approach and a bottom up approach, this Social and livelihoods Assessment, used as its point of departure the data sets collected as part of the Rapid Damage and Impact Assessment.[8] The team updated data sets where necessary and where gaps existed sought to fill those, both through the production of pre and post data sets, in order to better undertake the gap analysis and understand the situation as it pertained to the social conditions and the livelihood choices and possibilities of the Affected Population as a result of Tropical Storm Erika.

The study used a combination of literature review, data collection and analysis, key informant interviews and focus group discussions to ensure a rich analysis. Sector experts undertook a livelihoods analysis through a focus on the affected population; the social sector – housing, health and education, including the social protection measures; and the productive sector particularly agriculture, tourism and commerce. Infrastructure had been thoroughly examined by the Rapid Assessment undertaken earlier, so this material formed part of the literature reviewed. Through an examination of the effects of the event on these sectors, the Experts sought to identify recommendations for sustainable livelihoods.

The process of this examination allowed for previously unidentified issues to emerge. Key among these was the psycho social dimension of the impact of the event on the population and the significance of social capital in the processes of resettlement.

[8] Rapid Damage and impact Assessment. Tropical Storm Erika – August 27th 2015. A Report by the Government of the Commonwealth of Dominica September 25, 2015.

Section One: The Affected Population

A. A Social Perspective of Dominica in the Wake of TSE

1. Description of Storm and its Effects

On the morning of Thursday August 27th, 2015, Dominica was affected by Tropical Storm Erika, which bombarded the island with rainfall for approximately nine hours.

At the conclusion, Dominica was left with a trail of destruction and devastation leaving dead, injured, and missing particularly in the south eastern community of Petite Savanne. The Ministry of Planning, Economic Development and Investment reported that there have been 14 confirmed deaths and 18 persons missing.[9] Over 800 households were left homeless. The community of Petite Savanne was voluntarily evacuated due to the severity of damage and catastrophic impact resulting from landslides. Communication broke down within and among various communities around the island, a consequence of extensive damage to roads, bridges, telecommunications, ports both air and sea and almost all major infrastructure.

The Rapid Damage and Impact Assessment[10] reported that "gauge readings taken at Canefield Airport indicated the rain event started at approximately 7:00am local time and continued through 6:00pm. As recorded at Canefield, the heaviest accumulation occurred between 7:00am and 12 noon with an accumulation of approximately 200 mm (nearly 8 inches over the 5 hour period). Data recorded from the Gleau Gormmier station, located in the mountains near the center of the island, indicated that rainfall accumulation on the 27th between 1:00am and 5:00pm was 17.08 inches or 434mm of which 14.1 inches (359.7mm) accumulated from 4:00am to 9:00am which was higher than the Canefield data. As a result of the intense rainfall in combination with steep topography and relative short distance from the centre mountain ridge to the coastal areas (6 miles or so), flash flooding rapidly ensued with little warning to the population."

The Report concluded that the "combination of intense rainfall, unusual dry season and cracking of clay soils contributed to slope failures and debris generation which resulted in major damages and fatalities throughout Dominica."

"Torrential rain triggered massive flooding, rivers and streams surged thus carrying boulders and debris destroying homes, roads, bridges and land. Heavy rains also caused major landslides which engulfed homes and in some cases entire villages. Many people continue to be displaced due to loss of property, personal effects and livelihoods".[11]

The Government of Dominica declared nine (9) special disaster areas namely 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 are both uninhabitable. A total of 557 persons were evacuated as follows: Petite Savanne (515 persons by sea, 36 persons by air); Delices (6 persons by air).

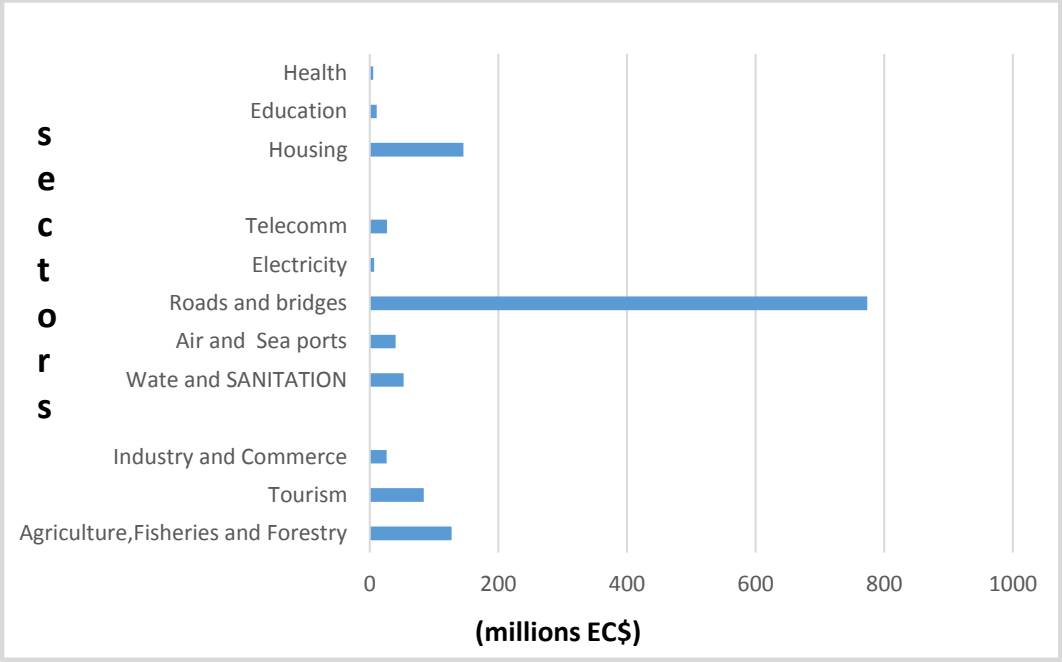
[9] Ministry of Health and Environment. Health Sector Report 10/21/2015, initially reported injured, numbering 20. Page 8. The number has been reassessed to 62.

[10] Rapid Damage and impact Assessment, Tropical Storm Erika – August 27th, 2015. A Report by the Government of the Commonwealth of Dominica.

[11] Post Tropical Storm Erika: Health Sector Report. Ministry of Health and Environment. 10/21/2015

It has been concluded that TS Erika resulted in damage and loss of EC 1.3billion (US$483 million), equivalent to approximately 90% of the Dominica's Gross Domestic Product (GDP).[12] The greatest effect of the event was felt in the transport sector (60%), followed by housing (11%) and agriculture (10%), as illustrated in Figure 2.

Figure 2.
Dominica: Summary of Total Effect of Tropical Storm Erika by Sectors and sub-sectors



Source: Table 1, Rapid Damage and Impact Assessment Tropical Storm Erika – August 27, 2015.

[12] Dominica GDP (2014 – in Current US$) $537.8 million. World Development Indicators, the World Bank , 2015

2. Dominica and its Vulnerability to Natural Disasters

The events surrounding TS Erika, although extreme, were not outside of the known hazards to which Dominica is exposed. Aside from hurricanes and volcanic eruptions, Dominica is prone to earthquakes, landslides, river floods, and heavy seas that often cause damage to the transportation network and cause environmental degradation. It has been concluded that Dominica is extremely vulnerable to disasters, ranking 12 in the Composite Vulnerability Index, produced by the Commonwealth Secretariat and the World Bank. Table 1 presents a review of selected disasters which occurred within the last 40 year period, suggesting a high toll not only in material costs but in human suffering. The World Bank concluded that a "natural disaster inflicting damage equivalent to more than 2 per cent of the affected country's GDP can be expected to hit the ECCU roughly once every 2 ½ years."[13]

Like most of its Caribbean neighbours, Dominica is very vulnerable to multiple hazards, some of which could occur simultaneously. The country has nine live volcanoes and experiences frequent seismic and geothermal activity. Dominica's terrain renders damage to physical infrastructure greater than in other counties of the Region and the cost of rehabilitation higher.[14]

Therefore, the economic impact of disasters can be large – disruption of economic activity, loss of income, fiscal and external account imbalances and increased poverty.

Dominica, due to natural hazards and the inherent vulnerabilities of Small Island State (SIDS) is constrained by risk and uncertainty, which affects economic and social planning for development and poverty reduction.

Table1. Dominica: Selected Disasters (1979 – 2015)
by Affected Population and Estimated economic cost

		Affected Population		
Name of Event	**Year**	**Deaths**	**Affected**	**Estimated Damage/losses**
Erika *	2015	13	15,951	482.84
Ophelia	2011	0	240	0
Dean	2007	2	7530	20,000
Marilyn and Luis	1995	2	5001	20,000
Hugo	1989	0	710	20,000
David and Frederick	1979	40	72,100	44,650

Source: The International Disaster Database. CRED 2016. http://www.emdat.be/disaster_list/index.html

*Erika data based on GCOD estimates

[13] Tobias Rasmussen, "Natural Disasters and their Economic Implications", The Caribbean: From Vulnerability to Sustained Growth, IMF, 2006. This discussion is presented in the GSPS 2014-2018, pg 58

[14] The discussion on Dominica's vulnerability is taken from the "Disaster Risk Reduction Country Profile, September 2014. Page 17

B. TSE: Its Effects on the Population

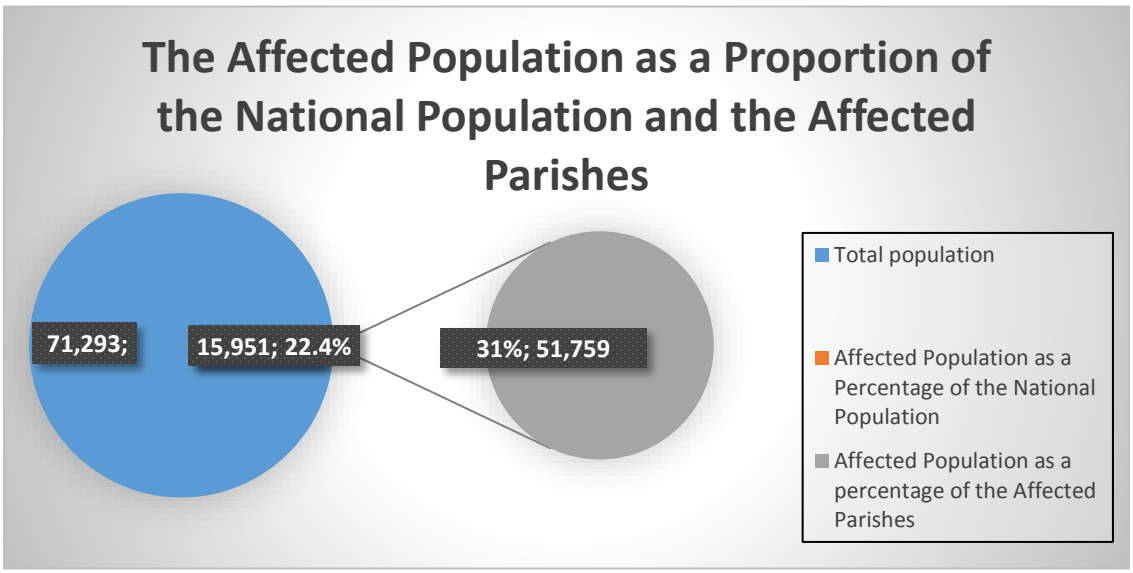
1. Social and Demographic Characteristics

According to Dominica's 2011 Population and Housing Census Report, the total population of Dominica numbered 71,293, of which 49 % are male and 51% female. The population registered a net decrease of 0.6% over the last census of 2001, suggesting that population movement in Dominica is not uncommon.

Dominica, compared to its sister Caribbean countries, has a comparatively low density rate of 96 per square klm.[15] The population is distributed among 10 Parishes with the Parish of St. Georges, of which the city of Roseau forms a part, accounting for some 29% of the total population. St. Andrew accounts for 14% of the population while another 24% of the population is distributed evenly between and St Patrick and St. Paul. St. Joseph accounts for 8%, while St David accounts for 10%. St Luke, St Mark and St Peter each account for approximately 2% of the population. Dominica has a growing young population with children below 14 years accounting for slightly more than a quarter of the population, and approximately 41.9% of the population comprising children and youth below 25 years. The elderly population (60 years and above) in Dominica accounted for 14.8%, and the majority of this population is female.[16]

It has been estimated that as a result of TS Erika, some 15,900 persons or 23% of the national population was directly affected. Of the population that resided in the Affected Parishes, some 32% were affected, as illustrated by figure number 3.

Figure 3. The Affected population



Source: Estimates based on official data from the GCOD

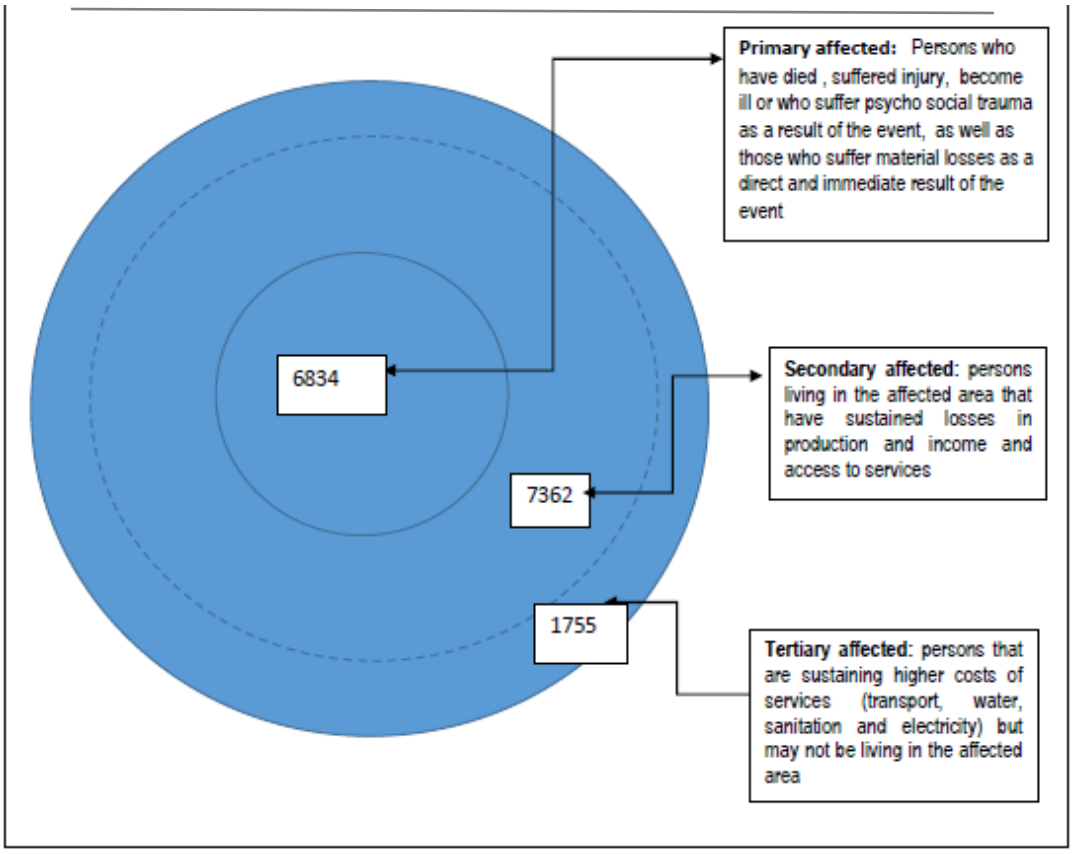
[15] http://caribjournal.com/2013/10/22/ranking-caribbean-countries-by-population-density/#

[16] ERIKA: GENDER AND CHILD RESPONSIVE RAPID ASSESSMENT RE: DAMAGE, LOSSES, AND SECTORAL NEEDS. UN Women and UNICEF

The recognised methodology for post disaster assessment,[17] suggests a categorisation of the population affected by a disaster, into, primary, secondary and tertiary. It is expected that through the differentiation of the effects of the event on the population, a more nuanced approach to their needs for recovery can be articulated by the policy makers.

The effects have been categorized into the following groups: Primary affected describing those persons living in the affected areas who have lost their lives, who suffer injury or illness as a result of the event and those whose assets have been destroyed. Secondary affected refers to those persons living in the affected area or outside of the affected area that have sustained losses in production and income. The Tertiary affected group refers to persons living outside of the affected areas that are sustaining higher costs of services (transport, water, sanitation and electricity) as a result of the event.

Figure 4. Dominica: Illustration of Categories of Affected Population



Source: Estimates based on official data from the GCOD

Each type of person affected will have different kinds of needs to achieve recovery and reconstruction following the disaster. Figure 4 illustrates the distribution of the affected population as a result of TS Erika.

[17] Handbook for estimating the socio-economic and environmental effects of disasters. ECLAC 2003; and Jamaica Handbook. 2013 http://www.pioj.gov.jm/Portals/0/Sustainable_Development/Final%20DaLA%20Handbook_Jamaica_Feb11_2013.pdf

Such a distribution suggests that some 6,834 can be described as primary, 7, 362 as secondary and 1,755 as tertiary[18].

Dominica exhibits many of the characteristics of Small Island Developing States (SIDS), particularly with regard to its closely knit population. It was evident that despite the very localised nature of the effects of TSE, the entire population of Dominica was affected if not directly by having family or friends affected, then by the ensuing disruption caused by the effects to the island's infrastructure. Still yet others experienced the psychological trauma of the effects of the tropical storm despite not having been personally affected. In addition, the devastation caused by the event, has left almost no one untouched, as Dominicans together face the direct and indirect challenges of recovery presented by TS Erika. The literature agrees that, Dominica as other SIDS because of their small size, may have events such as disasters affect a greater proportion of the population and have a significantly larger economic impact.

There were some effects in all of the ten Parishes of Dominica, but seven were seriously affected as a result of TS Erika. These were St. David, St. George, St. Joseph, St. Patrick, St. Paul and St. Peter. On August 29th the Prime Minister declared the following communities within those parishes 'special disaster' areas: Petite Savane, Pichelin, Good Hope, Bath Estate (Paradise Valley), Dubique, Campbell, Coulibistrie, San Sauveur, Petite Soufriere. Brief profiles of the affected communities are presented in Box 3. Of all the affected communities only Bath estate and possibly Coulibistre can be described as suburban. All else were rural communities.

In addition to the hazards themselves, there are a number of socio demographic characteristics that make people more vulnerable when considering the impact of a disaster. Factors affecting vulnerability include socioeconomic status, available resources, health, age, sex, family dynamics, gender and ethnicity. It has also been argued that strong explanatory factors of vulnerability, include educational attainment levels, dependency ratios and the age of the head of household.[19]

Selected social and demographic characteristics of the affected population, drawn from the data sets of the Population and Housing Census 2010, presented in Box 4, allows for a deeper understanding of the affected population.

[18] Estimates of increased costs of transport and other basic services were unavailable, a conservative estimate was identified for this group.

[19] Gender, Ethnicity and Climate Change in Mexico: An analysis of vulnerability and resilience based on household surveys. Lykke E. Andersen, Anna Sophia Doyle, Dorte Verner and Manfred Wiebelt http://www.inesad.edu.bo/pdf/wp2014/wp07_2014.pdf

Box 3. Profiles of Affected Communities

- **Petite Savanne** is a village on the southeast side of Dominica in the Parish of St. Patrick. It is characterized by the steepest terrain in Dominica and has a population of approximately 781 (748 at last census). Some 109 people (25 males, 38 females and 46 children) were taken by boat to Roseau and accommodated by relatives or were housed at the Dominica Grammar School. Death toll and the missing was highest in this village.
- **Petit Soufrière** is a small village in the Saint David Parish on the east coast of Dominica. It overlooks the Petite Soufrière Bay. Located on the steep, rugged slopes of Morne Aux Delices, it is one of the most isolated villages in Dominica. Petit Soufrière had never been part of a large estate because of the rough terrain, and is therefore a peasant farming settlement with a population of 561.
- **San Sauveur** is also in the Parish of St David. San Sauveur to Dominica's capital Roseau (Roseau) is approximately 17 km / 11 miles. An estimate of the population of this village in the absence of a firm estimate is 800.
- **Coulibistrie** is a village on the west coast of Dominica, to the north in the Parish of Saint Joseph. It lies between the villages of Colihaut to the north and Morne Rachette to the south. It extends inland from the coast within a deep valley, along both banks of the Coulibistrie River. It is primarily residential with few businesses. Many of the houses are built directly atop or adjoining the numerous large boulders that litter the valley along its base.. The people earn a living through agriculture, fishing and vending selling locally made food and produce along the main road leading south to the city of Roseau and north to the town of Portsmouth. There are 163 households with an average size of 2.6 individuals. An estimate of the population is 423 (213 males and 206 females).
- **Campbell** is next to Sylvania Estate and is located in Saint Paul. Its population is estimated to be 538.
- **Pichelin** sparsely populated. As of last census population stood at 520 persons.
- **Dubique** in Saint Patrick is about 7 miles (11 km) South-East of Roseau, the country's capital city. And has an estimated population of 216. In July 2006, the Caribbean Development Bank and the Government of Dominica compiled a report named, "Poverty and Inequality Mapping in the Commonwealth of Dominica" and reported that "The intensity of poverty is particularly pronounced in the village of Dubique/Stowe, where the severity of poverty also reaches one of the highest values in the country". In this village, the equivalent consumption is not very low, but is distributed very unequally among the households, so that "the Gini concentration index reaches the value of 52.76, well above the Parish and country average". Dubique continues to be a very resilient. Given its limited natural resource base, capacity building and sustainability is critical to the maintenance of household income and personal development. The population is 150 (79 males; 71 females)
- **Bath Estate** has a population of 700 and may be described as a suburb of Roseau.
- **Good Hope** is a small fishing farming community located on the east coast of Dominica. There is a variety of economic, cultural and social activities within the community which benefits from the attention of a Resource Centre Management Committee. The community has about 500 residents. In the absence of data for this village a description of loss of livelihoods of a similar village is provided here. This analysis can be instructive in identifying the challenge of restoration and creation of new livelihoods to women.

The data suggests that the proportion of women who are the heads of households is high. The average across all the communities was 35% but some communities had a proportion as high as of 47% (found in Pichelin), well above the national average of 39%. Only one community had a low of 23% (Boetica). Examination of Headship is useful as the literature suggests that female headed households are more vulnerable to shocks and the downside risks than households headed by men. They have greater difficulty with regard to access to labour markets, may find themselves in the lowest wage segments of the market and most significantly carry a 'double day burden' if as heads they have to handle domestic work and the role of main earner simultaneously, or put differently are responsible for reproductive and productive roles. The consequence is that such heads of households suffer from more pronounced time and mobility constraints than their male counterparts. [20] Over 87% of Heads of households in the affected areas were above 35 years. However 11.5% of affected households were headed by youth ages 25 – 34 years.

When the issue of family size is considered, Dominica has a relatively small family size (2.7), however the communities which were affected had larger household sizes that the average. Many of the affected were farmers and fisher folk whose family comprised of as many as four (4) or more persons. Single female headed households located in shelters, often reported family sizes ranging from the low of 3 to the high of ten to thirteen. Family size is a function of the dependency burden which the head of the household has to bear. Be that head male or female. Unfortunately female headed households usually have one income earner thus increasing the burden of care on main breadwinner, whereas the male headed household usually has the support of an additional income earner, his spouse, thus reducing the burden of care on the main breadwinner.

The size of poor female headed households should not be seen as unlikely as the CPA (2010) suggested that the poor tended to have larger number of children than the non-poor. [21] The Report also noted that children (0-14) and youth (15-24) comprised some 52% of all poor individuals.

[20] What about the Women? Female headship, poverty and vulnerability in Thailand and Vietnam. 2011 http://www.oecd.org/dev/pgd/46982877.pdf

[21] Country Poverty Assessment 2008/2009

Box 4. Social/Demographic Profile of the Affected population

- Women Headed Households
  a. Average 35%
  b. Max 47%
  c. Min 23%
- Average Family Size
  - The national average is 2.7
  - Farmers and Fisher folk – 4.275
  - Female headed households in Shelter range from 2 to as many as - 8 to 10 children
- Age Structure
  - Over 80 – 4%
  - Four and Under on average 7%
  - Five to 19 – 23%
- Average Highest level of Education attained by Head of Household

  Degree 2%
  GCE O'Level 7%
  School Leaving 15%
  High School Diploma 6%
  Junior Secondary Programme 6%
  Other Diplomas and Certificates 8%
  Professional Certificate 4%
  No Certificate 68%

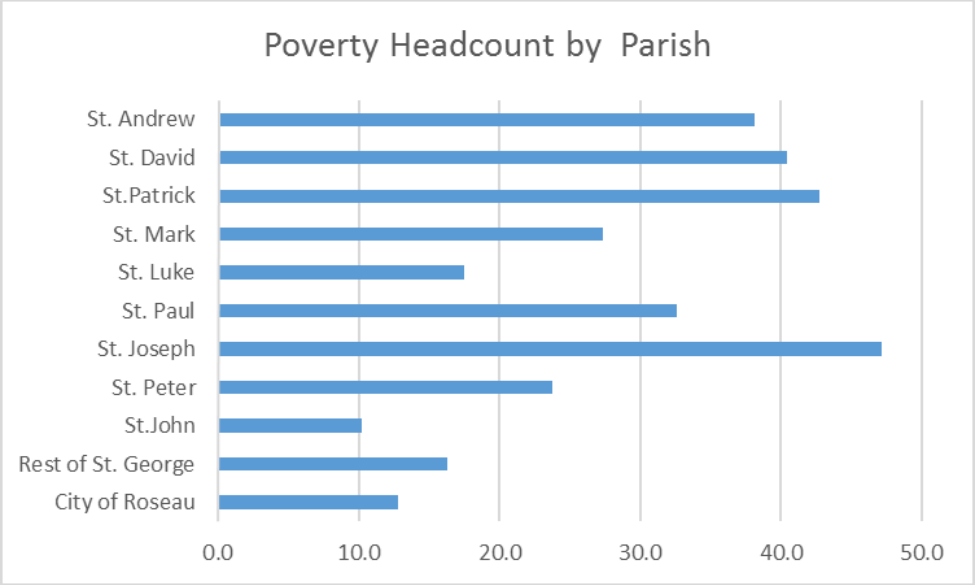
Source: Estimates based on official GCOD data

2. Socio Economic Status of the Affected Population

The country's most recent poverty assessment study detailed the socio economic status of the population. Using this data and matching it with the geographic areas that were affected by TS Erika, it is possible to ascertain the position of people living in the affected communities with regard to their level of indigence, poverty and vulnerability which has implications for the recommended initiatives for recovery. Since the level of indigence had fallen from 10% in 2003 to 3.1% in 2009, this section will focus on the poor and vulnerable. Figure 5 illustrates the headcount of the poor by Parish. It suggests that the parishes of St. Joseph (47.1%), St. Paul (32.5%), St. Patrick 42.6%), St. David (43%) and St. Andrew (38%) had poverty headcount indices that were higher than the national average of 28.8%.

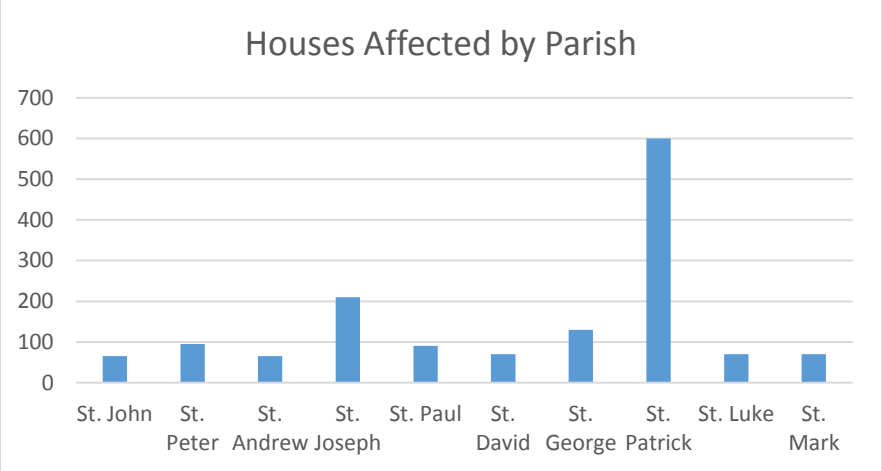
According to the CPA, vulnerability was set at 25% above the poverty line which was estimated at EC 7,788 per annum. Households consuming at levels below the vulnerability line were deemed to be 'vulnerable'. Persons living in households who did not fall below the poverty line (that is they were not poor) but who fell under the vulnerability line were deemed to be at risk of falling into poverty should any adverse economic shock or natural disaster occur.

Figure 5. Distribution of Individuals Poor by Parish



Source: Dominica CPA 2010, table 5.5

Figure 6. Houses Affected by Parish



Source: Estimates based on Official GCOD data

Figure 7. Dominica: Percentage Poor by Affected Community and Parish

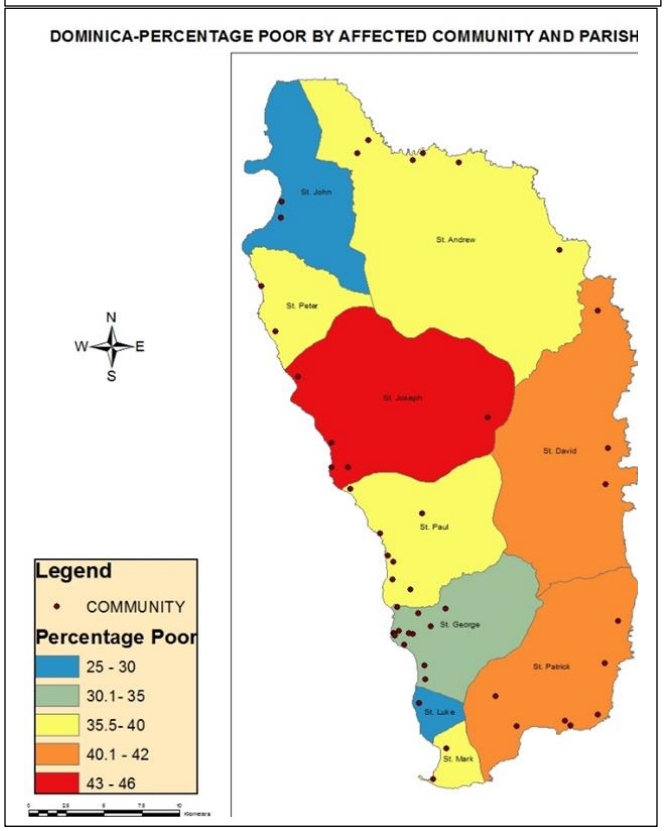


Figure 8. Dominica percentage vulnerable by Affected Community and Parish

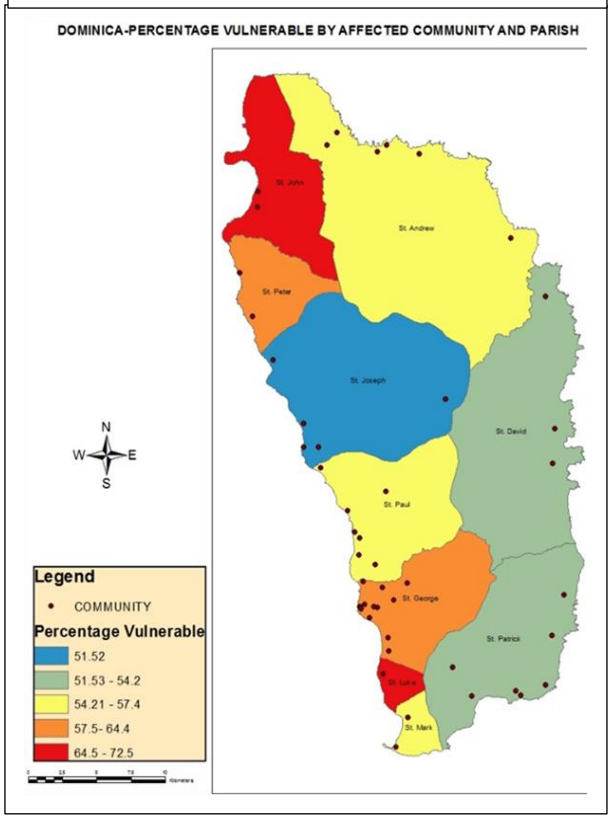


Figure seven suggests that the poorest Parish, St Joseph was also among the Parishes that were severely affected by TS Erika with the loss of over 200 houses.

See figure 6 which presents the houses affected by Parish. The Parishes of St. Patrick and St David which contained between 40 and 42 percent poor, and over 50 percent of its population deemed vulnerable (figure eight) had by far (41%) the largest proportion of households affected including destroyed, partially destroyed and at risk. The highest number of homes totally destroyed were found in St Patrick (250) followed by St. Joseph (50). St Joseph although the poorest parish had four communities affected while St Patrick had the highest number of communities affected (7) and St David had 3 communities affected. It should also be noted that it was in St. Patrick that the highest number of lives were lost.

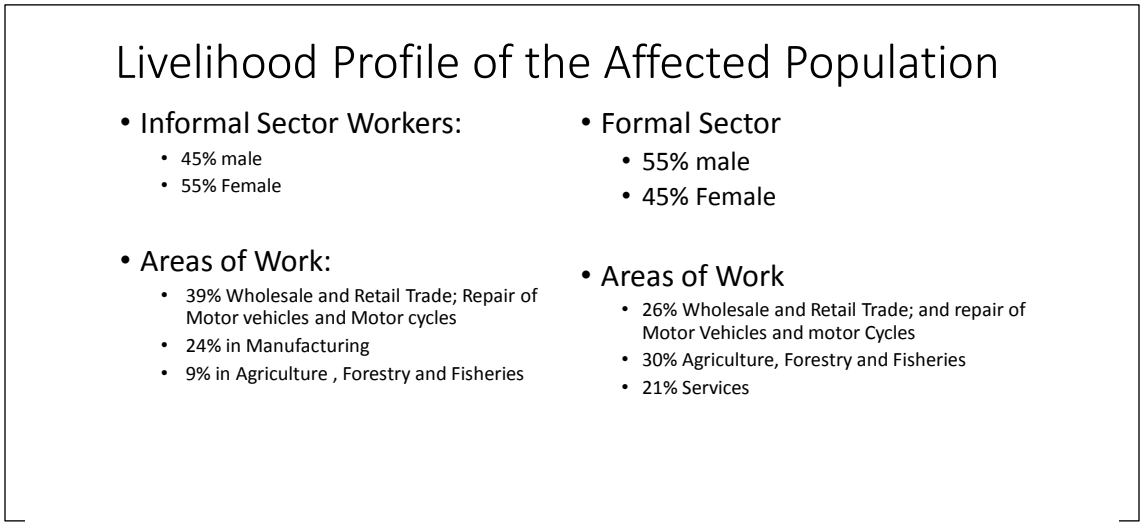
Figure eight suggests that the Parish of St. George, which was among those Parishes identified with the second highest level of vulnerable households, had the largest number of affected communities as a result of TS Erika. If this were so then one would expect that a significant portion of the population which had been living above the poverty line but below the vulnerability line, may now have succumbed to their vulnerability and have been pushed below the poverty line. As we explore the livelihoods of the affected population we should be able to arrive at a more definitive answer.

3. Livelihoods of Affected Population

Livelihoods can be affected by a number of factors: the political and economic environment; the security environment in which disasters or disturbances such as disruption to the supply chain or markets can occur; and the ecosystem in which changes that cause damage or destruction to the environment can take place. The literature suggests that over reliance on certain assets, particularly natural and physical livelihood assets, as often occurs in agriculture, can mean greater vulnerability to shocks. Insurance is seen as an alternative strategy for risk reduction. But for many who are unable to afford insurance, the strategy of choice is livelihood diversification. The greater the diversity of income, the greater is the resilience of livelihoods to disruption from particular shocks.[22] Many low income earners engage themselves in multiple income earning strategies in order to reduce risk and build resilience to future shocks. For the poor, securing a resilient livelihood is often the most direct route out of poverty.[23]

For most of the affected population, one means of livelihoods was not an option. Affected persons, if they were women reported that they worked their farms or backyard gardens and then sought a day's pay, bundling bay leaves to make a 'batch'; doing a little domestic work; weeding a garden or providing janitorial services. Men undertook their fishing or farming and then worked construction, carpentry or security. Box number 5 provides a view of the work profile of the affected population before TS Erika struck. The data suggested that the sex composition of the informal workers was the opposite of that of those working in the formal sector. In the aftermath of the storm many were now without a means to earn an income, either formal or informal.

Box 5. Livelihood Profile of Affected Population



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[22] Gender, Ethnicity and Climate Change in Mexico: An analysis of vulnerability and resilience based on household surveys. Lykke E. Andersen, Anna Sophia Doyle, Dorte Verner and Manfred Wiebelt http://www.inesad.edu.bo/pdf/wp2014/wp07_2014.pdf

[23] Investing in resilience. Ensuring a Disaster-Resistant Future. Asian Development Bank. 2013

4. Effects on the Quality of Life

Disaster specialists have been seeking to arrive at an index (or measure) that would represent the change in the quality of life of a population as a result of a disaster. [24]
There is recognition that the quality of life is a concept not directly measurable in itself, but which can be approached through the use of indicators carefully selected. The United Nations through its work on the Human Development Index (HDI) which is a tool developed to measure and rank countries' levels of social and economic development based on four criteria: life expectancy at birth, mean years of schooling, expected years of schooling and gross national income per capita, led the way in seeking to measure the quality of life.

With regard to a Post Disaster Quality of Life measure, the idea was to not only arrive at a number of indices that could be used as a measure for change in the quality of life, but to be able to produce a composite index that could also be used as a monitoring tool in the recovery process.

Box number 6 presents a number of indicators which have been recommended for use in the elaboration of a change in the quality of life index, as a result of a disaster.

Box 6.

Selected Indicators for measuring a change in the quality of life following a disaster

Indicators at the Macro level

1. Student Attendance at School
    a. Change in the number of education days provided to students in the year
2. Access to Potable Water
    a. Change in household access to potable water
3. Health Conditions
    a. Change in the number of persons treated for particular disease (relevant to disaster under examination)
4. Housing Conditions
    a. Change in selected aspects of housing conditions
        i. Materials used in the construction of walls
        ii. Materials used in the construction of roofs
        iii. Access to direct connection to electricity grid
5. Food Security
    a. Change in the number of persons facing food insecurity
    b. Change in the number of persons facing mal nutrition

Source: Kambon A. " Development of Standardized PDNA Methodology for India". (unpublished April 2015)

[24] UNDP initially sought to use changes in the Human Development Index, as a measure of change in quality of life following a disaster. This was soon recognised to be a very difficult task as the HDI was a static measure, and many of its sub indices were not sensitive to disasters nor were they based on current data sets. Jovel and Kambon working on developing a methodology for Government of India as part of an ADPC project proposed that at the macro level "the team should consider the utilization of a selected number of indicators available at the national or sub-national level that would be sensitive to disasters for use in measuring the impact of the disaster on the quality of life of the members of the community". They went on to suggest that "Indicators that may be sensitive to define the macro-social impact, would be those whose data sets have been used in sectorial assessments and where a marked change is measureable ".

A change in the retail price index is another measure that can be used to indicate the change in the price level, which affects the quality of life after a disaster.

Due to the constraints of time and availability of data, only a few indicators have been used to provide an idea of the change of quality of life following TS Erika . No composite index was produced as the Assessors were of the opinion that the data sets were not strong enough. Instead separate indices were calculated for consideration.

The present index or relative calculations presented below merely point in the direction and general magnitude of change. This calculation does not use a weighting diagram to put the components of the Index into their relative importance but calls attention to the movement of the indicators being used. [25]

For Education, as presented in table 2, the attendance at school was selected as a rough indicator. For Health, the statistics on Gastroenteritis for the final quarter of the years 2013 to 2015 were compared and converted to indices of an aspect of health that would impact the "quality of life". Data available for housing were not robust enough to admit of measurement for the purpose of suggesting an index to be considered in the calculations.

The consideration of such a concept has allowed the team to make the following measurements.

Table 2

EDUCATION STATISTICS FOR USE IN QUALITY OF LIFE PROXY INDEX

AREA	TERM1 AVERAGE 2013/2014	TERM1 AVERAGE 2014/2015	TERM1 AVERAGE 2013/14 TO 2013/2015	TERM 1 AVERAGE 2015/2016	RELATIVE 2015-2016/2013 TO 2015	INDEX 2015-2016/2013 TO 2015	INCREASE/DECREASE - IN ATTENDANCE RATE %
North	100	94	97	88	0.907	90.7	-9.3
South	90	87	93.5	83	0.874	87.4	-12.6
East	91	91	91	92	1.011	101.1	+1.1
West	92	99	95.5	88	0.921	92.1	-7.9
TOTAL	**93.168**	**92.647**	**94.229**	**87.692**	**0.9268**	**92.7**	**-7.3**

The conclusion from the above table is that there was an overall drop of 7.3 percent in school attendance after TS Erika as compared with the average attendance rate for the period 2013 to 2015 (term 1 Sept to December attendance). Only one area showed an increase in attendance rates (East) and this could have

[25] The team did not consider producing a composite index or any weighting of indices as much analysis of responses to surveys will have to be done before one derives a weighting diagram and time did not permit.

been the effect of bussing children to school. The relocation to shelters may have assisted the performance in this area.

The Health indicator, presented in table 3, selected is a fairly strong one for the measurement of the effect of TS Erika on the health of the population. Cases of gastroenteritis occurrences, reported were used as the indicator. The calculations were as follows:

TABLE

HEALTH INDICATOR – GASTRO ENTERITIS

Epiweek	2013	2014	2015	2014/2013 Relative	2015/2014 Relative
39	31	21	60	67.74	285.7
40	27	29	40	107.41	137.93
41	24	22	14	91.67	63.63
42	13	42	20	323.08	47.62
43	17	24	24	141.18	100.0
44	23	23	38	100.0	165.22
45	24	29	39	120.83	134.5
46	25	23	54	92.0	234.78
47	15	36	46	240.00	127.77
48	19	20	45	105.26	225.00
49	10	36	33	360.00	91.67
50	19	28	36	147.37	128.57
51	5	31	25	620.00	80.64
52	5	34	27	680.00	79.41
TOTAL	**248**	**379**	**501**	**152.82**	**634.18**

Source: Derived from Data provided by Ministry of Health

In the Housing Sector, the total of the housing stock was 25,000. The Tropical Storm destroyed or significantly compromised 1445 houses, reducing the stock by 1445 to a figure of 23555. A simple relative of the new housing stock as compared with the pre-Erika total yields a relative of 94.22 percent, indicating a 5.78 percent drop in available housing and indicating a drop in the quality of life as measured by the loss of the houses reported.

The three computations above suggest that the quality of life as measured by the rough indicators used was adversely affected by the Tropical Storm Erika in August of 2015

Section Two: Detailed Social and Livelihoods Analysis by Areas of Focus

In order to arrive at the best recommendations for policies that create jobs and make livelihoods more resilient, the paper focussed on the following areas for examination: the Social Sectors of Health, Education and Housing including Social Protection Measures; the Productive sector including Agriculture, Tourism and Commerce. Infrastructure was adequately covered by the Rapid Damage and Impact Assessment and was therefore not included for examination in this study.

A. Agriculture

1. Introduction

This document presents the findings and recommendations emanating from a Social and Livelihoods Impact Assessment of Tropical Storm Erika on the agricultural sector crops and livestock, forestry and fisheries of Dominica[26]. The general context is that Tropical Storm Erika, moving at a very low speed from the Atlantic poured approximately twelve (12) inches of rain on the Commonwealth of Dominica from the early morning of August 26th 2015, causing vast destruction and substantial damage to infrastructure, communications, transportation and agriculture, as well as loss of human life. The Storm has been regarded as one of the most devastating weather events to impact the Commonwealth of Dominica since Hurricane David in 1979.

The impact on the agricultural sector was significant, with estimated effects on agriculture, fisheries and forestry estimated at EC$ 122,832,078; EC$ 2, 949,324 and EC$ 1, 546,960**,** respectively**.**

2. Sectoral Context

The agricultural sector, although fluctuating in growth over the last five years (2006 - 2015) with a downward tendency, continues to play an important part in the economic life of the Dominica. The sector contributes to the Gross Domestic Product (GDP) through employment, foreign exchange earnings and more recently and importantly, through its linkages and impacts on the health and tourism sectors and the achievement of food and nutrition security for the population. Real agriculture growth rate in 2015 was estimated at negative -20.19%, compared 1.24% in 2006. However, the agricultural sector is expected to recover by 2016, with growth rates projected to be 2.2% and 2.1%, in 2016 and 2017 respectively (Table Annex 3).

In 2015 the contribution of the agricultural sector (including forestry and fisheries) to National GDP was estimated at only 10.39%, compared to its contribution of 12.53% in 2006. During the period under review, the contribution of the banana industry to Total GDP declined significantly, from 2.07% of GDP in 2006 to 0.60% of GDP in 2015. Declines were also recorded in the contribution of other crops, livestock, forestry and fisheries subsectors to GDP for the same period (See Table Annex 3). The distribution of Agricultural GDP by the various subsectors is presented in Annex 3.

Private sector development in the agriculture/agri-business (and tourism/eco-tourism sectors) is an important driver of enterprise development, economic growth and poverty reduction. However, men's and women's unequal participation in agriculture and tourism is linked to gender-based access to land, credit and other productive assets, and gendered occupational segregation and differential wages. The *2011 Population Census* indicates that males comprise 85% of skilled agricultural and fishery workers, compared to 15% of females (GOCD, 2014). Men generally own larger parcels of land, are involved in

[26] Full report is available as an addendum to this document. Excerpts of this report are presented for consideration.

larger scale agricultural production for export, and the rearing of large livestock. Individual women generally have access to smaller plots of land, are more involved in household food production, small scale vegetable production and the rearing of small livestock, with subsistence production and food security being the main outcomes[27].

Agriculture in Dominica is focused both on crop and livestock production, and in the majority of farming operations mixed farming is the dominant production strategy used. Crops grown include bananas, plantains, coffee, cocoa, citrus, coconuts, dasheen and other root and tuber crops, vegetables and bay leaf and its by-products. Livestock include cattle, sheep, goats, pigs and chicken. Together, these crops and livestock enterprises earn significant foreign exchange and are collectively the mainstay of the socioeconomic fabric of the country.

Dominica is in a crucial period of development. Having weathered the early challenges of a post-colonial economy, the country has had to address several financial, economic, political and other factors, including natural forces, which have adversely affected its quest to improve the welfare of its citizens. Indeed, these challenges have significantly impacted on agricultural growth and development and may be categorized under five broad headings:

- Low general economic growth rates and high debt to GDP ratios;
- ***Loss of export markets for the main agricultural sector product*** (bananas), and loss of domestic markets to rising food imports;
- Rising rural unemployment and the decline of rural agricultural industry;
- Rising health care costs due to changing consumption habits and demographics; and
- Increased vulnerability to climate change and external shocks that require more Government resources to be devoted to social programs to protect food security.

The negative impacts of climate change and the country's increased vulnerability to natural disasters have caused Dominica to put measures in place to respond more effectively to these challenges. Notwithstanding, the current dynamic changes taking place in the international economy, present the country with a great opportunity to confront these challenges with bold, decisive, well-ordered strategic interventions.

3. Identifying Vulnerable Livelihoods

A review of secondary data sources was conducted as a first step towards identifying vulnerable livelihoods in Dominica. In this regard, the Dominica Country Poverty Assessment (CPA) 2008/09 provided a good insight into the poverty and social and living conditions of the country's population. A summary of this information is presented in this section.

The 2000/09 CPA reported that nationally **3.1%** of the population was indigent (food poor), with the cost, at the prevailing prices, for an average adult to purchase the minimum acceptable food required to maintain good, bodily health (Indigence line), estimated at **EC$ 2,435** per adult, per year. The poverty rate (individuals below the poverty line and unable to meet both their food and non-food needs) was estimated at **28.8%** and the annualized Poverty Line was estimated at **EC$ 6, 230**. The vulnerability rate (individuals that are below the vulnerability line, but above the poverty line) was estimated at 11.5% and the annualized vulnerability line was estimated at **EC $7,788**. Individuals in the vulnerable group were at risk of falling below the poverty threshold[28] should an unanticipated event such as a natural disaster or economic shock

[27] Country Gender Assessment-Dominica. Caribbean Development Bank

[28] The poverty threshold (or poverty line) is the amount of consumption expenditure that is required to meet a households' or individuals' food and non-food needs. Households/individuals below this poverty line are considered "poor" (often referred to as absolutely poor).

occur. In effect, 40.3% of the population were at risk of being vulnerable, poor or indigent. In this report the population at risk is used as a proxy of vulnerability to food insecurity.

The Gini Coefficient of inequality was 0.44%. The richest 10% of the population accounted for 37.2% of consumption expenditure, while the poorest 10% of the population accounted for only 2.0% of total consumption expenditure.

4. The Vulnerable Livelihoods

The meetings conducted, discussions held and visits made to major sites impacted by Tropical Storm Erika were also used to identify the vulnerable livelihoods in Dominica where they are located. Data from the Dominica CPA (2008/09), the Dominica Agricultural Census (1995), and the Dominica Fisheries Industry Census (2011) were used to estimate the number of persons who are vulnerable to food insecurity.

Table in Annex 3 indicates that the working poor (wage and salary workers) constitute a livelihood in Dominica that is vulnerable to food insecurity. Further investigation of the data reported in the Dominica CPA (2008/09), revealed that of all persons employed in Dominica at the time when the survey was taken, 20.2% were poor. Moreover, among all the poor, 74.1% were employed and 25.9% were unemployed, higher than the then national unemployment rate of 14.0%. Taken together, these two statistics characterize these persons as the "working poor" in Dominica, a phenomenon that based on meetings and discussions seems currently applicable in the country. This high employment rate among the poor does not translate into an escape from poverty. Rather, the poor could not afford to be unemployed and were left with little option but to take low-paying jobs, and where possible, seek additional jobs to support their livelihoods. In this Report, wage and salary workers within the poorest income quintile will constitute the Working Poor Livelihood. Against these observations and other information in Box 7 provides a summary view of the most vulnerable livelihoods to food insecurity in Dominica

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Box 7: Livelihoods Most Vulnerable to Food Insecurity in Dominica

Vulnerable Livelihoods	Location	How Many?	Remarks
Farmers	▪ Located in all parishes	**10,100** holders/farms based on the 1995 Dominica Agricultural Census	Within each of the livelihoods there are "at risk" groups that are vulnerable to food insecurity. These groups include: ▪ Children ▪ Youth ▪ Single mothers ▪ The elderly ▪ The handicap ▪ Pensioners ▪ Vagrants The FIVIMS methodology assumes that "at risk groups belong to livelihoods and focusing on them run the risk of double-counting.
Fisher Folks	▪ Along the coastline of all parishes. ▪ Predominantly in St. Andrew (150 fishers), St. John (115), St. Peter (113), and St. Joseph (100).	**740** (Dominica Fisheries Census, 2011) involved in multiple roles. ▪ Fishermen (718) ▪ Vendors (365) ▪ Boat Owners (351) ▪ Gear builder/repairer (86) ▪ Boat builder/repairer (73).	
Working Poor	Spread throughout the country	Estimated at approximately **5,670:** ▪ Sales and Services (**1170**) ▪ Agriculture, forestry and fisheries (**1570**) ▪ Craft and related trades (**1140**) ▪ Elementary workers (**995**) ▪ Others (**1790**)	

Source: Dominica Country Poverty Assessment (CPA) 2008/09; 1995 Dominica Agricultural Census; and Dominica Fisheries Census, 2011

5. Assets of Farmers

The **human capital** among farmers in Dominica varies. Table in annex 1 **,** which presents the level of education of the farmers based on the 1995 Agricultural Census, shows that only 13.1% of all farmers have achieved the secondary school and higher educational levels. Older farmers generally completed primary education while some of their younger counterparts have completed some secondary education and beyond.

However, farmers generally have good skills in farming and are in fair health, although information gleaned from WHO statistics indicate that nutrition-related/life-style chronic diseases (mainly diabetes and hypertension) are the main public health problems in this livelihood. It should also be noted that Dominica is rated in the top 14 countries in the world with respect to high levels of obesity.

Gender analysis of the loan portfolios of banks and credit institutions indicates the availability of loans for persons to engage in small and medium enterprises, but these resources are allocated based on an individual's collateral and ability to pay back loans obtained. Since women own less land and property and occupy lower paid sectors of the economy than men, this affects their ability to access loans for enterprise development on an equal basis with men. Ultimately, this has a negative effect on the country's economic growth. There are comparatively low numbers of women accessing credit for agriculture and enterprises. More men than women also accessed credit for service enterprises and transportation enterprises. With regard to personal loans, greater numbers of women are accessing credit facilities, although equity has not been achieved.

Women are mostly accessing loans for micro-, small and medium enterprises in relatively equitable numbers with men. In August 2006, the Bureau of Gender Affairs established a revolving loan fund at the National Development Foundation of Dominica (NDFD) to assist women's small enterprise development. Women's groups were initiated through assistance provided by the Bureau included. Some of these groups are now well established, have received financial and skills-building support from other agencies, and are producing agro-processed products such as cassava flour and bread, seasonings, and other products for the local market. These enterprises would benefit from further support from the Government, banks and credit agencies, and CDB to contribute to export trade[29].

Social cohesion within this livelihood appears to be strong with frequent support given by the community to persons who may be in need. Some households in this livelihood do receive support (remittances, barrels, etc.) from relatives living abroad, although this has declined significantly in recent years following the recession in the developed countries.

6. Livelihood Activities and Outcomes

Despite accounting for only about 10.4% in real terms of Dominica's GDP, agriculture makes a significant contribution to the livelihoods of about 40% of the population who are engaged in varying degrees of farming and related activities. This is realised through linkages with tourism, manufacturing, trade, health and the environment. The sector provides important dietary staples including dasheen, sweet potato, cassava, yam, carrot, cabbage, banana and plantains.

Dominica's agriculture is highly defined between export and domestic agriculture. Based on data provided by the Customs and Exercise Division, agricultural exports recorded a total value of approximately EC$4, 122,880 for the period January to September, 2015. Of this total, the records indicate that only EC $15, 410 was exported in the months of August and September 2015 (EC $5, 192 and EC $10, 218, respectively). The main items exported during the January – September period were sweet potatoes, dasheen, bananas, plantains, yams,

[29] Country Gender Assessment-Dominica. Caribbean Development Bank

avocados, oranges and grapefruits. The Dominica Export Import Agency (DEXIA) is the main export-import agency for agricultural produce in Dominica

Banana production, once a major export crop, has been significantly scaled down following the dismantling of preferential trade arrangements with the European Union in the 1990s; damage caused by several hurricanes and losses due to the *Black Sigatoga* and yellow banana leaf spot diseases. Farmers also grow a wide range of crops that are used for home consumption and sell mostly in the local markets. Roots and tubers are grown mostly by medium and small-scale farmers largely because these are staples in their diets, can be grown on a wide range of crop soils and terrains and suffer less damage from hurricanes, compared to bananas and plantains. The seasonality of crop production coupled with very limited market information produces gluts and low prices for produce. In such circumstances, farmers prefer not to reap their crops for market sales. In addition to growing crops for the market, large and medium-scale farmers rear chicken and small ruminants.
The main constraints to farmers' livelihood activities include: praedial larceny, lack of own capital, poor farm roads, access to credit, risk from forces of change (especially natural disasters), and lack of market stability for produce. Coping strategies to sustain their livelihood include: use savings, borrow from friends/relatives, and sell stocks or other personal property.

Overall, the information gathered indicates strongly that the asset-base of medium and small-scale farmers is relatively weak. The main economic activity that supports this livelihood, viz. farming, is insufficient to sustain these two categories of farmers and they therefore have to engage in a range of other livelihood activities for support, including: general day labourer (with other farmers or wherever wage employment may be available), construction, security guards, operating a small village tuck-shop, and generally any activity that is available for which a wage is paid. The larger-scale farmers have hired-day labours, a solid asset base and are less vulnerable to food insecurity. Box 8 summarises the farmers' livelihood profile.

Box 8: Summary of Farmer Livelihood Profile

<table>
<tr><td colspan="2">FARMERS
Vulnerability to Shocks, Seasonality and Trends</td></tr>
<tr><td><u>Asset base:</u>
▪ Human capital
o Some primary education
o Agri-related and other skills
▪ Private capital
o Very little savings
▪ Natural capital
o Make use of forests, communal lands and rivers
▪ Physical capital
o Tree crops, roots and tubers, vegetables, livestock and farming tools
o Poor farm roads
o Limited irrigation infrastructure
▪ Social capital
o Best during crisis
o Some remittances.</td><td><u>Mediating factors</u>
▪ Most take advantage of Government programmes
▪ Negatively impacted by taxes/
▪ regulations
▪ Water catchments and farm roads in poor conditions
<u>Forces of change</u>
▪ Highly vulnerable to shocks and trends
▪ Affected by seasonality
<u>Livelihood activities</u>
▪ Engage in a wide range of other income earning activities
▪ Highly vulnerable to food and nutrition insecurity
<u>Livelihood Outcome</u>
▪ Fairly wide fluctuations in livelihood status
▪ Smaller-scale and quasi-subsistence farmers most vulnerable to food and nutrition insecurity.</td></tr>
</table>

7. Fisheries: Description of the Livelihood

The Fisheries Industry in Dominica is still in the early stages of development. Artisanal in nature, the industry lacks the hallmarks of progress typical of more developed nations. Generally:

- There are virtually no decked vessels, and those present are small – even when compared to those found in other Caribbean territories.
- Fishing gear is simple in construction and usage.
- Almost all fish caught is utilized locally.
- The fish resource is still largely underexploited.

The fishing sector's relative contribution to Dominica's real GDP averaged EC$4.0 million annually over the period 2011-15 and is projected to increase to EC$ 4.36 million and EC$4.45 million in 2016 and 2017 respectively. This translates to about 0.41% annual contribution to real GDP. Over the period 2011-2015, fish landings averaged just over 1500 tonnes (live weight) annually, with very little variation over the years. Clearly, this industry has significant potential for expansion in landings and value addition.

Box 9 provides a summary of the Fisher Folk Profile.

Box 9: Summary of Fisher Folk Livelihood Profile

<table>
<tr><th colspan="2">Fisher Folks -Vulnerability to Shocks, Seasonality and Trends</th></tr>
<tr><td>
<u>Asset base:</u>
▪ Human capital
o Primary education and some secondary and college
o Fairly healthy, but suffer from diabetes and hypertension
▪ Social capital
o Fairly strong
o 19 fisheries organizations
o Some remittances
▪ Private capital
o Very little savings
o Have minimal debt mainly with credit unions
o Duty-free concessions on vessels and equipment
▪ Natural capital
o The sea is the main natural assets
▪ Physical capital
o Vessels and equipment (Owners)
o Workers – small homes
o Access to government built complex and sites.
</td><td>
<u>Mediating factors</u>
▪ Most take advantage of Government programmes
▪ Perceptions that they are not adequately consulted on government policy
▪ High input costs, especially fuel cost
<u>Forces of change</u>
▪ Highly vulnerable to shocks and trends
▪ Affected by seasonality
<u>Livelihood activities</u>
▪ Engage in a wide range of other income earning activities
▪ Use many coping strategies
▪ Attitude towards savings/wealth creation best summarized as – "old money should not meet new money"
▪ Highly vulnerable to food and nutrition insecurity
<u>Livelihood Outcome</u>
▪ Fairly wide fluctuations in livelihood status
▪ Workers on vessels particularly vulnerable to food and nutrition insecurity
▪ Many vulnerabilities result in only three months of effective or optimal use of effort
</td></tr>
</table>

8. Social and Livelihood Impact of Erika on Agriculture

The consequences of storm Erika have resulted in major dysfunction and displacement of large proportions of Dominica's farming /fishing population (Table 14). Approximately 4,343 farmers and fisher-folk and related inter-sectoral linked livelihoods were impacted by Tropical Storm Erika, representing household membership of 13,593 persons. This affected food and agriculture sector population represents approximately 46.8% of the population vulnerable to food insecurity. The impacts of Tropical Storm Erika have certainly exacerbated the situation.

Table 4: Summary of Erika on Food and Agriculture Livelihoods

Description	Number of Farmers / Fisher folks	Estimated Household Members[30]
Impact on Farmers crops	**956**	**2,992**
Impact on Farmers Livestock	**105**	**329**
Less Combined Operations (Crops and Livestock)	**(33)**	**(103)**
Total Crop/Livestock	**1,028**	**3,218**
Impact on Farm Assets	**134**	**419**
Impact on Inter-sectoral Assets (plants, feeder roads, etc)	**3,032**	**9,490**
Impact on Fisheries	**149**	**466**
Grand Total	**4,343**	**13,593**

There are few key messages and conclusions critical to the development of the food and agriculture sector of Dominica that can be gleaned from the social and livelihoods impact analysis of tropical Storm Erika on the sector. These include:

- Dominica is faced with the major challenge of reducing the vulnerability of over 40% of its population to food insecurity;
- This can be achieved to a large extent through the development and implementation of a food and agriculture agenda that contributes to improving the living standards of all, especially the poor, in an economically, socially and environmentally sustainable manner.
- The country must therefore undergo a significant transformation in order to meet the related challenges of food security, natural disasters and other climate change related events.
- At the centre of the transformation process must be the desire to eradicate hunger, poverty and malnutrition by:
    - Stimulating sustainable economic expansion and diversification of the food and agriculture sector;
    - Increased production and productivity in the food and agriculture sector for increased growth, foreign exchange earnings/savings and employment;

[30] Average Farmer/Fisher Household Size is 3.13.

- Promoting sustainable management and utilization of natural resources; and
- Promoting rural development.

- Food security and disaster risk management can be addressed together by transforming agriculture and adopting practices that are "climate-smart".
- Farmers in Dominica are under the greatest threat from climate change, but they could also play a major role in addressing it. Climate-smart farming techniques would increase farm productivity and incomes, and make agriculture more resilient to climate change, while also contributing to mitigation.
- Effective climate-smart practices already exist and could be implemented in agricultural systems.
- Adopting an ecosystem approach, working at the landscape scale and ensuring inter-sectoral coordination and cooperation is crucial for effective responses to climate change induced natural disasters.
- Considerable investment is required in filling data and knowledge gaps and in research and development of technologies, methodologies, as well as the conservation and production of suitable varieties and breeds. This could be developed and implemented at the regional level.
- Institutional and financial support will be required to enable resource poor smallholders to make the transition to climate-smart agriculture.
- Strengthened institutional capacity will be needed to improve dissemination of climate-smart information and coordinate over the entire country and the large numbers of farmers.
- Greater consistency between agriculture, food security, disaster risk management and climate change policy-making must be achieved.
- Available financing, current and projected, are substantially insufficient to meet food security, disaster risk management and climate change challenges faced by the agriculture sector.
- Synergistically combining financing from public and private sources, as well as those earmarked by the international community for climate change and food security are innovative options to meet the investment requirements of the agricultural sector.

9. Recovery Interventions

The implications of the disaster for the livelihoods of the affected farmers/fishers, given the drastic losses of livelihood assets are significant. A strategic approach to recovery, rehabilitation and development has been taken by the Government of Dominica. As the first step in the recovery process, the Ministry of Agriculture has launched a programme with four main components:

- Humanitarian needs
- Immediate farmer/fisher needs
- Food sovereignty production
- Long term strategic plan in response to the Tropical Storm Erika

Component 1: Humanitarian Needs

Assistance is being provided through the following mechanisms:

- 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
- Tools and equipment to facilitate work at the community level

Component 2: Immediate Farmer/Fisher Needs

The programme focuses on assistance for the following:

- Farm access
- Supply of feed, minerals, vitamins, antibiotics and water for livestock
- Replacement hives
- Response to coping mechanisms which include:

- Purchase of livestock, crops or fish on hand for which marketing is problematic due to prevailing conditions
- Supply of wire and materials for fish pots and other fishing gear

Component 3: Food Sovereignty Production

The food sovereignty component is focused on rapid food crop production by small farmers targeting domestic needs. The programme is providing support through the following mechanisms:

- The supply of inputs (fertilizer, soil ameliorants, herbicides)
- Cash for work incentive for crop establishment
- Cash incentive for inclusion of disaster risk reduction practices on farm.

Component 4: Long Term Strategic Plan for Agriculture

A long term strategic plan in response to the Tropical Storm Erika was drafted based on a Dialogue on Agriculture held at the Atlantic View Resort and Spa on October 13th, 2015. The focus was on five pillars of development:

- Coffee and cocoa
- Bananas and plantain
- Root crops and vegetables
- Pork and poultry
- Bay oil development

B. Tourism

1. Background

Tourism and related services are the largest income earners in the economy of the Commonwealth of Dominica to date[31]. At an average of $275 million over the last three years, tourism revenues now account for an increasing percentage of annual GDP. Information from the Discover Dominica Authority (DDA) indicates that one out of every eight employed person in the country work in tourism and related activities[32]. Furthermore, men predominate as taxi and bus drivers (of 400+ members in the Taxi Association, less than 5 are women), tour guides, park wardens, security personnel and gardeners, and they also include chefs and bartenders. Women comprise the majority of craft and roadside vendors, and cooks, hospitality staff, waitresses, housekeepers, administrative staff, etc. in the hotel/guest house industry. Men and women play complementary roles in the sector. However, women tend to predominate in the lower-waged occupations[33]. Loss or decline of the sector would significantly impact on the economy, as witnessed by the sudden visitor arrival down turn after the passage of Tropical Storm Erika in August of 2015.

[31] Current account balances rose to 14.9 percent of GDP in 2015 and project to be wider in 2016 and 2017, incorporating the decline in tourism which was less than the sustained decline in exports of banana and other crops as projected decline in the agriculture sector.

[32] Based on the 2011 census total national employment is estimated at about 24,000. Of those employed, about 5% (1,200) are employed in hotels and restaurants. Between 400 and 600 employed in the other sub-sectors of the tourism industry (tour operators, dive shops, tour guides, etc.) is estimated at 1,800 jobs are directly dependent on tourism while some 1200 jobs are in travel and other related areas. Source 2011 Census and WTTC statistics

[33] Country Gender Assessment-Dominica. Caribbean Development Bank

The sector grew from approximately $252.82 million in visitor spend in 2010 to $343.46 million in 2014 ($310.228 million in 2015) as the result of a modest but targeted marketing campaign to highlight Dominica's pristine natural environment.

Tourism activities strongly contribute to the observed growth in GDP for the construction sector as well as for the primary sector (for example livestock, fish, fruits and vegetables). As a major contributor to the country's GDP, tourism activities provide significant revenues to the government through VAT and import duties.

Tourism's economic impact derives from the spending by visitors and the sector's value is the national economy can be measured in terms of:

- Contribution to national output (GDP) (14% of GDP in 2015)
- employment generation
- tax revenues to government
- income generation at community level
- foreign exchange earnings, helping to offset the Balance of Trade deficit
- Linkages with other sectors of the economy.

2. The Effects of Tropical Storm Erika

Tropical Storm Erika has severely affected the tourism sector, with estimated (preliminary) damage to the Tourism hospitality sector (damage to plant and property and loss of business) as being in excess of EC$ 45,899,104.34[34].

Assessments[35] put the overall damage to the Accommodation sub-sector at EC$33million with 50% of properties registering damage and 10% of which were uninsured. A full assessment of cancellations is not available. At the time of the assessment, 124 room nights had been cancelled.

The estimates for damage include $35 Million in insurance claims for two major hotels that remain closed, as well as an additional estimate of $40million in uninsured damage and loss.

The overall damage assessment figure for the Dive sector is EC$2.4 million with 91% of operators within that sector, reporting damage.

There are no values assigned to the assessments of non-infrastructural damage to the natural environment (forests, natural attractions, reefs and dive sites) on which the tourism product is premised.

The Discover Dominica Authority (DDA) projected a 5.6% decline in tourism activity in the aftermath of TS Erika, due to reduced access to the country and the damage to hotel infrastructure (estimated at $45.9million or 3.3% of GDP[36]. Signs of recovery are expected as early as 2016.[37]

Given the economic importance of tourism to Dominica, a revival of the tourism industry is vital. It not only provides employment and investment opportunities, but the industry's recovery can help stimulate trade, business and construction activities. In the aftermath of TS Erika, the provision of immediate

[34] Socio-Economic Impact Assessment of the Impact of Tropical Storm Erika – Min of Planning, Economic Development and Investment (2015)

[35] Socio-Economic Impact Assessment of the Impact of Tropical Storm Erika and the Rapid Damage and Impact

[36] 2014 nominal GDP, US$543 million.

[37] Letter of Intent – Appendix II Dominica Request for Disbursement from the Rapid Credit Facility of the International Monetary Fund – October 2015.

emergency relief, the restoration of basic services and the rebuilding of damaged infrastructure in destination communities were of paramount importance.

That said, it is not enough to respond to the immediate disaster. Given that much of the GDP contribution is generated in the peak travel months of October to April, cancellations and loss of future business represent a great risks to recovery. It is therefore imperative that such a fallout be mitigated against with appropriate promotions in the source markets and among the targeted visitors.

As the immediate needs of the affected communities are tended to, attention must be redirected toward longer-term preparedness strategies that aim to reduce vulnerability and increase capacities to cope and respond to future shocks.

The greatest challenges to the tourism sector in Dominica stem from the urgent need to reconstruct and re-establish damaged and destroyed room stock, recapture lost air access, while complementing reconstruction with marketing fund allocations to restore consumer confidence so that visitors honour plans to visit/return to the country.

The proposed Recovery and Reconstruction Strategy contained in the Rapid Damage and Impact Assessment addresses these key concerns[38].

3. The Pre Disaster Situation

Visitor arrivals in 2014 were at the highest levels since 2011, with approximately three quarter of arrivals coming by cruise ship and one-quarter by air. Over the last five years, cruise ship passenger arrivals have shrunk by approximately 45% -falling from to 517,979 in 2010, to 378,812 in 2014[39]. Cruise ship visitation is in the form of day visits, and 67% of passengers patronise tours to sites and attractions.
Tourism arrivals by air have grown inconsistently to 8% between 2010 and 2014. The figures do not show patterns of consistent growth and the anomalies warrant further published explanation,
Limited marketing funds have constrained further arrivals growth, with the DDA budget of XCD$4 million is considerably lower than competitors', the norm for Caribbean destinations is a budget representing between 2% and 3% of total visitor spending. On this basis, the DDA's budget would have to be doubled.

Dominica's source markets are the short-haul regional markets of (Martinique, Guadeloupe) and US, Canada, UK, France, Germany, the French West Indies is by far the largest market (53%), followed by US (20.3%) and UK (6.2%). The average length of stay is eight nights.

[38] *Annex A: Summary Table of Recovery and Reconstruction by Sector*

Sector	*Short Term (6-12 months)*	*Medium Term (12-24 months)*	*Long Term (24 months+)*
Tourism	- Ensure Douglas-Charles airport is fully operational - Ensure access to main touristic sites before the tourist seasons starts - Invest more in promoting tourism and Dominica to make up for potential losses	- Assess the location and zoning of hotel sites. The recommendation falls in line with the issues facing the housing sector overall. - Prepare a comprehensive plan for evacuation of hotels, tailored to the uniqueness of each property's location.	- Create the economic environment to increase the penetration of small and medium enterprise insurance - Develop a business continuity plan to ensure that service interruptions do not have long term effect on the economy

Source: Rapid Damage and Impact Assessment - Tropical Storm Erika

[39] Discover Dominica, ECCB http://www.eccb-centralbank.org/Statistics/index.asp#tourismdata

4. Vulnerability Assessment of the Tourism Sector in Dominica

A tourism sector is vulnerable to a multitude of external forces and influences that, usually temporarily, serve to reduce tourist flows and, hence, impact negatively on income, foreign exchange earnings, tourism-related duties and taxation, employment and so on. Collectively, these influences represent crises which the tourism sector experiences and to which they must respond. To address issues of vulnerability is thus a precursor to addressing resilience and responsivity if a Tourism sector is to remain viable.

Apart from the vulnerability of Dominica's Tourism sector to extreme weather events (Hazard exposure) such as TS Erika the following suggest other situations which compromise the impact of the sector on the local economy.

1. In general, performance of operators in tourism industry remains weak[40]. Insufficient resources and limited access to funding lead to low quality of service and facilitation provided. Lack of experience and limited professional skills are other weaknesses of current tourism industry.
2. Although there are 1,067 rooms registered as part of the product offering only 480 (45%) are reputed to be of market ready quality.[41] Such a situation fragments the destination and presents a marketing challenge
3. Infrastructure in some places are rudimentary and existing service modes are not attractive for visitors. "Limited places for visitors to meet and mingle". Additionally Infrastructure development remains limited (road network, directional signage, maps, GPS capabilities), access and connectivity between Dominica and neighbouring countries, thus reducing the array of the experience.
4. Poor reviews of the Destination product[42] offering
5. Unevenness between growth of tourism industry and that of the destination management framework, especially technical capacities in destination marketing and sustainable product development, could lead this sector to develop in a disorganized manner.
6. Inadequate maintenance of tourism sites.
7. In parallel to integration and cooperation, regional competition in tourism industry is also high and intensifying. Each country has used sort to upgrade their standards and services quality, while offering lower service charges to attract more tourists. Thus presenting additional challenges for Dominica's tourism sector.
8. Low level of awareness of the destination in source markets.

International political turmoil, international terrorism, pandemic outbreaks, and prolonged and unresolved economic crises in many countries could be an obstacle for development of Dominica tourism in the future.

5. Details of the Effects of TS Erika on the Tourism Sector

Dominica is an island facing several natural disaster risks – extreme climatic events of wind and rain and heretofore unexperienced volcanic eruption. Emergency preparedness and planning is therefore essential.

Based on information collected from accommodation and tour operators, it is estimated that TS Erika has produced damage of $35million in the south west region - which straddles the St David and St Patrick parishes (between Rosalie Point and Petite Savanne) - were the most affected by damage and losses overall

[40] Average occupancy levels are about 50%

[41] Commonwealth of Dominica Tourism Master Plan 2013

[42] BREA 2015 Economic Contribution Of Cruise Tourism To The Destination Economies reports extremely poor reviews of the Cruise Product

to the tourism sector (97% of total effects). The economic impact of these losses is mirrored by a significant social impact, including employment repercussions, especially for female employees who are also heads of households. The description of Damage and Losses for the Tourism Sector – by Location and Sub Sector. The details are presented in Annex 3.

Accommodation

Damage from the cyclone varied from minor repairs to major structural damage to buildings, facilities, and land caused by siltation, rock, mixed debris and water deluge. While most operators are functioning, two major operators were closed for longer periods to assess and repair damage, Jungle Bay a larger resort operator (*35 rooms - 4th largest hotel on the island 8% of market ready hotel room stock*) has not reopened. Because of this, 65 people were displaced.

Tour operators were also significantly damaged, with initial reports from the Ministry of Tourism indicating that reported damage was values at XCD$978,000.00[43]

Dive Sector

There are eleven (11) dive businesses registered, nine (9) of which been affected by TS Erika, of which seven (7) are operational.

Tour Operators

There are twenty-eight (28) tour operators registered, seven (7) are reported as affected. The damage reported was mainly to equipment and vehicles.

Community Based Tourism

World Creole Music Festivals

The WCMF was cancelled as a result of TS Erika has an estimated impact which is included in the cancellation of bookings and the reduction in overall expenditure. However the micro impact to the community because of loss of income to vendors must be emphasized.

Information from the Dominica Festivals Commission estimated vendor sales at venues at about XCD$750,000.00. In 2014, 19 vendors' permits were issued with the demography as presented in table 5.

Table 5. Demographic Characteristics of Vendors (WCMF) 2014 by type of Vendor

Vendor Type	**Parish**	**Male**	**Female**	**Business/ Organisation**
Food & Beverage	St George	4	7	3
	St Peter		1	
	St Mark		1	
Craft/Promotion	St George			1
Popcorn/Patties/Coconut	St George	1	1	
	Total	5	10	4

Initial anecdotal reports indicate that 15%of the accommodation and tour subsectors do not have adequate insurance cover to claim on the damage and losses caused by the cyclone. The delay in trade and repairs has both revenue and financial costs. Additional financial costs are incurred by the need for additional credit to carry out repairs that are not covered by insurance.

[43] Socio Economic Assessment of the Impact of Tropical Storm Erika - Ministry of Planning, Economic Development and Investment

C. Commerce

1. Overview

The country Poverty Assessment (CPA) reported unemployment at 13.9% in 2009, while among the poor, 74% were employed. Approximately 20% of poor males were unemployed compared to 33.8% of poor females. Both poor and non-poor women face higher levels of unemployment than men in Dominica.

Employment and occupational segregation

57.8% of males are employed compared to 42.2% of females. Of the total labour force, the unemployed comprise 2,164 or 63.6% males compared to 1,238 or 36.4% females (GOCD, 2014). Thus, higher numbers of males than females are categorized as 'employed' in the paid labour force, while male unemployment is higher than that of females. These figures mask the fact that women's reproductive work in the home and informal employment are not quantified as 'work' in the labour force statistics, as well as the fact that women are more likely than men to work for no or lower wages .

With regard to entrepreneurship, women predominate in the 'informal economy' as street and market vendors, 'hucksters' in the inter-island trade in agricultural produce and other commodities, and vendors at tourism sites. They are also taking advantage of small business skills training programmes (e.g., BNTF and DYBT). However, there is a continuing gender division of labour in the kinds of enterprises being undertaken by men and women (e.g., men are engaged in agriculture, and women in food and beverages).

Economic infrastructure and climate change/adaptation are both indicators and drivers of national and sustainable development. However, men dominate in infrastructure projects and given the absence of women in climate change policy development and implementation, gender-responsive approaches are recommended for equitable and sustainable development. This points to a need for specific training and internships on enterprise development and management, as well as tourism-specific courses

Based on a survey conducted by the CSO following TS Erika, 41.3% of respondents (Heads of Households) indicated they had not been employed for the last three months. Of these, 20.7% of respondents indicated unemployment as a result of TS Erika.

Of those who were involved in economic activities, through the collection of two sets of data following TS Erika, some information is available with regard to affected livelihoods. One data set was collected on MSMEs functioning in the formal labour market and another on livelihoods in the informal sector.

The evacuation of those areas and the placement of the residents in shelters has caused significant trauma as livelihoods were lost, people separated and their sense of independence challenged as they found themselves having to be totally supported by the state.

Table 6 presents partial data for one community, Colihaut. The data captures only the livelihoods of women. The nature of the damage and the scope of livelihoods impacted there can be used to give insights into the magnitude and varied nature of job loss in the wider community of primarily affected persons. To re-start those businesses, a maximum amount of $2500 has been made available to entrepreneurs who suffered the loss of their livelihoods, many of which will take in excess of 1 year to be restored, and more than one year to return to the previous level of profitability.

Table 6[44]
Analysis of women with loss of livelihoods - Colihaut

Name of livelihood activity	Duration of impact of disaster on livelihood	Suggested viable livelihood options	Priority ranking of viable livelihood option	What assets are essential for viable livelihood option	What types of training are needed for viable livelihood option
Grocery Shop	Out of business since 27/8/15	Same		Refrigerators (2), stock, air condition	Management of income and book keeping
Bread bakery	Out of business since 27/8/15	Same		Entire building, machinery(mixer), tables, stock, baskets	
Grocery shop	Has reopened with limitations	Same		Deep fridge and stock	
Production of cocoa sticks	Out of business since 27/8/15	Same		Cocoa mill	
Crocheting	Out of business since 27/8/15	Same		Crochet thread	
Unisex Hair Salon	Out of business since 27/8/15	Same		Ovens, products, curling irons, all was lost	Management
Shop	Out of business since 27/8/15	Not sure she wants to reopen			
Outdoor restaurant	Has reopened with limitations	Same		Freezers, chillers, coolers, stove, pots, deep fryer, baskets, cutleries, blender	
Cocoa stick and Castor Oil Production	Out of business since 27/8/15	Same		Pots, cocoa mil, cocoa beans	
Trade man/handyman	Out of business since 27/8/15	Same		Concrete mixer, generator, swiper, chainsaw, shovel, pix axe, wheel barrows, buckets, electrical tools(entire storeroom was washed away)	

2. Formal Market Sector

Workers in the formal labour market usually suffer less harm than those in the informal sector following a disaster. The reason being that formal labourers are usually salaried workers. However Own Account workers and those in their employ may suffer some effects depending on the level of insurance and the extent of the damage received as a result of the event.

Reports received by the Ministry of Finance noted that the Micro, Small and Medium Sized Enterprises (MSMEs) functioning in the formal sector, had limited or no insurance coverage, some suffered temporary or permanent closure of business due to damage to structures , flooding of premises and loss of stock and equipment. Others suffered total loss of income and livelihood.

[44] Source: Ministry of Social Services

Significant damage was done to the small manufacturing sector. Five of the 71 manufacturers contacted by the Ministry reported damage. Table 7 presents damage suffered by larger manufacturing establishments.

Table7

Damage to larger Manufacturing establishments and Outlook

Manufacturers	Remarks	Present Status
Dominica Coconut Products (DCP) Colgate Palmolive	Usually contributes 50% of exports of mfd. Goods. Suffered damage of EC$26 million	Not operational until mid-2016
Dominica Essential Oils and Spices Coop Ltd	Export value lost for 2015 =EC$150,000	Not operational until mid-2016
Shillingford Estates Ltd	Damage of EC#5 million	Not operational until late 2016
P.H. Williams & Co. Ltd.	Export value lost for 2015 =EC$400,000	Colihaut plant will not be operational for at least 2 years
Belfast Estate		Damage to warehouse estimated at EC$800,000.00

Source: Estimates based on Oficial GCOD data

The above description of damage to the Manufacturing Sector indicates the loss of livelihoods. Reports indicate that approximately 673 of individuals have been laid off, at least on a temporary basis, likely to last a number of months. The effect of these layoffs is felt by the entire family of the affected workers, bringing the total number affected as a result of disruption to this sector alone to some 1,400 persons.

In addition, several small and medium-sized enterprises (SMEs) suffered losses. In summary, the loss of manufacturing capacity has placed supply constraints on demand, has curtailed some exports and has created the reason for a larger negative Balance of Trade contributed to from both sides of the account.

Some 196 small and medium-sized enterprises were affected. Government has been able to date to give assistance to 170 of the 196 affected establishments. Flooded shops resulted in the loss of stock and a reduction in the quantum of food available for purchase. The need to restore livelihoods is a top priority. Some EC$ 8.2 million is estimated to be spent on the re-establishment of MSMEs. Small enterprises whose values were EC$ 15,000 or less were supported to the extent of EC$ 2,500 for the re-purchase of equipment without the burden of taxation. Whereas the EC$8.2 million, may refer to physical damage, at least an equal amount mat be estimated for loss of income and livelihood from September to December 2015 to small farmers and other households in the affected areas

A number of the small and medium-sized enterprises are traders involved in the wholesale or retail trade. They earn a little value added by packaging their produce, mostly in a rudimentary manner, for sale or for transport to a neighbouring country in exchange for money with which they purchase goods to return with and sell in Dominica. An estimate of their loss per month following TS Erika is of the order of EC$8000 to year end 2015 for each small farmer of informal sector worker. The hucksters have been known to have built their homes from the proceeds of their trade.

Data on 140 small business that were affected as a result of TS Erika suggests that the largest proportion of business , 27% were engaged in Retail Trade, followed by Agriculture 22%- if we include , Horticulture,

farming and fishing. The Services Sector accounted for 22%, and Agro Processing 9%. The lowest areas of economic activity were found in Tourism and Entertainment.

Four Cabinet appointed committees are working together to address a strategy and process for reconstruction in the areas of Tourism, Agriculture, Trade, Commerce and Kalinago Affairs.
Assessments made by those committees revealed:

- A loss of income/livelihood in Petit Savanne, Dubique and Coulibistrie
- The closure of businesses damaged structurally, damaged by flooding and compromised by loss of stock and equipment. Some of these will not re-open.
- For the most part, no insurance for small businesses

Data received showed that in the nine disaster areas loss was sustained in agro-processing, Retail Trade, Services, Manufacturing and a number of services that were within the reach of the residents of those areas. These constituted the livelihoods of the people in those areas. The following table supplied to the team is reproduced here for its comprehensiveness in communicating the damage. The valuation of the damage is given in terms of replacement cost, pursuant to the objective of building back better and catering for increases in the price of building materials and plant. The assessment of that committee appears in table 8.

The Committee was careful not to introduce duplication and therefore excluded activities such as Fishing and Farming in Agriculture.

Data from the Customs and Excise Division reveal a significant drop in exports. The August and September export figures were EC$5, 192.25 and EC$10,218.22 respectively, in contrast to EC$64,052.00 in July. This performance speaks to the loss of crops that has led to the loss of livelihoods.

Exports of manufactured products to a value of EC$14.4 million were recorded for the period January to September, with the September figure being $EC1.0 million

Table 8
Estimate of Damage and Loss by Sector

Sector	*Special Disaster Area*	*Replacement Cost*
Agro-processing	Coulibistrie	$222,330.00
Retail	Coulibistrie	$23,168.00
Services	Coulibistrie	$704,700.00
Manufacturing	Coulibistrie	$377,160.00
Trucking	Coulibistrie	$75,000.00
Services	Colihaut	$154,000.00
Retail	Colihaut	9$77,300.00
Retail/Services	Dublanc	$119,200.00
Retail	Bioche	$7,100.00
Retail	Bath Estate (P/Valley)	$17,000.00
Manufacturing	Bath Estate (P/Valley)	$18,000.00
Tourism	Copthall	$20,000.00
Mfg/Services	Savanne Park	$234,000.00
Services	Canefield	$8,000.00
Services	Jimmit	$9,500.00
Retail	Mahaut	$12,000.00
Retail	Marigot	$12,000.00
Services/Retail	Petite Savanne	$403,500.00
Manufacturing	Petite Savanne	$90,000.00
Agro-processing	Bagatelle	$12,875.00
Manufacturing	Roseau	$65,000.00
Agro-processing	Layou Valley	$11,920.00
Agro-processing	Cockrane	$32,500.00
Agro-processing	Riviere Cyrique	$1,100.00
	GRAND TOTAL	**Ec$3,025,763.00**

Source: Data provided to Mission

3. Informal Market Sector

Contrary to the notions that the informal employment would disappear with economic development, the ILO suggests that informal employment remains important, persistent and, in some regions of the world, is even rising[45]

Informal employment, includes (1) own-account workers and employers employed in their own informal sector enterprises; (2) family workers; (3) employees in informal jobs, whether employed in formal sector enterprises, informal sector enterprises, or households; (4) members of informal producers' cooperatives; and (5) own-account workers engaged in production of goods exclusively for own final use.

Yet the paucity of labour market data in developing countries makes quantifying its extent difficult, The ILO estimates that during the 1990s, informal work in the non-agricultural sector constituted 43% of employment in North Africa, 75% in sub-Saharan Africa, 57% in Latin America and 63% in Asia (Beneria, 2001).[46]

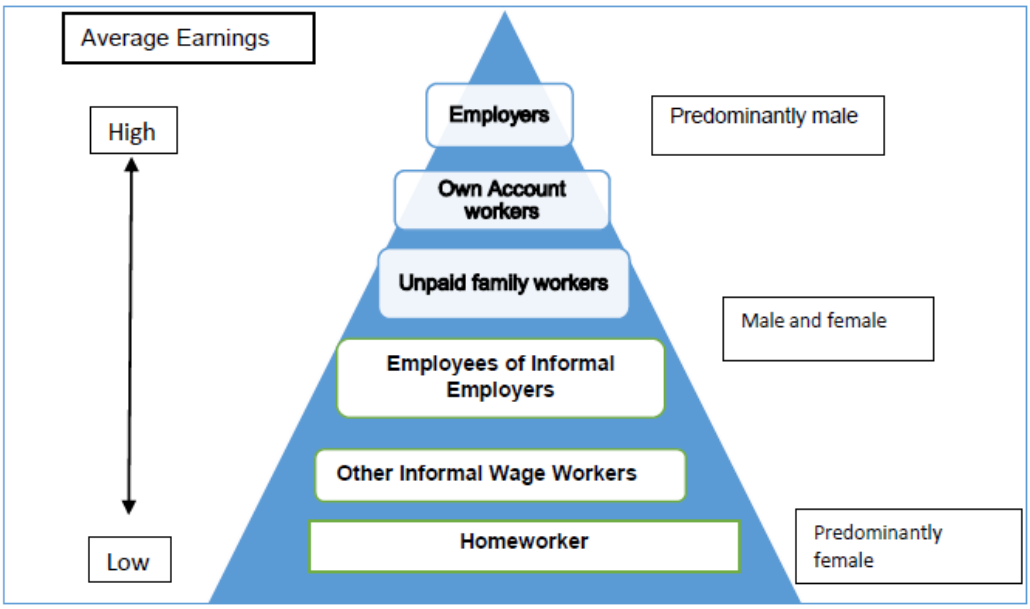
What is known about the wage structure in the informal sector, as illustrated by figure 9, is that even within the informal sector the gender segmentation leaves women at the lowest levels on the scale of economic earnings.

The struggle for achieving sustainable livelihoods is to upgrade the capacity of workers, women and men to that of the level of own account workers so as to increase their income earning capacity.

[45] The Role of Employment and Labour Markets ion the fight against poverty. Christoph Ernst and Janine Berg, ILO. 2009. http://www.oecd.org/dac/povertyreduction/43280231.pdf

[46] ibid

Figure: 9. Average earnings and gender segmentation across informal employment categories.



Source: The Role of Employment and Labour Markets in the fight against poverty. Christoph Ernst and Janine Berg, ILO. 2009. http://www.oecd.org/dac/povertyreduction/43280231.pdf

Data on the informal sector was scare as is the case in most countries in the Caribbean. The CSO was involved in the conduct of an informal sector survey which had to be halted due to budgetary constraints. However, some early preliminary data collected suggested that there were a wide range of informal economic activities being undertaken in the affected communities prior to Tropical Storm Erika. As was expected, many of the activities were home based or formed part of what is called in the disaster literature the 'backyard economy'. Table 9 details the activities by Affected Communities.

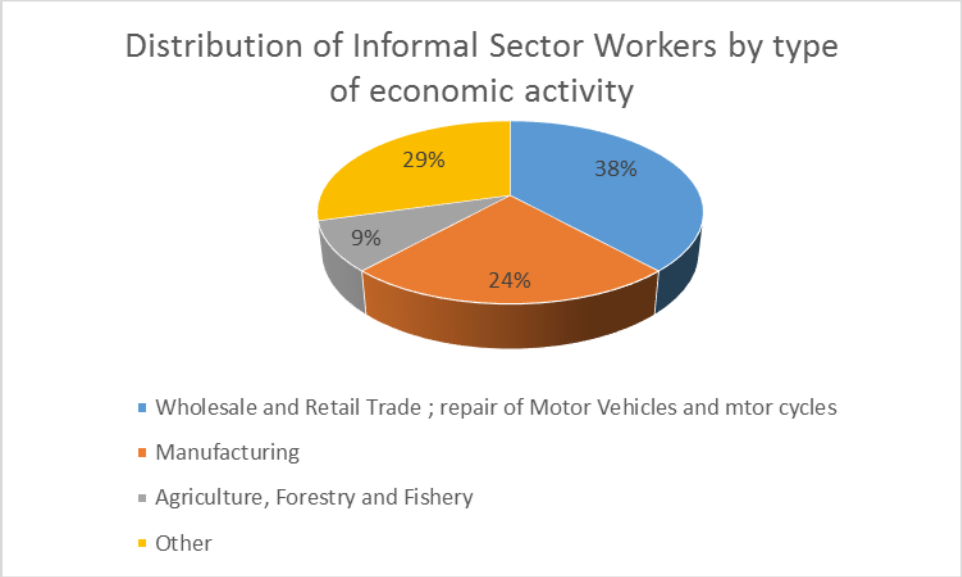
Table 9 . Pre Erika data on the distribution of Informal sector workers by Industry Classification from the Affected Districts

Activities	Wholesale and Retail Trade; Repair of Motor vehicles and Motor cycles	Manufacturing	Agriculture , Forestry and Fishery	Other	Total
Affected Communities					
Petit Savanne	2	2	0	0	4
Fond St. Jean	11	0	3	0	14
San Sauveur	2	0		1	3
Good Hope	10	0	40	1	51
Campbell	5	0	0	1	6
Petite Soufriere		2		1	3
Grand Fond				1	1
Dubique				1	1
Totals	30	4	43	6	83

Source : CSO Preliminary data from the Informal Sector Survey

Preliminary data collected in the post TSE period, suggested that some 40% of those existing informal economic activities had been disrupted, and that women were engaged in approximately 55% of those activities.[47] The distribution of economic activities is illustrated in figure 10.

Figure 10. Post Erika Distribution of informal sector workers by type of economic activity in the Affected Communities[48]



Source: Estimates based on Official GCOD data

[47] As self reported to the Ministry of Social Services
[48] Based on self reported data

Women predominated in the wholesale and retail trade sub-sector but there were a few in the manufacturing subsector producing agro industrial products such as cooca sticks and castor oil. Others could be found manufacturing clothing. The services sector which is captured in the 'Other' category found a number of women involved in provision of services for the tourism industry. Men predominated in the repair of motor vehicles and motor cycles and the manufacturing of agro industrial products particularly with regard to the Bay Oil (essential oils) industry.

What should be noted is that in addition to engaging in these informal economic activities, almost all affected households reported being engaged in some degree of agricultural activity.

D. Social Sector

1. Housing

The description of the negative impact on the economy of Dominica has been captured in the assessment of damage and losses in September 2015.

Table 1, contained in Annex 3 and referred to by figure 1, indicates that damage and losses to the Social Sector were of the order of 14 percent of the total damage and losses assessed. Most of the damage and loss (some 95 percent of the Social Sector total) was attributed to the Housing Sector.

The activities outlined for the Housing Sector are in accord with the policy of making safe and decent housing cheaper and more attainable particularly for low-income earners in the society.

The "Housing Revolution", begun in 2006, addresses the housing needs of the citizens and the improvement in their quality of life. The programme[49] involves:

- *Renovation of homes of targeted individuals who are unable to make good the repairs.*
- *Demolition of dilapidated houses and replacement with new structures.*
- *Improvement to sanitary conditions at existing homes.*
- *Regularization of squatters. More than 1000 families have benefitted from this component.*
- *The establishment of new housing estates with the construction of houses and installation of the requisite infrastructure in communities throughout the island including;*
    - *Hillsborough Gardens – 30 houses*
    - *Bellevue Chopin – 11 houses*
    - *Bellevue Rawle – 5 houses*
    - *Petro casa; 4 communities –40 houses (apparently updated to 50 houses)*
    - *Portsmouth (Chance) – 16 houses*
    - *Carib Territory (Venezuelan funded) – 44 houses*
    - *Carib Territory (Chinese funded) – 27 houses*
- *The construction of 60 apartment units (currently ongoing) at Elmshall and Bath Estate, and a six unit apartment at Silverlake.*

In addition to the above, government has also made funds available at the Government Housing Loans Board (GHLB) for lending to public officers and at the AID Bank for lending to the general public, both at very concessionary rates of interest.

Despite these initiatives, the demand for housing continues to be high. In 2009/10, 30 housing units at Hillsborough Gardens attracted applications from over 600 individuals. For the 60 units at Bath Estate and Elmshall, in excess of 400 applications have already been received. If we can use this to gauge demand, it tells us that the unmet need is high.

The existing housing stock on the island is estimated to be 25,000. Of this, some 20 percent is in need of replacement. Another 25 percent would need significant repairs and there is overcrowding in about 10 percent of the accommodation units. Government's plans to increase the housing stock on the island by 1,500 units by 2020 may be affected by the effects of TSE.

[49] The description of the programme, presented in italics above is taken with minor amendments from the document entitled "Expanded "Housing Revolution" Programme, provided by the Ministry of Housing.

To make inroads into the unmet demand for housing, the Government of Dominica has identified an expanded programme that will be accomplished on a phased basis over the five year time horizon. The time phasing is presented in box 10.

Box 10.

Time phasing of the Extended Programme of house construction

YEAR 1
• Seven apartment buildings, (60 units), at Elmshall and Bath Estate. • 10 units at San Sauveur with funds from the People's Republic of China. • 15 units on the West coast to relocate victims of Tropical Storm Ophelia. • 10 units at Castle Bruce. • 2 apartment buildings (12) units at Silverlake. • Replacement of 150 houses in selected communities island-wide. • 43 new houses island wide on lots owned by individuals/ individuals assisted with credit to build.
YEAR 2
• Rehabilitation of Pound, next to Financial Centre - 3 apartment buildings (18 units) • 6 Duplex houses (12 units) to house individuals who previously occupied houses at the Roseau River bank along the Goodwill Link Road and squatters who currently occupy houses on the Roseau River bank near the Bath Estate bridge • Apartments /duplexes at Cotton Hill for the relocation of the Lagoon residents (40 units). • 15 - 2 bedroom units at Dubique • Replacement of 160 houses in selected communities around the island • 50 new houses island wide on lots owned by individuals/ individuals assisted with credit to build • 1 apartment building at Silverlake (6 units)
YEAR 3
• Replacement of housing at *'Fomiko'* - Virgin Lane. 3 apartment buildings (18 units) • Replacement of 200 houses in selected communities around the island • 82 new houses island wide on lots owned by individuals / individuals assisted with credit to build.
YEAR 4
• Replacement of housing units in Roseau - 3 apartments (18 units). • Replacement of 200 houses in selected communities around the island. • 82 new houses island wide on lots owned by individuals/ individuals assisted with credit to build.
YEAR 5
• Replacement of housing units in Roseau- 3 apartment (18 units) • Replacement of 200 houses in selected communities around the island • 82 new houses island wide on lots owned by individuals/ individuals assisted with credit to build.

Source: Data provided by Ministry of Housing

The expanded plan has implications for the construction industry as the demand for construction workers is expected to increase. Some element of prior training of construction workers is therefore necessary to input into the expected surge in construction.

The effect of the expanded plan will be to create livelihoods in the construction sector for numerous young people, male and female, who have been displaced, beginning 2016. This calls for training in a variety of skills such as electrician, plumber, welder and the gamut of skills related to house construction and maintenance. This will help to confront the poverty configuration of the population.

The extent of damage to Housing in the affected areas caused official attention as a matter of priority to bring a measure of relief to the people who suffered loss or substantial damage to their houses. The estimate

of total damage and losses was put at $EC 122,125,725[50]. Cabinet resolved to take a number of decisions that in its view were the best at the time. The decision to mandatorily evacuate persons from the disaster areas was made at a time of emergency and did not admit of dialogue with the residents to be affected by the mandatory evacuation. This decision was made on the basis of the areas being on unstable land or surrounded by precarious slopes. At the same time, the gift of 50 houses from the Government of Venezuela is an opportunity to resettle a community in a less vulnerable area with improved planning that is poised to organize economic activity and education with empowerment of the residents to acquire skills and choose a livelihood that would be complementary instead of in competition with similar livelihood choices already made by other residents.

Table 10 presents the most current information on the extent of damage to the housing sector. It suggests that now that fuller access to previously inaccessible sites, the situation is even more grave than earlier information had suggested. Also informative is the fact that most of the persons affected reported that their houses and possessions were not insured.

Table 10. Affected Houses by Parish

Parish	Houses Fully Destroyed	Houses Partially Destroyed	Houses at risk	Total Houses Affected
St. John	5	50	10	**65**
St. Peter	30	50	15	**95**
St. Andrew	5	50	10	**65**
St. Joseph	50	100	60	**210**
St. Paul	10	70	10	**90**
St. David	15	45	10	**70**
St. George	15	75	40	**130**
St. Patrick	250	100	250	**600**
St. Luke	10	50	10	**70**
St. Mark	10	50	10	**70**
Totals	400	640	425	**1465**

Source: Estimates based on Official GCOD data.

Government has outlined a number of priority programmes that involve the following activities as outlined in table 11.

[50] Rapid Damage and Impact Assessment - Tropical Storm Erika – August 27, 2015

Table 11

Priority Programmes Ministry of Housing

Measure 1	Continue to source concessionary and innovative terms and means to adequately assist build their homes public and private sector workers
Measure 2	Begin the construction of 1,500 affordable house from late 2014;
Measure 3	Assist retired persons with finance to maintain their homes
Measure 4	Complete the process of refurbishing or rebuilding all dilapidated houses;
Measure 5	To improve the sanitary standards and conditions of needy families especially in the rural districts for better health, wellness and desired environmental state. To include replacing of all pit latrines by 2020
Measure 6	Focus on the acquisition of building and construction skills at the new Polytechnic

Source: Ministry of Housing

The achievement rate on the above programmes is highly dependent on the availability of financing – either from the Government Budget or from extra budgetary sources.

Overall objective of the housing strategy

Within the context of resettling people and (re)building communities in safe and sustainable environments, enabling people to resume their normal lives with better opportunities for individual, family and community development, the Government acted. The evacuated persons were accommodated in 13 shelters. The initial count of persons in shelters for the first two or three days was approximately 800. This number has progressively declined to some 302 after 5 months, with the prospect of this number continuing to be in shelters until June 2016. Many of the shelters still accommodating the displaced persons are located in Grand Bay and Roseau.

The numbers in shelters, even immediately after the event, do not adequately speak to the total number of primarily affected people as some sought accommodation elsewhere and some chose to remain in the devastated areas. An insight into the alternative accommodation leads to an image of the secondarily affected population. Table 12 presents an age and sex profile of the shelter occupants a number of days after the opening of the shelters.

Table 12
SHELTER OCCUPANTS BY AGE GROUP WITHIN SEX

AGE GROUP	Sex		
	Male	Female	**Total**
1-14	69	74	143
15-24	53	43	96
25-34	48	37	85
35-99	124	109	233
Total	294	263	557

Source: Estimates based on Official GCOD data

The table above shows the number of persons between the ages of 15 and 34 whose livelihoods have been interrupted and who are in shelters. The figure is greater as the count has not been exhaustive, given the method of collection of the data. Some are fishermen whose boats have been lost, who are now located far from their former places of work and, even if they returned to their work in the area where they formerly lived, do not have a market there for their catch. The figures of shelter (table 13) occupants show energy that cannot now find an expression in employment. These people are at risk to turning to unacceptable means of earning an income.

Table 13
ACCOMMODATION OF EVACUEES BY AGE GROUP AND SEX

	Age group	Home	Shelter	Roseau	Out of State	Elsewhere locally	Roaming homeless	Not stated	Total
Male	1-14	3	38	0	0	18	0	3	**62**
	15-24	4	19	1	0	23	0	1	**48**
	25-34	1	12	3	0	31	0	0	**47**
	35-99	6	37	2	2	61	1	1	**110**
Total Male		**14**	**106**	**6**	**2**	**133**	**1**	**5**	**267**
Female	1-14	5	35	3	2	24		0	**69**
	15-24	3	11	3	0	22		0	**39**
	25-34	2	21	2	2	8		0	**35**
	35-99	9	35	4	4	44		1	**97**
Total Female		**19**	**102**	**12**	**8**	**98**		**1**	**240**
TOTAL		**33**	**208**	**18**	**10**	**231**	**1**	**6**	**507**

Source: Ministry of Social Services

Whereas the numbers in the above tables may vary with estimates that may have been made within 2 days of the evacuation, they give an indication of the magnitude of the numbers, the age groupings, sex breakdown and the decisions of the persons who sought shelter to go elsewhere.

The accommodation in the shelters, mainly in the schools and Community Centres, was open in nature – a factor that might have triggered conflicts between some of the residents. Government has been providing food materials for the displaced and has been providing them with modest amounts of financial support. Government has in addition given income support to small farmers up to an amount of $2500. A number of the farmers had crops on their lands but could not bring them to market as most of the access roads were impassable. The financial implication of this support to date has not been ascertained.

It would be difficult for Government to continue to provide this level of support. Observations made by some of those in shelters speak of a supply of foodstuff that is not as forthcoming as in previous weeks. This may indicate difficulties in procurement stemming from one or more reasons including the dwindling of funds to procure foodstuffs to continue the supply to the people accommodated in shelters.

From the above table 13, those who stayed elsewhere in Dominica have impacted the estimate of those who fall into the category of tertiary affected, as the accommodation of friends or family members has caused some discomfort to the households that accommodate them. The analysis of the affected population has been discussed elsewhere in this report.

2. Education

Dominica's education targets are set in conformance with the Millennium Development Goals (MDGs). Dominica has already achieved universal primary and secondary education as well as universal access to early childhood education in 2012. At the tertiary level, gender differentials persist in favour of females, who account for two thirds of the student enrolment (MDG, 2010). Dominica's Growth and Social Protection Strategy (GSPS) papers for 2012-2014 and 2014-2018 include the role of the education sector in combating poverty. One action is to increase the provision of Technical and Vocational Education and Training (TVET) in schools, with a focus on Caribbean Vocational Qualifications (CVQs) from 2016 onwards to build skills required by employers as well as to help address issues of male underachievement.

Non-formal education programmes offered by the adult education division are developing life skills, including literacy and numeracy training, for adults wishing to continue their education and extend their employment options. The social transformation and empowerment project (step) seeks to enhance and sustain the living standards of the under privileged in Dominica as indicated by the country poverty assessment (cpa, 2008/2009). This project will be implemented through the ministry of social services, community development and gender affairs

The Ministry of Education responded to the event by re-ordering its planned activities to bring an effective response to the event. The re-opening of schools was staggered in accordance with the rapidity with which the schools could be made ready for operation. The supply of water factored into the date of reopening. Thirteen of the seventy-five schools on the island were damaged but by 28 September all schools had been re-opened. In the affected areas, many of the damaged schools were located close to

rivers and suffered flooding. Government is considering the relocation of at least three schools located near to rivers that flooded significantly. These were Primary Schools located in Coulibistrie, Colihaut and Pichelin. Children from the affected areas were bussed to schools in areas that were operating and that could accommodate them albeit on a shift system. The urgent work of the Ministry of Education resulted in no disruption in the attendance pattern of the children as absenteeism did not present itself. Some two weeks of school were lost but the Ministry has made moves to recover that lost time by adjusting its calendar through the addition of 1 week of school beyond the planned end of term in July 2016. In addition it has foregone special time that was to be devoted to Professional Development. The Return to Happiness Programme has contributed to the resilience of the Ministry to the event. Much work was done in the area of psycho-social counselling to both children and teachers. Excellent networking saw teams of counsellors coming in from St. Lucia and Trinidad to assist in the effort. Instances in which more counselling should be given to affected children and teachers have been noted and remedial work is being planned. In view of the exposure of schools to the hurricane season at the time of opening of the term, attention is being given to the proposal for changing the vacation period to address this seasonal characteristic.

Some funds in the Budget of the Ministry have had to be diverted in favour of carrying out unforeseen remedial work of the nature described above.
Table 10 below presents the social protection methods as articulated by the Government of Dominica. These methods were the following:

- Maintain Government pro-poor education assistance programs
- Increase provision of vocational technical education in primary and secondary schools.
- Maintain funding of projects dealing with troubled children and dropouts.

The methods listed above are adequate in broad terms to confront the present needs for education in schools.

3. Health

The estimate of damage to the Health Sector made in September 2015, put the damage and losses to the Health Sector at EC$ 5,229,682, as presented in table 14.

Government delivers health care services through 50 primary health care facilities and one secondary health care facility which is the Princess Margaret Hospital in Roseau. Public health services such as water quality monitoring and the monitoring of solid and liquid waste in the community are also delivered through the Type 3 facilities which serve as the administrative centres for the seven health districts. These facilities serve the entire population through the provision of access to basic health care services such as immunization, pre-natal and childcare as well as management of non-communicable diseases. Public health services such as water quality monitoring and the monitoring of solid and liquid waste in the community are also delivered. The Ministry of Health set up its Emergency Operations Centre – the Health EOC, to organize, coordinate and inform policy makers and the general public on its response to the event.

Nine of the primary health care facilities suffered flood damage and as a result were not operational for at least two days. Two of the facilities that were flooded also suffered relatively minor damage to structure and to fencing. Equipment loss was restricted to weighing equipment, step down transformers and other small monitoring equipment. Several of the facilities were not accessible from the outside by roads. All forms of telephone and cellular contact were disrupted for some time, preventing the transmission of

information on the status of the facilities to the Emergency Operations Centre. Several patients were airlifted to the Princess Margaret Hospital since access was not possible by road.

Table 14
Summary of Damages and Losses, Health Sector Damages EC$

COMPONENTS OF DAMAGE AND LOSS	EC DOLLARS
Facilities fully destroyed	*$5,239,000*
Facilities partially destroyed	*$625,000*
Equipment, furniture, medications destroyed	*$1,102,900*
Total Damages	**$1,727,900**
Treatment of injured	*$2,154,556*
Vector control, surveillance, information campaigns	*$260,187*
Demolition and rubble removal	*$24,500*
Other losses	*$1,06,539*
Total Losses	**3,501,782**
Total Damages and Losses	**$5,229,682**

Source: Estimates on official GCOD data

The Ministry moved to repair the damaged Health Centres to perform the intensified role that they should play and mobilized vehicles to travel to areas in need of ministerial intervention. In areas where the water supply was compromised, the harvesting of rain water was advocated and demonstrated to the affected population. The experience of damage to the health centres such as those at Roseau and Fond Cole has revealed their vulnerability and signalled the need to address it.

A vulnerability profile of the Health Sector reveals the following:

- **Financial Vulnerability in Health Ministry**

The high cost of health financing at both the individual and State levels may be cited as a source of vulnerability. In that regard, the identification of options for health financing is of great importance. Government is requesting the assistance of the Pan American Health Organization (PAHO) to identify options that could work for Dominica. Government's immunization program was intensified in the aftermath of the event to control the expected increase in water and dust borne diseases and to prevent rat-borne diseases that derive from the failure to dispose of garbage.

- **Health Environmental Vulnerability**

The actions in Health are determined by the environmental activity that includes the physical as well as the social environment, hence the attention to reducing the effect of behaviours of people that give rise to the HIV/AIDS challenge as well as other communicable and non-communicable diseases. The Budget of the Central Government and any extra-budgetary source in the form of a project funded by an external agency fuel the activities in Health. The increase in insect vector control and spraying/fogging activities has been financed by a reallocation of Budget funds in view of the urgency of meeting the challenges. Government activity continues to reduce vulnerability of this type by encouraging improved life styles while reducing non-communicable diseases. The challenge remains to reduce poverty through health services backed by education as other sectoral and social protection strategies are put in place.

The Ministry of Health has signalled a number of actions to be undertaken with a view to reducing vulnerability in the Health sector. These are presented below in box number 11.

Box 11. Actions to reduce vulnerability

A hydrological survey should be carried out on the water courses that are close to our health facilities. This will guide the mitigation measures that will be required for facilities including Coulibistrie, Pichelin, Massacre, Dublanc, etc.
Facilities such as Mahaut and Newtown should be relocated
Water of all facilities should be increased and improved as a matter of urgency
Also important to the Vulnerability Reduction Strategy, accessibility immediately after the event and the focus on Build Back Better, many of the facilities should be equipped with standby generators
58 increased storage capacity (some climate controlled –Refrigeration Units) in order to increase the quantity of supplies there

The Ministry of Health has observed the need to intensify its efforts to keep in check the outbreak or high incidence of water-borne diseases such as gastroenteritis and vector-borne diseases such as dengue and leptospirosis. The Ministry's programme of solid and liquid waste disposal requires more attention. The elimination of pit latrines would be of great help in this endeavour. While many of these prevention efforts are planned at central level, implementation at the local level through the primary health care system is critical to success.

The Health Ministry has stressed the point that the reduction of vulnerability in the Sector is dependent on the collaboration of other Ministries such as the Ministry of Works, the Ministry of Housing and the actions of home owners to reduce risk to their houses through adhering to Building Codes and/or retrofitting their houses for greater resilience to natural events, especially wind and water events. Its submission is presented in a comprehensive report.

The link between poverty and health is well recognized. The Ministry of Health advocates that high quality primary health care services remain accessible and affordable for all Dominicans. The reconstruction of all facilities that have been damaged or lost in locations that make the facilities readily accessible is advocated. This will include health facilities for the residents of Petite Savanne who have been evacuated from their village and will be resettled in a new site.

4. Social Protection

In the face of a disaster, relatively wealthier households, will rely on savings to assist and market insurance can provide them with efficient protection for larger losses. However, for the poorest households, savings are often not an option and the high costs make private insurance outside of their reach. The poor often need the support of the state because, besides suffering from larger immediate shocks than the wealthier, poor people also tend to be more alone in the struggle to cope and recover. The World Bank (WB)[51] argues that the ability to manage risk depends on the "support systems" available to poor households.

The WB suggests therefore that for the poorest households—and to cover the largest shocks—well-targeted and easily scalable social safety nets are needed.

[51] Shock Waves. Managing the impacts of climate change on poverty. World Bank Group 2016

Poverty continues to pose a serious threat to economic development in Dominica despite the gains achieved in the last decade as exemplified in the progress made in the achievement of the MDGs (see Box12).

Box 12: Status on the Achievements of the MDGs

GOAL	STATUS
Eradicate extreme poverty	More than 50% drop between 2003 to 2009
Achieve universal primary education	Achieved
Promote gender equality and empower women	Little gender disparity at early childhood, primary and secondary educational levels
Reduce child mortality	On track but still prevalence of underweight under 5 year olds
Improve maternal health	Decrease from105.9 to 2.2 deaths per 1,000
Combat HIV/AIDS	0.75% prevalence rate
Ensure environmental sustainability	96% water coverage and 84% households with access to sanitary facilities
Develop global partnership for development	Progress through membership in regional and bilateral groupings

Source: Various sources

The latest poverty assessment indicate that more than half of the children and youth live in poor households. Many of these live in women headed households which represent over 39% of total households. Among the displaced in the most disaster affected communities, women headed household represent approximately 45%.

a. Overview of the Social Programmes

The Government of the Commonwealth of Dominica (GOCD) has attempted to mitigate the economic downturn caused by the global economic crisis by administering several social protection programmes which target various strata of the population. Starting from as far back as 1940 and escalating in number following the 2003 Country Poverty Assessment, the multi-faceted portfolio of programmes is designed to provide support to the poor and vulnerable towards meeting critical needs thereby creating safety nets and buffers against economic shocks. The programmes are managed by different Ministries and there is no Central Beneficiary Registry, Gender Aware Beneficiary Analysis, or Costing and Budgeting Framework[52].

The gender dimension of poverty is evident in the percentage of poor people living in female-headed households compared to male-headed households. As part of the Government's GSPS (2008), a number of gender-friendly initiatives were implemented concurrently with the 2006 National Gender Policy which addressed the needs of women, children, senior citizens and other vulnerable groups in the society. These included: the Housing Revolution, which provided special arrangements for female heads of households who did not own a home; Transportation for school children, which eased the high cost of transport on parents with school-aged children; Exemption of hospital fees for persons under 18 years and over 60 years old; Increasing the Government scholarship subvention to students attending secondary schools; and the 'Yes We Care' Programme, designed to meet the needs of the elderly. In the first half of 2013, women

[52] Draft Post Tropical Storm Erika: Gender and Child Responsive Rapid Assessment re Damage, Losses and Sectoral Needs. Manuscript.

accounted for 53.8% of the total number of clients, with males accounting for 46.2% (Bureau of Gender Affairs, 2009).

A Community Empowerment Initiative with an allocation of 7Mn which was introduced in 2009 involved the execution of small community projects utilizing local authorities and community group to improve community infrastructure and living conditions using local labour. The targets include 20 persons employed per constituency (or 420 short-term jobs).

Public-funded finance institutions which support livelihoods are: AID Bank, Dominica Youth Business Trust (DYBT), National Development Foundation of Dominica (NDFD), Small Business Support Unit, and the Housing Loans Board.

Government's expenditure on the programmes has been leveraged by external grant resources. An overview of the major initiatives and levels of expenditure is shown at Table 15. (See Appendix 1 for detailed list of programmes and Appendix 2 for budget allocations to the relevant Ministries/Departments).

Table 15: Expenditure on the Major Social Programmes for Financial Year 2013/14 and 2015

PROGRAMME	EXPENDITURE (XCD)	
	2013/2014	Expenditure as at May 2015
Housing	5,536,715	
Public Assistance	6,148,853	
Public Support	2,616,624	3,765,721
Schools Transfer Grant	400,000	2,173,694
Grants to Primary School	1,204,388	
Grants to Secondary Schools	5,234,565	
Education Trust Fund	2,457,716	2,173,694
Child Welfare	700,755	
CHANCES	650,913	
School Feeding	139,578	
Yes We Care	966,267	

Source: Ministry of Finance

b. Response to TS Erika

Dominica has an integrated mechanism for disaster management, in keeping with its draft National Emergency Management Plan which is under the remit of the Dominica Emergency Management Organisation. The reaction of the GOCD to the natural disaster on August 27, 2015 was immediate and comprehensive. Emergency relief was provided to the most severely affected households to survive in the first stages post TSE. Physical access was the most defining factor in hindering rehabilitation, however, there was little or no disruption in governance.

The first measure was to relocate affected persons to shelters. Initially as many as 13 shelters were opened. Presently the shelter services and stipends are detailed in table 16.

Table 16: Interim Measures post TSE

Guest House	No residents	Cost
Springfield Guest House	53	27,595 for period of 3 mths
Mr. Clean's Bed and breakfast	20	17,250 monthly
Kent Anthony's Guest House	17	20,000 monthly
St. Aimie's Guest House	43	30,000
Roseau Youth Centre		
Mt. Carmel		
Total	**133**	

Source: Ministry of Planning

The other social protection measures post TSE are presented in Box 13 (with provisions for support to livelihoods highlighted).

Box 13. Post Tropical Storm Erika: Social protection Measures

Measures	Description
Rental assistance	A maximum of $1,000 per family who were moved into government identified guest houses with private homeowners who provided temporary accommodation also qualifying for period of 6 months. With an estimated 484 households displaced following complete loss of homes, significant structural damage and/or voluntary evacuation the total expenditure for temporary accommodation was given at $484,000
Assistance to shelters	Assistance to Our Lady of Mount Caramel Retirement Home affected by TSE including monthly payments to staff $7,700); food and general supplies ($4,000); insurance ($320); transportation ($1,500); utilities/taxes; maintenance ($900); and a lump sum of 5,000 for refurbishment of kitchen
Loss of personal items	Persons who experienced loss of personal items received financial contribution up to maximum of $5,000 per family for complete loss of household contents and $3,000 per family for partial loss. The estimated number of household eligible for financial assistance was 140 for partial loss giving a total of $420,000
Assistance to fishermen	$300,000 allocation to Ministry of Fisheries **which can impact on the livelihood of fisherfolk**
Replacement of capital stock	Payment of 60% of estimated value of stock damage, equipment up to a maximum of $2,500 which **can impact on the livelihood of self-employed/ business owners**
Home repairs	Maximum of $20,000 for significant structural damage to house. With approximately 119 houses eligible island wide the total estimated cost is $38 Mn. Maximum of $15,000 for home repairs for partial damage to house. With approximately 126 houses eligible island wide the total estimated cost was $1.89 Mn. For households earning income less than 10,000 qualify for 100% assistance; those with income between 10,000 – 20,000 qualify for 80%; and those with income 20,000 – 30,000 qualify for 60% **This can impact on home-based business particularly relevant to females.**
Displacement allowance	Stipend for a period of 6 mths is follows: 223 households (1-3 individuals) - 78,050/mth 114 households (4 – 6 individuals) – 86,400/mth 20 households (7 individuals and above) – 15,000/mth
Vehicle replacement	Waiver of import duties for vehicle owners for a period of 6 months commencing November 25, 2015 **which can impact upon business persons involved in the tourism and transport services industry**

To implement these measures, applications are subjected to review by the Chairperson of the Technical Committee for Social Services and approval by the Chairperson of the Cabinet Sub-committee for Social Services. The actual processing was overseen by the Permanent Secretary, Ministry of Social Services Family and Gender Affairs or by the Permanent Secretary, Ministry of Justice Immigration and National Security. The individual ministries have been directed to redirect significant development resources towards compensation, short-term relief, rehabilitation of infrastructure, and stimulation of economic activity.

The Country Gender Assessment research indicates that employers (including the Government and private sector) do not provide childcare facilities, although some workplaces allow parents (often single mothers) to bring their children to the workplace after school. Further, persons, predominantly women, engaged in unpaid domestic and agricultural work, are ineligible for work-related or retirement benefits.

c. Assessment of Social Protection Programmes

The estimate of persons directly and indirectly impacted by TSE is approximately 15,900 persons. The extent to which these compensation measures address the full or partial impact of the disaster on the population and create a buffer from the worst effects of the disaster or to buffer from the likely long term impact is difficult to ascertain. It is more than likely that the measures have temporarily halted the transition of several families from transient poverty descending into indigence, however most remain vulnerable. The GOCD responded to the most pressing immediate needs: rebuilding access, the need for alternative housing which was alleviated by placement in shelters and providing psychosocial support. Not everyone suffered total destruction of their homes or absolute loss of household item, but due to the voluntary evacuation, all residents of Petite Savanne and Dubique and some in Bath Estate now require long-terms housing solutions. According to the preliminary 2011 Census, there were 217 households in Petite Savanne with 3.5 persons per household made up of 40% males; and 46 households in Dubique with 3.3 persons per household (72% women among the displaced).

There are some observable strengths and challenges associated with the post TSE measures as outlined in Box 14.

Box 14: Strengths and Challenges Associated with Post TSE Measures

Strengths	Challenges
Existence of an extensive social protection programme which addresses multiple facets of social needs which could be easily widen to include those affected by TSE (such as transportation for school children and pprovisions for demolition and replacement of irreparable houses of vulnerable groups (elderly, terminally ill individuals, single –female headed households, mentally challenged, recipients of public assistance)	Limited human and financial resource capacity rehabilitation and compensation in the public service
	Efficacy of the Social Protection system including mechanism for standardised selection of applicants, methodologies to reduce leakages and improve coordination
	Limited data management systems
Partnerships with the Youth Development Division and the Ministry of Employment to provide labour	Lack of tracking mechanisms to measure impact
	Functional literacy of applicants and their ability to navigate the administrative processes
Decentralized structure of the Local Government system consisting of 38 Village Councils, 1 City Council, 1 Town Council, 1 Urban Council and the Kalinago Council with responsibility for small development projects and two way information between the communities and Central Government	Absence of overarching policy which would empower the Local Government machinery to implement the programmes without direct Cabinet intervention
	High dependence on Central Government and Parliament which delegates to local authorities
Community easily mobilized and contributed significantly to recovery and rehabilitation efforts. Prompt search and rescue action by first responders (including personnel and vehicles from the Ministry of Agriculture)	*"… it is also evident that it is becoming increasingly difficult to mobilise volunteers outside of disaster events. Community cohesiveness becomes very critical in the resuscitation of community organisations responding to events[53].*
Quick mobilization of National Emergency Operations Centre	The landscape of NGOs and CSOs could be more robust
Existence of Community Emergency Response Teams/Community Disaster Response Teams for example the Petite Savanne Resettlement Committee	
Utilities restored quickly or temporary measures implemented	Limited attention to valuation of the impact on leisure (to be addressed by the creation of green spaces/sporting facilities in 'new' communities.

The recovery stage in the aftermath of a disaster offers an opportunity to engage women, men and youth as protagonists in better and more innovative ways in the planning for their development in recognition of the differences in which disasters affect males, females and children. Failure to consider both women's and men's concerns in the design and implementation of DRM programs are likely to lead to overlooking the true costs of disasters and making DRM support less effective. Gender-blind responses can also reinforce,

[53] Paul Rolle, A. 2014. Dominica Country Profile for Disaster Risk Reduction. Office of disaster Management Dominica. European commission for Humanitarian Aid and civil Protection and the United Nations Office for Disaster Risk Reduction

perpetuate and increase existing gender inequalities, making situations worse for women and other vulnerable groups.

Although there are no formal legislative barriers to women's access to resources, titles to land are generally in the name of male relatives. Lack of title is a barrier to credit and would also limit access to assistance with housing in the post-TSE scheme which seeks to construct 2-bedroom prototypes housing units on lands already owned by individuals who have difficulty accessing credit. Immediately following the natural disaster women retain main responsibility for reproductive care thereby experiencing the brunt of disaster-related impact such as accompanying family members to access health services, care for the elderly and for children in situations where access to water and electricity is curtailed and disruptions to schooling. Many had to wash cooking utensils and laundry in the rivers with a fear of a repeat of the possibility of rivers overflowing. In the clean-up and rehabilitation works there was an absence of temporary employment for women. There is also a direct loss of livelihoods for many women with traditional home-based business and commercial and subsistence farming in the spaces directly around their homes. Within the shelters, there is the loss of privacy for both males and females with the added risk of increased gender-based violence. In confined and shared living quarters, reproductive duties become especially onerous. Women and men also display different coping mechanisms post disaster. With women generally engaging in mobilizing social networks while some men resort to more risky behaviours. Among young men, the shock of loss of property, especially cars, has reduced their capability of participating in the response and recovery. The elderly also have challenges in adapting to unfamiliar environments and changes in daily routines.

D. Livelihoods and Social Protection Mechanisms Before and After the Event

The social protection mechanisms have been geared to the empowerment of people as an avenue to the reduction of poverty and dependence on the state. A number of the mechanisms include the teaching of a number of skills to predominantly young people to assist them to choose a livelihood that they can pursue. In addition, the Social Investment Fund has paid attention to all activities that help to reduce poverty and elevate the quality of life, especially for the poor whose improvement will add significantly to the overall quality of life in Dominica while equipping them to be more focused on self-development that will result in poverty reduction and enable a greater Domestic Product. The following table presents social protection methods.

Table 17
Social Protection Methods

SECTOR	ACTION
Health	Maintain immunization programme and distribution of primary health care facilities to assist in reduction of Communicable and Non-Communicable Diseases (CNCDs) and the reduction of infant mortality
	Implement HIV/AIDS/Teenage Pregnancy Awareness Programme
	Investigate feasibility of graduated health charges
	Maintain participation in OECS PPS
	Explore options for health financing
Education	Maintain Government pro-poor education assistance programmes
	Increase provision of vocational technical education in primary and secondary schools.
	Maintain funding of projects dealing with troubled children and dropouts.
Social Safety Nets/ Social Sectors	Keep under continuous review the criteria and level of public Assistance
	Ensure integrity of Dominica Social Security
	Initiate research into poverty and crime
	Continue implementation courses in life skills education
	Implement community empower programmes
Housing/Infrastructure	Implement road maintenance schedules
	Monitor Squatter Regularization Programme/ Reduce vulnerability at squatter sites
	Implement housing and sanitation programme
	Ensure 100% access to potable water by 2015
Institutional	Implement public awareness on social assistance programmes
	Conduct workshops to create awareness of vulnerable groups
Legal	Improve operation of child maintenance system
	Implement reform of legal framework related to children, welfare, family support and small claims
	Reform magistracy operations
Environmental	Formulate strategies for addressing areas of environmental degradation

Source: GSPS 2012-14

The above table, 17, addresses the vulnerabilities from a sectoral viewpoint. It represents the "before Erika" situation. These converge and are directed to the more pointed actions to be taken at the local level. For example, the above table does not elaborate on the empowerment of communities, neither in Education nor in Institutions. Institutional support should be heightened in small enterprises such as the extraction of Bay Oil and the manufacture of farine and farine products to bring greater value added to the small manufacturers.

After the passing of Erika, the social protection modalities were accelerated with different priorities implemented in answer to the shock and displacement of the Tropical storm. The priority on life and limb and on people generally caused accelerated action in the provision of shelters, food and resettlement activities. Some redirection in budget was necessary to meet the unexpected and urgent needs of people who were acknowledged to be of prime interest.

The above actions must, however, be measured and evaluated. The need for statistics to monitor the social protection actions is sounded here. The Central Statistical Office (CSO) can help in the design and training of the Ministry to collect the data. The CSO can process the questionnaires after discussion with the Ministry of Health and any other Ministry undertaking an aspect of Social Protection. To that extent the CSO should be strengthened to produce a wider range of statistics with improved funding.

Section Three: Recommendations for Sustainable Livelihoods

There is little doubt that TS Erika has resulted in increased challenges for segments of the population engaged in livelihood activities both in the formal and informal sector. The preceding sections sought to elaborate with some degree of detail the extent to which the event has negatively impacted households and individuals, men and women, and sought to identify their geographic location, their social and economic characteristics and the differentiated challenges which they face.

This section seeks to provide a way forward. It sets out recommendations based on the analysis of the effects of the event in the four areas of investigation: the social sector, including social protection measures and the productive sector - agriculture, tourism, and commerce. The investigation treated infrastructure as an enabling factor. The Report commends the government for its recovery approach which at the time of this study has been based on an inter-Ministerial Cluster approach. It is the view that such an approach can, through the synergy achieved, extend the effectiveness of the budgetary allocations across Ministries and Government-funded organizations.

The recommendations for sustainable livelihoods are meant to strengthen resilience of the population. Initiatives should be taken on an ongoing basis to reduce the negative psycho social impacts resulting from the event, that may act as a constraint to meeting the development challenges.

Recovery

In view of huge recovery needs, it is expected that the GOCD will be required to undertake a sustained effort to mobilise financial resources. As is the case in most recovery programmes, the resources would be pooled through several windows of funding: the government's own resource mobilisation including budgetary reallocations, loans from IFIs, grants from multilateral and bilateral agencies, contributions from the private sector and citizens (which would include the remittance income from the diaspora), and reallocations from existing project portfolios. These resources should complement the efforts for self-recovery which are already underway.

The Report recommends that the resources be pooled in such way that would keep the ratio of debt within manageable levels, and utilise grant assistance to the extent possible. It is expected that the implementation of the recovery programmes would require considerable technical and management support, such support may be provided by out sourcing technical skills and expertise from the OECS and wider Caribbean.

The Report further recommends that discussions should be opened with key development partners on the issues of debt relief and/or restructure as a means of meeting the resource requirements for recovery.

Sustainable Livelihoods

The recommendations for Sustainable Livelihoods are made acknowledging certain assumptions about livelihoods. Most importantly, that livelihoods are a means to support an existence and as such comprises the assets, capabilities and activities required for a means of living. The recommendations also

acknowledge that livelihoods are complex systems that are non-sector specific and are influenced by multiple actors, strategies and outcomes. Significantly for the TS Erika outcomes, is the notion that livelihoods build on families and their communities' inherent potential.

Working through these multiple dimensions make livelihood systems resilient through four primary stakeholders: the livelihood owners, the community, with its formal and informal groups and organisations; the private sector (both formal and informal) and the government.[54]

Box 15. Livelihoods and Assets

Livelihoods are built on Assets:

Physical – access to infrastructure, service, tools and technology

Social – access to support, advice and assistance from one's community or networks

Financial – access to savings, credit, insurance and markets

Human – one's own practicality, health, education and ambition

Natural – land, water, forests and biodiversity

Source: Investing in Resilience

With this understanding in mind, of the combination of assets, detailed in box 15 and the work of stakeholders, the recommendations for restoration of livelihoods and the creation of sustainable livelihoods are grounded in a number of principles.

First, that for livelihoods to be sustainable it is key that actions lead to the empowering of the livelihood owners, the affected population so that they can take advantage of new situations and opportunities– allowing them greater flexibility in the livelihood choices they make. Secondly, for livelihoods to be sustainable there must be a reduction of dependence on the state or any other agencies, but not reduction of support from the state and other agencies. Thirdly, there is need for upscaling existing processes of production and distribution that provide livelihoods, for modernising others; and upgrading the skills set of the population with an eye to seizing opportunities for delivering community services. Lastly for livelihoods to be sustainable the burden of care which women carry in their productive and reproductive roles must be recognised and processes put in place to reduce this burden and allow women to make their full contribution to their households, the development of their country and to enable them to fulfil their own potential. This particularly so, as a significant proportion of the affected population are households headed by women.

An example of an empowerment approach to an affected group would be the provision of assistance to agro processors not only in health and safety requirements, marketing, or product standards, but general financial management (and financing) assistance. As well, small and micro entrepreneurs may require technical assistance which would help them, reap the benefits of 'value added' to increase their income. An integrated approach provided to farmers, fisher folk and small and micro entrepreneurs, therefore would include: adult education, skills training, and financing, and child care where necessary for the working mothers. Such action, would surely result in more sustainable livelihoods.

[54] Investing in Resilience. Asian Development Bank. 2013

The current social protection effort is challenged by the limited financial resources of the Government in light of TS Erika and the pressing demands of infrastructure recovery. However the GCOD must do all in its power to harness the strength of the social capital that is at the heart of Dominica, in this recovery effort. If this were ignored or dismantled it would surely make the task of recovery much more difficult.

To make the best use of the social capital may require strengthening capacity for effective local governance and incorporating the considerable talent and skills available through Dominica's diaspora.

It is expected that the policy framework for recovery would also be guided by the notion that the gap between rich and poor should be reduced, as a result of the recovery measures, instead of widened. In order to achieve equitable results through recovery it would be important for a new round of poverty estimates to be completed, including measures of inequality and vulnerability. Greater attention should be paid to the management of national statistical data so that social conditions and quality of life can be closely monitored.

Given the economic importance of tourism to Dominica, a revival of the tourism industry is vital. It not only provides employment and investment opportunities, but the industry's recovery can help stimulate trade, business and construction activities. In the aftermath of TS Erika, the provision of immediate emergency relief, the restoration of basic services and the rebuilding of damaged infrastructure in destination communities were of paramount importance.

The recommendations within the tourism sector therefor seek to identify longer term impacts and address the drivers of vulnerability in the affected communities and build on existing capacity.

That said, it is not enough to respond to the immediate disaster. As the immediate needs of the affected communities are tended to, attention must be redirected toward longer-term preparedness strategies that aim to reduce vulnerability and increase capacities to cope and respond to future shocks. In addition, Government should seek to mainstream DRR/DRM and CCA into its national and sectoral development agendas.

Livelihoods and Women

The Recommendations the Sustainable Livelihoods presents an opportunity to reduce the vulnerability of women and increase gender equality. This can be considered in a number of approaches. For example in the resettlement process where homes have to be allocated, women could be given joint home ownership in a legal sense, through the shelter programme. Their role as income earners as back yard gardeners and micro entrepreneurs would be recognised in livelihood recovery interventions, with an emphasis on training, cash support, and financial inclusion. Women could also be included in consultative fora at all levels, and gender sensitiveness would be an important feature of all programming initiatives. Such inclusive practices would be applied to people with disabilities.

In the tourism sector, women are mostly employed as housekeepers and waitresses, in the tourism sector, while more men tended to hold technical (maintenance) and managerial posts. It is commonly observed that in coping with post-disaster stress, the tourism sector often maintains managerial and ground staff such as gardeners while laying off housekeepers. Thus women's economic opportunities will probably suffer more significantly as a result of TS Erika, as women will most likely be the first to lose their jobs from within the tourism sector.

Recommendations for short and medium term livelihood support, must therefore address conceived so as to meet women's needs.

Livelihoods and Social Capital

It cannot be over emphasized that people who have been affected through the loss of homes and livelihoods as a result of TS Erika, should be fully informed and consulted on resettlement and compensation options. Where possible, the sites selected for relocation should be geographically close to the original homes, or at least allow them to fulfil their livelihood activities. Where persons were farmers or fisher folk, efforts should be made to resettle them where they can fulfil their livelihood activities. Urban settlements for such persons may be unsuitable. Resettlement sites should be carefully selected in order to re-establish the socioeconomic condition and cultural practices of those resettled.

The resettlement projects should be conceived and executed as part of a development program with resettled persons who should be provided sufficient resources and opportunities to share in the livelihood benefits. Work should be done to ensure that affected communities give their demonstrable acceptance to the resettlement and the development program, and that any necessary displacement is done in the context of negotiated settlements with affected communities.

Planning for the provision of economic and social services at the resettlement site must take into account the needs of both the resettled and the host communities, in order to minimize conflicts and create a common interest in the success of the resettlement project.

The details of the recommendations for sustainable livelihoods are presented in the following Matrix for Sustainable Livelihoods.

MATRIX – INITIATIVES FOR SUSTAINABLE LIVELIHOODS

Agriculture			
Initiative	**Period**		
Existing Recovery Interventions	**Short Term**	**Medium Term**	**Long Term**
	Continue the implementation of the four components of the Recovery interventions.		
		Strengthen the public policy framework to ensure increased private sector participation.	
		Introduce modern climate smart technologies that enhance productivity along the value chains.	
			Strengthen the implementation process to include – Targets and Phasing, Value Chain approach, Inclusion, Partnerships, Resource Mobilization and Monitoring and Evaluation to ensure accountability and to measure progress
Disaster Risk Management			

	Finalize, enact and enforce legislation for the National Land Use Policy for Dominica - develop and implement a robust portfolio of land use policies to cover policy issues such as designated floodways and encroachment lines, zoning and sub-division regulations.		
		Introduce improved watershed management systems - crop rotation, construction of terrace, contour strip cropping, selective planting and reforestation.	
	Stabilize and rehabilitate river banks and slopes impacted by floods and landslides – maintain the integrity of existing forests and encourage tree-planting initiatives, which will serve as a protection of soil and freshwater resources and habitats for animals.		
		Design a Prototype for the establishment of an early warning information system for food and nutrition security.	
		Conduct a feasibility study for the introduction of risk transfer instruments within the agricultural sector, including agricultural insurance.	
			Explore the possibility for the establishment of an Agricultural Disaster Management Fund.

Dominica Designation as the "Nature Island of the Caribbean"			
		Establish within the State College a "Centre of Excellence for Agro-Eco-Tourism" in the Caribbean.	
		Strengthen the Dominica Organic Farming Programme, including the strengthening of the Dominica Organic Association Movement (DOAM).	
Youth In Agriculture			
		Identify a portfolio of potential Youth Food, Agriculture and Linkages Business Enterprises and develop profitable Business Models	
		Enhance the training of young people around these identified business enterprises	
		Strengthen existing youth apprenticeship, mentoring and business incubator programs	
			Establish a centre for Youth Entrepreneurship, with an associated Youth Enterprise development Fund.

			Strengthen the existing Dominica Agriculture Forum for Youth (DAFY).
Value – Addition			
		Ensure better integration and coordination of demand and supply of raw materials for the agro-processing industries.	
		Introduce modern agro-processing facilities for cassava, bay leaf, coconut products, including the production of bottled coconut water.	
		Establish the Dominica Agricultural Health and Food Safety Agency (DAHFSA) with related capacity and capabilities.	
		Through the institutional mechanisms of the Bureau of Standards and DAHFA, improve the Agricultural Health and Food Safety standards along the value chain for priority industries such as bay, cassava and virgin coconut oil.	

Tourism			
Activity	**Period**		
Strengthen recovery of Sector	**Short**	**Medium**	**Long Term**
	Reestablishment and repair to sites and natural attractions, operations, done to appropriate standards and capacities, with inspections for resilience by engineers		
		Restoration of consumer confidence (redefinition) in the Dominica brand	
			Research on insurance schemes to increase resilience to future shocks
Build Resilience			
		Establish enabling governance processes and structures that advance public-private interaction and engagement;	
		Improve (prioritise) equity, inclusion and downward accountability in the recovery mandate	
		Build targeted and gap-specific capacity at the local level;	

			Improve the skill base needed for participation in tourism livelihoods which are targeted and enhances employability in the foreseeable future;
		Create more accessible funding sources for tourism sector micro and small businesses	
		Include disaster preparedness in in-house training for staff working in the tourism sector;	
Women's employment	Recruitment to positions of temporary employment (in debris clearance, solid waste management, and other activities) should always prioritize women where feasible, so that their incomes can be augmented until the tourism sector recovers.		
		Training for managerial and supervisory roles (as provided by UWI Open Campus) should be supported by the sector and the government.	

		the sector (represented by the Dominica Hotel and Tourism Association) in collaboration with the HRD of the Ministry of Education should collaborate to identify skill gaps and design and programme training packages to meet employment opportunities or to enhance existing capacities	
Community Tourism			
	In the post-disaster arena prioritizing community tourism initiatives remain the most sustainable initiative to reduce the livelihood impacts of TS Erika.		
		a deliberate policy for community tourism should be developed to promote the destination to the target investment interests and market segments.	
			Competitive incentives packages should be developed, offered to investors to support communities and reviewed on a regular basis.

Commerce and non-agricultural economic activity			
Activity	**Period**		
	Short	**Medium**	**Long**
Strengthen contribution to income generation and export		Build capacity of small actors in the market	
		Upscale /modernize plant and equipment	
		Strengthen Health/Safety Quality Standards	
		Strengthen the product base and access to raw material's supply from national sources	
	Provide incentives for the resuscitation of manufacturing establishments in the interest of the macro economy		
		Explore opportunities for creative use of stone boulders (e.g. river and sea wall defenses)	
	Create opportunities for work in the communities through the provision of regular sanitation services and development of aesthetics.		

Enable the Adult income earner			
			Strengthen the adult education programme to meet the needs of small farmers, fisher-folk tradesmen and small manufacturers with specialized training for excellence in identified areas of activity
			Continue the "Housing Revolution" to address the backlog in the supply of Housing and absorb the unemployed
		Engage as many of the affected population in the temporary work of Strengthening the safe-guards to schools that are near to river courses	

Enable Youth income earners			
	Child Care - Managed and serviced and maintained by members of the community. Provided in the community(particularly in new settlements) allows the young parents (particularly single mothers) to engage more fully in the labor market;		
		Retraining of women in alternative skills to meet the demands of the Construction Sector in the areas of electricals, tiling, ceiling, and plumbing.	
		Art industry with focus on stone carving/sculptures and use of drift wood.	
		Community contracting for maintenance of access roads	
	Expand Small engine repairs and boat building/repair		
	Structure the Manufacture of fish pots to involve affected population		

SOCIAL PROTECTION MEASURES			
Activity	**Period**		
	Short	**Medium**	**Long**
Strategic Recommendations		Build national capacity in the conduct of impact assessments with the CSO being an integral part of the assessment team.	
		Ensure that all data collected is sex and age disaggregated and also ensure the inclusion of gender-sensitive indicators as well as indicators for the elderly and persons with disabilities	
	Explore Mortgage Financing possibilities that are suitable for low income earners		

	Create opportunities to involve more women and youth, women's organizations, state gender focal points, and other organizations working on gender issues as partners in the recovery work to act as agents of change. These groups can take leadership roles in disaster assessment and management, for example in designing livelihood recovery programs and/or determining housing reconstruction priorities.		
		Build on and implement the multi-sectoral Gender and Child Responsive considerations within the Strategic Program on Climate Resilience (SPCR) and the Low Carbon Climate Resilient Development Strategy	
			Strengthen capacity and resources for addressing the psycho social effects following events such as TS Erika
		Examine and apply, as appropriate, the considerations for mainstreaming gender considerations in DRM being developed by CDEMA and other regional stakeholders	

Practical Recommendations	Create more opportunities to involve more women and youth, women's organizations, state gender focal points and the organizations working on gender issues as partners in the recovery		
	Enhance the employment placement mechanisms under the remit of the Commissioner of Labor		
		Institute a comprehensive training programme in construction to address the needs and cost of technologies and practices to build resilient infrastructure	
		Develop a networked labor market information system especially in the various localities affected by the disaster, with participation of local government authorities, employers and NGOs.	
		Develop User-friendly dissemination techniques of information on the transfers or soft-credit allowances earmarked for repairs (of building or equipment), inventory replenishing, and monetary working capital (to pay daily wages and other similar financial needs)	

Annex 1. References

1. Ministry of Health and the Environment. 10/21/2015. Post Tropical Storm Erika: Health Sector Report 2015. Ministry of Health and the Environment
2. Kairi Consultants Limited. (2008/2009). 2010. Country Poverty Assessment. Dominica : Reducing Poverty in the Face of Vulnerability. Vol. 1,2,3, Source: http://www.caribank.org/uploads/publications-reports/economics-statistics/country-poverty-assessment-reports/Dominica+CPA+-+Main+Report+Final+(Submitted).pdf
3. Data derived from the Population and Housing Census, 2011, on the Characteristics of the Affected Population by Tropical Storm Erika. January 2016. Central Statistical Office, Ministry of Finance and Planning. GCOD.
4. Data Derived from the Informal Sector Survey (2011) on the Affected Population by Tropical Storm Erika, January, 2016. Central Statistical office, Ministry of Finance and Planning, GCOD.
5. UNICEF Area Office, Barbados. (Draft 2015). Unpublished. Situational Analysis of Children, Commonwealth of Dominica.
6. Petite Savanne Resettlement Committee. (September, 2015?) Report on Petite Savanne, Post Tropical Storm Erika (unpublished).
7. Ministry of National Security, Labour and Immigration. Dominica Country Profile. Disaster Risk Reduction (CP-DRR). September 2014.
8. Report of the Private Sector and Agriculture Cabinet Sub-Committee. GCOD.01/ 2016. Unpublished
9. Impact of Tropical Storm Erika on Employment. GCOD 01/2016. Unpublished
10. CGOD. September 25, 2015. Rapid Damage and Impact Assessment, Tropical Storm Erika – August 27, 2015.
11. Dominica request for disbursement under the rapid credit facility—press release; staff report; for Dominica. IMF Country Report No. 15/316
12. Dominica Resettlement Strategy. UNDP Consultants: Alfonso Calzadilla & Randall Viales, January 2016
13. Sustainable livelihoods guidance sheets, DFID, April 1999
14. Fourth Medium-Term Growth and Social Protection Strategy (GSPS) 2014 – 2018. Government of the Commonwealth of Dominica
15. The 2011 Dominica Fisheries Industry Census
16. The 1995 Dominica Agricultural Census

17. Investing in Resilience: Ensuring a Disaster Resistant Future. Asian Development Bank. 2013
18. Shock Waves: Managing the Impacts of Climate Change on Poverty. World bank Group 2016
19. Paul Rolle, A. (2014). Dominica Country Profile for Disaster Risk Reduction. Office of Disaster Management Dominica; European Commission for Humanitarian Aid and Civil Protection; and the United Nations Office for Disaster Risk Reduction
20. Nepal Earthquake 2015 Post Disaster Needs Assessment. Vol. A: Key Findings. Government of Nepal, National planning commission, Kathmandu, 2015
21. Education Digest 2013/14. Ministry of Education and Human Resource Development-Education Planning Unit
22. Commonwealth of Dominica Economic and Social Review for Fiscal year 2014/15
23. Third Medium-Term Growth and Social Protection Strategy -Redoubling the Effort Towards a Sustainable Development Pathway 2012 – 2014
24. Estimates of the Commonwealth of Dominica –Budget Address for fiscal Year 2015/2016: Keeping It Real. Ministry of Finance. July 2015
25. Estimates of the Commonwealth of Dominica –Budget Address for fiscal Year 2014/2015: Towards Expansion of the Economy. Ministry of Finance. July 2014
26. Estimates of the Commonwealth of Dominica –Budget Address for fiscal Year 2013/2014: Building on the Gains We have Made. Ministry of finance. July 2013
27. Draft Post Tropical Storm Erika: Gender and Child Responsive Rapid Assessment re. Damage, Losses and Sectoral Needs. Manuscript. Undated
28. Personal Profiles of Affected Families and Individuals: Petite Savanne. Ministry of Social Services Family and Gender Affairs-Department of Local Government and Community Development. Manuscript. Undated
29. Personal Profiles of Affected Families and Individuals:Dubuque. Ministry of Social Services Family and Gender Affairs-Department of Local Government and Community Development. Manuscript. Undated
30. Initial Damage and Needs Assessment Survey Form. Ministry of Justice Immigration and National Security-Office of Disaster Management: Manuscript. Undated
31. Socio Economic Assessment of the Impact of TSE. Ministry of Planning Economic Development and Investment. Manuscript. Undated
32. BREA Economic Contribution Of Cruise Tourism To The Destination Economies of the Caribbean 2015

33. Calgaro: Emma, Dominey-Howes: Dale & Lloyd: Kate "Application of the Destination Sustainability Framework to explore the drivers of vulnerability and resilience in Thailand following the2004 Indian Ocean Tsunami" Journal of Sustainable Tourism May 2014
34. Compete Caribbean Dominica-Private Sector Assessment. 2014
35. Dominica Hotel and Tourism Association Post Tropical Storm Erika Requests from the DHTA.pdf"
36. Dominica Hotel and Tourism Association Three Months Post-Erika - Membership Update - December 1, 2015.pdf"
37. Dominica Labour Party Manifesto 2014 - Labour ka Twavay.pdf"
38. Government of the Commonwealth of Dominica Commonwealth of Dominica Tourism Master Plan 2013
39. Government of the Commonwealth of Dominica National Tourism 2020 Policy - 2013
40. Government of the Commonwealth of Dominica Request for Disbursement under the Rapid Credit Facility.
41. Government of the Commonwealth of Dominica Initial Guidelines for Legal and Entitlements Approach in the Dominica Resettlement Programme.pdf"
42. Government of the Commonwealth of Dominica Letter to IDA re Fiscal Framework & Incentives Regime - December 23, 2015.pdf"
43. Government of the Commonwealth of Dominica National Investment Strategy and Action Plan 2010.pdf"
44. Government of the Commonwealth of Dominica 2016_Budget_Address_Dominica_20150724
45. Patterson: Trista and Rodriguez: Luis "The Political Ecology of Tourism in the Commonwealth of Dominica" - Tourism and Development in Tropical Islands: Political Ecology Perspectives by Stefan Gossling (Editor) (January 2004) Publisher: Edward Elgar Pub
46. Sharpley: Richard Tourism and Vulnerability - A Case of Pessimism - Tourism Recreation Research VOL. 37(3), 2012: 257–260
47. van Aalst: Maarten "Dominica Strategic Programme for Climate Resilience Independent Review" - prepared for the Pilot Program for Climate Resilience (PPCR)April 2012

Annex 2. List of Persons Consulted

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13. Ms. Yvanette Baron-George - PS Housing
14. Hillman Jules - Manager, Housing Division
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16. Ms. Careen Prevost, PS. Ministry of Trade, Energy and Employment
17. Ms. Portia Nicholas, Business Development Officer,
18. Mr Don Corriette, Disaster Corrdinator
19. Ms. Kyra Paul Director (Ag.) Bureau of Gender Affairs
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21. Mr. Weeferly Jules, Senior Planning Officer (Ag.)Ministry of Education
22. Mr. Nazarine William-Litre – Senior Education Officer (Ag.)
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24. Mr. Robert R. Guiste – Senior Education Officer, Curriculum and Measurement
25. Ms. Jemma Auille-Lewis, Coordinator, Child Abuse Prevention, Ministry of Social Services family and Gender Affairs
26. Ms Nicole Toussaint Welfare Officer, Child Abuse Prevention
27. Leroy Morvan, chief Welfare Officer, Social Welfare Division
28. Mr. John Fontaine, Local Government Commissioner, DepaRTMENT OF Local Government and Community Development
29. Oliver Wallace, Assistant Chief Welfare Officer (Ag), social Welfare Division
30. Selected groups of internally displaced persons

Annex 3. Tables

Table 1. Dominica: Summary of Damage and Loss by Sector (in millions)

	Sectors	Damage EC$	Loss EC$	Total EC$	Damage US$	Loss US$	Total US$
Productive							
	Agriculture, Fisheries and Forestry	114.22	13.11	127.33	42.46	4.87	47.33
	Tourism	52.40	31.48	83.88	19.48	11.70	31.18
	Industry & Commerce	24.56	1.50	26.06	9.13	0.56	9.69
Infrastructure							
	Water and Sanitation	46.11	6.39	52.50	17.14	2.38	19.52
	Air and Sea Ports	40.08	0.21	40.29	14.90	0.08	14.98
	Roads and bridges	643.59	129.87	773.46	239.25	48.28	287.53
	Electricity	5.89	0.88	6.77	2.19	0.33	2.52
	Telecomm	26.90	0.00	26.90	10.00	0.00	10.00
Social							
	Housing	119.80	25.86	145.66	44.53	9.61	54.15
	Education	9.55	1.20	10.75	3.55	0.45	4.00
	Health	1.73	3.50	5.23	0.64	1.30	1.94
TOTAL		1084.82	214.01	**1298.83**	403.28	79.56	**482.84**

Source: Rapid Damage and Impact Assessment. A Report by the Government of the Commonwealth of Dominica. September 25, 2015

Table 2. Dominica: Population by Parish and Sex

	Sex		Total
PARISH	Male	Female	
City of Roseau	7078	7962	15040
Rest of St George	2360	3108	5468
St. John	2849	2661	5510
St Peter	852	650	1502
St. Joseph	2788	3176	5964
St Paul	4442	4245	8687
St. Luke	863	762	1625
St. Mark	965	1008	1973
St. Patrick	3800	4872	8672
St. David	3807	3184	6991
St. Andrew	5445	5148	10593
Total	35249	36776	72025

Source: Data provided by Statistical Office

Table 3. **Dominica: Population Affected by Effects and Impact of TS Erika**

Category		Persons
Primary Affected		
	Dead	14
	Missing	18
	Injured	62
	Homeless	6263
	Required Psycho social support	50
	Treated for other illness	429
Secondary Affected		
	Workers in closed factories	1426
	Workers from Hotel who lost employment	251
	Farmers	4395
	MSMEs owners	654
	Fisher folk	637
Tertiary		
	Increased burden of accepting homeless family members	400
	increased transport costs and inconvenience due to damage suffered by road systems	1355
Grand total		15951

Source: Estimates based on official data from the GCOD.

Notes: Health Data on dead, missing and injured and ill provided by Ministry of Health (28/01/2016); Numbers of Farmers and Fisher folk were estimated using family size of 4.275; persons working in factories (528) or hotels (92) were estimated using national average family size 2.7

Number of dead and missing updated based on Government of Dominica email 24 June 2016

Table 4. Heads of Household in Selected Affected Parishes and Communities by Sex

		Heads of households		
		Male	Female	Total
Parish	**Affected community**			
St. George				
	Bath Estate/Paradise	109	56	165
	Pichelin	315	277	592
St. Patrick				
	Fond St. Jean	76	31	107
	Bagatelle/Point Carib	89	47	136
	Boetica	37	11	48
	Petite Savanne	148	65	213
	Dubique	27	20	47
St. David				
	San Sauveur	24	13	37
	Good Hope	159	71	230
	Grandfond	116	71	187
	Petit Soufrrierre	104	51	155
St. Paul				
	Campbell	142	58	200
St. Peter				
	Colihaut	228	157	385
St. Joseph				
	Coulibistrie	101	50	151

Source: Estimates based on official CGOD data

Table 5. **Dominica: Mean Adult Equivalent Household Size and Minimum Cost Consumption Estimates, (EC$), 2009**

Mean Adult Equivalent Household size	Indigence Line Per month per Adult	Poverty Line Per Month Per Adult	Minimum Required Per Month For an Average Household Size	Annual Poverty Line per Adult	Minimum Annual Required for an Average Household to be above poverty line
2.3	EC$203	EC$519	EC$1,194	EC$6,230	EC$14,329

Table 6
Poverty Status of Population

Category	Households %	Population %
Indigent / Very poor	11%	15%
Poor	18%	24%
ALL POOR	**29%**	**39%**
Vulnerable but not poor (percentage of individuals below the Vulnerability line but not poor)		12%
NON POOR (Including Vulnerable)	**71%**	**61%**

Source: The Social Investment Fund and the CPA 2010

Table 7: Dominica: Indigence, Poverty and Vulnerability Lines, 2009

Indigence line (Annual in EC$)	2,435
Poverty line (Annual in EC $)	6,230
Vulnerability Line (Annual in EC$)	7,788

Source: Dominica CPA 2010

Table 8: Indicators of Poverty and Vulnerability to Food Insecurity – Dominica CPA (2009)

Parish	Headcount (%)	Poverty Gap (%)	Poverty Severity (%)	Population	Pop. Vulnerable to Food Insecurity[55] (Within Parish)		Pop. Vulnerable to Food Insecurity (% Across Parish)
					No.	%	
City of Roseau	12.78	2.67	0.97	15,040	3,652	24.3	12.6
Rest of St. George	16.32	4.33	1.90	5,468	1,521	27.8	5.2
St. John	10.23	1.55	0.33	5,511	1,198	21.7	4.1
St. Peter	23.71	5.87	1.88	1,502	529	35.2	1.8
St. Joseph	47.15	15.47	6.59	5,964	3,498	58.7	12.1
St. Paul	32.58	10.86	4.99	8,686	3,829	44.1	13.2
St. Luke	17.50	7.50	3.69	1,625	471	29.0	1.6
St. Mark	27.34	5.37	2.14	1,973	766	38.8	2.6
St. Patrick	42.70	12.99	6.22	8,672	4,700	54.2	16.2
St. David	40.38	11.45	5.07	6,991	3,627	51.9	12.5
St. Andrew	38.08	14.98	7.25	10,593	5,252	49.6	18.1
Total	**28.82**	**8.91**	**4.01**	**72,025**	**29,043**	**40.3**	**100.0**

Source: Dominica CPA (2008/09).

[55] Estimated by taking the product of the headcount poverty and the respective parish population then increasing the result by 11.5% (the percentage of vulnerable population).

Table 9: Livelihoods that are the Most Vulnerable to Food Insecurity, Location and & How Many

Parish	Vulnerable Livelihoods[1]	Location of Livelihoods[1]		District Population[2]	Persons Who are Vulnerable to Food Insecurity[2]
City of Roseau	▪ Farmers ▪ Fisher folks ▪ Working poor	▪ Roseau	▪ Newtown ▪ Pottersville	15,040	3,652
Rest of St. George	▪ Fisher Folk ▪ Farmers ▪ Working poor	▪ Roseau Valley	▪ Fond Cole	5,468	1,521
St. John	▪ Fisher Folk ▪ Farmers ▪ Working poor	▪ Portsmouth ▪ Tanetane ▪ Toucari	▪ Capucin ▪ Clifton	5,511	1,198
St. Peter	• Farmers ▪ Fisher Folk • Working poor	▪ Bioche ▪ Calihaut	▪ Dublanc	1,502	529
St. Joseph	▪ Farmers ▪ Fisher Folk ▪ Working poor	▪ Batali ▪ Coulibistri ▪ Salisbury	▪ Layou ▪ Mero ▪ St. Joseph	5,964	3,498
St. Paul	▪ Farmers ▪ Fisher Folks ▪ Working poor	▪ Campbell ▪ Cochrane	▪ Canefield ▪ Jimmit ▪ Mahaut ▪ Massacre ▪ Tarou	8,686	3,829
St. Luke	▪ Fisher Folks ▪ Farmers	▪ Pointe Michel		1,625	471
St. Mark	▪ Fisher Folks ▪ Farmers	▪ Soufriere	▪ Scotts Head	1,973	766
St. Patrick	▪ Fisher Folks ▪ Farmers ▪ Working poor	▪ Bellevue Chopin ▪ Delices ▪ Pichelin ▪ Grand Bay	▪ Fond St. Jean ▪ Stowe ▪ Geneva	8,672	4,700
St. David	▪ Farmers ▪ Fisher Folks ▪ Working poor	▪ Castle Bruce ▪ Petite Soufriere ▪ Good Hope	▪ San Sauveur ▪ Salybia ▪ Sineku	6,991	3,627
St. Andrew	▪ Farmers ▪ Fisher Folks ▪ Working poor	▪ Anse Du Me ▪ Calibishie ▪ Marigot	▪ Woodford Hill ▪ Wesley	10,593	5,252
Total				**72,025**	**29,043**

Notes: These estimates were derived from data in Dominica Country Poverty Assessment (2008/09), the Dominica Agricultural Census (1995), the Dominica Fisheries Industry Census (2011), meetings conducted and sites visited.

Table 10: Fish Categories and Vendor Prices

Fishery	Fish Label	Price per Pound (EC $)		
		Average	**Minimum**	**Maximum**
Coastal Pelagics	Ballyhoo	1.83	1.00	6.00
	Jacks	6.45	4.00	10.00
	Mackerel scad	5.86	3.00	8.00
	Round sardinella	2.58	1.00	7.00
	Sardine	1.00	1.00	1.00
Demersals	Coney	6.38	5.00	7.00
	Doctor fish	7.00	6.00	8.00
	Grouper	7.72	5.00	15.00
	Grunts	7.00	7.00	7.00
	Lobster	14.02	3.00	30.00
	Parrot fish	6.78	4.00	10.00
	Red Hind	6.67	6.00	7.00
	Snapper	7.75	5.00	15.00
	Squirrel fish	6.50	5.00	7.00
	Trigger fish	2.50	2.50	2.50
	Yellow goatfish	6.96	3.00	10.00
	Black tuna fish	6.17	4.00	9.00
	Blue marlin	5.70	4.00	8.00
	Dolphin fish	7.13	5.00	10.00
Offshore Pelagics	Flying fish	3.37	1.00	8.00
	King fish	8.00	8.00	8.00
	Rainbow fish	7.00	6.00	8.00
	Tuna	6.00	6.00	6.00
	Whoo	6.96	4.00	10.00
	Yellow fin tuna	6.41	5.00	9.00
	Grand Total	**6.78**	**1.00**	**30.00**

Source: The 2011 Dominica Fisheries Industry Census

Table 11: Fishers by Age and Gender

AGE (YEARS)	FEMALE	MALE	TOTAL	%
More than 80	-	6	**6**	**0.8**
71-80	-	40	**40**	**5.4**
61-70	5	91	**96**	**13.0**
51-60	7	143	**150**	**20.3**
41-50	6	185	**191**	**25.8**
31-40	4	131	**135**	**18.2**
20-30	6	93	**99**	**13.4**
Under 20	-	23	**23**	**3.1**
Total	**28**	**712**	**740**	
%	**3.8**	**96.2**		**100.0**

Source: The 2011 Dominica Fisheries Industry Census

Table 12: Fishers Age and Marital Status

AGE (Years)	Marital Status					TOTAL
	Single	Married	Widow(er)	Divorced	Separated	
< 20	23	-	-	-	-	**23**
20-30	92	7	-	-	-	**99**
31-40	118	13	2	1	1	**135**
41-50	138	45	2	5	-	**190**
51-60	80	59	4	5	1	**149**
61-70	35	43	7	4	7	**96**
71-80	11	21	5	3	-	**40**
>80	2	3	1	-	-	**6**
Total	**499**	**191**	**21**	**18**	**9**	**738**
%	**67.6**	**25.9**	**2.9**	**2.4**	**1.2**	**100.0**

Source: The 2011 Dominica Fisheries Industry Census

Table 13: Fishers Age and Educational Level

AGE (Years)	Educational Level					TOTAL	%
	None	Primary	Secondary/ High	College	University		
< 20	-	3	20	-	-	**23**	**3.1**
20-30	-	22	60	15	-	**97**	**13.3**
31-40	-	88	38	6	3	**135**	**18.4**
41-50	-	166	21	2	-	**189**	**25.8**
51-60	2	134	8	2	-	**146**	**19.9**
61-70	3	88	4	1	-	**96**	**13.1**
71-80	2	37	1	-	-	**40**	**5.5**
>80	2	4	-	-	-	**6**	**0.8**
Total	**9**	**542**	**152**	**26**	**-**	**732**	
%	**1.2**	**74.0**	**20.8**	**3.6**	**0.4**		**100.0**

Source: The 2011 Dominica Fisheries Industry Census

Table 14: Fishers Reasons for Fishing

Reasons For Fishing	%
Always wanted to be a fisher	65
There is a history of fishers in family	53
There was no other job available at the time	14
Not qualified for another job	8
Other	6
Financial support	5

Source: The 2011 Dominica Fisheries Industry Census

Table 15: Multiple Roles of Persons in the Industry

Role	Boat Builder/ Repairer	Boat Owner	Equipment Supplier	Fisher	Gear Builder/ Repairer	Outboard Engine Mechanic	Retired Fisher	Vendor
Boat Builder/ Repairer	3	51	2	66	35	10	0	41
Boat Owner	51	0	2	351	61	16	2	221
Equipment Supplier	2	2	4	2	1	3	0	2
Fisher	66	351	2	223	82	20	0	342
Gear Builder/ Repairer	35	61	1	82	0	13	1	50
Outboard Engine Mechanic	10	16	3	20	13	3	0	15
Retired Fisher	0	2	0	0	1	0	13	0
Vendor	41	221	2	342		15	0	22
Total	**73**	**351**	**8**	**718**	**86**	**25**	**16**	**365**

Source: The 2011 Dominica Fisheries Industry Census

Table 16: Distribution of Fishers by Landing Sites

NORTH WEST		SOUTH WEST		SOUTH		EAST	
Landing Site	**Number of Fishers**	**Landing Site**	**Number of Fishers**	**Landing Site**	**Number of Fishers**	**Landing Site**	**Number of Fishers**
Batali	8	Canefield	2	Fond St. Jean	41	Anse Du Me	41
Bioche	45	Fond Cole	18	Scotts Head	45	Calibishie	24
Capucin	17	Jimmit	3	Soufriere	8	Castle Bruce	1
Clifton	10	Layou	33	Stowe	15	Marigot	80
Colihaut	28	Mahaut	38			Petite Soufriere	1
Coulibistri	4	Massacre	11			Saint Sauveur	37
Dublanc	40	Mero	6			Salybia	1
Portsmouth	53	New Town	12			Sineku	3
Salisbury	17	Pointe Michel	1			Wesley	2
Tanetane	14	Potterville	11			Woodford Hill	3
Toucari	21	St. Joseph	32				
		Tarou	2				
Total	**257**		**169**		**109**		**193**

Source: The 2011 Dominica Fisheries Industry Census

Table 17: Level of Income from Fishing by Age

AGE (Years)	Income Level from Fishing			TOTAL
	All or Most	About Half	Less than Half	
< 20	16	3	3	**22**
20-30	52	21	20	**93**
31-40	54	38	36	**128**
41-50	76	45	56	**177**
51-60	45	30	63	**138**
61-70	31	19	30	**80**
71-80	7	3	21	**31**
>80	1	-	3	**4**
Total	**282**	**159**	**232**	**673**
%	**41.9**	**23.6**	**34.5**	**100.0**

Source: The 2011 Dominica Fisheries Industry Census

Table 18: Fishers Alternative Income Activities

Alternative Income Activities	%
Agriculture	42.0
Construction	20.4
Other	9.2
Maintenance	7.1
Carpentry	5.1
Retail	4.7
Agri-Produce	3.3
Transportation	2.9
Security	2.6
Tourism	1.4
Fisheries	1.2

Source: The 2011 Dominica Fisheries Industry Census

Table 19: Summary of Damage and Losses to Agriculture

Description	**EC$**
Damage	
Destruction of agricultural lands	$29,000,000
Damages Irrigation and drainage systems	$1,900,000
Agricultural machinery and equipment	$4,200,769
Damage to storage and farm related buildings	$3,047,000
Plantation and production facilities damaged or destroyed	$13,034,736
Livestock killed	$851,000
Damage to road infrastructure	$57,650,000
Total Damage	**$109,722,705**
Losses (*Aggregated losses)*	
Loses due to production changes	$13,034,736
Losses due to increased production costs	$74,637
Total Losses	**$13,109,373**
Total Damage and Losses	**$122,832,078**

Source: Division of Agriculture Report on Damage to the Agriculture Sector by Tropical Storm Erika (September 9, 2015)

Table 20: Summary of Damage to the Fisheries Sector

Description	EC$
Fishing pots	101,400
Engines	1,132,700
Boats	4,200,769
Fishing Tackle	44,806
Nets	39,000
Navigation & Safety	3,475
Containers/Coolers	24,180
Sheds	15,000
Fish attraction devices (FAD)	3,000
Misc Damages	96.763
Total Damage	**2,949,324**

Source: Division of Agriculture Report on Damage to the Agriculture Sector by Tropical Storm Erika (September 9, 2015)

Table 21: Total damage to Forestry Sector

Description	EC$
Lost land (30Ha)	600,000
Damage to forest roads	150,000
Reforestation of lost forest cover	56,960
Park infrastructure, trails and visitor facilities	740,000
Total Damage	**1,546,960**

Source: Division of Agriculture Report on Damage to the Agriculture Sector by Tropical Storm Erika (September 9, 2015)

Table 22: Impact on Farmers crops and Livestock

Crops	Acreage	Number Farmers		Livestock	Number of Animals	Number of Farmers
Roots & Tubers	89.7	257		**Cattle**	**112**	**14**
Sugar Cane	53.0	1		**Small Ruminants**	**137**	**27**
Citrus	10.6	5		**Pigs**	**42**	**6**
Vegetables	6.5	13		**Poultry (layers)**	**3,600**	**6**
Plantains	37.0	98		**Poultry (Broilers)**	**2,500**	**35**
Bananas	23.5	46		**Poultry (Chicks)**	**1,100**	**2**
Tissue culture	220.3	11		**Rabbits**	**30**	**4**
Bay Leaf	400.0	447		**Bee Hives**	**86**	**11**
Passion fruits	17.0	13				
Pineapple	4.5	12				
Cocoa	22.0	11				
Ginger	5.0	23				

Seasoning Pepper	1.0	2				
Pumpkins	2.2	6				
Arrow Root	6.5	11				
Total	**898.8**	**956**			**7,521**	**105**
Grand Total			**1,061**			

Source: Division of Agriculture Report on Damage to the Agriculture Sector by Tropical Storm Erika (September 9, 2015)

Table 23: Impact on Plant facilities and Infrastructure

Type of Infrastructure	Type and damage	Location	No. of Farmers affected
Bay Oil Distillery (Equipment and Plant)	Washed away	Pt Savanne	**447**
Other distillery Components	Washed away	Pt Savanne	
Small Distillery	Landslide	Boetica	**35**
Distillery Equipment	Washed away	Delices	**40**
Virgin Oil Equipment Processed oil	Washed away	Pichelin Coulibistrie	**50**
Rum Factory	Flooding, equipment	Machoucherie	
Vauxhall Bridge	Washed away	Marigot	**72**
Other Bridges and river crossings	Washed away, broken etc.	Selected roads	**47**
Feeder Roads	Slide clearing	All locations	**2,400**
	Surface damage, undermining, Breakage	All locations	
Castle Bruce Irrigation	Intake damage, 100 ft. lines washed away	Castle Bruce	**39**
Milton Irrigation system	Lines along the river washed and intake damage	Milton	**62**
Total			**3,479**
Less Bay leaf producers			**447**
Grand Total			**3,032**

Source: Division of Agriculture Report on Damage to the Agriculture Sector by Tropical Storm Erika (September 9, 2015)

Table 24: Impact on Farm Housing, Machinery and Equipment and Stock

Type of Infrastructure	Type and damage	Location	No. of Farmers affected
Livestock Housing	Flooded, slides, undermined foundation, Roseau Valley	Geneva North Region	**16**
Water Pumps	Washed away	Belles, Clarke Hall Londonderry	**8**
Water Tanks	Washed away, damaged	Marigot, Belles, Clarkhall	**7**
Irrigation Lines	Lost by run-off	At specific farms	**17**
Greenhouses	Twisted frames through slides	All locations	**14**
Sheds	Slides, flooded	Southeast, South, Northeast, Central and West	**17**
Fertilizers	Flooded	Northeast, Central and West	**43**
Livestock Feed	Flooded	Southeast, South, Northeast, Central and West	**6**
Farm Vehicles	Washing away	West Region- Coulibistrie	**6**
Total			**134**

Source: Division of Agriculture Report on Damage to the Agriculture Sector by Tropical Storm Erika (September 9, 2015)

Table 25: Summary of Erika on Food and Agriculture Livelihoods

Description	Number of Farmers / Fisher folks	Estimated Household Members[56]
Impact on Farmers crops	**956**	**2,992**
Impact on Farmers Livestock	**105**	**329**
Less Combined Operations (Crops and Livestock)	**(33)**	**(103)**
Total Crop/Livestock	**1,028**	**3,218**
Impact on Farm Assets	**134**	**419**
Impact on Inter-sectoral Assets (plants, feeder roads, etc)	**3,032**	**9,490**
Impact on Fisheries	**149**	**466**
Grand Total	**4,343**	**13,593**

[56] Average Farmer/Fisher Household Size is 3.13.

Table 26. The composite vulnerability index and other indices ordered according to vulnerability score for 111 developing countries (States ranked 1-24 are presented)

	Population	Real per capita GDP	Rank	Output Volatility Index	Rank	Composite Vulnerability Index	Rank
Vanuatu	161	2,500	53	3.61	90	13.295	1
Antigua and Barbuda	65	5,369	86	13.38	3	11.246	2
Tonga	93	3,740	73	13.18	4	10.439	3
Bahamas	268	16,180	110	7.37	25	10.433	4
Botswana	1,401	5,220	85	10.21	12	10.158	5
Swaziland	809	2,940	58	11.17	10	9.633	6
Gambia	1,042	1,190	27	7.67	22	9.331	7
Fiji	758	5,530	89	6.84	32	8.888	8
Maldives	236	2,200	47	2.97	97	8.654	9
Singapore	2,821	19,350	111	3.35	94	8.651	10
Solomon Islands	354	2,266	49	11.21	9	8.398	11
Dominica	71	3,810	76	6.12	41	8.122	12
Guyana	816	2,140	45	11.87	5	7.953	13
Djibouti	557	775	14	11.6	6	7.932	14
Grenada	92	3,118	61	6.89	31	7.848	15
Bahrain	535	15,500	109	5.22	61	7.748	16
Sao Tome	127	600	4	4.23	79	7.69	17
Jamaica	2,411	3,180	63	3.43	91	7.484	18
St Lucia	139	3,795	74	6.59	35	7.449	19
Samoa	167	3,000	59	6.92	30	7.371	20
Equatorial Guinea	379	1,800	39	11.26	8	7.029	21
Malta	361	11,570	106	2.36	107	6.857	22
Belize	204	4,610	82	9.63	15	6.652	23
St Vincent	11	3,552	69	6.08	43	6.563	24

Source: Table 2 Small states: a composite vulnerability index.

ctrc.sice.oas.org/geograph/caribbean/Vul_index.doc

Table 27

Admissions by type and Health District

Heath District	Gastro Enteritis	Acute Respiratory Infection	Undifferenti-ated Fevers	Injury	TOTAL
Roseau	113	48	26	3	190
Portsmouth	79	5	3	5	92
Grand Bay	28	8	6	15	57
St. Joseph	35	3	2	36	76
Marigot	43	0	3	0	46
La Plaine	6	3	1	1	11
Castle Bruce	12	4	1	2	19
TOTAL	**316**	**71**	**42**	**62**	**491**

Source: Estimates based on the Official GCOD data

Table 28 . Type of Injury by number of reported incidents

Type of injury	Frequency	Percent
Laceration	24	38.71%
Multiple abrasions	14	22.58%
Fracture	6	9.68%
Punctured wound	6	9.68%
Ankle sprain	1	1.61%
Non-specified injuries	11	17.74%
TOTAL	**62**	100.00%

Source: Ministry of Health

Table 29 . Selected Medium, Small and Micro Enterprises affected by TS Erika by Affected communities and area of economic activity

	Total	Bagatelle	Colihaut	Coulibistrie	Good Hope	Paradise Valley, Bath Estate	Petite Savanne	Petite Soufriere	Petite Soufriere/Fond Cole	San Sauveur	Savanne Park	Total
	2	0	0	0	1	0	0	0	0	0	0	3
Agriculture	0	0	0	0	13	0	0	0	0	1	0	14
Agro-processing	0	1	0	6	1	0	0	0	0	0	0	12
Agro-Processing	0	0	1	0	0	0	0	0	0	0	0	1
Entertainment	0	0	0	0	0	0	0	1	0	0	0	1
Farming	0	0	0	5	0	0	0	1	0	0	0	6
Fishing	0	0	0	9	0	0	0	0	0	0	0	11
Horticulture	0	0	0	0	0	0	0	0	1	0	0	1
Manufacturing	0	0	0	3	0	2	1	0	0	0	2	9
Retail	0	0	6	12	4	2	0	0	0	0	0	38
Retail/Services	0	0	0	0	0	0	2	0	0	0	0	2
Sector	0	0	0	0	0	0	0	0	0	0	0	9
Services	0	0	4	15	1	0	4	1	0	0	1	32
Tourism	0	0	0	0	0	0	0	0	0	0	0	1
	2	**1**	**11**	**50**	**20**	**4**	**7**	**3**	**1**	**1**	**3**	**140**

Source: CSO

TOURISM

Sector	Estimated Impact
Accommodation	$40,350,000
Dive Operators	2,413,575
Tour Operators	971,248
Vehicle Rentals	745,000
Food & Beverage Establishments	10,000
Sites & Attractions	4,557,650
Loss of Business (est.)	$2,000,000
Other Losses	$31,490,000.00[57]
	EC$83,891,200

Table 1. Damage and Loss to the Tourism Sector

PARISH	PROPERTY	DAMAGES	AMOUNT
St Georges	Anchorage Hotel	1.Loss of to one boat , along with life vests and other seaworthy materials –	EC$790,000
		2. At least 10 rooms and flooding occurred in main lobby areas.	EC$110,000
	Castle Comfort Lodge & Dive Dominica	Flooding from rains and river runoff.	EC$15,000
	Evergreen Hotel, Castle Comfort (Estimated by DDA)	Flooding from rains and river runoff.	EC$45,000
	Fort Young Hotel, Roseau	1. Extensive damage to their dive boat.	EC$2,000,000
		2. Damage to the jetty and boardwalk	
St Patrick	Jungle Bay	Completely destroyed	27,000,000.00
St David	Rosalie Bay	1. Extensive damage to grounds.	EC$4,000,000
		2. A 150ft riverside wall destroyed.	
		3. A 30ft portion of a front wall destroyed.	
		4. Damage to multiple appliances.	
		5. Undermining of spa room	
St Mark	Hide Out Cottage	1. Clearance of debris and damage to landscaped property	EC$23,900
		2. Assorted infrastructural damages	
		3. Solar energy equipment damaged.	
		4. Potable water infrastructure damage.	

[57] The Rapid Assessment included a loss estimate of EC$31,490,000.00 which were based on the projected variance in visitor expenditure over parallel periods after allowing for a (2%) nominal annual increase and a projected 8% decline due to TS Erika. It is assumed that loss of airlift from LIAT's reduced schedule inclusive of night landings at Douglas Charles airport, cancellation of the World Creole Music Festival etc. are included in this figure.

		5. Approximately 30 ft of land was washed away by the river.	

Table 2. Distribution of Damage and Loss in the Tourism Sector by Parish

Agricultural Tables

Table A1: Growth Rate of Agriculture and Total Gross Domestic Product (GDP)
Constant Prices (2006)

Description	YEAR											
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Crops, Livestock, Forestry	0.55	(9.19)	14.99	1.65	(7.92)	7.15	8.65	4.85	(1.36)	(20.58)	2.14	2.11
➢ **Crops**	(0.31)	(11.65)	18.85	1.90	(9.06)	8.76	9.48	4.82	(1.03)	(21.21)	2.12	2.18
▪ **Bananas**	1.15	(54.74)	66.87	(12.49)	(8.98)	26.07	(16.63)	(13.43)	(21.07)	(23.94)	(10.00)	5.00
▪ **Other Crops**	(0.66)	(1.18)	13.50	4.26	(9.07)	6.38	13.74	7.01	0.91	(21.00)	3.00	2.00
➢ **Livestock**	6.50	13.31	(7.55)	(0.41)	0.68	(5.04)	2.98	6.44	(5.49)	(20.00)	3.00	2.00
➢ **Forestry**	8.75	(6.77)	(5.96)	0.47	0.59	0.44	0.11	0.61	0.78	0.46	0.46	0.46
Fishing	23.90	25.83	(14.90)	3.88	(17.51)	11.78	(14.61)	(4.92)	38.73	(10.00)	4.00	2.00
Total Agriculture	**1.24**	**(7.92)**	**13.49**	**2.6**	**(8.29)**	**7.30**	**7.82**	**4.58**	**(0.33)**	**(20.19)**	**2.2**	**2.1**
Total GDP	3.75	4.38	6.92	(0.82)	0.74	1.03	(1.08)	1.70	3.42	(3.46)	5.68	2.90

Source: Central Statistical Office, Dominic and the Eastern Caribbean Central Bank (ECCB)

Table A2: Contribution of Agriculture to Total Gross Domestic Product (GDP)

Constant (2006) Prices

Description	YEAR											
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Crops, Livestock, Forestry	12.07	10.50	11.30	11.58	10.58	11.22	12.33	12.71	12.12	9.97	9.64	9.56
➢ **Crops**	10.57	8.95	9.95	10.22	9.22	9.93	10.99	11.33	10.84	8.85	8.55	8.49
▪ **Bananas**	2.07	0.90	1.40	1.23	1.12	1.39	1.17	1.00	0.76	0.60	0.51	0.52
▪ **Other Crops**	8.50	8.05	8.55	8.98	8.11	8.54	9.82	10.33	10.08	8.25	8.04	7.97
➢ **Livestock**	1.11	1.21	1.05	1.05	1.05	0.99	1.03	1.08	0.98	0.81	0.79	0.79
➢ **Forestry**	0.39	0.35	0.30	0.31	0.	0.31	0.31	0.31	0.30	0.31	0.29	0.29
Fishing	0.46	0.55	0.44	0.46	0.38	0.42	0.36	0.34	0.45	0.42	0.41	0.41
Total Agriculture	**12.53**	**11.05**	**11.74**	**12.04**	**10.96**	**11.64**	**12.69**	**13.05**	**12.57**	**10.39**	**10.05**	**9.97**

Source: Central Statistical Office, Dominic and the Eastern Caribbean Central Bank (ECCB)

Table A3 : Distribution of Agriculture Gross Domestic Product(GDP)

Constant (2006) Prices

Description	YEAR											
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Crops, Livestock, Forestry	106.61	96.81	111.32	113.16	104.20	111.65	121.31	127.20	125.46	99.65	101.78	103.93
➢ **Crops**	93.35	82.47	98.02	99.88	90.83	98.79	108.16	113.37	112.21	88.41	90.28	92.25
▪ **Bananas**	18.26	8.27	13.79	12.07	10.99	13.85	11.55	10.00	7.89	6.00	5.40	5.67
▪ **Other Crops**	75.09	74.21	84.23	87.81	79.85	84.94	96.61	103.38	104.32	82.41	84.88	86.58
➢ **Livestock**	9.84	11.15	10.31	10.27	10.34	9.82	10.11	10.76	10.17	8.14	8.38	8.55
➢ **Forestry**	3.42	3.18	2.99	3.01	3.03	3.04	3.04	3.06	3.09	3.10	3.11	3.13
Fishing	4.04	5.08	4.32	4.49	3.70	4.14	3.53	3.36	4.66	4.20	4.36	4.45
Total Agriculture	**110.65**	**101.89**	**115.64**	**117.65**	**107.90**	**115.79**	**124.84**	**130.56**	**130.12**	**103.85**	**106.14**	**108.38**

Source: Central Statistical Office, Dominic and the Eastern Caribbean Central Bank (ECCB)

Table A4: Educational Level of Farmers

Educational Level	%
No Schooling	**2.0**
Primary School	**84.9**
Secondary School	**9.3**
College/University	**3.8**
Total	**100.0**

Source: Dominica Agricultural Census, 1995.

Table A5: Number and Land Under Farms

Farm Size (Acres)	Number of Farms		Land Under Farms (000 Acres)	
	1961	**1995**	**1961**	**1995**
Landless	442	824	0	0
0.01 – 4.9	6405	6696	10.1	13.7
5.0 – 49.9	2087	2448	20.3	24.1
50.0 – 99.9	78	61	5.1	4.0
100 and over	97	71	40.8	16.2
Total	**9109**	**10100**	**76.3**	**58.0**

Source: Dominica Agricultural Census, 1995.

Table A6: Land Use in 1961 and 1995 Agricultural Censuses

Census Year	Total Acreage Under Farms (000)	Actual Land Use					
		Cultivated		Forest		Other	
		Acres	%	Acres	%	Acres	%
1961	**76.2**	**33.7**	**44.2**	**37.1**	**48.7**	**5.4**	**10.0**
1995	**58.0**	**35.8**	**61.7**	**16.4**	**28.3**	**5.8**	**7.1**

Source: Dominica Agricultural Census, 1995.

Table A7:

Land Tenure in 1961 and 1995 Agricultural Censuses

Land Tenure	1961		1995	
	Acres (000)	%	Acres (000)	%
Owned	72.8	95.5	37.8	65.1
Family Land			6.3	10.9
Rented	2.2	4.2	3.2	5.6
Squatted			1.0	1.7
Communal land			3.2	5.6
Other Tenures	0.2	0.3	0.8	1.3
Not Stated			5.7	9.8
Total	**76.2**	**100.0**	**58.0**	**100.0**

Source: Dominica Agricultural Census, 1995.

Table A8: Comparison of Main Livestock in 1961 and 1995 Agricultural Censuses

Livestock	1961		1995		Ration 1995/1961
	Number (000)	Average	Number (000)	Average	
Cattle	3.1	2.4	3.9	3.4	**1.258**
Goats	4.6	3.0	13.4	5.5	**2.913**
Sheep	2.5	2.4	4.1	4.6	**1.640**
Pigs	7.0	2.0	5.1	4.2	**0.729**
Chicken	43.4	9.5	74.2	24.0	**1.710**

Source: Dominica Agricultural Census, 1995.

Table A9: Composition of Farm holders in Dominica

Number of Individual Female Holders	1,937	19.2%
Number of Individual Male Holders	8,163	80.8%
Median Age of Individual Female Holders	52 years old	
Median Age of Individual Male Holders	46 years old	

Source: Dominica Agricultural Census, 1995.

Table A10: Number of Farms with Machinery and Equipment

Number of Farms with Machinery and Equipment	%
Motor Vehicles	12.6
Subsidiary Vehicles	0.5
Sprayers	71.1
Pumps	0.5
Seeding Equipment	0.2
Clearing Equipment	10.6
Processing Equipment	0.1
Augurs	1.3
Others	3.1
Total	**100.0**

Source: Dominica Agricultural Census, 1995.

Table A11: Main Purpose (destination) of Farm Produce

Main Purpose of Farm Produce	%
Only Home Consumption	**16.0**
Only Sale	**16.6**
Both	**67.4**
Total	**100.0**

Source: Dominica Agricultural Census, 1995.

Table A12: Main Source of Farm Income

Main Source of Farm Income	%
100 % from Farm	**29.5**
50-99% from Farm	**27.5**
1-49% from Farm	**43.0**
Total	**100.0**

Source: Dominica Agricultural Census, 1995.

Table A13: Farmer Use of Fertilizers and Agro-chemicals

Use of Fertilizers and Agro-chemicals	%
Organic Manure Fertilizers	26.2
Inorganic Fertilizers	78.9
Agro-chemicals	73.2

Source: Dominica Agricultural Census, 1995.