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SAINT LUCIA

**MACRO SOCIO-ECONOMIC ASSESSMENT OF THE DAMAGE AND LOSSES
CAUSED BY HURRICANE DEAN**

In collaboration with the Inter-American Institute for Cooperation on Agriculture (IICA).

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PREFACE

This report was prepared on the request of the Government of Saint Lucia following the passage of Hurricane Dean on 16 and 17 August 2007. The implications of the impact of Hurricane Dean posed a need, apart from the immediate humanitarian response, for a rapid assessment of the social and economic impact.

The assessment was carried out by using the Economic Commission for Latin America and the Caribbean (ECLAC) disaster assessment methodology. A limited sustainable livelihood approach explored the vulnerability context of the affected groups and is situated within the wider macroeconomic framework of the country.

This assessment will complement and expand on the emergency and humanitarian needs identified previously by the Government of Saint Lucia. The result of such an assessment provides a quantitative approximation of the overall damage to the economy and its impact on the affected population.

Baseline data for the conduct of the Macro Socio Economic Assessment are drawn from among official government data sets including: the Population and Housing Census 2001, the Survey of Living Conditions 2006, the Core Welfare Indicators Questionnaire (CWIQ) 2004, and other relevant data sets from the Government Central Statistical Offices, Ministry of Finance and Ministry of Planning and the Eastern Caribbean Central Bank (ECCB).

Mission components

The ECLAC mission was supported by the United Nations Development Programme (UNDP) Barbados SRO and the Inter American Institute for Cooperation on Agriculture (IICA). The ECLAC mission followed a joint IICA/Ministry of Agriculture assessment of the agricultural sector using the ECLAC methodology and benefited from the findings. The mission was undertaken from 5-11 September 2007.

The ECLAC team comprised:

Asha Kambon	ECLAC, Coordinator and Social Sector Specialist
Michael Hendrickson	ECLAC, Macro Economist
Vincent Little	IICA, Agriculture Specialist
David Smith	Coastal Zones and Infrastructure Specialist
Erik Blommestein	Tourism and Environmental Specialist

This report was made possible by the cooperation, coordination and support provided by the relevant government authorities. The national counterparts were coordinated by Ms. Aviva Fredericks, Deputy Chief Economist, Economic Planning, Ministry of Economic Affairs, Economic Planning, National Development and the Public Service. Technical support and ground logistics were coordinated by Ms. Una May Gordon, Representative of IICA, Saint Lucia office.

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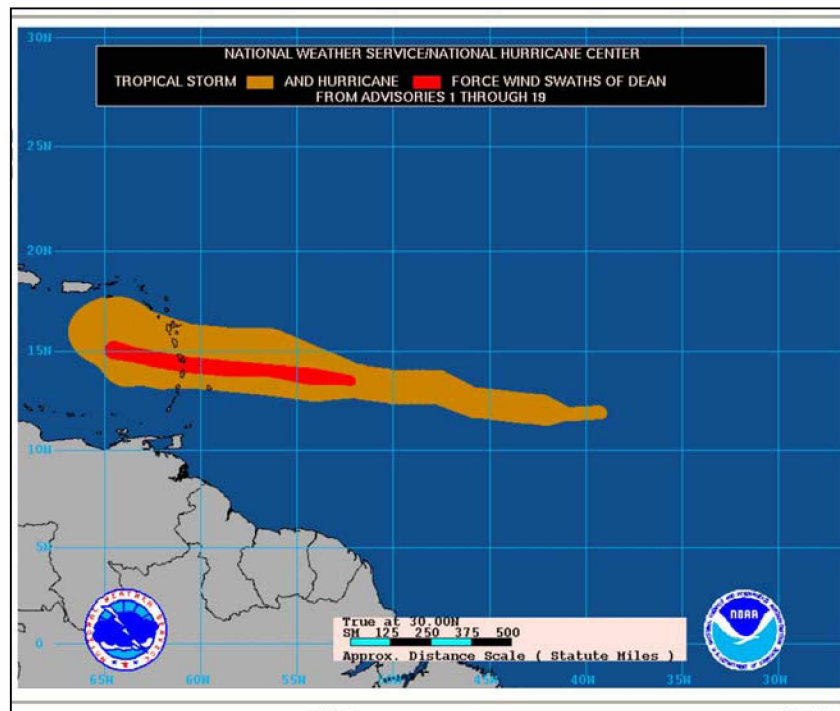
I. BACKGROUND

Saint Lucia, ‘the Helen of the West Indies’, lies roughly between 60 and 61 degrees west longitude and 13 and 14 degrees latitude. The island is situated in the Windward Islands 33.6 km (21 miles) north of Martinique, 40 km (26 miles) south of St Vincent and the Grenadines and 126 km (110 miles) northwest of Barbados. The total area of Saint Lucia is approximately 616 km² (238 square miles).

A. Description of the event

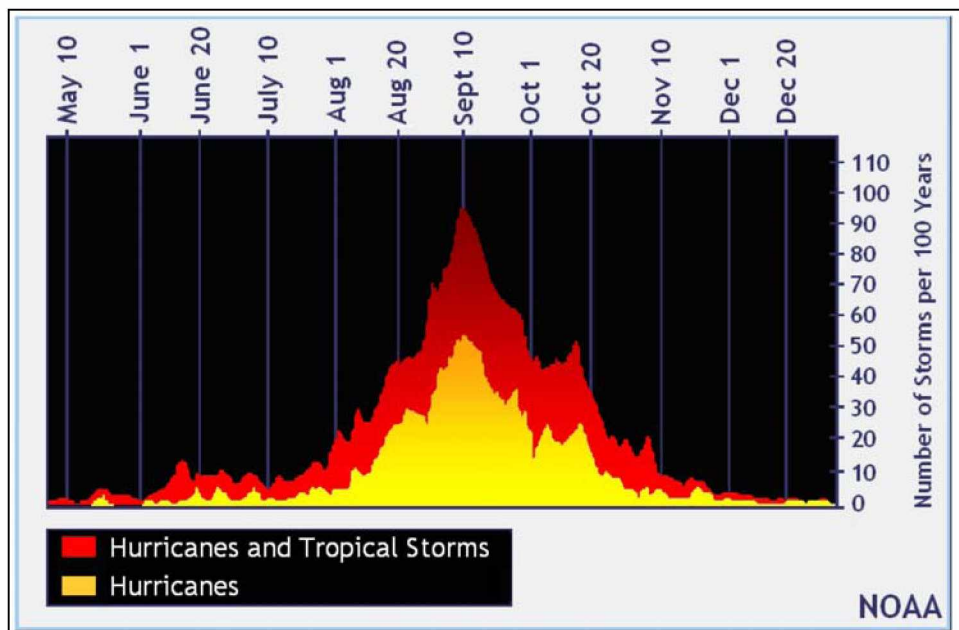
On Monday 13 August, the fourth depression of the 2007 hurricane season formed in the far eastern Atlantic Ocean. At 11:00AM EDT, the centre of this depression was located near to latitude 12.0° north and longitude 31.6° west, or about 520 miles west-southwest of the Cape Verde Islands (2000 miles east of the Lesser Antilles). At this stage, the depression was moving in a westerly direction at a speed of 21 mph, a motion that was expected to continue for the next 24 hours. Maximum sustained winds were near 35 mph, with higher gusts being observed. Strengthening of the depression was forecast by the National Hurricane Center, with the expectation that it could become a tropical storm over the next 24 hours. The minimum central pressure was estimated at that time to be 1005 MB or 29.68 inches of mercury.

MAP 1
PROJECTED CONE OF TROPICAL STORM AND HURRICANE FORCE WINDS
FROM START OF SYSTEM



By 5:00AM EDT on Thursday 16 August, the tropical depression had strengthened to a hurricane, with occasional glimpses of an eye in infrared satellite imagery. At this point, Dean was upgraded to the first hurricane of the 2007 hurricane season. Hurricane models called for Dean to become a major hurricane over the western Caribbean, although there was little change in strength predicted during the first 60 hours of the forecast. At that time, the centre of Dean was located near latitude 13.5° north, and longitude 53.3° west, or about 415 miles east of Barbados. It is interesting to note that a review of hurricane frequency of occurrence as a function of seasonality, as documented by the National Oceanic and Atmospheric Administration (NOAA), gives an indication of the historical occurrences of hurricanes in August, within the Caribbean basin. These historical records indicate that there is an expectation of one hurricane every three years in the middle of August. Generally, it now appears that the rate of occurrence of more intense hurricanes is on the increase.

FIGURE 1
HISTORICAL OCCURRENCES OF TROPICAL STORMS AND
HURRICANES THROUGHOUT THE SEASON



Source: NOAA

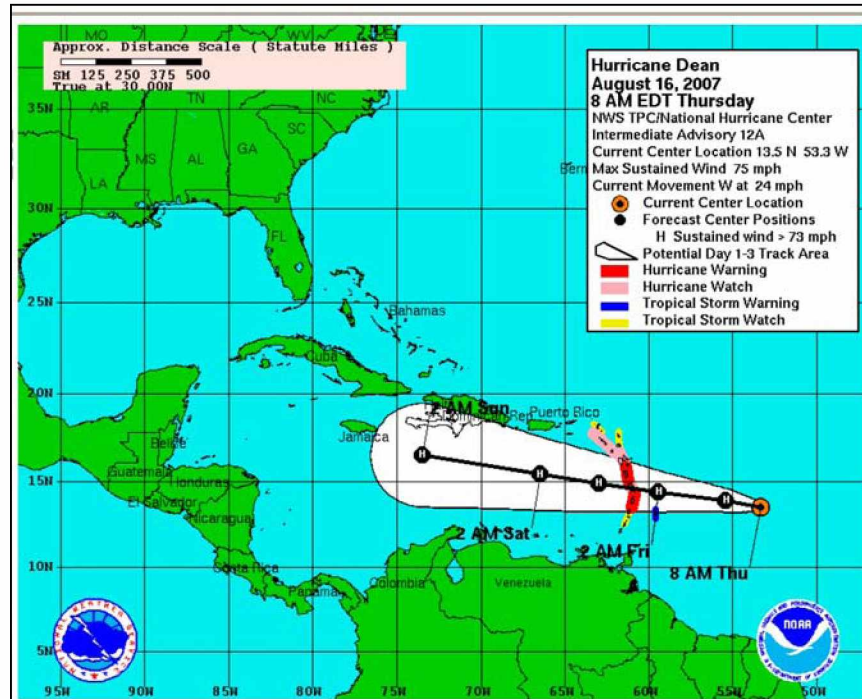
A hurricane warning continued in effect for the islands of Dominica and Saint Lucia, while a hurricane watch was posted for Martinique and Guadeloupe on 16 August. Hurricane Dean continued to move quickly towards the west at a speed of nearly 24 mph, a motion that was expected to continue for the next 24-hour period. This motion was expected to bring the centre of Dean near the Lesser Antilles on Friday 17 August.

Maximum sustained winds had increased by that time to 80 mph, with higher gusts being observed. This put Dean as a Category 1 hurricane on the Saffir Simpson scale, with additional strengthening forecast over the next 24 hours. Hurricane force winds extended outward up to 25 miles, with tropical force winds extending outwards up to 70 miles. The estimated minimum

central pressure by that time was 985 MB, or 29.09 inches. Storm surge predictions were of the order of 2-4 ft above normal tide levels, accompanied by large and dangerous waves.

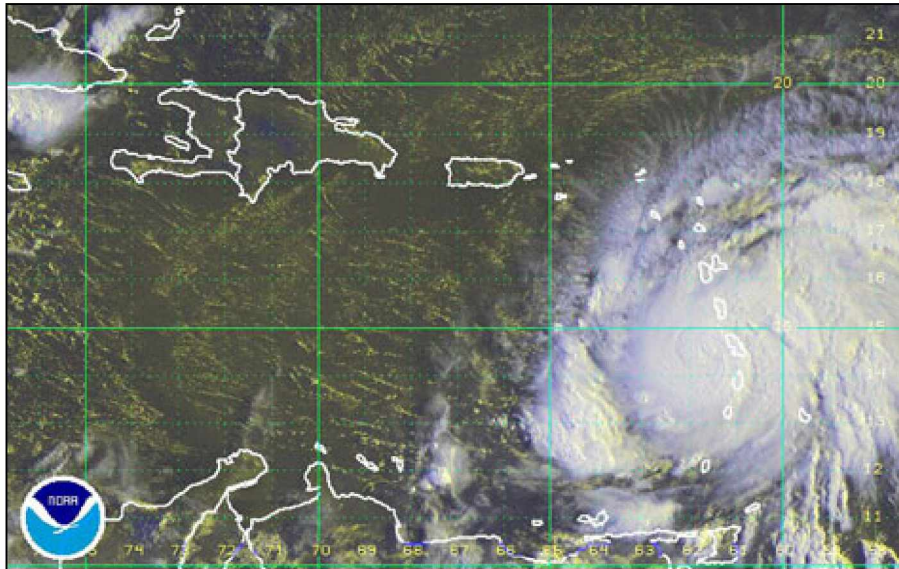
Even as a less intense hurricane, Hurricane Dean caused some concern in the Lesser Antilles, because of its direct approach direction.

MAP 2
FORECAST TRACK PROJECTIONS FOR HURRICANE DEAN
AS OF 8:00 A.M. EDT ON 16 AUGUST 2007



By the morning of Friday 17, the centre of Dean had crossed the Lesser Antilles between Saint Lucia and Martinique. The meteorological service of Martinique reported sustained winds of 76 mph, with gusts up to 104 mph. The minimum pressure in the eye was measured at 964MB. The latest imagery also showed a definite eye feature. The official forecast called for strengthening as Dean crossed the Caribbean Sea.

MAP 3
VISIBLE SPECTRA SATELLITE IMAGE TAKEN JUST AFTER THE EYE OF HURRICANE DEAN PASSED BETWEEN SAINT LUCIA AND MARTINIQUE

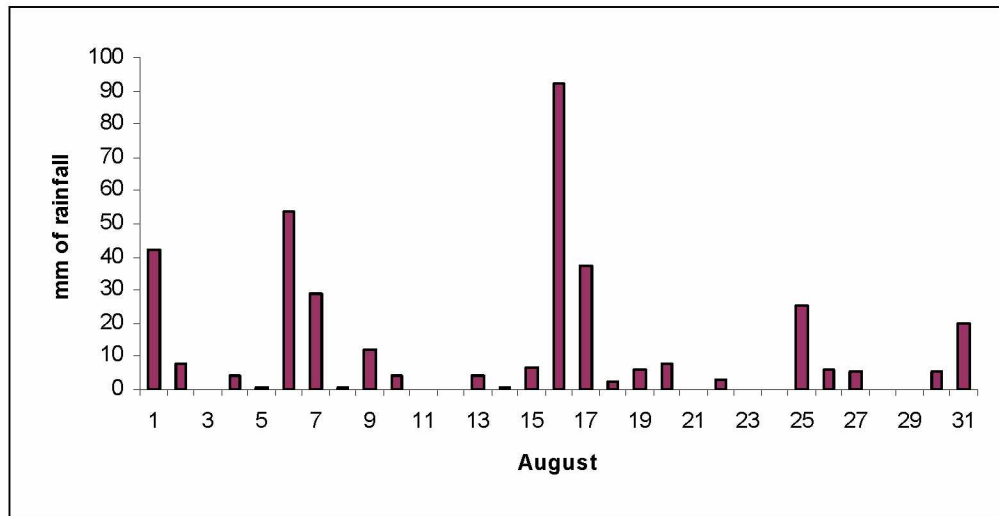


Source: NOAA

Because of the direction of approach, the northern and eastern sections of Saint Lucia were more exposed to damage in the early stages of the passage of the hurricane, while the western and southern areas were affected once the system had moved to the east. During the day, Dean continued to batter Martinique and Dominica, with lesser effects being felt in Saint Lucia. Air Force Hurricane Hunter aircraft located the hurricane near latitude 14.4° north and longitude 61.7° west, or 50 miles west-southwest of Martinique, and moving in a westerly direction at a speed of 23 mph. Maximum sustained winds increased to 100 mph, with higher gusts being observed. Hurricane force winds extended outwards up to 25 miles, and tropical force winds outwards to 140 miles.

Rainfall records collected from the gauge at the George Charles Airport reveal that on 16 August, a total of 92.1 mm of rain fell. This was as a direct result of the passage of Hurricane Dean, and should be compared with the minimum and maximum limits previously recorded at this station, of 24.7mm and 31.8mm, respectively. Notwithstanding the amount of rainfall that fell, it is not considered that Hurricane Dean was accompanied by an excessively large amount of rainfall. The following figure following shows a plot of the rainfall for that month. The bar chart shows that the week before the hurricane, there was little or no rain, a fact that would certainly have helped to reduce the incidence of landslides, since the ground would not have been saturated.

FIGURE 2
RAINFALL DATA FOR AUGUST 2007,
GEORGE CHARLES AIRPORT



Source: Meteorological Office of Saint Lucia.

B. Emergency actions

The Regional Response Mechanism coordinated by the Caribbean Disaster Emergency Response Agency (CDERA) was placed on standby on Tuesday 14 August 2007, in the wake of the threat posed by Hurricane Dean. As Hurricane Dean approached Saint Lucia, the Director of the National Emergency Management Organization (NEMO) went on radio to inform the public of the need to be fully prepared for the impending storm. Cable TV stations also provided updates on the progress of the hurricane. NEMO was activated to provide relief and assistance after the passage of the hurricane.

Fortunately, the hurricane did not warrant the housing of a large number of persons in shelters. Indeed, only two main shelters were operated – one in Dennery South that housed 18 families and the other in Vieux Fort South that housed 10 families. These persons, who were among the most vulnerable in their communities, were provided with food, lodging and other necessities.

Indications are that initial donor relief assistance was not extensive. The United States Agency for International Development/Office of Foreign Disaster Assistance (USAID/OFDA) committed US\$40, 432 to aid in the relief and recovery and assistance was expected from the European Union and the United Nations Office for the Coordination of Humanitarian Affairs (OCHA).

II. THE METHODOLOGICAL APPROACH

A. Sustainable Livelihoods Approach (SLA)

This assessment applied a limited Sustainable Livelihoods Approach (SLA)¹ to the process. The SLA is based on two concepts, sustainability and livelihoods. Livelihoods refer to the capabilities, assets and activities required for a means of living. It is understood that for livelihoods to be considered sustainable, they should demonstrate:

- (a) Resilience in the face of external shocks and stresses;
- (b) Capacity to maintain the long-term productivity of natural resources; and
- (c) Ability not to undermine the livelihoods of, or compromise the livelihood options open to others.

The goal of the SLA is to eradicate poverty through six objectives. These are:

- (a) Improved access and management to natural resources;
- (b) Improved access to high-quality education, technology, nutrition and health;
- (c) A more supportive and cohesive social environment;
- (d) Improved access to infrastructure;
- (e) Improved access to financial resources; and
- (f) A policy and institutional environment to promote multiple livelihood strategies and equitable access to competitive markets.

The disaster assessment using the SLA sought to ascertain:

- (a) Where were the affected communities located;
- (b) Which households were affected (how many and to what extent);
- (c) What were the damage and losses suffered by each household with regard to their assets;
- (d) How were their income-earning activities affected?
- (e) What would it take to get them back up and running;

¹ The Sustainable Livelihoods Approach (SLA) was developed by the Department for International Development (DFID), for further information see www.livelihoods.org.

- (f) What assistance was required to build resilience and reduce future risk; and
- (g) What would it take to make the livelihoods of the affected households sustainable?

The unit of analysis for the SLA is the household. To ensure a rigorous undertaking, sound household data disaggregated by the basic demographic characteristics of age, sex of the head of the household, family structure, education levels, health status, livelihoods/income streams and expenditures are required. The sources of baseline data are the country's most recent population and housing census, the survey of living conditions, the Core Welfare Indicators Questionnaire (CWIQ) and the most recent agriculture survey. The livelihoods analysis seeks to gain an accurate and realistic understanding of the strengths (assets or capital endowments) of households and how these assets are converted into positive livelihood outcomes.

In undertaking a rapid assessment of livelihoods, as needs to be done following a natural disaster, the methodology involves key informant interviews and group interviews which seek to ascertain the processes of the primary, secondary and tertiary income-earning activities of the households in the affected areas; and the structures, contributors and beneficiaries of the household's current livelihoods. Such an assessment seeks also to understand how each activity has been affected by the recent disaster. Finally, a gender analysis is applied to understand the differential impact of the disaster on the livelihoods of men and women. From such a comprehensive analysis, recommendations that will support sustainable livelihoods follow.

B. The vulnerability context

The districts which, according to the assessment, have been most severely affected are Castries sub-urban (rural), Anse La Raye, Vieux Fort, Dennery and Micoud which share a number of characteristics that increase the susceptibility of persons in those districts to the impact of natural hazards. Among them are their dependence on agriculture and fishing as the main source of income, the low lying coastal nature of their settlements, and the rivers which run through, making these districts prone to flooding.

However, not all households in the five districts that were heavily impacted by Hurricane Dean found themselves susceptible, or uniformly susceptible, to the effects of the event. As table 1 indicates, the populations that live in these districts, even before Dean, possessed different vulnerability profiles, based on their poverty or non poverty status and living conditions. Of the people living in Anse La Raye, for example, some 71 per cent were deemed to be already vulnerable, before Dean struck.

**TABLE 1:
CHARACTERISTICS OF POPULATION AFFECTED BY THE IMPACT OF HURRICANE DEAN**

Administrative Districts	Population	% indigent	% poor but not indigent	% Vulnerable	% Technically vulnerable	Number of people technically vulnerable
Castries Sub-urban (rural)	51,100	0.6	21.6	16.8	39.0	19929
Anse - La - Raye	10,287	5.3	39.6	26.1	71.0	7304
Vieux Fort	14,096	4.8	18.2	15.4	38.4	5413
Dennery	11,986	.	34.2	16.9	51.1	6113
Micoud	18,071	4.1	39.5	13	56.6	10228
Total	105,540					48987
All St. Lucia	164,842	1.6	27.2	16.2	45.0	74179

Source: Draft Report: The Assessment of Poverty in Saint Lucia, 2006 and ECLAC estimates based on official GOSLU data

From the data collected, it is possible to ascertain that the major damage caused by Dean was inflicted on the agricultural sector. In that regard it is not surprising that the most significant group of persons affected by the hurricane would be farmers. As a consequence of Hurricane Dean, one person, a farmer, rescuing his cow from a flooded river, lost his life. Preliminary data from the Agricultural Census, 2007, is presented in table 2.

**TABLE 2:
POPULATION IN THE AGRICULTURE SECTOR SEVERELY AFFECTED BY HURRICANE DEAN**

Population	Male	Female	Total	Average HH size all STL
Individual farm holders	9620	3494	13114	
Most vulnerable farm holders	4329	1572	5901	
Average HH size of rural families	3.8	4		3.9
Vulnerable persons in the farming sector	16450	6288	22738	
Percentage of the population of farm holders	72%	28%	100%	

Source: Preliminary data from Agricultural Census data 2007 and Draft Poverty Assessment 2006

Based on preliminary data it can be ascertained that some 22,738 persons or 47 per cent of the population already deemed vulnerable were severely affected by Hurricane Dean. Of those, males appeared to outnumber females 3:1. This may have to do with fact that there are significantly larger proportions of farms held by males than females, and the severely affected population came mainly from among the farming community. When all persons affected by Hurricane Dean are taken into consideration the number increases slightly as presented in table 3.

**TABLE 3:
TOTAL POPULATION SEVERELY AFFECTED BY HURRICANE DEAN**

Description	Number
Population severely affected from the agricultural sector	22738
Population severely affected due to damage and destruction of Homes and Possessions	429
Totals	23167
Source: ECLAC estimates based on official GOSLU data	

We can conclude, therefore, that Hurricane Dean has severely affected some 14 per cent of the total population of Saint Lucia and some 13 per cent of its households as detailed in table 4.

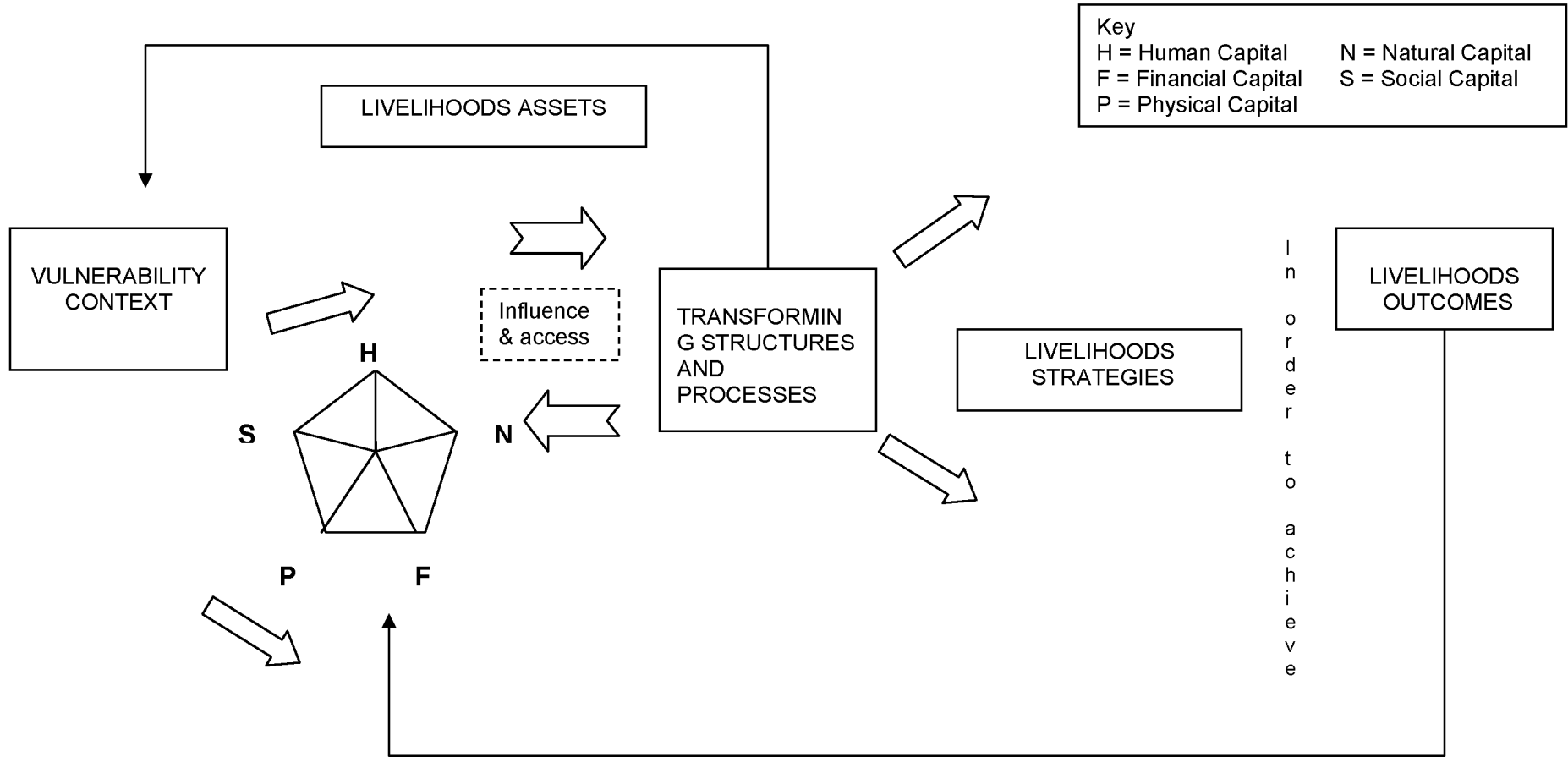
**TABLE 4:
PROPORTION OF POPULATION AFFECTED**

Percentage of total Vulnerable population	47%
Percentage affected as a proportion of the total population of STL	14%
Percentage of affected households as a proportion of total households in STL	13%
Source: ECLAC estimates based on official GOSLU data	

The government acknowledges that the rural population faces greater challenges than their urban counterparts, particularly as it relates to access to social services and the generation of economic opportunity. There are also differences found in the stock of human and social capital, in poverty levels, in education, in health and also in the social structure of households and their size.

Highlighting and clarifying these differences improves the chances of developing programmes and projects that can lead specifically to the reduction of risk and the increase of resilience to future hazards.

FIGURE 3
SUSTAINABLE LIVELIHOODS FRAMEWORK



C. The elements of vulnerability present in the districts affected

1. Human and social capital

Human capital represents the skills, knowledge, ability to work and good health that together enable people to pursue different livelihood strategies; and the term social capital has been used to refer to the social resources upon which people draw in pursuit of their livelihood objectives.²

The regions declared a disaster zone are similar in that their populations reside in what has been defined as the rural coastal parts of the country. It is in these rural environments that one often finds the paradox of strong social capital coupled with weak human capital. Many rural communities are deeply rooted and maintain strong bonds and trust among household members and households. These characteristics prove useful in preserving lives and sharing the burden of a natural disaster. Unfortunately the weak human capital may mean that persons possess a narrow skill base that is not easily transferable, or low levels of educational attainment may be evident in heads of households. Such uneven combinations of social and human capital may challenge the best capacities for resilience of a people.

Data from the 2001 Population and Housing Census Report, as presented in table 5, suggest that approximately 40 per cent of the household population lives in Castries and that, together with Anse la Raye, Vieux Fort, Micoud and Dennery, all these districts experienced some increase in their household populations. On the other hand, districts such as Canaries, Soufriere, Laborie and Choiseul all contracted. These changes in population suggest a general migration pattern from rural to urban areas. Social capital may be affected by such migration patterns as people lose the bonds which give deeper meaning to life.

**TABLE 5:
POPULATION CHANGE BY DISTRICT, 1980-1991 AND 1991-2001**

Districts	1980 HH pop	1991 HH Pop	2001 HH Pop	% Change 80-91	% Change 91-01
Castries	42,964	51,994	60,390	21.0	16.1
Anse la Raye	4,971	5,035	5,954	1.3	18.3
Canaries	2,085	1,799	1,741	-13.7	-3.2
Soufriere	7,295	7,683	7,337	5.3	-4.5
Choiseul	6,498	6,405	5,993	-1.4	-6.4
Laborie	6,889	7,491	7,329	8.7	-2.2
Vieux Fort	10,957	13,140	14,561	19.9	10.8
Micoud	11,934	15,088	15,892	26.4	5.3
Dennery	9,652	11,168	12,537	15.7	12.3
Gros Islet	10,164	13,505	19,409	32.9	43.7
SAINT LUCIA	113,409	133,308	151,143	17.5	13.4

Source: Saint Lucia Population Housing Census 2001, Table 7

² DFID Sustainable Livelihoods Guidance Sheets 1999.

Saint Lucia, as indicated by the 2001 Population and Housing Census, has a population that is steadily shifting from the rural to the urban areas as detailed in table 5. Such a rural to urban drift, if not halted, brings with it attendant social ills evidenced by crime, overcrowding and over-burdened health and sanitation facilities. In a 2004 survey conducted in Saint Lucia³, 6 per cent of households reported being a victim of crime in the past year, an increase from the 2001 population and household census, when a 4 per cent level of crime was reported in the census. One of the negative consequences of the impact of Hurricane Dean may be increased flight from the rural communities, unless measures are taken to encourage and facilitate the sustainable livelihoods of the populations of those communities.

2. Poverty

Among the indicators most often correlated with vulnerability is poverty. Examining poverty can often lead to an analysis of the strength or weakness of the human capital in a household or a community. The poorest have been found to be the least able to rebound from the effects of a natural disaster as they possess the least assets and often those assets are not of a diverse enough nature that would allow them to spread the risk during difficult times.

The relevant data for poverty has been presented in table 1. Additional poverty data indicates that, some 28 per cent of the population was estimated to be poor⁴ and 1.6 per cent was considered to be indigent. Another 16.2 per cent, however, was reported to be vulnerable⁵, but not poor. The report concluded that some 46.6 per cent of the population were technically vulnerable and “could be affected by the volatility of income and other vicissitudes”.

The passage of Hurricane Dean and the resultant damage to the agricultural sector which provides a livelihood to a significant proportion of the population of Saint Lucia, may just be that “other vicissitude(s)” which the poverty assessment was considering. There is little doubt that Dean may increase the precarious living conditions of those persons already burdened with the challenges of poverty. More importantly, however, Dean’s passage may increase the vulnerability of those persons whose life chances were dependent on the agricultural sector and shift them, from among the vulnerable, to be counted among the poor, if not provided with adequate and timely support.

Data from the Poverty Assessment Report, presented in table 1, indicates that poverty in three of these regions, Anse la Raye (44.9 per cent), Micoud (43.6 per cent) and Dennery (34.2 per cent) were well above the national average, of 28.8 per cent, for Saint Lucia. The data also suggest that levels of technically vulnerable people in these five administrative areas were, prior to Hurricane Dean, over 50 per cent in three out of the five regions, with one, Anse la Raye, having some 71 per cent of its population being deemed ‘technically vulnerable’.

³ The Core Welfare Indicators Questionnaire Survey (CWIQ) Pilot 2004 Saint Lucia.

⁴ The poverty line per adult was estimated, by the Report to be, EC\$13.93 (US\$5.22) daily or EC\$423.83 (US\$158.74) monthly or EC\$ 5,086 (US\$ 1,904.87) per annum. The estimate for the indigence line was EC\$3.40 (US\$ 1.27) daily or EC \$131 (US\$ 46.06) per month or EC 1,570 (US\$ 588.02) annually.

⁵ The Report uses an estimate of 33 per cent above the poverty line as the criterion of vulnerability, suggesting that 46.6 per cent of the population would be deemed vulnerable.

Another aspect of poverty in Saint Lucia has to do with the fact that persons found to be living below the poverty line are disproportionately young in comparison to the proportion of youth in the general population. Some 51 per cent of those living below the poverty line are below the age of 20. Among the non-poor, the corresponding figure was 37 per cent.

With reference to children aged 0-14 years, the poverty report suggested that Micoud had the largest proportion of indigent poor 32.9 per cent, followed by Anse la Raye, 26.8 per cent.

**TABLE 6:
SELECTED HDI AND INEQUALITY FOR SELECTED CARIBBEAN COUNTRIES**

Indicators	BGI	BZE	GRN	GUY	JAM	SKN	STL	SVG	T&T
Life Expectancy at Birth	76.9	71.7	65.3	65.5	75.5	70.0	72.2	73.8	71.5
Adult Literacy	99.7	93.4	94.4	98.6	87.3	97.8	90.2	88.9	98.4
Gini Index	0.39	0.04	0.45	0.413	0.399	0.397	0.50	0.56	0.393
Source: ECLAC, CCSDs; Guyana Survey of Living Conditions (2000); 2002 Census of Population and Housing of Guyana									

It must be remembered that not all households were as susceptible to the disaster and this may have to do with the differences in their asset base. The Gini coefficient provides an indication of the extent of the relative disparity in income distribution. Despite its known inadequacies as a measure of inequality in income distribution, it is still considered one of the most useful measures available. Latin American and the Caribbean region, as a whole, is considered to have the highest inequality in comparison to other regions in the world. In Latin America the Gini Co-efficient ranges from 0.42 (Uruguay) to 0.59 in Brazil. As table 6 suggests the Gini Coefficient for Saint Lucia stands at 0.50 placing it among those societies in the Caribbean with the highest income inequality.

3. Vulnerability of women and children

The vulnerability of women and their children derives in the main from their relative poverty and the burden of care or the disproportionately large size of female-headed households, in comparison to those of their male counterparts. Female-headed households comprise some 40 per cent of all households in Saint Lucia and of all households with six and more persons, female-headed households account for 39 per cent.⁶

In addition to size of household is the multi generational nature of many female-headed households and the patterns of early childbearing found among poor females, which leads to large family size. The Assessment of Poverty in Saint Lucia, Draft Report 2006, suggested that households with single parents and three generations are particularly at risk of poverty. This was due to high rates of fertility found among poor young adolescents who began child bearing earlier than their non poor counterparts.

⁶ Source: Compiled by the CARICOM Secretariat from (i) 1980-1981 Population and Housing Census of the Commonwealth Caribbean- National Reports, (ii) 1990-1991 Population and Housing Census of the Commonwealth Caribbean-Volume of Basic Tables for Sixteen CARICOM Countries, Regional Census Office, Trinidad and Tobago, and (iii) data provided by Member States.

It is of some significance that the areas which were most affected by the impact of Hurricane Dean had very high proportions of its population deemed technically vulnerable as detailed in table 1.

Added to these issues are those of the gender wage gap prevalent in most Caribbean islands, the low levels of certification (the Poverty Assessment Report indicated that among poor persons 64.5 per cent had no certification as opposed to 46.7 per cent among the non-poor) and the lack of skills outside of the traditional areas of work, found among poor females which together, work to increase women's susceptibility to natural disasters. The results of the CWIQ conducted as a pilot study in Saint Lucia in 2004, suggested that 25 per cent of all female-headed households fall into the poorest quintile, compared to 18 per cent of male-headed households. Half of female heads of households also reported as unemployed. The results also suggested that female-headed households were less likely to own assets such as land, housing or vehicles (61 per cent compared to 65 per cent of male-headed, 76 per cent compared to 80 per cent and 14 per cent compared to 34 per cent). In regard to unemployment, there was a significant gender difference with a 14 per cent unemployment level for males, yet a 25 per cent level for females. Youth unemployment is markedly higher at 39 per cent, and female youth especially high at 44 per cent.

Children were considered at a disadvantage as the CWIQ Report suggested that the proportion of children living without one or both of their parents is high at 62 per cent. However in regard to reproductive health Saint Lucia's record is generally positive. Nearly all (96 per cent) of women who had a live birth in the year preceding the survey had pre-natal care. Of all babies borne in the last five years, only 2 per cent were not delivered at a hospital/maternity home and with professional care. Teenage pregnancy was low at just 3 per cent of all live births in the past year, however, for the urban poor this proportion was higher at 9 per cent. Most under-five children (95 per cent) participated in the three standard six-week and eight-month development assessment programmes. Vaccination rates were high at over 90 per cent for DPT1, two and three, BCG and Polio 1, 2 and 3. 7.5 per cent of children under five were reported as having had no vaccinations.

Box 1 displays a number of selected issues which, if not taken into consideration may act to increase susceptibility to natural disasters, such as those posed by Hurricane Dean, in Saint Lucia.

BOX 1
ISSUES THAT MAY INCREASE SUSCEPTIBILITY TO NATURAL DISASTERS IN SAINT LUCIA

- High levels of Poverty and indigence in coastal communities;
- Threats to Loss of competitiveness in the tourism sector;
- High levels of Debt
- Low levels of certification of the population;
- Limited training and general education of the population dependent on agriculture;
- High burden of care, of female heads of households with limited resources;
- Roadways on the coast
- Low levels of profitability and viability of the farming systems;
- Small acreage of land cultivated by most farmers especially “other crop” farmers;
- Narrow economic base within which people make their livelihoods;
- Weak financial risk management mechanisms;
- Limited opportunities for economic diversification resulting in an increasing rural to urban migration;
- Threats to the environment caused by pollution of water resources from human faeces, seepage of agricultural chemicals, dumping of garbage.

III. ANALYSIS OF THE AGRICULTURAL SECTOR

A. Agriculture

The impact of Hurricane Dean was widespread throughout the island inflicting significant damage to the agricultural sector, in general, and the banana industry in particular. According to preliminary estimates provided by NEMO the destruction to the banana industry ranged from a low of 40 per cent in the Belle Vue (Region 5) area to a high of 85 per cent in the Roseau Valley (Region 7) area.

1. Agro-ecological environment

Saint Lucia has a tropical maritime climate tempered by the influence of the ocean and the north easterly trade winds. Daily temperatures range from 18-32 degrees C, with relative humidity ranging between 70 to 77 per cent. Rainfall patterns in Saint Lucia are highly dependent on elevation. High levels of rainfall (over 150 inches) occur in the mountainous interior, whereas the low lands in the south and north receive less than 60 inches (1,524 mm) per year. Rainfall in the dry season (January to May) is approximately 1/5 (20 per cent) of yearly total.

The variation in rainfall distribution has the following implications for agricultural production in Saint Lucia:

- (a) Production of rain-fed crops, especially vegetables, is seasonal.
- (b) Prices of locally grown produce fluctuate widely, coinciding with a period of glut or scarcity; and
- (c) Irrigation is essential if a constant level of production is to be maintained throughout the year.

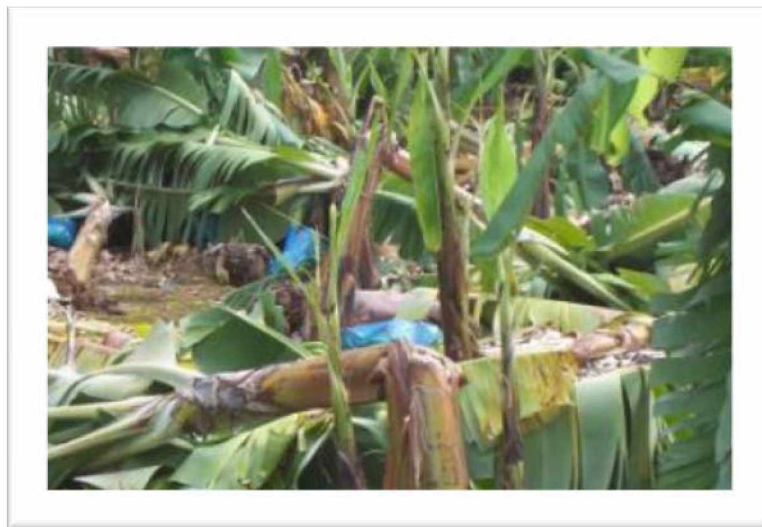
The island has a steep, mountainous topography except in the south and extreme north. Saint Lucia is crossed by a central mountain ridge running axially south-southwest to north north-west which causes a radial drainage pattern with rivers running to coasts on either side of the island.

Three main physiographic areas are distinguished. The first comprises the central, eastern and northern parts of the island, which have mature relief and alluvial valleys (Roseau, Cul De Sac, Fond D'or and Marquis); peaks range from 200 feet in the north to 1,800 feet in the center. The second area is the mid western section, starting south of Roseau Valley and extending 5 miles inland up to the Pitons; the area includes the highest and most precipitous mountains (Mount Gimie – 3,117 feet, Piton Canarie – 3,012 feet, Paix Bouche – 2,445 feet) and youthful landforms. It contains the only active Soufriere (hot water sulphur spring) on the island. The third region, located in the southwestern section of Saint Lucia, is characterized by a fan-shaped flacis sloping gently seaward, deeply-cut by narrow gorges.

The ecology of Saint Lucia is extremely diverse; vegetation ranging from cacti to giant evergreen forest trees is found within a few miles. Five life zones and two transitional life zones are identified. Their arrangement is almost that of concentric rings, as a result of rainfall increases towards the mountainous centre of the island. The major life zones are:

- (a) Tropical dry forest;
- (b) Tropical dry forest transition to tropical very dry forest;
- (c) Tropical moist forest;
- (d) Sub-tropical moist forest;
- (e) Sub-tropical west forest;
- (f) Sub-tropical west forest transition to sub-tropical rain forest; and
- (g) Tropical rain forest.

It is against this background of the agro-ecological environment of Saint Lucia that Hurricane Dean and its impact on the country must be assessed.



Damaged banana plants at the Roseau Valley

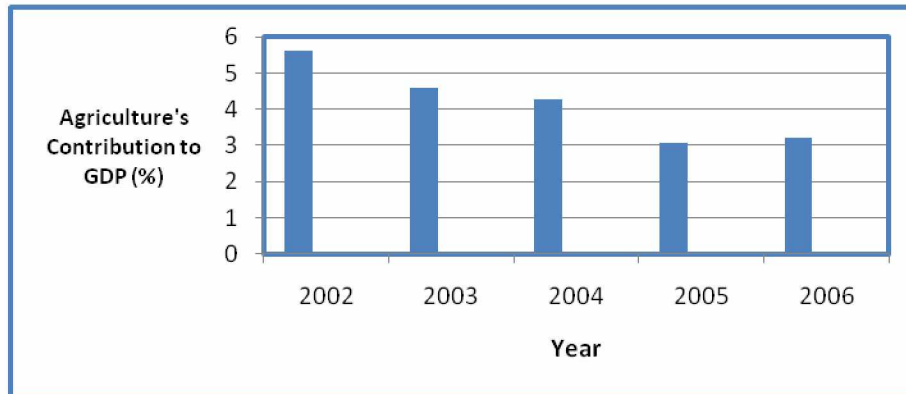
B. Performance of the agricultural sector

The agricultural sector continues to be a critical sector in the economy of Saint Lucia and although its contribution to GDP has been steadily declining over the last five years, it continues to play a significant role in the country's socio-economic development. The sector plays a multi-

functional role in earning foreign exchange, generating employment, and contributing towards economic growth and food security.

In 2002, for instance, the sector accounted for 5.62 per cent of total GDP, compared with 3.08 per cent and 3.20 per cent in 2005 and 2006, respectively. Agriculture’s contribution to total GDP for the period 2002 to 2006 is presented in figure 4.

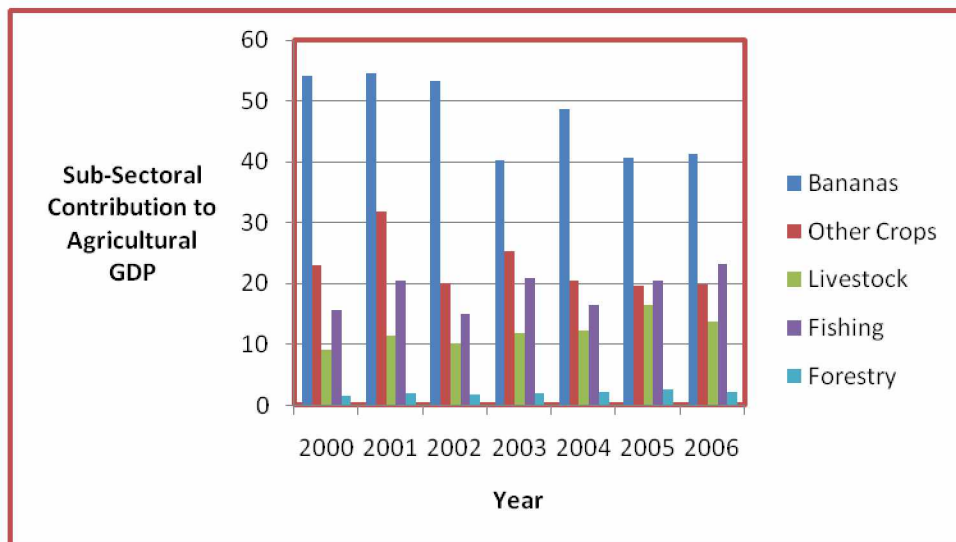
FIGURE 4
AGRICULTURE’S CONTRIBUTION TO GDP (2002-2006),
1990 CONSTANT PRICES



Source: ECLAC estimates based on official GOSLU data:

The contribution of the various subsectors to total agricultural GDP is presented in figure 5, which clearly demonstrates the importance of the banana industry to the agricultural sector.

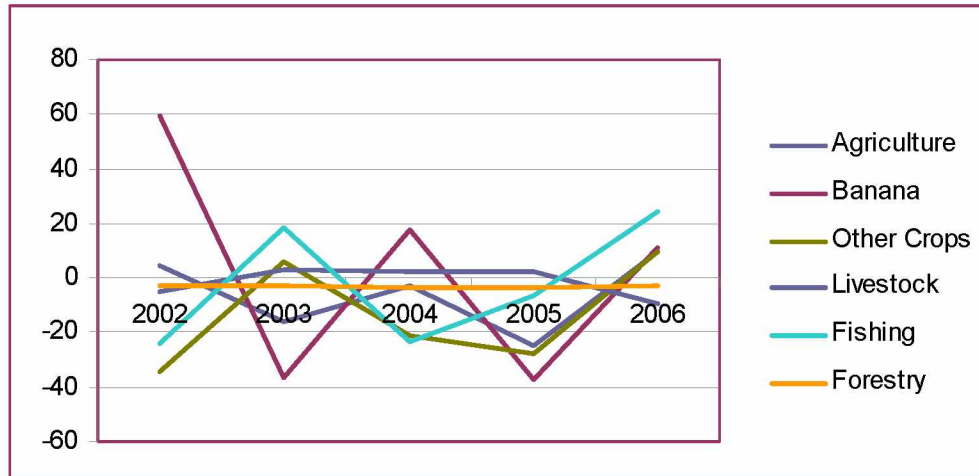
FIGURE 5
CONTRIBUTION TO THE AGRICULTURAL SUB-SECTORS TO TOTAL AGRICULTURAL GDP



Source: ECLAC estimates based on official GOSLU data:

For the period under review, the graph shows growth in the relative contribution of the livestock, fishing and forestry subsectors; the relative contribution of the “other crops” subsector fluctuated over the period with a tendency to decline. Figure 6 presents the growth rate in the agricultural sector as well as the various subsectors for the period 2002 to 2006.

FIGURE 6
AGRICULTURE AND SUB-SECTORAL GROWTH RATE, 2002 TO 2006



Source: ECLAC estimates based on official GOSLU data

The 9.8 per cent growth rate recorded for the agricultural sector in 2006 was as a result of strong growth in the banana industry, following a decline of 37.2 per cent in the subsectors' contribution to GDP in 2005.

The improved performance of the banana subsector was recorded against the negative impact of falling banana prices in the European market as a result of increase imports into that market occasioned by the new European Union Banana Regime. The application of modern technology and good weather contributed significantly to higher export levels of bananas experienced in 2006 compared to 2005. In 2006, Saint Lucia provided more than 54 per cent of the Windward Islands' share of bananas to the United Kingdom market, despite an increase in exports from the other three countries.

The Government of Saint Lucia has adopted the stance of the other banana growing countries of the Eastern Caribbean States and reaffirmed its position that the banana industry was of extreme importance in the economy and the welfare of rural communities. As such, the industry continued to be seen as critical in the economic development process of Saint Lucia. Accordingly, the Ministry of Agriculture, Forestry and Fisheries and the Banana Emergency Recovery Unit continued to implement measures to enhance the viability and sustainability of the industry.

The non-traditional “other crops” subsector grew significantly in 2006 with increases in exports and local purchases by hotels and supermarkets. Despite the above, the performance of non-traditional agriculture is still a long way from bridging the gap created by the decline in the

banana industry. In many ways, the sector is a mix of challenges and opportunities and remained an important development issue for Saint Lucia.

The livestock sector which is small and dominated by the poultry and pork industry declined significantly by 9.7 per cent in 2006. The Pork Producers Association in Saint Lucia is currently developing a strategic business plan which is aimed at the revitalization and expansion of the industry.

Access to credit by the agricultural sector for investment and working capital continues to be a major national issue, with financing to sector in 2003 accounting for only 2.0 per cent of commercial bank credit. During 2004, the credit crunch continued as there was a 3.1 per cent contraction in credit issued by the commercial banks to EC\$33.4 million. The contractions in credit to the sector continued in 2005 and 2006.

Chronic vulnerability of Saint Lucia to drought and tropical storms/hurricanes has also plagued the agricultural sector. The passage, near Saint Lucia, of Hurricanes Ivan in September 2004 and Emily in July 2005 reaffirms the importance of contingency planning and the bolstering of risks mitigation and disaster management strategies and plans. Tremendous progress has been made by Saint Lucia in its disaster mitigation and preparedness programme. The country did not experience any major natural disasters in 2006.

C. Land capability

Table 7 shows the land capability of Saint Lucia and its total land area and cultivation possibilities.

**TABLE 7:
LAND CAPABILITY CLASSES: TOTAL AREA AND CULTIVATION POSSIBILITIES**

Class	Land Area (acres)	% of Total Area	Cultivation Possibilities
I	3,989.70	2.65	Cultivable
II	1,422.03	0.94	Cultivable
III	1,809.57	1.20	Cultivable
IV	1,178.08	0.78	Limited cultivation
V	5,757.58	3.82	Pasture
VI	25,477.51	16.90	Permanent Crop
VII	101,050.70	67.01	Timber, natural forest
VII	10,103.90	6.70	National Park
Total	150,789.07 235.6 sq miles	100	
Source: OAS Saint Lucia National Resources and Agricultural Development Project, 1986			

The table illustrates the skewed distribution of land capability classes. The predominance of Class VII and the lack of land in the desirable Classes I-IV is evident. The factors that render areas unsuitable for agriculture are steep slopes, shallow soil, stoniness, low fertility and aridity.

Lands suitable for intensive agriculture, Classes I-IV, cover about 8,400 acres or about 5.6 percent of the total area of the country's intensive agricultural lands. Agriculture will continue to be established in these areas. Efforts must be made to maintain these high potential lands in agricultural production and restrict their use for urban and industrial activities.

D. Farm holdings

1. Number of holdings

The 1996 census of agriculture has identified 13,366 holdings after screening 38,845 households. This figure means an increase of 15.7 per cent in the number of holdings when compared to the 1986 census.

Table 8 presents data on the total number of agricultural holdings recorded in the last four agricultural censuses.

**TABLE 8:
TOTAL NUMBER OF HOLDINGS**

Year	Number of Holdings
1961	13,008
1973/1974	10,938
1986	11,551
1996	13,366
Source: ECLAC estimates based on official GOSLU data and agricultural census	

As can be gleaned from table 9, the district of Anse la Raye reflects the highest increase in the number of holdings during the period between 1986 and 1996 (74 per cent). Micoud also recorded a significant increase of 45.4 per cent during the same period. See table 9 for details.

**TABLE 9:
NUMBER OF HOLDINGS BY ADMINISTRATIVE DISTRICT**

Administrative District	1973/74		1986		1996	
	No. of Holdings	%	No. of Holdings	%	No. of Holdings	%
	10,938	100.0	11,551	100.0	13,366	100.0
Castries	2,399	21.9	2,611	22.6	3,160	23.6
Anse la Raye	618	5.6	406	3.5	708	5.3
Canaries	363	3.3	189	1.6	140	1.1
Soufriere	999	9.1	855	7.4	792	5.9
Choiseul	1,004	9.2	994	8.6	913	6.8
Laborie	787	7.2	819	7.1	887	6.6
Vieux Fort	915	8.4	1,332	11.5	1,399	10.5
Micoud	1,086	9.9	1,693	14.7	2,464	18.4
Dennery	1,586	14.5	1,389	12.1	1,397	10.5
Gros Islet	1,181	10.8	1,263	10.9	1,508	11.3
Source: ECLAC estimates based on official GOSLU data and agricultural census						

2. Total area on holdings

With respect to total area on holding, the 1996 census of agriculture reported a total area of 51,323.10 acres. This figure reflects a decrease of 6,693.4 acres of 11.5 per cent as compared to the 1986 census. Table 9 shows the evolution of the total area in the last four agriculture censuses, while Table 10 shows the evolution of total area on holdings over the last three censuses by administrative districts.

It is noted that Castries accounts for 22.2 per cent of the total area followed by Micoud with 21.2 per cent. Generally the administrative districts showed a declining trend in total area dedicated to agriculture. Castries was the only exception, which showed an increase of area during the last inter-censal period. The major decreases occurred in Soufriere (-36.6 per cent) and Dennery (-29.2 per cent). The new developments in both administrative districts resulted in a shift from agricultural land to other economic uses.

**TABLE 10:
TOTAL AREA ON HOLDINGS BY ADMINISTRATIVE DISTRICT**

Administrative District	1973/74		1986		1996	
	Total Area on Holdings (acres)	%	Total Area on Holdings (acres)	%	Total Area on Holdings (acres)	%
Saint Lucia	72,000	100.0	58,016.5	100.0	51,323.1	100.0
Castries	10,659	14.8	7,553.9	12.9	11,416.2	22.2
Anse la Raye	5,796	8.1	4,454.0	7.7	3,674.5	7.2
Canaries	2,248	3.1	1,630.4	3.1	1,590.1	3.1
Soufriere	6,953	9.7	5,988.2	10.3	3,784.3	7.4
Choiseul	2,016	2.8	1,941.3	3.4	1,553.1	3.0
Laborie	5,832	8.1	3,588.0	6.2	3,089.3	6.0
Vieux Fort	4,692	6.5	5,251.8	9.0	4,033.7	7.9
Micoud	11,301	15.7	12,416.4	21.4	10,810.7	21.1
Dennery	10,552	14.7	8,037.9	14.7	5,688.4	11.1
Gros Islet	11,952	16.1	7,154.5	12.3	5,682.8	11.0

Source: ECLAC estimates based on official GOSLU data and agricultural census

3. Land concentration

The increase in the number of holdings and the decline in the agricultural area have had a change in the size structure of holdings, as a consequence. In fact, they are more and more concentrated in small holdings as can be seen in table 11. The increase in almost 2,000 holdings between 1986 and 1996 is explained by 780 new landless holdings in the size classes of less than 25 acres of total area. This increase in the number of holdings is compensated by a decrease of 23 holdings in the greater 25 acres category. This behavior continues a trend observed since 1973/1974.

Looking at distribution of the area by size, it appears that there is an increase of area among the holdings under 25 acres (5,879.6 acres more in 1986) while a decrease in total area is noticeable in medium and large holdings (12,573.1 acres less in 1986 for holdings with more than 25 acres of total area. (See table 12 for details).

**TABLE 11:
SIZE STRUCTURE OF HOLDINGS**

Size Group (in acres)	1973/74		1986		1996	
	No. of Holdings	%	No. of Holdings	%	No. of Holdings	%
Total	10,983	100.0	11,551	100.0	13,366	100.0
Landless	502	4.6	850	7.4	1,630	12.2
Up to 5	8,558	78.2	8,770	75.9	9,166	68.6
5 to 9.9	1,082	9.9	1,191	10.3	1,713	12.8
10 to 24.9	475	4.3	560	4.9	700	5.2
25 to 49.9	199	1.8	98	0.9	92	0.7
50 to 99.9	58	0.5	35	0.3	27	0.2
100 to 199.9	19	0.2	17	0.2	15	0.1
200 to 499.9	26	0.2	17	0.2	16	0.1
500 and over	19	0.2	13	0.1	7	0.1

Source: ECLAC estimates based on official GOSLU data and agricultural census

**TABLE 12:
DISTRIBUTION BY AREA BY SIZE**

Size Group (in acres)	1973/74		1986		1996	
	No. of Holdings	%	No. of Holdings	%	No. of Holdings	%
Total	72,001	100.0	58,016.5	100.0	51,323.1	100.0
Up to 5	10,204	14.2	12,350	21.3	13,521.1	26.4
5 to 9.9	7,068	9.8	7,802.4	13.4	10,898.7	21.2
10 to 24.9	6,396	8.9	7,763.1	13.4	9,375.3	18.3
25 to 49.9	6,299	8.8	3,218.6	5.6	3,072.2	6.0
50 to 99.9	4,282	6.0	2,338.0	4.0	1,625.9	3.2
100 to 199.9	2,690	3.7	2,233.5	3.9	2,076.0	4.0
200 to 499.9	8,160	11.3	4,881.0	8.4	5,250.3	10.2
500 and over	26,902	37.4	17,430.0	30.0	5,503.6	10.7

Source: ECLAC estimates based on official GOSLU data and agricultural census

Both changes in the number of holdings and agricultural area caused a smooth trend towards a better distribution of land. In fact, while in 1974, 88 per cent of the smaller holdings with land, held 24 per cent of the land and 0.2 per cent of the larger holdings operated just over 37 per cent of the land. In 1986, 80 per cent of the smaller holdings with land, held almost 35 per cent of the land (a better distribution than in 1974) and 0.1 per cent of the larger ones held 30 per cent of the land. For the 1996 census, those figures changed to 81 per cent of the smaller holdings with land, operating almost 48 per cent of the land, while less than 0.1 per cent of the larger holdings held just under 11 per cent of the total land.

To complete the picture on trends in the land concentration, it is interesting to look at the fragmentation process. The mean area of holdings with land dropped from 6.9 acres in 1974 to 5.4 in 1986 and 4.4 in 1996.

4. Land tenure

Table 13 shows that the structure of land tenure has changed only slightly between 1986 and 1996. Family land continues to be the predominant form of land tenure (more than 45). An increase in the number of parcels owned (1098 in absolute terms and 3.7 per cent in participation in total) is noted between 1986 and 1996. This increase accompanies a decrease in the number of parcels squatted (157 parcels less in 1996 than in 1986 and their participation in total has dropped from 10.8 per cent to 6.6 per cent).

**TABLE 13:
LAND TENURE (1986 AND 1996)**

LAND TENURE	1986		1996	
	No of Parcels	%	No of Parcels	%
TOTAL	13,530	100.0	15,468	100.0
Owned	3,611	26.7	4,701	30.4
Family Land	6,132	45.3	7,094	45.9
Rented/Private	1,717	12.7	1,558	10.1
Squatting/Government	383	2.8	682	4.3
Squatting/Government	790	5.8	614	4.0
Squatting/Private	680	5.0	399	2.6
Other	217	1.6	420	2.7
Source: ECLAC estimates based on official GOSLU data and agricultural census				

5. Main characteristics of farm holders

In the census of agriculture, landholders are classified by some important characteristics. In general, according to their legal status, more than 99 per cent of holdings in 1986 and more than 97.5 per cent in 1996 are operated on an individual basis. For that reason it is interesting to analyze the profile of the individual holder. This characteristic refers to sex, age, size of their holding and size of their household and occupation.

The typical Saint Lucia holder is a man, about 45 years old, whose main occupation is agriculture, operating a holding less than one acre in total size in only one parcel of land, living in a three to four person household and working alone or with members of his family on a temporary basis. These characteristics arise from the moral values for those variables in the 1996 census of agriculture. These characteristics have not changed from the 1986 census.

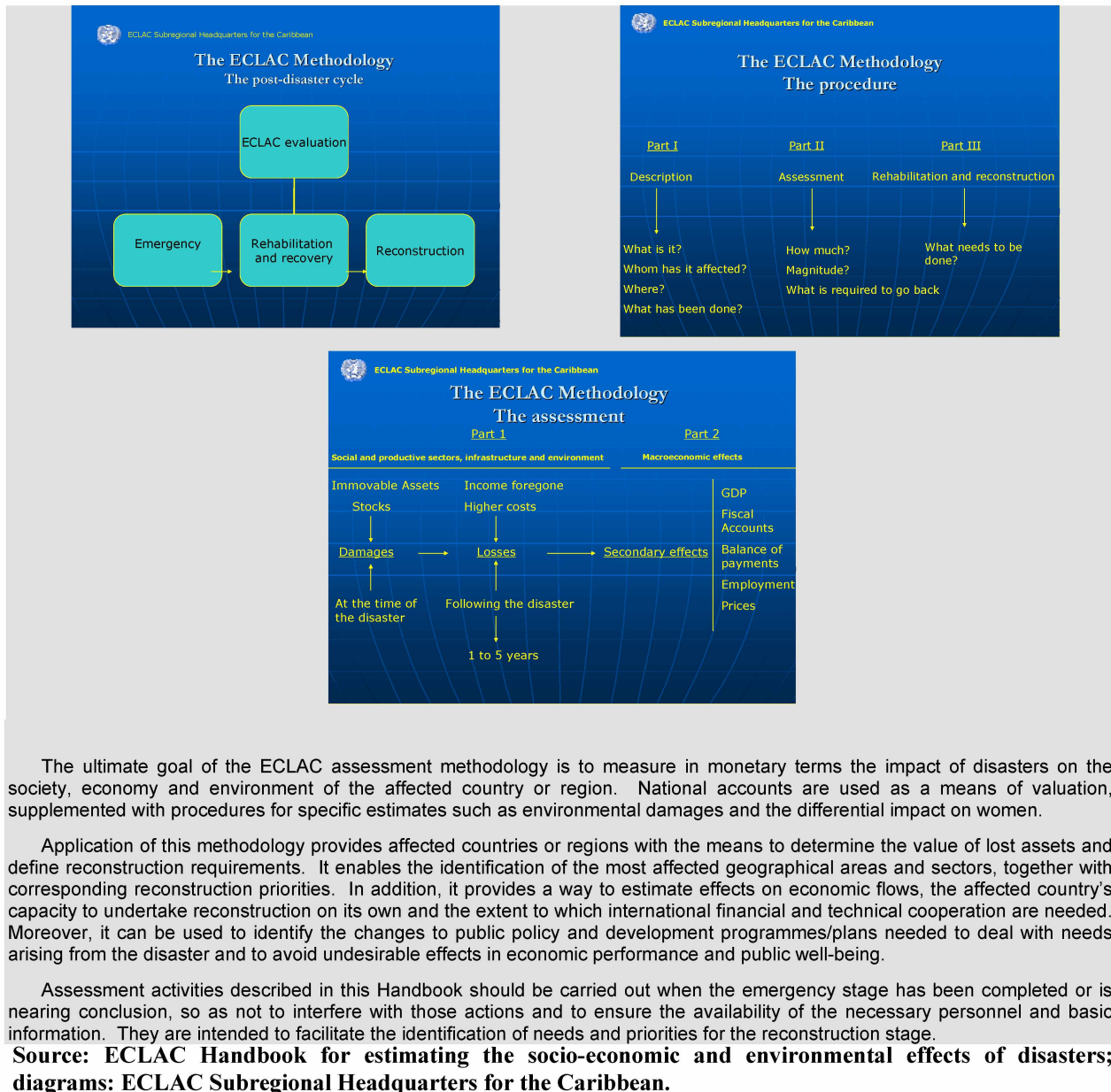
It is interesting to analyze the particularities of holdings according to the sex of the holder. Table 14 summarizes the main characteristics for the 1986 and 1996 censuses. From the table, it can be noted that female holders are older than male holders, operate holdings a little smaller on average than male holders, head larger households, only a little more than one half has agriculture as her main occupation (against almost 61 per cent of male holders), and less than two out of five of their households receive more than 50 per cent of their income from agriculture (versus almost one half of the male holdings' household). Between 1986 and 1996 there was a small increase in the participation of women operating holdings (from 24.6 per cent in 1986 to 26.3 per cent in 1995).

**TABLE 14:
CHARACTERISTICS OF INDIVIDUAL FARM HOLDER**

Individual Holdings	1986		1996	
	Male Holders	Female Holders	Male Holders	Female Holders
-Total Number	8,672	2,832	9,620	3,494
-Percentage	75.4	24.6	73.7	56.3
-Area of holdings (acres)			37,265	12,375.6
-Average size of holding (acres)			3.75	1.89
- Average size of household (acres)			3.8	4.0
- Median age	42.8	46.6	44.4	47.9
- Number with agriculture as main occupation	5,750	1,659	5,837	1,788
-Percentage with agriculture as main occupation	66.3	58.5	60.7	52.0
- Number receiving more than 50 households income from agriculture	4,503	1,218	4,563	1,333
- Percentage receiving more than 50 households income from agriculture	51.9	43	47.4	38.8
Source: ECLAC estimates based on official GOSLU data and agricultural census				

IV. DESCRIPTION OF DAMAGE AND LOSSES BY SECTOR

Box 2: Damage assessment: The ECLAC Methodology



A. Agricultural sector

Damage caused by the hurricane that will have a negative impact on production and income throughout the recovery were assessed as indirect damage/loss. In addition, the costs involved in mitigating the impact of the hurricane in order to rebuild back better were included as indirect costs.

The impact of Hurricane Dean was widespread throughout the island, inflicting substantial damage to the agricultural sector. The damage was concentrated in the main banana producing areas of Regions 2, 3, 4, 5, 7 and 8 where extensive damages were recorded as a result of the high velocity winds experienced with Hurricane Dean.

However, the damage was most severe in Region 3, accounting for 23.5 per cent of the total impact. The banana industry was the subsector most affected, accounting for 80.3 per cent of the total damage. The banana producing areas significantly impacted were those located in the Roseau, Cul De Sac and Dennery valleys, Northern Farms, Micoud/Patience and Belle Vue.

As indicated earlier, the ECLAC methodological framework for estimating socio-economic and environmental effects of disasters was utilized in assessing the damage to the agricultural sector. Within this context, damage to the sector was categorized under two broad headings, direct damages and indirect damage/losses. In assessing the direct damage to the sector, only damages/losses to capital assets were considered. The direct damages were identified under four broad headings:

- (a) Damage to farmland;
- (b) Damage to the physical infrastructure and to machinery and equipment;
- (c) Damage/loss of crops that are ready to be harvested; and
- (d) Damage/loss of stock (livestock, inputs, harvested products, etc).

In assessing damage, only production ready to be harvested at the time of the hurricane was taken into consideration. For affected annual crops that were still growing at the onset of the hurricane, however, losses were based on investment in labour and input.

In the case of losses of stock, where total losses occurred, damages were estimated at farm prices and inputs at replacement value. Assessments for partial loss and damage were effected on a prorated basis.

Table 15 provides a summary of the damage, losses and total impact of Hurricane Dean to the banana, "other crops", livestock, fisheries and forestry subsectors as well as on-farm infrastructure. On-farm infrastructural damages for the livestock industry are included in the livestock subsector damage.

Damages to farm roads are not included in the estimates as this will be addressed under the communication, transport and works sector. The total damage to the agricultural sector is presented in table 15.

TABLE 15:
TOTAL ESTIMATED DAMAGE TO THE AGRICULTURAL SECTOR

(a) Direct Damage

Region	Bananas	Other Crops	Livestock	Fisheries	Forestry	Infrastructure	Total Cost
	Direct Damage						
1	26,810	66,770	210,985	60,150	-	32,070	396,785
2	689,260	1,700	171,836	-	-	17,470	880,265
3	1,857,350	92,789	13,313	7,100	-	210,295	2,180,847
4	702,810	22,912	-	20,600	-	12,300	758,622
5	906,290	13,058	44,240	45,140	-	72,100	1,080,827
6	57,045	611,450	58,446	4,600	-	228,640	960,181
7	1,883,690	174,285	-	62,870	-	33,300	2,154,145
8	832,515	3,929	199,344	58,970	-	41,830	1,136,588
Others	-	-	-	38,460	389,430	-	427,890
Sub Total	6,955,770	986,892	698,164	297,890	389,430	648,005	9,976,151
Percentage	69.72	9.89	7.00	2.99	3.90	6.50	100

Source: ECLAC estimates based on official GOSLU data and agricultural census

(b) Indirect damage/loss

Region	Bananas	Other Crops	Livestock	Fisheries	Forestry	Infrastructure	Total Cost
	Indirect Damage/ Loss						
1	41,600	13,080	41,490	31,335	-	6,090	133,595
2	1,113,100	2,550	38,540	-	-	3,495	1,157,685
3	3,013,240	47,310	2,155	4,355	-	73,600	3,140,660
4	1,135,590	34,370	-	3,665	-	3,095	1,176,720
5	1,472,890	3,210	8,905	6,770	-	23,070	1,514,845
6	101,190	362,760	10,820	920	-	80,025	555,715
7	3,035,730	19,910	-	24,070	-	8,660	3,088,370
8	1,337,970	6,020	38,590	17,730	-	13,390	1,413,700
Others	-	-	-	5,970	503,215	-	509,185
Sub Total	11,251,310	489,210	140,500	94,815	503,215	211,425	12,690,475
Percentage	88.66	3.85	1.11	0.75	3.97	1.67	100.00

Source: ECLAC estimates based on official GOSLU data and agricultural census

(c) Total damage

Region	Bananas	Other Crops	Livestock	Fisheries	Forestry	Infrastructure	Total Cost
	Total Damage						
1	68,410	79,850	252,475	91,485	-	38,160	530,380
2	1,802,360	4,250	210,376	-	-	20,965	2,037,950
3	4,870,590	140,099	15,468	11,455	-	283,895	5,321,507
4	1,838,400	57,282	-	24,265	-	15,395	1,935,342
5	2,379,180	16,268	53,145	51,910	-	95,170	2,595,672
6	158,235	974,210	69,266	5,520	-	308,665	1,515,896
7	4,919,420	194,195	-	86,940	-	41,960	5,242,515
8	2,170,485	9,949	237,934	76,700	-	55,220	2,550,288
Others	-	-	-	44,430	892,645	-	937,075
Total Damage (%)	18,207,080	1,476,102	838,664	392,705	892,645	859,430	22,666,626
Percentage	80.33	6.51	3.70	1.73	3.94	3.79	100

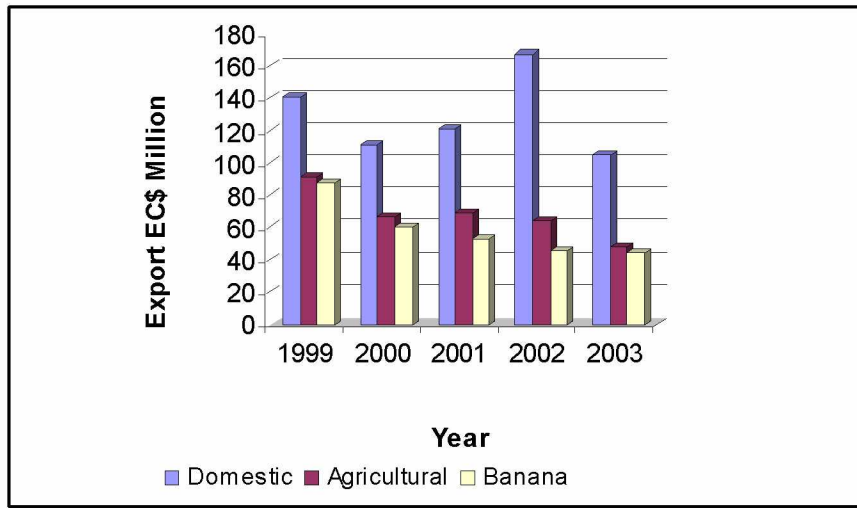
Source: ECLAC estimates based on official GOSLU data and agricultural census

1. The banana industry

The banana industry has played an important role in the economy of Saint Lucia contributing significantly to Gross Domestic Product (GDP), foreign exchange earnings and employment. Analysis of available disaggregated data shows that the contribution of the banana industry to total GDP varies from a low 1.25 per cent in 2005 and to a high 3.54 per cent in 2000. The data also shows that the contribution of the banana industry to total agricultural GDP varies from a low 40.2 per cent in 2003 to a high 54.1 per cent in 2000.

Figure 7 demonstrates that the banana industry is a major contributor to export earnings in Saint Lucia.

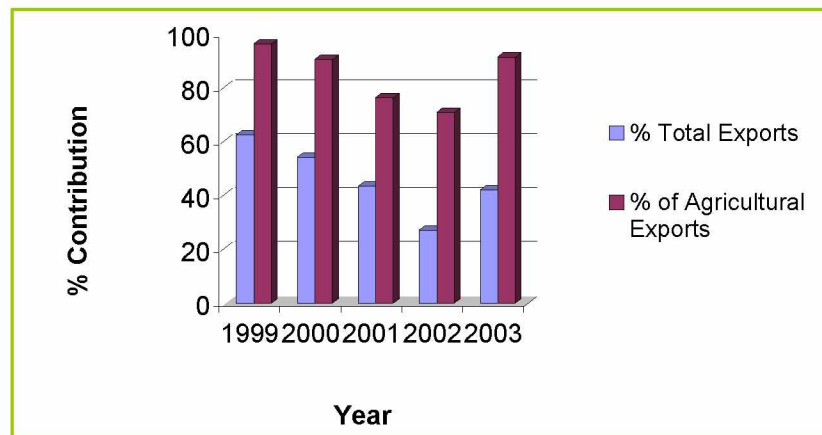
FIGURE 7
BANANA CONTRIBUTION TO TOTAL AND AGRICULTURE EXPORTS, 1999-2003



Source: Department of Statistics, Government of Saint Lucia (<http://www.stats.gov.lc>)

Figure 8 shows that the percentage contribution of the banana industry to total domestic trade ranged from a low of 27.1 per cent in 2001 to a high of 62.5 per cent in 1999. As a percentage of total agricultural export, banana contribution ranged from a low of 70.9 per cent in 2001 to a high of 96.4 per cent in 1999.

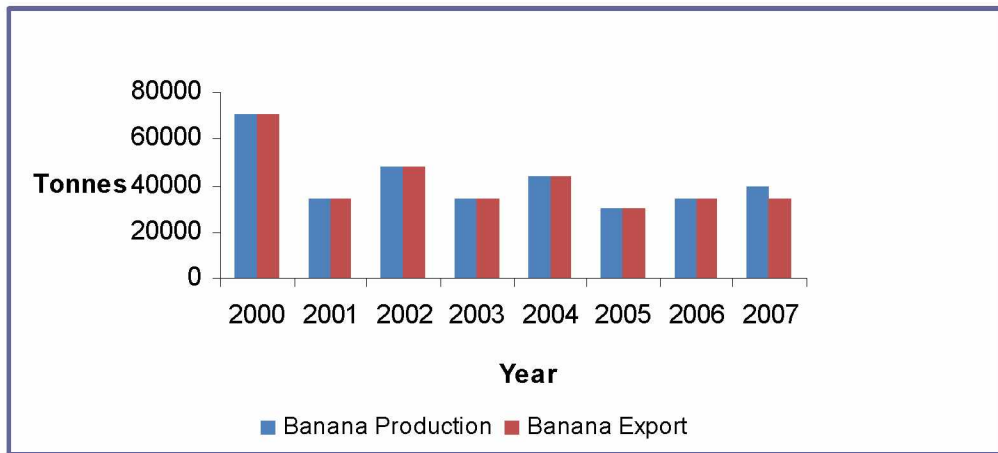
FIGURE 8
PERCENTAGE CONTRIBUTION OF BANANAS TO TOTAL DOMESTIC AND AGRICULTURAL EXPORTS



Source: Department of Statistics, Government of Saint Lucia (<http://www.stats.gov.lc>)

The production and export of bananas for the period 2000 to 2006 as well as projections for 2007 is presented in figure 9.

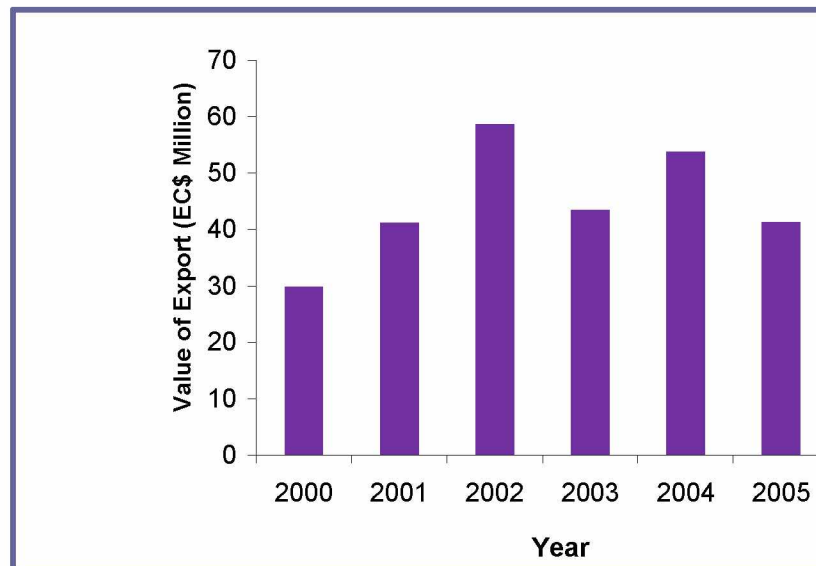
FIGURE 9
BANANA PRODUCTION AND EXPORT, 2000-2007



Source: ECLAC estimates based on official GOSLU data

The value of banana exports for the period 2000 to 2006 as well as the projection for 2007 is presented in figure 10.

FIGURE 10
VALUE OF BANANA EXPORTS 2000-2007 (2007 PROJECTED), EC\$ MILLION



Source: ECLAC estimates based on official GOSLU data

The banana industry is also a significant contributor to employment in Saint Lucia. It is estimated that there are 1,350 active farmers operating on about 5,000 acres of land, employing approximately 4,000 workers directly.

The banana industry was heavily impacted by Hurricane Dean, with some farmers occupying some 3,099.4 acres affected. Total impact of the disaster on the industry is estimated at EC\$18,207,080. The direct damage and indirect losses were estimated EC\$6,955,790 and EC\$11,251,310, respectively.

The impact of the disaster was more pronounced in Region 7 and 4, which reported total impact estimates of EC\$4,919,420 (27.0 per cent) and EC\$4,870,590 (26.8 per cent), respectively. Approximately 546.0 acres in Region 7 and 540.6 acres in Region 3 were impacted.

The overall level of impact on the banana industry was estimated at 65.1 per cent. The banana industry in Region 7 was severely impacted, with the level of impact estimated at 80.2 per cent. Regions 5, 8, 4 and 2 were impacted to varying degrees. See table 16 for details.

**TABLE 16:
TOTAL DAMAGE TO BANANA INDUSTRY (EC\$)**

Region	No. of Farmers affected	Acreages under Production	Acreages Affected	% Acreage Impacted	Crop Damage Estimate	Indirect Losses	Total Damage
1		13.0	7.6	58.5	26,810	41,600	68,410
2		314.9	197.0	62.6	689,260	1,113,100	1,802,360
3		887.5	540.6	60.9	1,857,350	3,013,240	4,870,590
4		343.3	204.0	59.4	702,810	1,135,590	1,838,400
5		431.8	264.1	61.2	906,290	1,472,890	2,379,180
6		27.2	17.6	64.7	57,045	101,190	158,235
7		680.5	546.0	80.2	1,883,690	3,035,730	4,919,420
8		401.2	240.9	60.0	832,515	1,337,970	2,170,485
Total		3,099.4	2017.8	65.1	6,955,770	11,251,310	18,207,080

Source: ECLAC estimates based on official GOSLU data

The impact of Hurricane Dean on the banana industry obviously will have serious impact on and implications for future banana production as well as for farmers and export income. These implications are presented in table 17. The country is expected to have a shortfall in banana export of EC\$15.3 million in value up to February 2008.

Some critical assumptions utilized in arriving at the projections are:

- (a) Recovery period extends up to end of February 2008;
- (b) Farm gate of bananas (less carton box) – EC\$0.52.; and
- (c) Export value per tone – EC\$1,442.37.

**TABLE 17:
IMPLICATIONS OF HURRICANE DEAN ON PRODUCTION AND FARMERS
AND EXPORT INCOMES**

Year	Pre-Dean Expected Production (Tonnes)	Post-Dean Projected Production (Tonnes)	Production Losses (Tonnes)	Projected Farmer Incomes Losses	Projected Export Losses
2007	40,000	30,350	9,650	10,036,000	1,391,8870
Jan-Feb 2008	6,350	5,390	960	99,840	1,384,675
TOTAL	46,350	35,740	10,610	10,034,400	15,303,545
Source: ECLAC estimates based on official GOSLU data					

2. Other crops

The category “other crops” which includes legumes, root crops, fruits, vegetables and fruit trees suffered moderate damage with total impact of the hurricane on this subsector estimated at EC\$1,476,102. The direct damage was estimated at EC\$986,892 and the indirect losses at EC\$489,210.

Region 6 accounted for approximately 66.0 per cent (EC\$974,210) of total “other crops” impact estimates, Region 7 accounted for 13.2 per cent, with the other six regions combined accounting for the remaining 20.8 per cent.

**TABLE 18:
TOTAL DAMAGE TO “OTHER CROPS”**

Region	Direct Damage	Indirect Losses	Total Damage
1	66,770	13,080	79,850
2	1,700	2,550	4,250
3	92,789	47,310	140,099
4	22,912	34,370	57,282
5	13,058	3,210	16,268
6	611,450	36,276	974,210
7	174,285	19,910	195,195
8	3,929	6,020	9,949
Total	986,892	489,210	1,476,102
Source: ECLAC estimates based on official GOSLU data			

3. Livestock industry

The livestock industry suffered moderate damages as a result of the hurricane. Regions 1, 2 and 8 were the regions mostly affected.

The overall estimate of the damage to the livestock industry is put at EC\$839,499. Of this total, EC\$698,184 represents direct damage and EC\$141,315 indirect damage/loss. The livestock infrastructure including houses for animals and fencing was the area most impacted, with estimated damages attributed to this area put at EC\$717,230 or 84.5 per cent of total animal

damage. While some animals were lost (poultry mainly) and feeding regime impacted, damages in these two areas were considered minor.

The swine industry recorded the highest damages to the livestock industry, with the value of total damage estimated at EC\$652,229 or 77.7 per cent.

Details of the damage incurred by the livestock subsector by industry and region are presented in Table 19.

TABLE 19:
TOTAL DAMAGE TO THE LIVESTOCK INDUSTRY

(a) Direct damage

Region	Swine			Sub Total	Poultry			Sub Total	Small Ruminants			Sub Total	Cattle		Sub Total	Grand Total
	Animal	Feed	Infra-structure		Animal	Feed	Infra-structure		Animal	Feed	Infra-structure		Feed	Infra-structure		
	Direct Damage															
1	11,083	4,819	171,238	187,139	248	-	-	248	-	-	23,598	23,598	-	-	-	210,985
2	4,740	1,595	107,590	113,925	21,165	3,780	31,405	56,351	1,020	-	540	1,560	-	-	-	171,836
3	1,248	540	11,525	13,313	-	-	-	-	-	-	-	-	-	-	-	13,313
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	18,125	2,510	2,080	22,715	-	520	6,468	6,988	385	420	7,738	8,543	2,188	3,806	5,994	44,240
6	8,491	891	43,635	53,017	-	-	-	-	800	-	4,649	5,449	-	-	-	58,466
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	1,551	360	149,418	151,329	-	12,000	36,015	48,015	-	-	-	-	-	-	-	199,344
Sub Total	45,238	10,715	485,486	541,439	21,414	16,300	73,888	111,602	2,205	420	36,525	39,150	2,188	3,806	5,994	698,184

Source: ECLAC estimates based on official GOSLU data and agricultural census

(b) Indirect damage

Region	Indirect Damage															Grand Total
	Swine				Poultry				Small Ruminants				Cattle			
	Animal	Feed	Infra-structure	Sub Total	Animal	Feed	Infra-structure	Sub Total	Animal	Feed	Infra-structure	Sub Total	Feed	Infra-structure	Sub Total	
1	3,650	240	34,250	38,140	100	-		100	-	-	3,250	3,250	-	-	-	41,490
2	1,565	95	22,590	24,250	7,400	280	6,280	13,960	250	-	80	330	-	-	-	38,540
3	410	15	1,730	2,155	-	-	-	-	-	-	-	-	-	-	-	2,155
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	5,435	150	520	6,105	-	25	1,230	1,255	70	85	1,390	1,545	130	685	815	9,720
6	2,120	50	7,545	9,715	-	-	-	-	220	-	885	1,105	-	-	-	10,820
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	530	10	29,885	30,425	-	960	7,205	8,165	-	-	-	-	-	-	-	38,590
Sub Total	13,710	560	96,520	110,790	7,500	1,265	14,715	23,480	540	85	5,605	6,230	130	685	815	141,315

Source: ECLAC estimates based on official GOSLU data and agricultural census

(c) Total damage

Total Damage																
Region	Swine				Poultry				Small Ruminants				Cattle			Grand Total
	Animal	Feed	Infra-structure	Sub Total	Animal	Feed	Infra-structure	Sub Total	Animal	Feed	Infra-structure	Sub Total	Feed	Infra-structure	Sub Total	
1	14,733	5,059	205,488	225,279	348	-	-	348	-	-	26,848	26,848	-	-	-	252,475
2	6,305	1,690	130,180	138,175	28,565	4,060	37,685	70,311	1,270	-	620	1,890	-	-	-	210,376
3	1,658	555	13,255	15,468	-	-	-	-	-	-	-	-	-	-	-	15,468
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	23,560	2,660	2,600	28,820	-	545	7,698	8,243	455	505	9,128	10,088	2,318	4,491	6,809	53,960
6	10,611	941	51,180	62,732	-	-	-	-	1,020	-	5,534	6,554	-	-	-	69,286
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	2,081	370	179,303	181,754	-	12,960	43,220	56,180	-	-	-	-	-	-	-	237,934
Sub Total	58,948	11,275	582,006	652,229	28,914	17,565	88,603	135,082	2,745	505	42,130	45,380	2,318	4,491	6,809	839,499

Source: ECLAC estimates based on official GOSLU data and agricultural census

4. Fisheries

The damage to the fisheries subsector may be characterized as minor to moderate with total estimated damage put at EC\$369,080. Of this total damage, direct damage accounted for EC\$297,890 while direct loss was estimated at EC\$71,190.

The major areas of damage incurred by the fishing industry were the loss or destruction of fish ports (EC\$190,005), boat damage (EC\$52,750) and net damage (EC\$45,220).

Nine hundred and forty-one pots were either lost or destroyed, 17 boat engines were damaged and 24 net were also damaged. Three fads were destroyed, while 241 seamoss lines were lost.

The Anse la Raye/Canaries Region (EC\$86,940) followed by Castries/Bananes Bay (EC\$76,700) and the Gros Islet area (Region 1) was the area most affected (EC\$91,485).

Details on the damage caused by Hurricane Dean to the fisheries industry are presented in table 20.

**TABLE 20:
DAMAGE ASSESSMENT OF THE FISHERIES SECTOR**

(a) Direct damage

Region	Bananas	Other Crops	Livestock	Fisheries	Forestry	Infrastructure	Total Cost
	Direct Damage						
1	26,810	66,770	210,985	60,150	-	32,070	396,785
2	689,260	1,700	171,836	-	-	17,470	880,265
3	1,857,350	92,789	13,313	7,100	-	210,295	2,180,847
4	702,810	22,912	-	20,600	-	12,300	758,622
5	906,290	13,058	44,240	45,140	-	72,100	1,080,827
6	57,045	611,450	58,466	4,600	-	228,640	960,201
7	1,883,690	174,285	-	62,870	-	33,300	2,154,145
8	832,515	3,929	199,344	58,970	-	41,830	1,136,588
Others	-	-	-	38,460	389,430	-	427,890
Sub Total	6,955,770	986,892	698,184	297,890	389,430	648,005	9,976,171
Percentage	69.72	9.89	7.00	2.99	3.90	6.50	100.00
Source: ECLAC estimates based on official GOSLU data and agricultural census							

(b) Indirect damage/losses

Region	Bananas	Other Crops	Livestock	Fisheries	Forestry	Infrastructure	Total Cost
	Indirect Losses						
1	41,600	13,080	41,490	11,085	-	6,090	113,345
2	1,113,100	2,550	38,540	-	-	3,495	1,157,685
3	3,013,240	47,310	2,155	980	-	73,600	3,137,285
4	1,135,590	34,370	-	3,665	-	3,095	1,176,720
5	1,472,890	3,210	9,720	6,770	-	23,070	1,515,660
6	101,190	362,760	10,820	920	-	80,025	555,715
7	3,035,730	19,910	-	24,070	-	8,660	3,088,370
8	1,337,970	6,020	38,590	17,730	-	13,390	1,413,700
Others	-	-	-	5,970	503,215	-	509,185
Sub Total	11,251,310	489,210	141,315	71,190	503,215	211,425	12,667,665
Percentage	88.82	3.86	1.12	0.56	3.97	1.67	100.00

Source: ECLAC estimates based on official GOSLU data and agricultural census

(c) Total damage

Region	Bananas	Other Crops	Livestock	Fisheries	Forestry	Infrastructure	Total Cost
	Total Damage						
1	68,410	79,850	252,475	71,235	-	38,160	510,130
2	1,802,360	4,250	210,376	-	-	20,965	2,037,950
3	4,870,590	140,099	15,468	8,080	-	283,895	5,318,132
4	1,838,400	57,282	-	24,265	-	15,395	1,935,342
5	2,379,180	16,268	53,960	51,910	-	95,170	2,596,487
6	158,235	974,210	69,286	5,520	-	308,665	1,515,916
7	4,919,420	194,195	-	86,940	-	41,960	5,242,515
8	2,170,485	9,949	237,934	76,700	-	55,220	2,550,288
Others	-	-	-	44,430	892,645	-	937,075
Total Damage	18,207,080	1,476,102	839,499	369,080	892,645	859,430	22,643,836
Percentage	80.41	6.52	3.71	1.63	3.94	3.80	100.00

Source: ECLAC estimates based on official GOSLU data and agricultural census

5. Forestry

The impact of Hurricane Dean on the forest resource base may be characterized as moderate. An analysis of the effects of the hurricane on the subsector indicates five main categories of damage, as follows:

- (a) Damage to the forestry;
- (b) Damage to trails and related infrastructure;
- (c) Damage to forest roads and access routes;
- (d) Damage to wild life and habitat; and
- (e) Damage along river banks and soil structure.

The major areas of impact of the hurricane on the forest resource base was on the western side, whereas there was very little disturbance on the eastern side of the forest.

A summary of the total impact of Hurricane Dean on the forestry subsector is presented in table 21 while details are presented in table 22(a) through (c).

**TABLE 21:
DAMAGE ASSESSMENT – FORESTRY SUB-SECTOR (EC\$)**

Category	Damage		
	Direct Damage	Indirect Loss	Total
1a. Plantation Forest	222,731	20,045	242,776
1b. Natural Forest	107,441	7,520	114,961
Sub-Total Forest	330,172	27,565	357,737
2. Natural Trail	37,000	17,500	54,500
3. Wildlife Habitat	-	405,000	405,000
4. Forest Roads and Access Routes	5,768	650	6,418
5. Rivers, river banks and water intakes	16,490	52,500	68,990
TOTAL DAMAGE	389,430	503,215	892,645
Source: ECLAC estimates based on official GOSLU data			

**TABLE 22:
SUMMARY OF RESULTS INDICATING THE EFFECT OF HURRICANE DEAN
ON THE FOREST RESOURCE BASE**

(a) Plantation Forest Damage

Ranges	Acreages	Num. Trees	Percent damage	Class	Value (\$)
Millet	2.5	505	80	1	76,760.00
Northern	-	233	1.7	1	16,982.00
Quillesse	-	20	1	1	2,209.33
Soufriere	-	235	1	1	121,000.00
Sub-Total	-	993		1	217,651.33
Dennery	-	75	12.4	1	5,080.00
			20 (x-mas trees)	-	700.00
Total	2.5	1,068	19.2	1	222,731.33
Source: ECLAC estimates based on official GOSLU data					

(b) Natural Forest Damage

Ranges	Acreages	Num. Trees	Percent damage	Class	Value (\$)
Millet	-	52	1	1 to 5	3,708.04
Northern	-	2,702	4	1 to 5	76,973.60
Quillesse	-	28	1.1	1 to 5	1,714.16
Sub-Total	-	2,782		1 to 5	82,395.80
Dennery	12	120	8.7	1 to 5	7,300.00
		<u>Bamboo</u>	80	-	9,000.00
Soufriere	10	128	0.5	1 to 5	8,744.87
		<u>Bamboo -</u> 800	-		-
Total	-	3030	3.1	1 to 5	

Source: ECLAC estimates based on official GOSLU data

(c) Nature Trail Damage

Type of Damage		Value
Obstructions	Number of fallen trees - 83	
Damage to Signs	8	\$15,000.00
Damage to trail surface	17%	\$13,500.00
Damage to trail structures	One bridge	\$7,000.00
Damage to infrastructure	One Toilet	\$1,500.00

Source: ECLAC estimates based on official GOSLU data

The total damage to the Forestry Resource Base is estimated at EC\$892,645 with direct damage estimated at EC\$389,430 and indirect damage/loss put at EC\$503,215.

Total damage to forest (plantation and natural) is estimated EC\$357,737 with direct damage estimated at EC\$330,172 and indirect loss at EC\$27,565. Direct damage to natural trails is estimated at EC\$37,000 with indirect loss put at EC\$17,500. A monitoring system is proposed as an essential component of the mitigation strategy and this indirect cost is estimated at EC\$405,000 (US\$150,000).

There was no major direct damage reported for the wildlife species. However, the assessment recognized and focused on habitat destruction and the effects this could have on the wildlife population in general.

Within this context, the assessment compiles existing information on wildlife population fluctuations as a direct result of the passing of Hurricane Dean, pressures on these populations, and current ecological health. The goals of this approach are to document the extent, characteristics, causes and consequences of the fluctuating wildlife populations on the island within the following chosen locations giving the best possible representation of the full extent of the damage caused during this disaster. The following wildlife areas were evaluated:

- (a) Off Shore Islands
 - Dennery
 - Praslin
 - Maria Island (major and minor)
 - Rat Island

- (b) Coastal Areas
 - Cas-En-Bas
 - Pigeon Island/Causeway

- (c) Dry Forest Areas
 - Louvet Estate
 - Grande Anse Estate

- (d) Rain Forest Areas (by range)
 - Northern Range
 - Dennery Range
 - Quilless Range
 - Millet Range
 - Soufriere Range

The off-shore islands, though battered by the strong winds, resisted most of the damaging effects and preliminary signs indicate a low impact on the existing vegetation on all of these sites. However on the islands where the Saint Lucia Wiptail (Maria Island and Praslin Island) and the Saint Lucia Racer (Maria Major) live the extent of damage to these reptiles will be observed in post analysis of the damage on their food source and general habitat requirements, given their importance, and the fact that this is where the remaining world populations exist. So too is the case for all the sea birds and other local species like the Zenaida Dove and Scaly Napped Pigeon that leave the mainland and nest on these off-shore islands. It is important to determine how many of the juvenile birds would have survived and in the next nesting season how much nesting will occur in these areas.

Most of the directly affected wildlife was observed in and around the coastal areas of the island. Consequently, a small number of Cattle Egrets, Brown Boobies and other sea birds were killed (seen either dead) or injured by the strong winds in their failed attempts to flee from the dangers of the ensuing storm. On both Cas-En-Bas and Pigeon Island on the east and west coast respectively, there were dead sea birds and also some very exhausted and traumatized young and adult birds including some local species like the Zenaida Dove.

Range reconnaissance conducted as part of the Forestry Department administrative protocol determined that there were no preliminary deaths to report among mammals, reptiles or birds found within the natural forest areas and its immediate environs. Notwithstanding, the substantial damage to plant species will have a direct impact on the entire forest ecosystem and thus it is expected that with the extent of habitat loss and the destruction/topping of many fruit trees, many of the young birds (including the Saint Lucia Parrot) will eventually die as a result of starvation given the limited availability of food sources.

Dry forest areas showed a similar trend of destruction which was more visible in the existing vegetation in the case of Grande Anse and Louvet Estates, with the loss of many major fruit and nesting trees as a result of landslides and strong winds. This is an area that is rich in biodiversity and though under private ownership is especially important for nesting turtles, the Saint Lucia iguana and many endemic bird species like the Saint Lucia Oriole, the Saint Lucia Wren, Saint Lucia Nightjar and many others that are sheltered within these remaining habitat areas already threatened by future development.

Two important management actions are necessary:

- (a) Timely remediation and consistent assessment of the affected areas as it relates to the habitat requirements of these wildlife species; and
- (b) Increased protection and restoration of existing wildlife habitat.

While the degradation of many wildlife populations on the island is irreversible, effective management will continue to improve ecosystem health so that wildlife populations become and remain self-sustaining.

Forest roads and access routes within the forest suffered minor damage. The only damage reported was at two locations, mainly Soufriere and Barre de l'isle. The estimated direct cost of repair was EC\$5,768.00, while indirect cost is put at EC\$650.

The assessment also focuses on landslide occurring along rivers, riverbanks, water intakes and other watershed related projects. A total of 40 landslides were reported of which 13 were classified as major and 21 as minor. A major landslide is considered to be a slide greater than two acres while minor are less than two acres. The slides were reported within three ranges, mainly Millet, Northern and Soufriere. The major landslides all occurred within prime forest areas and affected water intakes. The direct estimated cost to these areas was set at EC\$16,490, rehabilitation, including mitigation cost is put at EC\$52,500.

6. On-farm infrastructure

On-farm infrastructure suffered moderate damage. The overall estimate of the damage is put at EC\$859,430 of which direct damage represented EC\$648,005 (75.4 per cent) and indirect losses EC\$211,425 (24.6 per cent). The total damage estimate, however, does not include damages sustained by farm roads and the livestock industry infrastructure.

Most of the infrastructure was in the areas of irrigation and drainage structure, some farm lands (landslide), farm houses and minor on farm roads.

Most of the damages occurred in Region 6 (35.9 per cent), Region 3 (33.8 per cent) and Region 5 (11.1 per cent). The indirect losses include costs resulting from some mitigation work to strengthen infrastructure.

**TABLE 23:
TOTAL DAMAGE TO FARM INFRASTRUCTURE**

Region	Direct Damage	Indirect Losses	Total Damage
1	32,070	6,090	38,160
2	17,470	3,495	20,965
3	210,295	73,600	283,895
4	12,300	3,095	15,395
5	72,100	23,070	95,170
6	228,640	80,025	308,665
7	33,300	8,660	41,960
8	41,830	13,390	55,220
Total	648,005	211,425	859,430

Source: ECLAC estimates based on official GOSLU data

Table 24 presents the summary impact of damage to the agriculture sector which amounts to EC\$22.6 million of which \$9.9 million can be attributed to damage and \$12.6 million to losses.

**TABLE 24:
SUMMARY OF IMPACT ON AGRICULTURE**

Sub Sector	Damage	Loss	Total Damage
Bananas	\$6,955,770.00	\$11,251,310.00	\$18,207,080.00
Other Crops	\$986,892.00	\$489,210.00	\$1,476,102.00
Livestock	\$698,164.00	\$140,500.00	\$838,664.00
Fisheries	\$297,890.00	\$71,190.00	\$369,080.00
Forestry	\$389,430.00	\$503,215.00	\$892,645.00
Infrastructure	\$648,005.00	\$211,425.00	\$859,430.00
TOTAL	\$9,976,151.00	\$12,666,850.00	\$22,643,001.00

Source: ECLAC estimates based on official GOSLU data

B. Infrastructure

1. Water

The passage of Hurricane Dean resulted in damage to some of the production facilities. In general the impacts were not severe, as most systems were back to normal by Saturday 18 August 2007. There were, however, still some delays in the distribution of water after this, due primarily to the delays in the resumption of the electricity supply.

As of Monday 20 August all systems in the south sections of the island were restored, with the exception of those at Micoud and Bouton. Ongoing works at Micoud were expected to be completed by Tuesday 21 August 2007. The back up plan for Bouton was to bring in truck-bourne water. In the north sections, the Hill 20 system was still experiencing difficulty after the hurricane due to damaged lines on the gravity intakes. Repairs to this system were expected to be

concluded by Tuesday 21 August. The other sources of the Hill 20 system were also affected by an intermittent three-phase power supply, and LUCELEC was being called upon to rectify those issues.

The following table, provided by the Water and Sewerage Company (WASCO), gives a detailed description of the extent of damages experienced and the areas where these occurred. The numbers indicate that for the distribution stations in the north sector of the island, only 15 per cent of the production capacity was affected by Hurricane Dean. These were Hill 20 and Desbarra, which suffered from silted intake lines and fallen trees.

In the south, the affected capacity was approximately 53 per cent of the total production capacity. The stations that were affected in either major or moderate ways were: Grace; Denney; Micoud; Desruisseaux; Pierrot; Upper Diamond; Ruby; Upper Saltibus; and Bouton. These stations suffered from silted intakes, landslides, water-based erosion, fallen trees, and damaged and/or clogged transmission lines. As noted above, the only two stations in the south that were not back in operation within three to four days were Micoud and Bouton. These stations represent approximately 2.8 per cent of the total production capacity for the south.

The cost of remedial works (damages), as estimated by WASCO personnel, follows:

- (a) For the north sector, the estimated cost of remedial works was EC\$5,200.
- (b) For the south sector, the estimated cost of remedial works was EC\$34,200; and
- (c) The total estimated all-island cost of remedial works (damages) was EC\$39,400.

An estimate of income losses (indirect losses) was made primarily for lack of production within the Hill 20 system. The estimate made, for a down time of five days, at a loss of income rate of EC\$19,477 per day, gave the total indirect loss for this utility at EC\$97,385.

**TABLE 25:
DESCRIPTION OF DAMAGE TO WATER FACILITIES BY REGION**

Production Facility	Production Gallons (UK) per day	Impact of Hurricane Dean
North		
Cicéron	7,700,000	No impact
Hill 20	1,300,000	Major Impact: La Sorciere and Piton, Louisy, Joseph intakes silted and raw water lines damaged by fallen trees. Marquis and Talvern pumping stations are out of power.
Forestierre	20,000	No impact
Desbarra	15,000	Moderate Impact : Raw water lines damaged by fallen trees, intake silted.
Desrameau	20,000	No impact
Anse La Raye	100,000	Minimal impact: distribution line damaged by fallen tree
South		
Grace	1,500,000	Major impact: Silted intake at Woodlands, distribution line affected by landslips. Manhole at La Ressource nearly washed into river
Thomazo	80,000	Minimal impact: silted intake
Dennerly	200,000	Major impact: silted intake at Errard, transmission lines damaged by landslips and fallen trees
Aux Lyon	50,000	Minimal impact: pipeline access route blocked by fallen trees
Deniere Riviere	100,000	Minimal impact: silted intake
Patience	130,000	Minimal impact: silted intake at Lumbard and part of transmission line clogged
Micoud	120,000	Major impact: silted intake, damaged and clogged transmission line. Mahaut intake silted and transmission line damaged by fallen trees and landslips
Desruisseaux	190,000	Moderate impact: silted intake, raw water transmission line damaged by water erosion
Belle Vue	140,000	Minimal impact: intake clogged
Pierrot	10,000	Moderate impact: transmission lines damaged by land slips
Beausejour	850,000	Minor impact: Grounds flooded, water purification plants got wet.
Toucousson	60,000	Minimal damage: fallen trees in intake vicinity
Delcer	280,000	Minimal impact: damaged transmission line.
Lower Diamond	60,000	No impact
Upper Diamond	100,000	Moderate impact: chlorinator hut damaged by fallen tree, fallen trees in intake
Ruby	170,000	Moderate impact: silted intake and access to intake blocked by fallen trees
Lower Fond St. Jacques	170,000	Minimal impact: tree fell on rubble wall tank . Tank suffered no damage.
Upper Fond St. Jacques	60,000	No impact
Upper Saltibus	50,000	Moderate impact: silted intake and access to intake blocked by fallen trees
Bouton	9,000	Moderate impact: intake silted and covered with debris and fallen trees
Anse la Verdure	40,000	Minimal impact: silted intake
Canaries	100,000	Minimal impact: damaged transmission line
Source: ECLAC estimates based on official GOSLU data		

2. Electricity generation

The infrastructure of the Saint Lucia Electricity Services Limited (LUCELEC) began experiencing the impact of Hurricane Dean from the evening of Thursday 16 August 2007, as strong winds brought down trees onto the Transmission and Distribution infrastructure. This resulted in the Feeder Protective Devices coming into operation and cutting off the supply on those feeders. At approximately 7:00 am on Friday 17 August 2007 the entire system was de-energized.

LUCELEC technical staff began assessing the damage to the lines and power station shortly after 9:30 am on 17 August. The power station did not suffer any visible damage and was put in a state of readiness awaiting the availability of feeders for dispatch. Staff and contractors were deployed throughout the country inspecting the transmission and distribution lines and carrying out repair work to restore power to the customer base. The first feeder to be energized was the Vieux Fort Feeder at 12:15 PM on Friday 17 August, while the last high voltage circuit was restored at 6:42 AM on Saturday 18 August.

In addition to the damage to the transmission and distribution lines, a section of the roof of the administrative building at San Souci was damaged. This allowed the ingress of water to the ground floor offices with resultant damage.

In summary, the transmission and distribution system sustained some damage from the high winds and flying debris associated with the hurricane. As of Monday 20 August 2007 the estimated cost of this damage stood at EC\$550,000.00. The damage to the buildings resulted in an estimated expenditure of approximately EC\$15,000.00. The costs are summarized as follows:

(a) Cost of repairs to transmission and distribution lines (direct damages) was estimated at EC\$550,000.

(b) Cost of repairs to the administration buildings at Sans Souci was estimated at EC\$15,000.

(c) The total cost of the estimated direct damages for the electricity generation sector was EC\$565,000.

LUCELEC also estimated the loss of sales resulting from the short period of down time due to the onset of the hurricane, to be indirect losses EC\$458,255.

3. Communications

(a) Cable and Wireless

A summary of damages submitted by Cable and Wireless (C and W) gave a listing of the issues that were faced after the passage of the hurricane, the areas and exchanges where these problems occurred, the cost of repairs, the time for repairs and the crews assigned to the work. Issues that had to be dealt with included:

(a) Downed cables that had to be replaced;

- (b) Poles downed or broken that needed replacing;
- (c) Poles slanting that required straightening;
- (d) Burst lines that needed to be replaced;
- (e) CATV lines not working; and
- (f) Trees that had fallen on cables and which required trimming.

These issues and problems were experienced in a number of exchanges, which included: Babonneau; Bexon; Canaries; Cap Estate; Central; Choseiul; Corinth; Cul-de-Sac; Desbarras; Entrepot; Fond Cacao; Labourie; Saltibus; Massacre; Micoud; Monchy; Morne; Redit; Vanard; and Vieux Fort.

An estimate of the total cost of repairs given by C and W is presented below:

- (a) Cost of materials and equipment for repairs was estimated at EC\$941,585.
- (b) Cost of labour for implementing repairs was estimated at EC\$792,435.
- (c) Total estimate of Direct Damages was EC\$1,734,020.

The indirect losses related to Hurricane Dean for this provider were estimated to be EC\$33,200 and included the cost of diesel used to run standby generators.

In regard to the other service provider on the island, Digicel, unfortunately no information was forthcoming.

4. Fire Services

Damage to fire services infrastructure was reported primarily at Castries. Visual observations made during the hurricane confirmed that the sea rose at the northern wharf, next to the Port Fire Station in Jeremie Street, Castries. This storm surge resulted in damage to the side wall structure which housed the generator at this location. Further, the generator, which was in operation at the time during the passage of the hurricane, was struck with direct sea water as a result of a combination of openings in the damaged wall and the occurrence of heavy winds and high seas.

A summary of the extent of damage (in terms of repair and/or replacement costs) is provided:

1. Repair of the damaged wall structure – approximate value - \$ 6,000.00
2. Replacement/repair of the damaged 40 kw engine generator - \$190,000.00

3. The total cost of the associated direct damages was therefore EC\$196,000.

It should be noted that the generator received extensive damages and currently is no longer in operation. The Fire Service is now investigating the possibility of dismantling the generator to examine and decide whether it can be repaired.

5. Ports

The Saint Lucia Air and Sea Ports Authority (SLASPA) carried out an assessment of damages following the passage of Hurricane Dean. Based on this assessment, it was determined that damage occurred to the Port of Castries, to Pointe Seraphine and to the George Charles Airport. Damage to the sea port areas were primarily as a result of damaged seawall and/or revetment areas, and damage to sheds. Damage to the airport was primarily related to the areas adjacent to the runway. A summary of the noted damage is provided:

(a) Port of Castries

- (i) For Shed No. 7
 - a. Damage to revetment;
 - b. Damage to pavement adjacent to the shed;
 - c. Replacement of security fencing; and
 - d. Total estimate of damages for this item was EC\$205,400.
- (ii) Clean-up was estimated at EC\$7,500.
- (iii) For reparation works related to the retaining structure and floor of the Ferry Terminal/Berth No. 6
 - a. Demolition and reconstruction of reinforced concrete floor and walls of building;
 - b. Reconstruction of revetment; and
 - c. Total estimate of damages for this item was EC\$391,650.
- (iv) For CCTV equipment and works, the estimate of damages was EC\$38,000.
- (v) For replacement of the roofing structure at Shed 6 and damaged guttering at the Ferry Terminal, the estimate of damages was EC\$275,825.
- (vi) For reinstatement of fencing between the Ferry Terminal and bridge, the estimate of damages was EC\$4,000.

The total estimate for damages at the sea port was approximately EC\$1,000,000 which includes the items listed above plus some other miscellaneous items.

(b) Pointe Seraphine

Some damage was observed to the rock armour at Pointe Seraphine, in addition to there being sand on the pier, necessitating some clean up activities. It is estimated by SLASPA that repacking of the damaged rock armour will be an appropriate repair mechanism. In addition to the damage at Pointe Seraphine, there was also some damage to an area west of the Port and at the Ganters Bay area west of Pointe Seraphine. An estimate made of the cost of repair works for these areas is EC\$150,000. This estimate is to be reconfirmed, following a survey to map any displaced rock at the toe of the damaged rock armour zones.

(c) George Charles Airport

Some damage was observed to the rock armouring around the end of the runway. The cost to repair this was estimated to be EC\$100,000.

The total cost for the required repairs in the ports sector (direct damages) was estimated to be EC\$1,250,000.

6. Roads

The network of main roads remained in excellent condition after the passage of Hurricane Dean. These main coastal roads had been recently resurfaced and little or no damage occurred to this network of roads. With the exception of the need to clear landslides and remove fallen trees and to clean silted drains and culverts, which resulted in a total cost of repairs of EC\$1.2 million (an amount already accounted for in the Environment sector), no other repair works appeared necessary for the network of main roads.

The picture was, however, markedly different for the network of feeder roads that service the agricultural sector. These roads which provide access routes for the many farmers in the countryside from their inland farms to the main urban areas were severely damaged by the rainfall that accompanied the hurricane. In most cases, these roads are covered with a 6" layer of crusher run material, with the addition of a weak mix of cement to act as a stabilizing agent, in other cases, the surface dressing for these roads consists of a sprayed mixture of bitumen and gravel. In both cases, the combination of heavy rainfall and poor drainage results in susceptibility to flooding and extensive pitting of the surface layer. Deterioration of this road network affects the ability of the farmers to transport their goods to their main markets.



Typical condition of feeder roads after Hurricane Dean

After the passage of the hurricane, the Ministry of Works deployed personnel to assess the damage to these roads and to develop a schedule of repairs and repair costs. The required works were grouped according to an existing system of zonation used to define agricultural boundaries across the island. In summary, the island is divided into eight such zones. The primary damage was experienced to roads in Zones 2 (Babonneau), 3 (Dennerly) and 7 (Anse la Raye). Some damage was also observed in roads in Zones 4 (Micoud), 5 (Vieux Fort) and 6 (Soufriere). In general, damage observed and repair works required included:

- (a) Cleaning of earthen drains and verges;
- (b) Placing and compacting stabilized base course for road surfaces;
- (c) Cutting fallen trees;
- (d) Clearing landslides;
- (e) Clearing culverts;
- (f) General de-bushing;
- (g) Grading and reshaping of roadway; and
- (h) Repair of collapsed section of road.



Breakdown of pavement on feeder road after Hurricane Dean

The estimate of direct damage costs for these repairs, was given as EC\$8,309,959 as detailed in table 26.

**TABLE 26:
ESTIMATE OF DAMAGES TO AGRICULTURAL FEEDER ROADS**

Location	Approx Length	Scope of works	Estimate Costs ECD
Zone 3	9,900	The proposed works are geared towards minimal reinstatement of verges, earthen drains and unsealed surfaces, clearing of slides, critical pavement strengthening and concrete strips to steep sections.	475,000
Zone 3	45,778		3,986,959
Zone 7	8,994		1,025,000
Zone 4	11,217		586,000
Zone 5	23,258		1,623,000
Zone 6	4,246		614,000
Total	103,393		8,309,959

Source: Ministry of Communications, Works, Transport and Public Utilities

7. Coastal Zone

The direction of approach of Hurricane Dean resulted in many sectors of the coastline being exposed to damaging waves. Fortunately, however, the island was not exposed to the most damaging waves from the north-east sector of the hurricane. Nevertheless, some damage was observed around the coastline. These are described in the following subsections.

(a) Pigeon Island

The north side of the Pigeon Island peninsula appears to have been exposed to relatively high waves (personal observation), as all of the smaller stones in the armour rock revetment were taken out of the structure and thrown onto the adjacent road. Aside from this, however, the structure withstood the wave attack rather well.



It is important to note that for the rehabilitation exercise, all of the smaller stones should be removed from the structure and taken off-site.

On the leeward side of the peninsula, there was significant shoreline erosion along the trail road that traverses this national landmark. The evidence shows that the hurricane waves would have come into the bay and eroded the shoreline, damaged existing groyne structures and destroyed an existing jetty structure. This latter jetty has served an important function, in that it allows a point of docking for visitors alighting from yachts who wish to tour the Pigeon Island National Landmark and associated restaurants. The beach associated with this facility was probably also eroded, however, the effects of this are not extensive. It should be noted that this beach area is actively used by visitors to the facility.



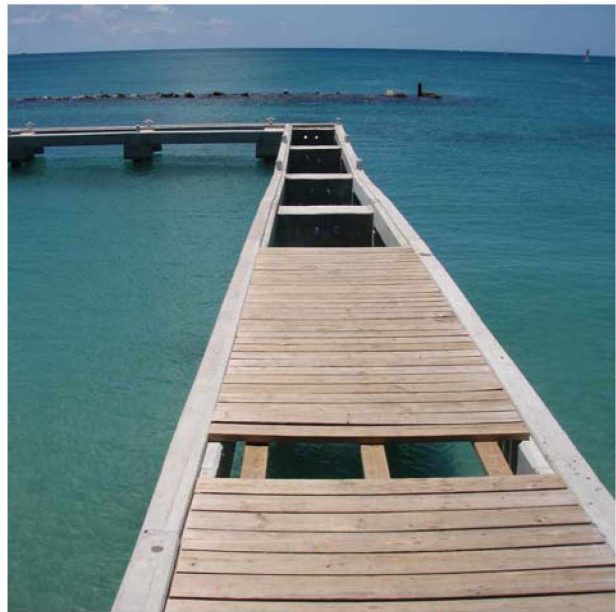
**Top left: Erosion of access trail road; Top right: Damaged groyne structure;
Above: Eroded shoreline approaching jetty; Right: Demolished jetty**

Direct damages to this section of the coastline is estimated at approximately EC\$1,200,000.

(b) Gros Islet

Damage in the Gros Islet area consisted primarily of beach erosion, sand washed up on to the coastal road and damage to a new jetty. The existing offshore breakwaters that were constructed after Hurricane Lenny in 1999 have provided protection to the shoreline in their lee and, even though some beach erosion was observed, the width of the beach has been maintained for the most part. Evidence of erosion along the Gros Islet beach included the exposure of foundations around a new lifeguard tower, and appears to indicate a vertical erosion of the beach of approximately one metre.

Other damage along this stretch of shoreline included the removal of timber panels along a new jetty. No remedial action is recommended for the beach erosion, as the sand is expected to return over time. For the jetty, repairs are required, in order to make this structure functional once more. The costs of these repairs are estimated at EC\$50,000.



(c) Dennery

No major shoreline damage occurred at Dennery, largely as a result of the breakwater and buried revetment structures that have recently been built. Impacts at this location consisted primarily of washout of informal shacks at the northern end of the Dennery shoreline and the washing up of debris onto the shoreline. It should be noted however, that the relatively exposed reclaimed land area at the north of Dennery is not a zone where habitation should be encouraged, as it is in a hazard area. Recovery of this informal housing is therefore not encouraged.



(d) Vieux Fort

Some shoreline erosion was experienced at the Coconut Bay Hotel in Vieux Fort. Erosion was experienced over a distance of approximately 75 metres. A recommended solution to this problem is the construction of a low, buried revetment, which is anticipated to cost approximately EC\$200,000.

(e) Soufriere

Some damage to jetty panels (similar to what occurred at Gros Islet) was observed following the passage of the hurricane. Aside from this, none of the rock armour structures suffered damage. Repairs to these structures are expected to cost approximately EC\$200,000.

(f) Clean-up

The initial cost to the clearing of landslides, fallen trees and the culverts and drains amounted to EC\$ 792,925 as per the following table:

**TABLE 27:
CLEAN UP COSTS IN EC\$ 000'S**

Zones	Locations	Clearing of slides	Clearing fallen trees	Clearing silted Culverts/ Drains	Total
Initial Response to Zonal Issues					
1	Gros-Islet District	0.0	32.5	49.4	81.9
2	Babboneau & Environs	17.8	30.5	1.5	49.8
3	Dennery District	2.5	24.8	5.5	32.8
4A/4B/5A	Savannes Bay to Mon Repos	3.8	46.1	22.5	72.4
5B	Vieux-Fort	0.0	5.0	21.4	26.4
5C	Saltibus/Laborie	7.2	0.7	0.0	7.9
6A	Choiseul	16.2	20.4	2.8	39.4
6B	Soufriere District	73.8	17.0	4.6	95.5
7	Anse la Raye / Canaries	31.9	39.0	9.5	80.4
8A	Castries City & Environs	70.0	61.5	105.2	236.7
8B	Wider Castries District	3.0	29.2	37.5	69.7
Total		226.3	306.7	260.0	792.9
Source: Ministry of Communications, Works, Transport and Public Utilities					

There are other clean-up costs that are allocated under the sectoral headings.

8. Summary Costs

Table 28a presents data on the affected agricultural feeder roads with estimates for repair with mitigation. Data suggests that mitigation costs would amount to EC\$19,941,672.

**TABLE 28a:
SAINT LUCIA: MITIGATION COST FOR FEEDER ROADS**

Location	Approx Length	Scope of works	Estimate Costs ECD
Zone 3	44,550	Includes additional works for upgrading the pavement and application of a bituminous seal and surface dressing to reduce maintenance need, protect against erosion /damage and for durability.	1,588,750
Zone 3	206,001		9,136,984
Zone 7	40,473		2,036,825
Zone 4	50,477		1,847,913
Zone 5	104,661		4,239,525
Zone 6	19,107		1,091,675
Total	465,269		19,941,672
Source: Ministry of Communications, Works, Transport and Public Utilities			

A summary of all costs developed under the infrastructure heading is presented in the following table 28b, mitigation costs are not included.

**TABLE 28b:
SUMMARY OF DAMAGE TO INFRASTRUCTURE**

	Cost EC\$ 000's
Total Impact	15762.1
Damage	
Road /transport	8310
Water supply	136.7
Fire Services	196
Electricity	1023.3
Communications	1767.2
Sea and Air ports	1250
Coastal Zone	2286
Total damage	14969.2
Total loss	792.9
Source: ECLAC based on official GOSLU data.	

C. Tourism

The 2006 Economic and Social Review states that tourism remains the principal source of growth and foreign exchange in Saint Lucia. The same report indicated that the sector contracted in 2006 for the first time since 2001. Arrival data for 2007 indicates that the contraction in stay-over visitors continued in 2007 with stay-over arrivals almost 8 per cent lower for the first six months as compared with the same period in 2006. The 2006 Economic and Social Review stated that the decline in tourism was most pronounced in the main markets of the United Kingdom and the Caribbean. The European decline is even more of a concern when one realizes that the Eastern Caribbean dollar has depreciated against European currencies by about 30 per cent. This indicates a rapid loss of competitiveness. In 2006 this loss of the European and Caribbean market was partly compensated by an increase in North American arrivals. With the United States heading for a recession, the performance of Saint Lucia in the second half of 2007 is worrisome.

In 2007 the yachting sector remained at about the same level as in 2006. It is likely that the yachting contribution is understated for both years because of the way the yachting contribution is recorded.

In the first six months of 2007 the number of cruise ship passengers increased significantly by almost 53 per cent over the same period in 2006. Because the expenditures of cruise ship tourists comprise less than 10 per cent of those of stay-over tourists, the increase in cruise ship visitor arrivals will only partly compensate for the loss in tourist arrivals.

With the above in mind, the potential impacts on the tourism sector by Hurricane Dean could have been devastating to the economy. As it turned out the impacts were moderate.

1. Hotel tourism

By and large the tourism sector weathered the storm well and all hotels were fully operational the day after the hurricane. Following the hurricane the Saint Lucia Hotel and Tourism Association requested damage reports, including costs, from its members. Few hotels responded and reported the extent and cost of the damages. Some submitted a description of the damages, while some hotels did not respond to the information request at all.

Damages were limited, although one hotel suffered flooding of some of its rooms. Reported damages range from zero to about EC\$200,000 with the majority reporting damages and clean up costs of less than EC\$50,000. Reported damages included damage to roofs (minor) and solar panels, fencing, landscaping and beach facilities, such as the loss of beach furniture, minor damage to docks or loss of beach sand. Based on the limited information received, ECLAC estimates that the total damage in the hotel sector may not exceed EC\$2 million. This estimate is subject to revision if more information becomes available.

Information from the Saint Lucia Hotel and Tourism Association indicates that the passage of Hurricane Dean did not affect bookings. Since there are no major supply constraints in the form of destroyed rooms and given the low occupancy rates there should be no loss of business as a result of the hurricane. Clean up costs for all hotels are estimated at about EC\$150,000, based on the same limited information received and subject to revision. Hotel staff was used for the clean-up operations. Therefore no adverse social impacts are anticipated.

2. Yachting

Like the hotel sector, damages and losses to the yachting sector were small. In Ganter's Bay one Betram powerboat, two vessels used for the Pointe Seraphine town ferry, four speedboats of between 27 – 30 and two yachts at the Vigie marine police dock were lost at a total estimated cost of US\$1 million or EC\$2.7 million. While the ferry will have lost revenues it is anticipated that these losses were offset by additional income for taxi drivers so that there are no net losses to the economy.

The Le Marin marina in Martinique suffered damage and a few yachts as well as other vessels have relocated to Saint Lucia. Apart from this relocation there has also been a doubling of fuel sales since the fuel dock at Le Marin was damaged. In addition, Saint Lucia may benefit from the repair of yachts damaged in Martinique.

3. Cruise ships

August and September are low season months and the cruise lines had effected a reduced cruise ship schedule with one cruise ship arriving every Thursday and one cruise ship every other Thursday. Because of the timing of the hurricane the event did not interrupt the arrival schedule even though immediately after the hurricane the cruise ship had to be anchored at roadstead. Damages to Pointe Seraphine will be described at the ports and harbour section.

**TABLE 29:
SUMMARY TABLE TOURISM (EC\$ 000'S)**

	Cost EC\$ 000's
Total Impact	4,850
Damages	4,700
Hotel sector	2,000
Yachting sector	2,700
Cruise ship (see coastal zone for Point Seraphine)	0
Losses	150
Hotels	150
Source: ECLAC based on official GOSLU data.	

4. Heritage landmarks

(a) National Trust

(i) Pigeon Island National Landmark

The Pigeon Island National Landmark is an island reserve off the northwest coast and which is joined to the mainland by a man-made causeway. The island which suffered damage as a result of the hurricane has a total area of 17.8 hectares. Many trees, particularly in the multiple use areas, were damaged or uprooted. Most of the damages, however, were incurred along the coast. The jetty was completely destroyed while the groynes that protected the beaches have suffered damage. Surprisingly there was little impact on the beaches, however, there was erosion along both the southern and northern shores.

The perimeter road leading to the main office, the museum and to Captains Cellar was washed away. In addition, the access road to the beaches and the trails to Fort Rodney and the Carib Caves were blocked.

(ii) Loss of visitor revenue

In August 2005 the site received 1607 visitors, however, this number excluded visits by residents and children. In August 2006 Pigeon Island received 4872 visitors, including residents and children. After the hurricane, the Pigeon Island facilities were closed for a week resulting in losses in the form of lost entrance fees and the cancellation of wedding fees. Total income losses are estimated at EC\$10,000.

(iii) Other national trust sites

The other national trust sites sustained minimal damage, limited to broken branches and consequent clean up. Since none of these sites generate income there are no lost income losses.

**TABLE 30:
SUMMARY OF DAMAGE TO PIGEON ISLAND**

National trust		
Item	Cost	
Jetty repairs	500.0	
Groynes	300.0	
Shoreline stabilization	400.0	revised estimate by team
Electrical repairs	22.0	assessment + repairs
Roads	40.0	
AC unit	4.0	
Repairs	10.5	roof + fence
Bollards	5.3	
Beach chairs	5.0	
Subtotal	1286.8	
subtotal excluding coastal defense and jetty	86.8	
Clean up	26.5	footpaths, branches, beaches, jambe bois
Clean up other sites	12.5	
Loss of Income	10.0	
Source: ECLAC based on official GOSLU data.		

5. OECS building

The Organisation of Eastern Caribbean States (OECS) building, a historic landmark building on the Morne, received damage to its roof and its fixtures and electrical wiring. Reconstruction of the roof and other works is estimated at EC\$295,000.

If the Government of Saint Lucia decides to rent premises for the OECS Secretariat pending the repairs, these costs could not be assessed at this point in time which should be added to the losses.

**TABLE 31:
SUMMARY TABLE NATIONAL HERITAGE SITES
(EC\$ 000'S)**

	Cost ECS000's
Total Impact	430.8
Damage	381.8
National trust	86.8
OECS buildings	295.0
Loss	49.0
Clean up	39.0
Loss of income	10.0
Source: ECLAC estimates based on official GOSLU data. Note: The coastal conservation costs for Pigeon Island are included in the coastal zone section.	

6. Marine

(a) Soufrière Marine Management Area

Although a full assessment still needs to be carried out, preliminary indications are that damages to the marine environment are limited to the near shore area. The fragile corals in particular have suffered from wave action, though there was limited damage seen in the deeper areas. Damage to the near shore corals depended on the wave angle and damages to adjacent sites would differ depending on the wave angle. For example, damage to corals at the southern part of the Petit Piton was severe while it was limited in the northern part.

The corals would recover in 10 to 20 years. This will depend, however, on the extent of human impact as, for example, corals on the western part of the Gros Piton, which is subjected to sewage and human caused sedimentation, have not shown any recovery since Hurricane Lenny in 1999.

The Soufrière Marine Management Area (SMMA) lost three mooring buoys and four demarcation signs at a cost of EC\$40,500 and EC\$4000, respectively.

Loss of income has not yet been quantified but could be substantial. Following the bleaching of corals in 2005, Saint Lucia dropped in the world diving ranking from 6th to 12th place and the local dive industry may have lost up to 30 per cent its revenue since that year. It is anticipated that the damages to the coral in the SMMA and in the Canaries/Anse La Raye Marine Management Area (CAMMA) will negatively affect diving.

(b) Fish pots

It is estimated that the majority of the 941 fish pots destroyed and that 17 to 20 per cent continued to fish. Some of these pots have degradable parts and those pots would stop fishing after about a month. Also indications are that fish pots stop to fish whenever there are dead fish in the pot. A high estimate then is that 150 pots continue to fish at an average of 40 lbs. of fish per pot

TABLE 32:
SUMMARY TABLE – ENVIRONMENT

	Cost EC 000's
Total Impact	784.4
Damage	44.5
Damage to forestry (see agriculture)	
Damage to marine parks	44.5
Loss	739.9
Income losses diving	..
Income losses forestry	10
Clean up costs	729.9
Source: ECLAC estimates based on official GOSLU data	

D. Social Sectors

1. Housing

The housing stock in Saint Lucia is considered relatively modern with well above 60 per cent of housing units being less than 16 years old. The low level of damage to the housing sector may be attributed to two factors: one, the low category level of Hurricane Dean, at the time when it struck Saint Lucia, and the relatively sturdy stock of housing. Such damage as occurred, amounts to EC\$2.4 million, which represents estimates of damage to less than one per cent of the housing stock, as presented in table 33.

Houses which were totally destroyed were, in the main, houses built of plywood materials, and apparently constructed without using the Saint Lucia Building Code and Guidelines (SLBCG). Data submitted to the ECLAC team indicated that when reports from all districts were taken into consideration, some 16 houses were totally destroyed, and 94 suffered roof and window damage. The housing destruction occurred predominantly in the western part of the island, Castries and Canaries, with additional damage found in the eastern region of Dennery.

**TABLE 33:
CHARACTERISTICS OF HOUSEHOLDS BY DISTRICT**

Districts	1991	2001	% change	Total number of houses destroyed and damaged
Total	33079	47,124	42.5	110
Castries	13,179	18,820	42	42
Anse la Raye	1314	1907	45.2	
Canaries	504	592	17.4	30
Soufriere	1905	2020	6	2
Choiseul	1491	1847	23.9	6
Labourie	1677	2177	29.8	
Vieux Forte	3097	4586	48.1	2
Micoud	3496	4928	41	2
Dennery	2760	3843	39.3	18
Gros Islet	3656	6404	75.2	8
Source: ECLAC estimates based on Saint Lucia Population and Housing Census 2001 and GOSL data				

The value of the damage as presented in table 34, suggests that the value of destroyed houses, EC\$ 480,000 accounted for approximately 20 per cent of the overall cost of the damage.

**TABLE 34:
SUMMARY EFFECTS ON THE HOUSING SECTOR**

Total Damage	2,400,770.00
Total Direct Damage (Ii+ii+iii)	2,345,770.00
<u>Direct Effects</u>	
i. Cost of Damaged Houses	1,128,000.00
ii. Damage to houses totally destroyed	480,000.00
iii. Cost of damage to furnishings	737,770.00
iv. Import component ⁷	1,759,327.50
Total Indirect Losses	55,000.00
<u>Indirect effects</u>	
i. removal of debris	55,000.00
Source: ECLAC estimates based on official GOSLU data	

2. Education

Damage to the education sector amounted to EC\$2.3 million. This reflects the minor damage which Hurricane Dean had on the education sector. There was little or no disruption of the school system as Hurricane Dean occurred during the school vacation period. One of the main secondary schools on the island, St. Mary's College, could not open in time for the new school year due to damage to roof and windows. Details of damage incurred appear in table 35.

⁷ National Report on Housing and Resettlement in Saint Lucia, prepared by Engineering Construction and Management Consulting (ECMC) Ltd. April 2007. The report indicates that from the data collected, it could be suggested that average costs of imports, could amount to approximately 70 to 75 per cent of the total cost of construction.

**TABLE 35:
DESCRIPTION OF DAMAGE TO EDUCATION FACILITIES BY REGION**

Regions	Name of School	Description of damage/loss	Damage	Loss
Castries North	St. Mary's College	Roof/ Window s	60,000	
		Removal of debris		8,000
	Forestiere Combined	Roof/ Windows	40,000	
		Removal of debris		5,000
Castries Central	Anglican Primary	Toilet block	20,000	
		Removal of debris		3,000
	Camile Henry	Roof and fence	20,000	
		removal of debris		3000
Dennerly	Clendon Mason	Roof/structural wall damage	80,000	
		Removal of debris		3,000
Viex Fort	Special Education Centre	Roof/Ceiling/Electrical/floors replacement of tiles	50,000	
		removal of debris		3000
Soufriere	Bouton Combined	Damage to ceiling and electricals	40,000	
		removal of debris		3,000
	Soufriere Infant	Fence damage	25,000	
		removal of debris		3,000
Roseau	Roseau Infant	roof damage	20,000	
		removal of debris		2000
Gros islet	Dame pillet primary	damage to fence	20,000	
		tree clearing		2000
Anse La Raye	Anse la Raye Infant	tidal damage/ floor/ furnishings/ fence	60,000	
Totals			435,000	35,000
Source: ECLAC estimates based on official GOSLU data				

Some 78 per cent of value of the damage to the sector, EC\$1.8 million, arises from the indirect losses, as detailed in table 36, which will have to be incurred due to the relocation of an infant school which is precariously close to the sea. The school, Anse la Raye Infant School, suffered tidal wave damage during Hurricane Dean.

**TABLE 36:
SAINT LUCIA: SUMMARY EFFECTS OF HURRICANE DEAN ON
THE EDUCATION SECTOR**

Total Damage	\$2,345,000.00
Total Direct damage	\$510,000.00
<u>Direct effects</u>	
i. Cost of damaged public schools	\$435,000.00
ii. Cost of Damage to school materials	\$15,000.00
iii. Cost of damage to agricultural plots attached to schools	\$60,000.00
iv. imported components	\$382,500.00
Total Indirect Losses	\$1,835,000.00
<u>Indirect effects</u>	
i. losses incurred for removal of debris and cleaning	\$35,000.00
ii. Damage to schools used as shelters	\$0.00
iii. Cost for reconstruction of one school	\$1,800,000.00
Source: ECLAC Estimates based on official GOSLU data	

3. Health

Total damage to the health sector contributed a mere 20 per cent or EC\$1.2 million of the value of damage to the social sector, which amounted to nearly EC\$6 million. See table 37 for details of the description of damage to the health facilities, which in the main, represents roof damage to hospitals and water damage to some three health centres.

Table 38 presents the summary of damage and losses to the health sector. Of significance among the losses is the replacement cost of a roof, which was partially removed as a result of the impact of Hurricane Dean, and which poses a hazard because of its asbestos content.

**TABLE 37:
SAINT LUCIA: DESCRIPTION OF DAMAGE AND COST BY HEALTH INSTITUTIONS**

Number of health institutions	Health Institutions	Description of damage	Cost of Repair
1	Victoria Hospital, Castries Paediatric Ward, duke of Edinburg Building	Loss of secondary roof cover; partial destruction of reinforced concrete stairs	170,000.00 12,000.00
		link bridge roof between Paeds building and Medica/surgical building	30,000.00
		exposed cables to Radiology Unit	\$10,000
		Glass Panel Façade	10,000.00
1	St. Jude Hospital, Vieux Fort Medical Wards Building and A&E Dept.	Loss of roof gable infill and cladding on south end of building	19,348.00
		damage to lower roof and structure of A&E	72,650.00
		Roof over Canteen	8,000.00
3	Health Centres, Ti Rocher, Castries; Castries Centre; Bexon Centre	Water damage to floors and walls	30,000.00
Total			361,998.00
Source: ECLAC estimates based on official GOSLU data			

**TABLE 38:
SAINT LUCIA: SUMMARY EFFECTS TO THE HEALTH SECTOR**

Total Damage	1,213,557.00
Total Direct Effect	307,000.00
Direct effect	
i. Damage to Health facilities	361,998.00
ii. Damage to the equipment	...
Imported component	230,250.00
Total Indirect Losses	906,557.00
Indirect Effects	
i. cleaning and removal of debris	10,000.00
ii. Additional cost of staff services	...
iii. Additional public health services	...
iv. Replacement of Roof	896,557.00
Source: ECLAC estimates based on official GOSLU data	

4. Summary damage and losses

Although the social impact of Hurricane Dean on Saint Lucia was relatively severe for the most badly affected communities, the economic fall-out was much more moderate. The total impact of the hurricane on the country amounts to EC\$50.7 million, or the equivalent of US\$18.8 million. As usual this estimate is constrained by the lack of adequate data for some sectors, which means the estimate could have been somewhat higher. Nevertheless, the above figure is a good estimate of the impact of the hurricane on the economy. The details are presented in table 39.

Reflecting the higher proportionate impact on assets, relative to loss of future income, damage accounted for 64 per cent of the impact, while the remaining 36 per cent represented losses.

Underscoring the relatively small economic impact of the hurricane, the total damage and losses represented 2.5 per cent of GDP (see data below). With respect to the other macroeconomic variables, the total impact was equivalent to 18.8 per cent of exports of goods, 3.7 per cent of consumption and 4.6 per cent of public external debt- the last figure suggesting that only modest increases in debt at most would be required to facilitate reconstruction and rehabilitation of affected sectors.

Total impact as a proportion of main macroeconomic variables in 2006:

- (a) 2.5 per cent of GDP;
- (b) 63.4 per cent of agriculture GDP;
- (c) 18.8 per cent of exports of goods;
- (d) 3.7 per cent of exports of goods and services;
- (e) 6.9 per cent of gross domestic investment;
- (f) 3.3 per cent of consumption; and
- (g) 4.6 per cent of the public external debt stock.

A breakdown of the impact by sector shows that the productive sectors, including agriculture, manufacturing and tourism, accounted for 54.1 per cent of the total impact, while the other sectors made up of the social sector and infrastructure accounted for the remaining 45.9 per cent. Of the productive sectors, agriculture represented 44.5 per cent of the total fall-out of the hurricane, with bananas bearing the brunt with damage and losses amounting to \$18.2 million or 35.9 per cent of the total impact. Thankfully, the tourism sector was largely spared the worst effects and suffered damage to the tune of only \$4.9 million or roughly 10 per cent of the total. The impacts on the other productive sectors were marginal- amounting to \$1.8 million (3 per

cent of total) for other crops, including fruits and vegetables; \$0.89 million for forestry (1.8 per cent) and 1.7 per cent for livestock and fishing.

The impact on the infrastructure, including farm roads, electricity generation and coastal zone area amounted to \$15.8 million, or the equivalent of 31 per cent of the total impact. Of the sub-group of sectors, road transport was the most badly damaged, as a number of roads were eroded and damaged by the heavy rains. The coastal zone suffered damage amounting to \$2.3 million, as Pigeon Island and some other coastal areas were damaged by wave erosion. Electricity generation and communications were spared the worst effects of the hurricane and suffered impact of \$1.0 million and \$1.8 million, respectively. Meanwhile, the impacts on the water and fire services subsectors were quite small.

**TABLE 39:
SUMMARY TABLE OF DAMAGE AND LOSS**

Sector and subsector	Total Impact	Total Impact	Damage	Losses
	US\$ thousands	ECS thousands		
	2.7			
Total	18808.63	50783.3	32308.4	18474.9
Productive sectors	10182.59	27493	14676.2	12816.8
Agriculture	8386.30	22643	9976.2	12666.8
Bananas	6743.37	18207.1	6955.8	11251.3
Other Crops	546.70	1476.1	986.9	489.2
Livestock	310.63	838.7	698.2	140.5
Fishing	136.70	369.1	297.9	71.2
Forestry	330.59	892.6	389.4	503.2
Infrastructure	318.30	859.4	648	211.4
Tourism	1796.30	4850	4700	150
Social Sectors	2788.22	7528.2	3251.8	4276.4
Housing	889.19	2400.8	2345.8	55
Education and culture	1159.04	3129.4	554.5	2574.9
Health	449.48	1213.6	307	906.6
Other services	290.52	784.4	44.5	739.9
Infrastructure	5837.81	15762.1	14380.4	1381.7
Road transport	3371.44	9102.9	8310	792.9
Water supply and water disposal	50.63	136.7	39.4	97.3
Electricity generation	379.00	1023.3	565	458.3
Communications	654.52	1767.2	1734	33.2
Sea and air ports	462.96	1250	1250	
Coastal zone	846.67	2286	2286	
Fire Services	72.59	196	196	
Source: ECLAC estimates, on the basis of data provided by the Statistical Division, Saint Lucia				

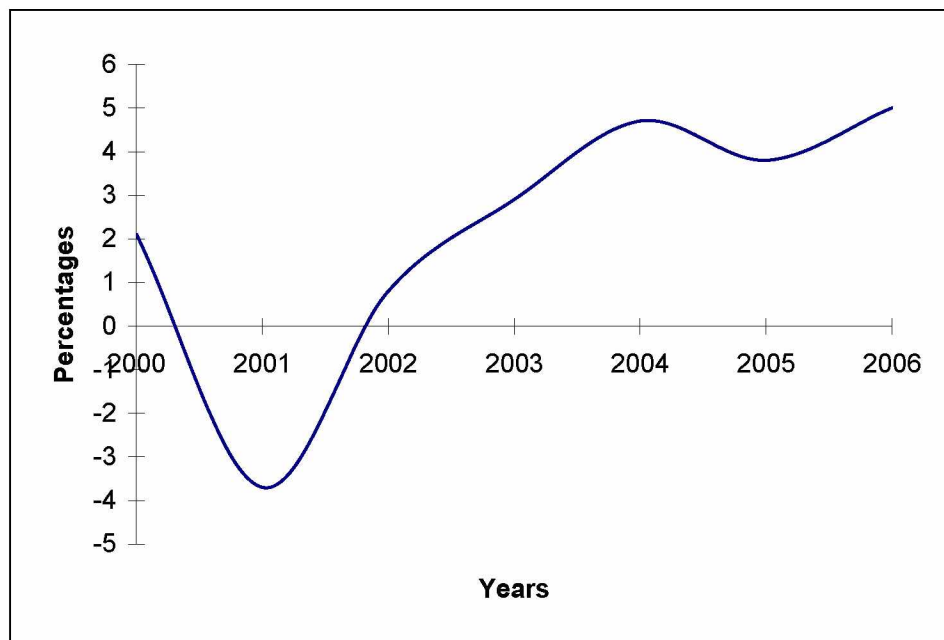
VI. THE MACROECONOMIC IMPACT OF HURRICANE DEAN ON SAINT LUCIA

A. The pre-disaster macroeconomic performance

1. Output and inflation

Economic activity in Saint Lucia has recovered over the last few years following marginal growth in 2002, after the events of 11 September 2001. Growth has averaged around 4.1 per cent over the last four years. In 2006, growth picked up to 5.02 per cent, the strongest rate for the last decade (see figure 11). Growth impetus in 2006 came from dynamic construction activity, recovery in agriculture and buoyant growth in the manufacturing sector. On the downside, tourism, a major contributor to macroeconomic performance, turned its first contraction since the fall-out from the 11 September 2001 events.

FIGURE 11
SAINT LUCIA – REAL GDP GROWTH RATE (2002-2006)



Source: ECLAC estimates based on data from the Saint Lucia Statistical Division

The upsurge in construction activity from 2005 carried over into 2006, when value added in the sector rose by almost 1 per cent to 13.22 per cent, raising the sector's contribution to GDP to 8.7 per cent in 2006, from 8.1 per cent in 2005. Uptick in construction was driven both by public and private sector activity. Public construction was buttressed by road construction, education facilities, the Cricket World Cup (CWC) development project and health facilities. A welcomed development was the over 63 per cent increase in spending on economic infrastructure, particularly roads. Meanwhile, spending on social infrastructure jumped fourfold to EC\$55.1 million, reflecting outlays on education, health, sporting and community facilities.

Agriculture posted a welcomed rebound in activity, growing by 9.8 per cent following the drastic contraction (-24.7 per cent) in 2005. Banana output recovered to grow by 13.3 per cent to 33,982 tonnes. Production was resuscitated as a result of the control of leaf spot infestation, more favourable input costs and increased availability of planting material and improved crop protection and monitoring. Similarly, output of non-traditional crops improved significantly propelled strong domestic demand from supermarkets and hotels, which led to higher prices for produce. Small farmers benefited from crucial assistance by Oxfam International in marketing and production planning, which helped to match supply with demand. Similarly, fish catch increased by over 15 per cent on account of favourable climatic conditions.

At the same time, the manufacturing sector achieved buoyant growth of 6.7 per cent thanks to higher domestic demand and improved penetration of the regional market, especially for alcoholic beverages. Meanwhile, output of paper and paperboard increased supported by the recovery in banana export in the Windward Islands.

Value added in the banking and insurance sector increased by almost 18 per cent, reflecting continued financial deepening, strong growth in deposit liabilities and demand for credit.

Despite the pass through effects of higher fuel prices, inflation moderated in 2006, falling to 2.3 per cent, from 3.9 per cent in 2005. Also from the imported side, the depreciation of the United States dollar relative to major currencies led to higher prices of products from these trading partners. Domestic supply shortages and moderate growth in wages also contributed to price pressures. Nevertheless, upside factors were partly offset by the fall in the price of food items and fuel in the latter part of the year.

2. Fiscal performance

Fiscal policy was expansionary in 2006/07. Although central government achieved a current surplus of 4.2 per cent of GDP on the backs of strong revenue growth, this was surpassed by strong growth in capital spending up 11 per cent to \$264.5 million). This led to an overall fiscal deficit after grants of \$136.9 million, the equivalent of 5.5 per cent of GDP.

Growth in current revenue more than doubled to 10.2 per cent in fiscal year 2006/07, to reach 27.3 per cent of GDP. Revenue intake was propelled by dynamic economic activity, which resulted in a 12 per cent rise in tax proceeds. Receipts from taxes on income and international trade were particularly buoyant, reflecting growth in incomes and strong growth in imports. Taxes on international trade and transactions expanded by almost 15 per cent to \$238.4 million associated with the spike in non-oil imports, including motor vehicles, capital goods imports and consumer goods.

Meanwhile, taxes on goods and services were up by almost 10 per cent due to higher receipts from consumption tax on imports, hotel occupancy tax, stamp duties and licenses. Nevertheless, consumption did not realize its full potential yield in spite of higher spending on imported materials, especially to expand hotel room capacity for the CWC. Taxes on property

also posted strong growth built on growth in employment and wages and increased business activity that resulted in higher corporate tax yields.

On the other hand, non-tax receipts contracted by 14.5 per cent associated with lower fees, fines and sales and interest and rents.

Although Saint Lucia is in a more favourable position than its OECS counterparts, debt which has risen fairly rapidly from 39 per cent of GDP in 2000 to 65 per cent of GDP in 2006, has become as an area of concern.

3. Monetary and exchange rate developments

Underpinned by dynamic growth, broad money expanded by around 20 per cent in 2006, relative to 13.4 per cent in 2005. The money supply was influenced by strong holdings of private sector foreign currency deposits and savings deposits.

Credit demand was also robust as private sector credit surged with confident expectations in the outlook for the economy. Importantly, two productive sectors, tourism, and manufacturing experienced significant growth in credit. Meanwhile, the net foreign assets of the banking system contracted sharply, as banks drew down assets to meet credit demand in a tightened liquidity environment.

4. Balance of payments position

The balance of payments swung into a surplus of EC\$36.3 million, the equivalent of 1.4 per cent of GDP, following the deficit of 1.7 per cent of GDP in the previous year. The current account deficit expanded by over 21 per cent to EC\$534.9 million, but was more than covered by robust capital inflows.

Underscoring economic recovery and preparations for CWC, the capital and financial account which recorded a healthy surplus of EC\$571.2 was partly driven by large inflows of foreign direct investment (up 47 per cent to EC\$ 310.5 million) into tourism and construction, which would improve the future productive capacity of the country. This was complemented by an increase in net inflows of commercial bank short-term capital to foster domestic credit demand, which more than doubled to \$174 million.

On the other hand, the structural current account deficit widened to EC\$534.9 million to 21.3 per cent of GDP up from 17 per cent of GDP in 2005. In a somewhat unusual development, the deficit on both goods and services increased in 2006. The merchandise trade deficit rose to 40.4 per cent of GDP up from 40.1 per cent in GDP in 2005. Imports expanded by over 7 per cent to EC\$1,210.5 million, reflecting higher import payments for fuel, construction materials and capital goods linked to the rise in fuel prices and investment activity. Exports grew by 12.7 per cent to \$195 million, propelled by a 14.1 per cent growth to EC\$47.2 million in banana receipts. Banana receipts benefited from higher export volume and favourable prices for the Fairtrade label bananas, which face more dynamic demand on the European Union market.

B. Expected macroeconomic performance in 2007 without the hurricane Dean

Following the above growth in 2006, the economy is expected to slow down in 2007. Construction activity, although expected to be relatively vibrant, is not forecasted to reach levels achieved in 2006. Tourism value added is projected to be fairly flat, as the forecasted boon in arrivals for the CWC did not materialize and airlift difficulties could affect the more important stay-over market.

1. Output and inflation

Real output is projected to grow by 3.3 per cent in 2007, slower than the 5.02 per cent achieved in 2006. This growth will be built on dynamic activity in agriculture (up 15.5 per cent) and positive, but slower activity in construction, manufacturing and services. Banana production was projected to recover and post growth of 32 per cent, reflecting improved crop management, pest control and yields. Value added in livestock and fishing was also expected to increase in 2007.

Manufacturing output was expected to continue to register positive growth bolstered by higher output of boxes for the banana industry, and domestic appliances and electrical goods. Meanwhile, manufacturing production increased marginally by 0.9 per cent to \$9.22 million. Output of paper products rose by over 19.8 percent in line with stronger demand from a growing banana subsector.

2. Fiscal performance

The fiscal position was expected to improve in 2007, with the overall deficit after grants contracting by 14 per cent to \$117.4 million. Current expenditure was projected to post moderate growth of 7 per cent, but was partly offset by a 13 per cent decline in capital spending. Growth in current spending was expected to be buttressed by higher outlays on goods and services (8 per cent), interest payment (25.4 per cent) linked to higher debt contracted in the previous year and transfers and subsidies (9 per cent).

Current revenue, however, was expected to grow more slowly at around 3 per cent, associated with a similar growth in tax revenue and a 9 per cent increase in non-tax receipts. Taxes on goods and services were projected to rise by 7 per cent, while proceeds from taxes on international trade and transactions would fall by 0.1 per cent.

The authorities, in a pitch for fiscal consolidation, announced a policy of earmarking 10 per cent of recurrent revenues for capital infrastructure projects. This would be done within an overall framework of using loan finance sparingly mainly when the economy is strong. Such a policy is sound and should help to alleviate the debt burden in the country.

3. Monetary and exchange rate developments

Monetary conditions were expected to tighten, after the boom conditions in 2006. Growth in broad money was expected to slow down in line with reduced growth in activity.

Similarly, credit demand was expected to weaken as a number of projects were either completed or near completion by the end of last year. However, demand in the construction sector was projected to remain fairly dynamic associated with home construction and repairs and private properties.

Meanwhile, the banking system was expected to reduce its pace of drawdown of foreign assets due to reduced domestic loan demand.

4. Balance of payments position

In 2007, the current account deficit was projected to contract marginally (0.1 per cent) to \$535.5 million. The deficit on goods and services was projected to contract by 12 per cent to \$309.1 million, largely due to marked improvement in the surplus on the services account. Tourism would remain flat, as the anticipated increase in receipts from stay-over and cruise passenger arrivals did not materialize, as a result of the lack of dynamism in the CWC. Nevertheless, the structural goods deficit was forecasted to expand by almost 10 per cent, reflecting a decline in goods exports and growth in imports.

The capital account was expected to register an important improvement in line with increased assistance for infrastructure and other projects. On the other hand, the financial account was projected to deteriorate as a sharp growth in foreign direct investment (over 54 per cent) to 480.7 million would be offset by a contraction in other investment, especially long-term loan capital as government reduced its acquisition of debt in the wake of the completion of major projects for CWC.

C. Macroeconomic performance as at the first half of 2007

1. Output and inflation

Economic performance for the first half of the year provides some indication of direction in which the economy was headed before the impact of Hurricane Dean. For the first semester, real activity grew by 3.11 per cent, buoyed by strong growth in agriculture, the financial sector and wholesale and retail trade. Agriculture expanded by 20.8 per cent, reflecting increased output of bananas and other crops. Production of bananas increased sharply by 34.8 per cent to 20,515 tonnes thanks to improved crop husbandry, continued control of leaf spot infestation and the inducement of higher prices for the Fair Trade label bananas on the EU market. Similarly, value added in the other crop subsector was up by 25.2 per cent on the backs of stronger demand from the hotel and supermarket chains.

Meanwhile, manufacturing production increased marginally by 0.4 per cent to \$70.97 million. Output of paper products rose by over 17 per cent in line with stronger demand from a growing banana subsector. Increases in output were also recorded by the wood products, furniture and electrical products subsectors.

Construction activity picked up by 1.4 per cent during the first semester of 2007, compared with the similar period last year, underscoring the slowdown in activity in the sector

after an average boon year in 2006. Public construction centred on the upgrading of roads and highways, school construction and the upgrading of the Beausejour Cricket Stadium. Private sector construction focused on large hotels, villas and commercial properties.

The relative weakness in the tourism sector continued into the first half of 2007. Value added in the sector declined by about 8 per cent, reflecting a similar fall in stay-over arrivals. In addition, the total bednights spent by visitors declined by 8 per cent.

Consumer prices rose marginally during the first half of the year to 0.83 per cent.

2. Government finances

The fiscal position improved during the first half of 2007, relative to the similar period of 2006. The overall deficit after grants contracted by 71 per cent to \$21.5 million, reflecting improvements in both the current and capital accounts. The current account surplus increased by 45.7 per cent to \$85.1 million due to growth in revenues and a modest decline in spending. Tax receipts rose by 10 per cent buttressed by higher proceeds from all major categories. On the expenditure side, outlays on wages and salaries were down by 7 per cent and expenditure on goods and services declined by 12 per cent. Capital expenditure fell sharply by 17 per cent underscoring the completion of major projects in 2007 in line with CWC commitments.

3. Monetary and exchange rate conditions

Monetary variables expanded in the first semester of 2007, relative to the similar period of 2006. Net domestic assets expanded sharply by over 33 per cent to \$2120.6 million. Domestic credit increased by over 32 per cent, reflecting strong growth in credit to both the private and public sectors. The distribution of credit by sector shows that whereas credit to businesses increased by 12.9 per cent, credit to households was up by 11.5 per cent. In a welcomed development, credit to tourism expanded by 71 per cent, highlighting the building up of capacity in the sector. Meanwhile, growth in credit to agriculture was sluggish at around 2 per cent, reflecting relatively weak confidence in the sector and its proneness to disasters and other shocks. Pointing to some tightening of liquidity in the banking system, the loans to deposits ratio shifted upwards to 99.08 per cent from 86.15 per cent in the similar semester last year.

4. Balance of payments performance

The current account of the balance of payments was expected to improve in the first semester of 2007, relative to the same period of 2006. Import payments contracted by over 41 per cent, reflecting sharp reductions in consumer, capital and intermediate goods. The decline in the imports of all three major categories of goods was associated with a tapering off of construction activity with the completion of some projects that were linked to the hosting of the CWC.

D. The post-disaster macroeconomic performance

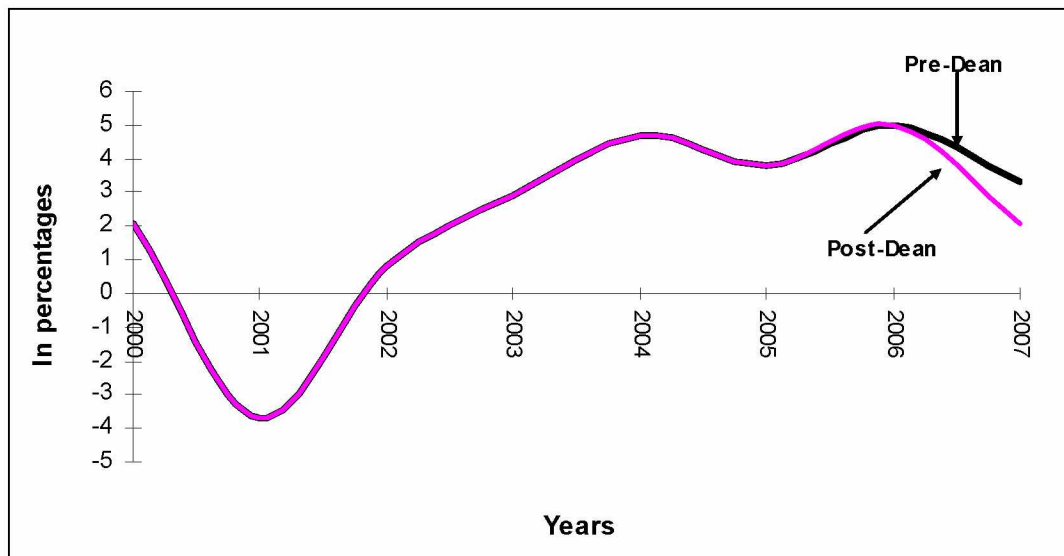
The effects of Hurricane Dean were relatively concentrated on the agricultural sector and to a lesser extent the social sectors and infrastructure. As a consequence, other productive activity including manufacturing, tourism and other services, notably construction, commerce and financial services, were little impacted by the disaster. Given these disparate effects, Hurricane Dean is not expected to have a major impact on macroeconomic performance in Saint Lucia in 2007. Moreover, it is anticipated that the impact of the hurricane will largely be confined to the year 2007 as by 2008 the economy should be well on the path to recovery.

1. Impact on GDP

The overall effects of the disaster on real activity will depend on the net effects of the fall-out from the disaster itself and the compensating effects of measures taken to resuscitate the economy in its aftermath. Important among these offsetting measures will be steps that will be taken to ensure a speedy recovery in agricultural production.

In aggregate, Hurricane Dean is expected to lead to a 1.2 per cent reduction in real GDP in 2007, leading to a reduced rate of growth of around 2 per cent instead of the more than 3 per cent forecasted without the disaster (see figure 12). Slower growth will result largely from the negative multiplier effects of dampened agricultural production. Indeed, agricultural output is projected to contract by 11.4 per cent, on account of lower value added in all sub-sectors. In the dominant banana subsector, production is expected to decline by almost 33 per cent as the sector was buffeted by the hurricane, with over 65 per cent of the crop either damaged or destroyed. In fact, the annual fall-out in value added in the sector will only be cushioned by the average expected (almost 35 per cent) growth in the sector in the first semester of 2007, compared with the same period for 2006. A substantial portion of fruit that were not ready for harvest were lost, and even fruit that might have been in a harvestable condition were damaged making them unable to meet the rigorous standards of the external market.

The “other crops” subsector, made up of cash and own-use crops including root crops, fruits and vegetables was less severely affected than the more vulnerable banana subsector. Real production in the “other crops” subsector is projected to decline by about 2.7 per cent in 2007 due to plant damage, soil erosion and loss of fruit crops. Meanwhile, livestock production is estimated to fall by 1.1 per cent and fishing by 0.33 per cent, reflecting marginal impacts on these subsectors.

Figure 12: GDP Growth rates pre-Dean and post-Dean

Source: ECLAC estimates based on data from the Saint Lucia Statistical Division

Value added in the infrastructure and utilities sectors were only marginally affected by the hurricane. Value added in the transport sector was expected to decline on average by 0.41 per cent, reflecting a fall of 0.1 per cent in road transport and 0.72 per cent in sea transport. At the same time value added in communications was projected to slow down marginally by 0.01 per cent. Similarly, real output in government services and other services were estimated to decline by 0.62 per cent, respectively, associated with higher costs and loss of income in these sectors.

2. Prices, wages and employment

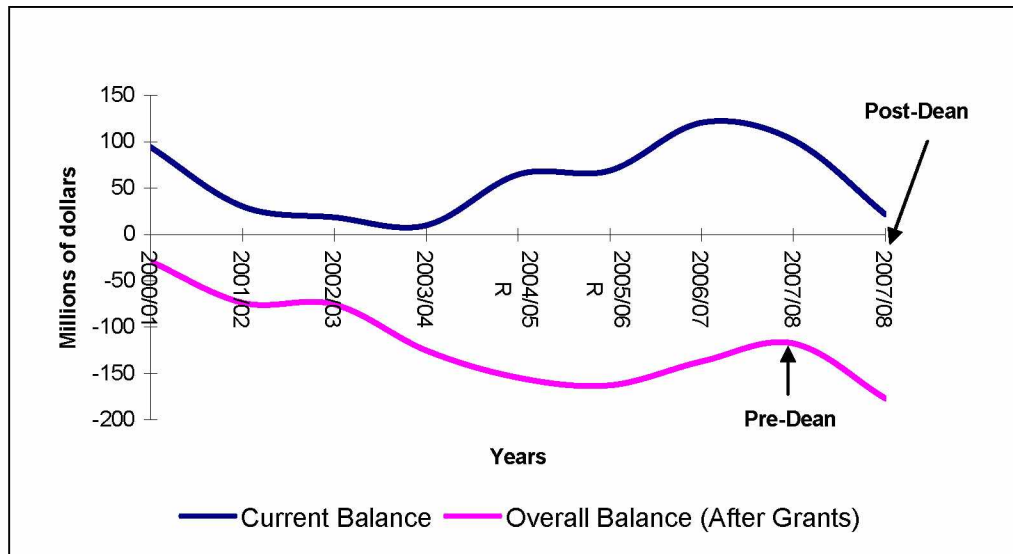
Hurricane Dean will lead to some supply side bottlenecks in the agricultural sector, especially the “other crop” subsector. This is expected to lead to a marginal increase in the rate of inflation. Growth in imports in the aftermath of the hurricane for the revival of the agricultural sector (such as fertilizers and pesticides) and for infrastructure repairs also presents some upside risks for imported inflation depending on foreign prices, especially given the recent above average international commodity prices.

3. Fiscal operations of central government

The fiscal fall-out from Hurricane Dean will not be severe as the tax buoyancy is expected to be little affected and government spending on transfers, rehabilitation and reconstruction will be moderate at most. The current account is expected to remain in surplus, albeit at a lower level of EC\$15.1 million compared with a healthy EC\$101.6 million in last fiscal year (see figure 13). Total revenues and grants are expected to contract by some 3 per cent to EC\$653.33 million, largely reflecting a decline in tax receipts as proceeds fall with slower growth in the economy and reduced ability to pay on the part of affected households. Non-tax

receipts, which are a relatively small proportion of total revenue, are projected to decline by around 18 per cent, in line with reduced earnings from government departments and lower fees, fines and sales.

Figure 13: Saint Lucia - Fiscal Current account and overall balance ECS millions



Source: ECLAC estimates based on data from Ministry of Finance, Saint Lucia

Current expenditure will expand by about 3.3 per cent to \$579.36 million, largely a 9 per cent rise in spending on goods and services and greater transfers and subsidies. Higher outlays on goods and services are associated with spending on materials and supplies for relief, recovery and rehabilitation after the hurricane. Current transfers are expected to grow by 19 per cent to \$83.3 million, bolstered by relief to banana farmers and other affected households. Total expenditure will expand by around 5 per cent to \$830.1 million, surpassing growth in revenue and resulting in an overall deficit of \$176.73 million. Growth in grant receipts should help to defray the cost of some of the banana recovery and infrastructure rehabilitation works. Nevertheless, the need for increased spending would put off track, temporarily, government's plans for fiscal consolidation. However, over the medium term, the fiscal deficit is expected to contract and debt levels will also become more manageable.

Table 40: Saint Lucia: Central Government Revenue by Economic Classification (ECS millions)

	2006/07	Pre-Dean 2007/08	Post-Dean 2007/08
Total Revenues and Grants	650.22	673.45	653.33
Capital Grants	6.64	10	25
Capital Revenue	0.66	1	1
Current Revenue	642.93	662.45	627.33
Tax Revenue	615.64	632.68	601.05
Import Duty	98.09	103.97	110.21
Throughput Charges	1.12	1	1.05
Travel Tax	3.95	4.31	4.31
Service Charge (imports)	68.13	65.79	68.43
Environmental Levy	21.49	20.11	20.11
Surcharge on Int'l Calls	-	-	
Airport Tax	6.87	6.27	6.27
Excise tax (imports)	39.12	37.14	39
Security Charge	2	2	2
Non-Tax Revenue	27.28	29.77	24.37
Earnings From Govt. Depts.	3.02	3.3	3.14
E.C.C.B. Profits	0	0	0
Interest and rents	4.83	5.27	5.27
Fees, Fines and Sales	15.22	16.6	15.96
Other Non Tax Revenues	4.21	4.6	4.51
Wages and Salaries	238.23	241.1	241.91
Wages	26.69	26.96	27.77
Salaries	209.94	214.14	214.14
retro-active	1.6	0	0
N.I.S	6.03	6.6	6.6
Retiring Benefits	37	38.84	38.84
Interest Payments	75.93	95.18	89.79
domestic	26.38	32.44	
foreign	49.55	62.74	
Goods and Services	100.9	109.08	118.89
Current Transfers	64.22	70.064	83.32
public sector	59.61	65.034	78.04
private sector	4.61	5.03	5.28
subsidies	1.32	1.436	1.58
other	3.29	3.594	4
Current Expenditure	522.31	560.85	579.36
Capital Expenditure	264.81	230	250.7
Local Revenue	11.12	11.12	
Grants	11.32	11.32	22.64
Loans	242.37		
Total Expenditure	787.12	790.85	830.06
Current Balance	120.62	101.6	21.69
Primary Balance	-60.97	-22.22	
Overall Balance (Before Grants)	-143.54	-127.4	
Overall Balance (After Grants)	-136.9	-117.4	-176.73

Source: ECLAC, based on data provided by the Authorities

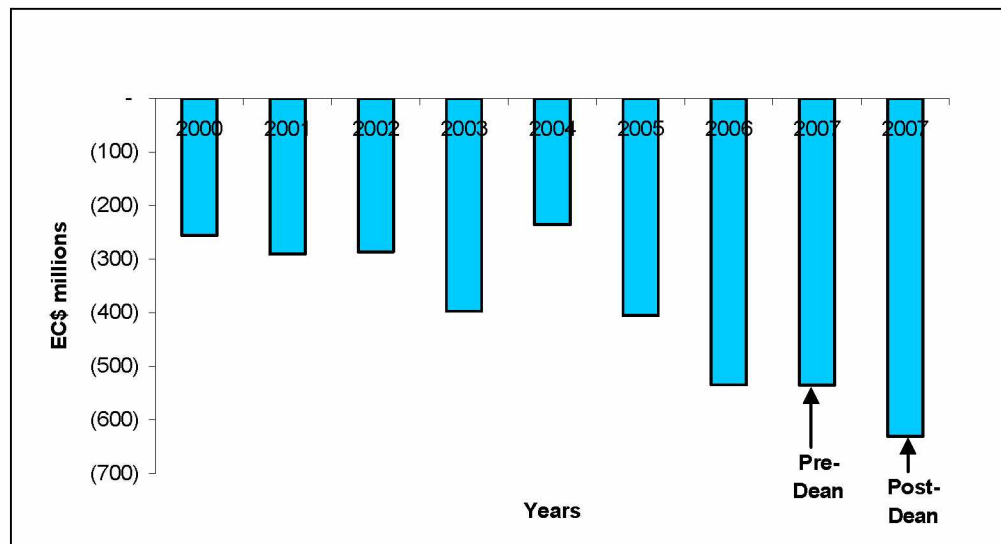
4. Monetary and exchange rate conditions

With the slower growth in incomes and reduced saving, growth in the money supply is expected to decelerate in 2007. Growth in domestic credit would also slow down as household and firm demand weakens in the wake of caution after the disaster and also reduced capacity to service loans. Fortunately, however, these dampened conditions are not expected to last for long and so the reinforcing effects of weak borrowing and investment in an already more sluggish environment would be limited. The real exchange rate is expected to continue to depreciate somewhat with the weakening of the United States dollar against other currencies and hopefully this could buy Saint Lucia some price competitiveness advantage in the tourism market relative to competitors. With sluggish domestic credit demand, net foreign assets of the banking system will increase as banks hold a larger portion of their portfolio in overseas investments.

5. Balance of payments

Although the tourism sector was largely spared the ravages of the hurricane, the fall-off in banana exports, growth in imports of fertilizers and pesticides for crop rehabilitation and also construction material for road repairs along with the impact on transfers will change the outcome in the balance of payments. Overall developments are expected to lead to 17 per cent expansion of the current account deficit to EC\$631.1 million (see figure 14). The merchandise deficit is projected to increase by 8 per cent largely in response to the decline in banana exports due to the loss of production. Fortunately, these effects are not expected to be protracted as with a sound recovery programme production should have returned to near normal levels by the end of the first quarter of 2008.

Figure 14: Balance of payments current account (EC\$ millions)



Source: ECLAC estimates based on data from Statistical Division, Saint Lucia.

The surplus on the services account is expected to narrow marginally by some 3 per cent. Tourism receipts are projected to fall by around 3 per cent, as there was some limited fall-out in the stay-over sector and anticipated disruption in cruise passenger arrivals. Nevertheless, even before the hurricane, the performance of the tourism sector was turning out to be worst than expected. First semester data indicated that stay-over arrivals were down by 7.9 per cent and even though average length of stay increased from 10.1 to 11.5 days, visitor expenditure would have fallen due to reduced arrivals.

At the same time net insurance receipts were expected to increase as banana farmers received compensation for crop damage and loss. The income account was expected to remain relatively stable, as the disaster was not expected to have much effect on income flows. Meanwhile, net current transfers were projected to rise by over 31 per cent on account of increased relief and recovery assistance to the government and other sectors.

In the capital account, capital transfers were expected to expand by 46 per cent, reflecting assistance for infrastructure and other projects and remittances, as families abroad send more assistance in the aftermath of the disaster.

E. Economic challenges and vulnerability issues

On the economic front, Saint Lucia confronts certain vulnerabilities and challenges that pose downside risks to long-term equitable growth and development. One of the more important challenges relates to the restructuring of the economy to create a more balanced economic base built on agriculture, tourism and light manufacturing. Tourism has arisen as the dominant productive sector in the economy, but there is a need to strengthen its competitiveness through improved product and service development, more creative marketing and sustained development of the human capital base in the sector as a catalyst for improved management, service delivery and value for money.

Despite some improvement in price competitiveness consequent on the depreciation of the Eastern Caribbean dollar relative to the Euro area, Saint Lucia has gained little additional market share in the sector. This stems in part from relatively weak non-price competitiveness—manifested in fairly high unit labour costs, inadequate value for money and the need for greater attention to product diversification and quality. The authorities have embarked on a programme of revitalization, including major upgrade in Castries, incentives for hoteliers and planned expansion in the south of the country. These developments will hopefully reinvigorate the sector and enable it to capture market share, increase employment and create a more balanced economy.

Nevertheless, higher fuel prices pose a serious challenge to the economy and sustained prices above benchmark levels could help to undermine competitiveness in most sectors of the economy.

VII. CONCLUSION

The assessment presented in this report should form the basis for the government and the international community to identify and set national priorities in the recovery and rehabilitation process. It should also be utilized as the basis for introducing disaster preparedness, planning and mitigation in the agriculture planning apparatus of the country and into the consciousness of the people of the country, in general, and the agriculture sector in particular. A select number of strategic approaches are advanced.

Strategic approaches to reduce susceptibility to the shocks of natural disasters:

- (a) Need for fiscal consolidation and improved debt management;
- (b) Use modern and appropriate technology in the production processes;
- (c) Strengthen disaster management capacity at the community level;
- (d) Provide special incentives to increase the participation of youth and female producers, particularly those who are heads of households, in the economic development process;
- (e) Strengthen economic diversification efforts (within and outside of agriculture) to generate alternative employment opportunities and as a risk reduction strategy;
- (f) Embark on a programme of sea defenses for most vulnerable roads on the coastal zones;
- (g) Address the relocation of social infrastructure located in the hazard zones;
- (h) Establish affordable micro credit facilities (rural development investment funds);
- (i) Strengthen baseline information systems;
- (j) Explore the benefits of biodiversity and strengthen eco-tourism;
- (k) Explore the potential of the introduction of a national agricultural insurance scheme;
- (l) Evaluation of drainage requirements of feeder roads network followed by the design of drains and implementation of landslide control measures; and
- (m) Undertake effective measures to address high risk infrastructure.