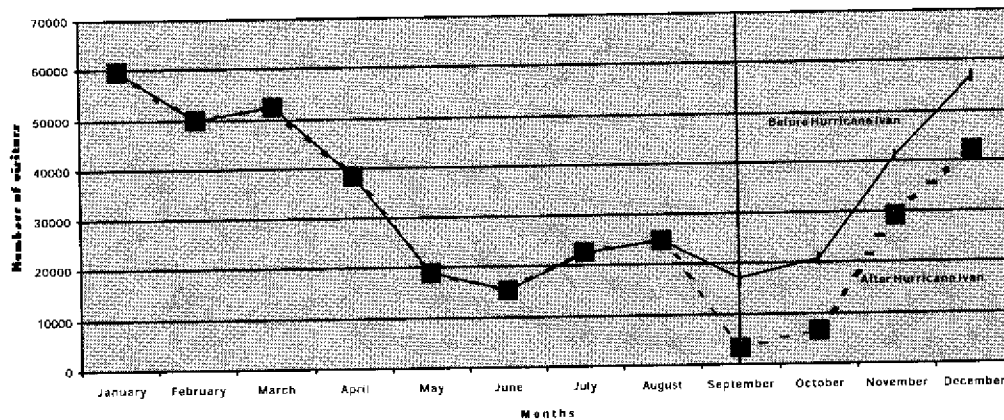


damaged by the hurricane would be restored and thereafter the room capacity would be restored at a rate of 10%, the indirect costs for the year 2005 sum up to 28, 937, 948 million EC\$ (not taking into account tour operators income losses).³²

2.2.3 The yachting subsector

The yachting subsector suffered significant damages mainly as a result of the impact of the wind on yachts. By far the majority of the damage was reported in the Island of Grenada. Carriacou did not incur in any losses and Petite Martinique reported only two yachts lost. The information here provided was obtained on the basis of interviews and surveys with the manager/owners of Grenada's Yacht Club, True blue Resort and Marina, Prickley Bay Marina, Martin's Marina, Grenada Marine and the Spice Island Marina. The last two establishments perform full service boatyards.

Figure 6
Estimated number of total visitor arrivals with and without the natural disaster
January - December
2004



Note: Includes yachts, stayover and cruise ship arrivals.
Source: On the basis of official information and information provided by

a) Direct damages

At the time of the Hurricane, Grenada hosted 800 yachts. Of these fifteen sank, six disappeared and fifty were found stranded on land. The number of boats damaged is estimated at roughly 400. At present the yachting rescue operation is in the process of salvage. The repair phase will begin once the contractors have fully estimated the extent of the damage.

³² These are however small compared to the loss of income of tourist accommodations.

Boats were damaged while at sea and also in boatyards. The extent of the damage was varied according to the marina and boatyards. Most boats however had a common pattern of damage. The direct damage refers mainly to:

- lost rings
- mast damages
- stainless steel framework
- hull damages.

Direct damage was also sustained by the yachting installations. These include (i) repairs to fence, car-park, electricity; (ii) electricity and plumbing; (iii) roof and infrastructure; (iv) wall repairs; (v) refueling. According to interviews these categories represent 8%, 22%, 35%, 17% and 9% of the total respectively.

Taking into account that there were 800 yachts in Grenada at the time of disaster and that half have been damaged, 15 have been reported destroyed, the total direct damage is estimated to be of the order of 108 millions EC\$. The figure was obtained through interviews with cruisers and yacht surveyors. It was also considered that the costing of yacht repairs can easily vary between 162,000 and 540,000 EC\$.

b) Indirect damage

As in the case of tourist accommodations Indirect damage estimates comprise both supply and demand induced damages. Supply induced damages refer to the decline in income due in turn to reduction in harboring capacity due to the effects of the Hurricane.

At least three yachting installations in Grenada are closing and others have also considered moving their base of operations to safer locations. As a result the harboring capacity of the island will be at least temporarily reduced.

Demand induced damages refer mainly to the income loss due to the decline in the number of yacht arrivals due to the disaster. This will be determined in the short run by the Hurricane itself but also by a loss in the level of trust placed on Grenada as a Hurricane haven. The predicted number of yacht calls for 2004 without the Hurricane was 4,900, the projected number of yacht calls with the Hurricane is 4,380. Taking into account both the supply and demand induced factors in the yachting sector, the mission estimated the indirect losses to be 4.7 million EC\$ (See table 26 below).

The economy is also likely to register insurance flows but only a part will flow into Grenada. In the particular case of the yachting sector, insurance flows will not find their way into Grenada since most yachts are owned by non-residents.

Effects on growth and income will include the change in the contribution of tourism to GDP as a result of the Hurricane. Taking into account the effects of the natural disaster the tourist sector will contract by 25%.

Secondary effects	Millions of Eastern Caribbean Dollars (unless stated otherwise)
Loss of expenditure	45.0
Loss in sectoral GDP (Constant 1990 dollars)	20.3
Loss of indirect tax revenue	2.7
Employment losses (direct and indirect)	
Number of unemployed	8,000

Note: On the basis on projected tourist expenditure The secondary effects are for 2004.

Table 27 Secondary effects of the tourism sector

This also comprises the disposable income which is actually spent by the accommodation sector. Taking into account the major's hotels gross revenue, their tax payments and the variation in tourist arrivals, it is expected that net profits may decline in some cases by more than 50%.

The damages felt in the tourism sector also will spill over to indirect tax revenues. The estimate is that in terms of indirect tax revenues, the economy would lose close to 3 million EC\$.

Finally and most important, the effects on the tourism sector will have a negative impact on employment. The impact on employment refers not only to direct employment but also indirect employment. The estimate of job losses ranges from 2,860 if the impact of the Hurricane touches only the 'direct jobs' component of employment in the tourism industry. If the direct and indirect components are taken into account the number of jobs lost can be of the order of at least 8,000.

2.3 The Manufacturing Sector

The manufacturing sector in Grenada is relatively small, accounting for approximately 6.0 per cent of GDP. The sector is dominated by the production of beverage and tobacco; garments; grain mill products and bakery products; and chemicals and paints.

Since 2001, the sector registered declines in each year, which averaged 4.5 per cent over the period, and activity in the sector was projected to remain stagnant in 2004. This was

influenced by the fluctuations in output of the major industrial products, particularly chemicals and paints and grain mill products and bakery products. Over the period 2005 and 2007, growth in manufacturing is projected to be marginal at an average rate of 1.0 per cent.

With the passage of hurricane Ivan, the sector experienced significant damage of approximately 75 per cent of buildings and stocks. The level of employment in the sector was also significantly reduced, particularly in the industries related to the production of garments and furniture as some of these entities are not expected to recommence operations in 2004.

Consequently, the sector is projected to decline by 10.0 percent in 2004, by 5.0 percent in 2005 and remain stagnant in the subsequent years.

Table 28 below summarises the direct and indirect effects of hurricane Ivan on some of the major industrial enterprises. The data is based on a survey response of twenty five (25) enterprises in the manufacturing sector. The survey questionnaire, which was prepared and distributed by the OECS mission while carrying out the assessment of the damage, requested data on the level of employment before and after the hurricane; the status of the operations of the enterprise; value of sales; the value of buildings, equipment and machinery, and inventories; and the estimated loss as a result of the hurricane. Based on the data received, both direct and indirect damage was calculated.

The direct damage is related to the destruction of assets at the time of the hurricane namely, buildings, equipment and machinery, and inventories. The indirect costs are related mainly to the loss in flows of income and additional cost as a result of the hurricane.

As indicated in the table, the direct damage is much higher than the indirect damage, and this is associated with the high cost of buildings and equipment. The direct damage to the sector was estimated at \$17 million EC\$ and the indirect cost at \$4 million EC\$.

Among the manufacturing industries, the rum, furniture and garment industries suffered the most significant damage. In the case of the production of rum, buildings were most severely affected while for the furniture and garment industries both buildings and inventories were damaged. The beverage sub-sector, which dominates the industry, was affected by damage to buildings but operations were not halted for a lengthy period. A number of light manufacturing industries lost substantial portions of inventories and suffered from damage to buildings. The period for the commencement of their operations is uncertain.

Type of Establishment-:	Direct Damage	Indirect Damage	Total
Production of			
Beverages	2.6	0.1	2.7
Furniture	2.4	0.4	2.8
Rum	4.0	0.9	4.9
Garments and Bags	4.6	1.7	6.3
Food	0.8	0.2	1.0
Other	3.4	1.0	4.4
Total	17.8	4.3	22.9

Source: On the basis of field interviews and information provided by the manufacturer's association and the ministry of finance and planning.

Table 31 The manufacturing sector Direct and indirect damage in Millions of Eastern Caribbean Dollars

2.4 The Wholesale and Retail Sector

The wholesale and retail trade which accounts for approximately 10 per cent of GDP, comprises a large variety of traders in foodstuff, clothing and accessories, and books and stationary. Development in the sector is generally influenced by the performance of the other economic sectors and, except in 2001 when overall economic activity declined, the wholesale and retail trade sector has been recording growth. In 2004, the sector was estimated to grow by 8.0 per cent and at an average rate of 7.0 per cent between 2005 and 2007.

Following hurricane Ivan, the sector is projected to record zero growth in 2004. Despite the projected growth on construction, the wholesale and retail sector will be adversely affected by the reduction in income from the other major economic sectors namely tourism and agriculture. In addition, the sector suffered both direct and indirect damage from the hurricane, which interrupted normal business activities.

The direct damage is related to that of physical assets and stocks. The sector was seriously affected by the loss of inventories due mainly to the looting that occurred immediately after the hurricane. This contributed to indirect damage as entities did not immediately reopen because of the general impact of the devastation; the loss of stocks from the hurricane and the subsequent looting; and the need to secure available stocks. A period of restricted trading in supermarkets was manifested in limited opening hours and restrictions on the number of shoppers in the supermarket.

At this stage as the sector had not been able to complete the run on their inventory stocks following the disaster. The mission was nonetheless able to provide an estimate of indirect damage based on national accounts and in site interviews. The value of the indirect damage was estimated at 11 million EC \$.

3. Infrastructure

3.1 Public Utilities

Electricity

Grenada's electricity is provided by the privately owned Grenada Electricity Services Ltd. (GRENLEC), from its power station located in Queen's Park, St. George's. GRENLEC's present generating capacity is 40 megawatts, and was scheduled to be upgraded to 43 megawatts by the end of 2004, with a peak load of 25 megawatts. As a result of the hurricane³³, it is estimated that 80% of GRENLEC's distribution system was damaged, while the main generating system was left essentially intact (some water induced damage to panels occurred).



Photo 4 Typical Damage to Electric Poles

A damage assessment subsequent to the hurricane was carried out by USAID and by CARILEC. These assessments confirmed that the majority of the damage occurred in the parishes of St. George and St. David, while in the north of the island, the damage was not as extensive.

One of the key rehabilitation strategies adopted by GRENLEC has been the assignment of priority areas for the restoration of power. These are described following.

1. The **health sector**, specifically power was restored within 3-4 days to the main general hospital in St. George and to the Mt. Gay Mental Hospital. This was achieved through the restoration of a feeder supply from the main generating plant. For hospitals such as the Princess Alice Hospital in Grenville, where it was not possible to restore the feeder supply, a standby plant was installed.
2. Priority was then assigned to the **security forces**, where either feeder supply or standby plants were used.
3. **Water supply systems** were also assigned secondary priority, which proved to be a relatively difficult objective given the remote nature of some of these systems. Portable generators have now been installed at the two most critical sites, Baillie's

³³ Information obtained through discussion with Mr. Vernon Lawrence, CEO of GRENLEC

Bacolet and Chemin Valley. Six other portable plants have been sourced from the United States and are to be flown in to be installed at six sites which are to be designated by NAWASA. It is estimated that by the end of September, 2004, all water supply stations should be powered and in operation.

4. The *commercial sectors* were then targeted for start up (tertiary priority). These areas are contained primarily in downtown St. George's, where substantial restoration of power has already taken place north to Tanteen and south to the Carenage. It is estimated that by the end of September 2004, all of St. George's (town) will be powered. Grenville is to receive a generator, with full power to be back in that town by the first week of October. From Grenville, the feed will go westward to Gouyave.
5. The next area also targeted for restoration (tertiary priority) was the *main tourism area* of Grand Anse. GRENLEC anticipates restoration of power to this area towards the end of September 2004.

An additional plant was placed at the *St. George's University* and the main feeder supply is presently being restored back to True Blue. Line crews are working their way from True Blue back to Grand Anse. The efforts for these areas are being helped with the emplacement of a 1.5 MW unit that has been located in Lance Aux Epines.



Photo 5 1.5 MW Unit in Lance Aux Epines

The long-term restoration strategy for GRENLEC includes the importation of 1000 electricity poles, which are due to arrive by end September, 2004 from the United States. Following this, it is expected that the main load centres will be restored by mid-October, while for general distribution, all power should be back within a period of six (6) months.

Assistance has been received from electricity generating companies out of Trinidad, St. Lucia, St. Vincent, Montserrat, Antigua and Dominica. In addition, the Trinidad and Tobago Electricity Corporation (T&TEC) has brought in pole diggers (digger derricks) and bucket trucks, while VINLEC out of St. Vincent also sent in some equipment. These have greatly assisted the restoration efforts. Notwithstanding this assistance, additional pole diggers are sorely needed in order to bring the entire country back on stream. A long term mitigation strategy for the reduction of vulnerability within this sector may be to lay underground cables. In order to optimize economies for such an undertaking, however, this would likely have to be coordinated with Cable & Wireless, and be concentrated within specific population centres such as St. George's and Grenville.

The damage assessment carried out for this utility estimates a restoration cost of EC\$70 million (direct costs). In terms of resultant losses of revenue, the following is noted:

- Monthly revenues are approximately EC\$8.5 million
- No revenues are expected to be collected for the month of September
- 50% of the revenues for this utility come from St. George's, Grand Anse and Grenville, where power will be restored within the first month.
- Over the remaining five (5) month period, it is assumed that power will be restored to rural areas at a rate of 10% per month.
- Using these facts and assumptions it is estimated that the total loss of revenue to this utility as a result of Hurricane Ivan (indirect costs) would be EC\$21.3 million.

Water Supply and Sewerage

NAWASA, a government owned Statutory body, is responsible for water supply in Grenada. In all, there are twenty-five (25) dams/intake structures in the NAWASA system. The Authority plans in 2004, to commission a new desalination plant with a design capacity of 1,820 m³/day (0.4 mgd). This desalination plant is intended to supply the Woburn storage tank during the dry season.

NAWASA operates the Grand Anse sewerage system which serves the residential, tourism and industrial areas from Falege, Grand Anse to Point Salines, with collection, screening and pumping to a sea outfall at Point Salines.

As a result of the storm³⁴, it was assessed that the dams suffered damage through siltation and the introduction of debris and trees. In addition, several distribution lines (from the dams to the treatment plants) were damaged, as they are supported overland on elevated columns and thrust blocks (Photo 3). These structures were in turn damaged by falling trees.

³⁴ Telephone interview with Mr. Neptune, Acting Manager of Production and Quality