

II. Assessment of the Damage

This chapter contains an assessment of the damage caused by Hurricane Ivan to the social sector (housing, education and health), infrastructure and telecommunications, and production sectors (agriculture, including fisheries; manufacturing; retail and wholesale trade; and tourism), and to the environment, including water and sanitation. The assessment was carried out on the basis of information available during the mission. Direct damages or effects were assessed, that is, damage to physical infrastructure and the country's capital reserves, and indirect damages or effects, such as lower production of goods and services and emergency outlays.

The costs of rebuilding damaged assets have also been calculated where relevant. If the aim were to return to the situation prior to the hurricane, the value would be the same as the direct cost according to this methodology. However, for the purpose of a reconstruction programme, the assessment should also take into account the value of improved replacement, including disaster prevention and mitigation criteria, such as better technology and quality and more resistant structures. Natural disasters provide a country with an opportunity to rebuild, taking into account the approaches to economic, social and environmental development, which could simultaneously reduce its vulnerability to natural disasters.

The OECS mission interviewed representatives of the government, the private sector, and international organizations, who frequently provided information and valuable suggestions for the preparation of this document.

The figures used in this chapter were calculated in local currency.

1. Social Sectors

1.1 Housing

Just under 28,000 houses or 89% of the country's housing stock of 31,122 houses have been damaged by Hurricane Ivan. Near 10,000 houses, or 30%, have been so badly damaged that they require complete replacement. Approximately 22,000 or 70% require repair. Table 6 presents an estimation of the proportion of houses requiring repair and reconstruction based on the population census data. The cost of damage to the housing sector has been estimated at \$EC1,380 million dollars, as detailed in table 7. Of that, 36% represents costs of repair and 64% reconstruction costs.

Parish	Total Number of Households	Proportion requiring Repair		° Proportion requiring reconstruction	Proportion Suffering No damage	Total Number of Houses damaged
		Minor ^a	Major ^b			
St. George's	11367	15	70	15	0	11367
St. John's	2739	60	20	0	20	2191
St. Mark's	1210	55	15	0	30	847
St. Patrick	3210	50	20	0	30	2247
St. Andrew's	7140	35	50	10	5	6783
St. David's	3530	15	70	15	0	3530
Carriacou	1926	35	5	0	60	770
Totals	31,122					27,735

Table 6 Households affected by Hurricane Ivan by type of repair required by Parish¹⁶

^a Minor damage includes windows, doors destroyed or damaged and damage to partial roof covering;

^b Major damage includes roof structure destroyed or damaged;

^c Requiring reconstruction due to significant damage to structural frame

Note those parishes where houses were not damaged

In a number of parishes, the entire housing stock of a particular village was destroyed. In the parish of St. David the village of Après Toute was moved from the hillside, with only a pile of wood and sheets of zinc as an indication of its previous location. In St Georges, Darbeau, Vendome and Grande Anse Valley had been swept away and in St. Andrew, Soubise which was by the sea, took the brunt of the winds and sea surges from the hurricane, leaving a small number of houses standing.

Although a vast number of houses were still without roof and in a state of collapse, many houses were being made livable through the efforts of a custom called "marooning"¹⁷ which involves villagers coming together in groups to help each other construct a house without payment. The housing stock of Grenada was a fairly sturdy one, with at least 40% having been built before 1980. At least 48% of the houses were constructed of wood and concrete and 30% of wood alone. In regard to roofing, some 79% the houses had their roofs covered with galvanize or alu-zinc sheeting.

Hurricane force winds of 115 miles per hour tore off roofs belonging to persons in the low and high income houses without distinction. The Prime Minister's Official residence, personal house and the official house of the Governor General were extensively damaged, good illustrations of the more substantial houses being damaged along with houses put together by members of the squatter community. Although the

¹⁶ Source: OECS estimates based on official sources and consultation with government officials

¹⁷ Marooning comes from the notion of 'maroonage' found among Africans brought to the new world, who having escaped slavery, built independent societies. It is a custom rooted in the notions of independence and self-help.

Governor General's house was over 100 years old, making it a peculiar case. In the example, however, where houses were totally destroyed or severely damaged, in many instances they could be identified as having been constructed of light wood and precariously built. Poorly constructed housing, built without adherence to the building codes, or to land use guidelines, makes persons more vulnerable to hurricanes. Many housing settlements of this nature were built upon steep hillsides increasing their vulnerability to the wind force of hurricane Ivan.

Thousands of EC Dollars	
Total	<u>1,380,851,015.00</u>
Direct effects	
i. Reparation of damaged houses	495,229,840.00
ii. Replace of lost houses	877,095,175.00
Imported component ^a	1,097,860,012.00
Indirect effects	
i. loss income from rent ^b	8,526,000.00

Table 7 Summary effects on the Housing sector¹⁸

a/ imported component calculated at 80% of direct effects

b/ based on the cost of an average two bedroom flat – rate EC\$1,000.00 for a period one year.

The repairs and replacement to similar conditions have a value of EC\$1,380 million as presented in table 7. Reconstruction with some required improvements to reduce vulnerability is a larger figure, and amounts to some EC\$1,945 million dollars as can be seen in Table 8.

Thousands of EC Dollars	
Total	<u>1,945,827,517.00</u>
Direct effects	
i. Reparation of damaged houses	544,752,824.00
ii. Replace of lost houses	1,064,804,693.00
iii. Cost of furnishings	336,270,000.00
Imported component ^a	1,556,662,014.00

Table 8 Estimated Reconstruction costs¹⁹

a/imported component calculated at 80%

1.2 Education

¹⁸ Source: OECS estimates based on official sources and consultation with government officials

¹⁹ Source: OECS estimate based on official sources and consultations with Government officials

Damage to the education sector was second only to the housing sector in its severity. The estimated cost to the sector is \$EC196 million dollars, as detailed below. A more correct figure however, would be approximately \$EC215 million²⁰. This figure would accurately reflect the damage to the entire network of schools and skills training institutions in the country.

The destruction to the education sector is a particularly hard blow to the Grenadian society as much emphasis and hope had been placed on education in order to transform the economy and the society. Some, 30,481 students have been affected, in the aftermath of hurricane Ivan. The Government of Grenada's medium Term Economic Strategy paper 2000-2002, notes that the development of the human resources constitutes the single most important element of Grenada's national development. The most recent poverty Assessment Report for Grenada concluded that at the base of poverty reduction in Grenada must be a radical human resource strategy that embraces the entire nation and excites it to acquire knowledge and skills.

The government recently concluded a Strategic Plan for the Educational Enhancement and Development 2002-2010, SPEED, with significant support from the international donor community. The first three objectives of the plan: to provide universal access to education; to improve radically the quality of education; and provide learners with relevant knowledge attitudes and skills, is going to be seriously challenged by the effects of the disaster on the education sector.

Parish	Schools										
	Pre-primary			Primary			Secondary			Tertiary	
	No	Repair	Recon	No	Repair	Recon	No	Repair	Recon	No	Repair
St George's	18	1,806,984	84,150	19	11568850	2772350	7	8429250	2662400	1	45,000,000
St. Andrew's				8	3415900	0					
Carriacou					24,000		2	10,000			
				22							
Totals	18	1,806,984	84,150	49	15,008,750	2,772,350	9	8,439,250	2,662,400	1	45,000,000

Table 9 Number Public Schools affected by Hurricane Ivan: Cost of repair and reconstruction by selected Parishes²¹

Table 9 above shows the details of the costs of repair and reconstruction to the public schools by selected parishes. The main tertiary level institution in the country the T.A. Marrayshaw Community College has been severely damaged and requires repair costs of \$EC45 million dollars. The main boys secondary school, Grenada Boys Secondary School, suffered damage to the tune of \$EC 2.6 million dollars. Particularly hard hit

²⁰ This information was based on discussions with government officials and verified by the independent information collected.

²¹ Source: OECS estimate based on official sources and consultations with Government officials

were other secondary and primary schools that suffered damage to their roofs and to their structures due to the high winds of the hurricane. Many of the schools can be found in the St. Georges parish but the network of primary and secondary schools spread throughout the length and breadth of the country. Those located in St. David's and St. Andrew and St. John, also suffered loss of their roofs.

Parishes	Schools			
	Special Education		Day Care Centres	
	No	Repair	No	Repair
St. George's	2	222,750.00	14	314,306.00
Totals	2		14	314,306.00

Table 10 Number Public, Special Education Schools and Day Care Centres affected by Hurricane Ivan: Cost of repair and Reconstruction for the Parish of St. George's²²

Table 10 above details the number of special education schools and day care centres in the parish of St. George's requiring repair as a result of hurricane Ivan. The loss of school facilities at the start of the school term for children with special needs could be a critical setback to their development.

The cost of damages to sporting facilities, which received a severe battering from Hurricane Ivan, amounted to over \$EC 83 million dollars. Pavilions were broken, hard courts damaged and bleachers turned into rubble. Table 11 details the number of facilities and costs by parish. Of particular significance was the damage sustained by the premier sporting facility of the country the Grenada National Stadium, in St. George's, which accounted for the lion's share of the cost at \$EC80 million.

Parishes	No.	Extent of Damage	Cost of damages
St. George's	4	Structural damage to roof, pavilion and perimeter fence and clearing of debris	1,165,000.00
St David's	2	Structural damage and clearing of debris	350,000.00
St Andrew's	2	Structural damage and clearing of debris	430,000.00
St Marks's	1	Structural and Clearing	100,000.00
St John's	1	Structural damage and clearing of debris	600,000.00
St. Patrick's	3	Structural damage and clearing of debris	410,000.00
Grenada National Stadium in St. Georges	1	Roof and supporting structure of all pavilions destroyed; private press boxes destroyed, Electronic score boards destroyed; Mondo Track damaged; Office Equipment destroyed	80,100,000.00
Totals	14		83,155,000.00

Table 11 Number of sporting facilities affected and cost of damage by Parish²³

²² Source: OECS estimates based on official sources and consultations with government officials

²³ Source: OECS estimates based on official sources and consultations with government officials

Damage to historical sites due to hurricane Ivan, in the town of St. George, the capital of Grenada, is of considerable concern. St. George's unique characteristic of fish scale roof, Georgian Architecture and system of fortifications has been a source of pride and a unique tourism attraction. The damage to the historic sites in the city has been estimated at approximately EC\$8 million dollars. The details are presented in table 12. The sites include Government House – Governor General's Residence, the Roman Catholic Cathedral and Presbytery, the Presbyterian Kirk and a number of historic Forts, and the Tourist Shopping Centre on the Carenage. This cost does not include cost of materials and training which would be necessary to enable skilled workers to undertake the repair and refurbishment that is necessary.

Historic Sites	Cost
House of parliament	790,000
Supreme Court Registry	450,000
Roman Catholic Cathedral and Presbytery	1,500,000
Equity House/ Methodist manse	60,000
Fletcher's Residence	75,000
Leroy Robinson residence	575,000
Grenada Cooperative Bank Building	50,000
Grenada Building and loan Offices	50,000
Fort George	400,000
Forth Matthew	100,000
Fort Federick	50,000
Grenada National Museum	120,000
Grenada Public Library	60,000
Presbyterian kirk	1,600,000
Knox House	40,000
Julien's Building	60,000
Huggins Buildings	
Hubbards main Office Building Young Street	50,000
Hubbards lumber Yard	150,000
La Chappelle	50,000
Technical and Allied Workers Union Bldg	350,000
Government House – Governor General's Residence	1,850,000
Tourist Shopping on the Carenage	50,000
1810 Building and three other on Melville Street	125,000
Hassan Building Melville Street	35,000
Total	7,940,000.00

Table12 Historical Sites damaged by hurricane Ivan in the town of St. George's and the cost of repair²⁴

²⁴ Source. OECS estimates based on official sources and consultations with government officials

Parish	Name of facility	Nature of damage	Cost of damages
St. George's	River Road multi-purpose centre (pre school and library)	Roof blown off, flooding and structural damage	50,000.00
	Brizan Multi-purpose Centre	Partial roof damage . windows and flooding	40,000
	Mt Montz multi-purpose centre	Roof blown off	40,000
	Happy Hill Community Centre	Roof blown off	10,000
	Vendome Multi purpose centre	Roof blown off	40,000
	Mt. Gabon/Mt Toute Community Centre	Roof blown off, windows lost	30,000
	Calliste Community Centre	Roof blown off	20,000
	Waburn Community Centre	Roof blown off windows and doors lost	25,000
	St. Paul's Multi purpose centre	Roof , windows, doors	70,000
	Belmont Community Centre	Roof blown off, windows and structural damage	40,000
St David's	Bellevue Community Centre	Roof blown off, windows and toilet facilities destroyed	40,000
	Wisden Forest Comm. Centre	Roof damage, structural damage	35,000
	Corinth Comm Centre	Roof blown off	20,000
	Westerhall Comm. Centre	Roof blown off	20,000
	Berrotte Comm Centre	Roof blown off	15,000
	Beaton Comm. Centre	Partial roof destroyed	7,000
	Belle isle Cmm. Centre	Roof blown off	10,000
	Après Toute Comm. Centre	Total destruction	30,000
Totals	18 community centers		542,000

Table 13 Number of Community Centres affected and cost of damage by Parish²⁵

Community centres play a central role in the community. Many serve as community libraries, day care centres during the day, adult skills training centres and adult literacy centres in the evening and as a location for community meetings. The loss of these centres may negatively impact the strength of social capital in Grenada and reduce the support services which the government and civil society, can make available to members of the various communities. Because Grenada does not have local government institutions, the community centres can perform a vital link in the people's participation in the governance process. Sturdy community centres may be able to replace schools as a shelter in the event of a natural hazard, thus reducing the wear and tear of the school buildings in the event of a natural disaster.

²⁵ Source: OECS estimates based on official sources and consultations with government officials

	Thousands of EC Dollars
Total	<u>195,820,884.00</u>
<u>Direct Effects</u>	194,560,884 00
i. Reparation of Schools (without improvement)	99,773,884.00
ii. Replacement of school materials and furnishings	3,150,000 00
iii. Damage to libraries, national archives and historic sites	7,940,000.00
iv. Damage to Community Centres	542,000 00
v. Damages to sport facilities	83155000 00
<u>Indirect effects</u>	
i. Damages from use as shelters	1,260,000.00

Table 14 Summary of Effects on the Education System²⁶

Table 14 presents the direct and indirect costs of damage to the education sector which stands at \$EC 195 million dollars. Reconstruction and reinforcement of existing structures in order to reduce vulnerability will increase the cost of repair and reconstruction to some \$EC215 million, as presented in table 15.

	Thousands of EC Dollars
Total	<u>215,402,972.00</u>
<u>Direct effects</u>	<u>214,016,972.00</u>
i. Reparation of damaged schools	109,751,272 00
ii. Replacement of lost schools	3,465,000.00
iii. Repair to libraries , national archives and historic sites	8,734,000 00
iii. Repair of Damage Communities centres	596,200.00
iv. Repair to sport facilities	91,470,500.00
<u>Indirect effects</u>	<u>1,386,000 00</u>
Imported component ^a	171,213,577 00

Table 15 Estimated Reconstruction Costs for the Education Sector²⁷

a/ imported component calculated at 80%

1.3 Health

The damage to the major public hospitals, health centers and other health care institutions has been estimated at \$EC 11 million dollars following the aftermath of hurricane Ivan. The damage to various aspects of the Government's health system, will

²⁶ Source: OECS on the basis of official information and consultations with Government officials

²⁷ Source: OECS estimate based on official sources and consultations with Government officials

cause hardship to the users of the system and to the care givers seeking to provide the services to which the public is accustomed, while maintaining optimum quality.

The medical laboratory at the two hundred bed St. George's General hospital suffered the worst damage within the hospital compound; the laboratory lost approximately 40 % of its roof, 25 % windows, and all reagents. Due to the continued power outage at the laboratory following the hurricane, estimating the extent of damage caused by the disaster, was not feasible, though it was expected to be extensive. The physical structure of the laboratory was already dilapidated prior to the catastrophic event, and was due to be incorporated in the second phase of the General hospital renovation project. Hurricane Ivan has exacerbated already deteriorating circumstances and accelerated the urgent need to construct a new medical laboratory. The roofs of several ancillary buildings within the General hospital's complex have also been destroyed. The ophthalmic ward suffered extensive damage. Total damage to the general hospital is estimated to be \$EC 4.5 million dollars. Table 16 presents the cost of damage by health institutions.

Institutions	Cost EC \$
Carlton Drug Rehabilitation Centre	2,625,000.00
Central Medical stores	1,750,000.00
Community health Centres	590,500 00
Princess Alice Hospital	3,550,000 00
Princess Royal hospital (Carricaou)	60,000 00
Richmond home for the elderly and indigent	525,000 00
St Georges General Hospital	4,500,000.00
School of nursing	70,000.00
Vector Control building	109,000.00
Project Office building for General hospital	75,000.00
Pharmaceuticals in Health Centres	70,000 00
Total	10,599,500.00

Table 16 Summary of damage to Public Health Institutions²⁸

The 30 bed Princess Alice hospital in St. Andrew suffered major damage and is mostly dysfunctional. It lost 90 % of its roof, and most of its equipment, furniture, and supplies were looted. Within this complex, the roofs of the nurse's hostel and a doctor's quarters were completely lost, while the other doctor's residence was destroyed. The cost of damage to the complex is estimated at \$ 3.5 million. The remaining two hospitals in Grenada, the psychiatric and Princess Royal, were spared. Carriacou's 35 bed hospital,

²⁸ Source: OECS estimated based on official sources and consultations with Government officials.

Princess Royal, sustained roof damage, and its cistern water supply was contaminated, at total replacement cost of \$ 60,000.

The complete galvanize sheeting, and 30 % of the ceiling of Central Medical Stores (CMS) was destroyed, at a cost estimated at \$ EC17 million dollars. The pharmaceuticals section of CMS was unscathed, but 30,000 examination gloves, 65,000 needles, and related medical supplies valued at approximately \$EC 60,000 had deteriorated. Fortunately, prior to the hurricane, refrigerated items were relocated to another safe building. CMS lacks electrical power to store vital pharmaceuticals, such as vaccines and insulin. Pharmaceuticals valued at \$ 70,0000 in the health centres were reported destroyed.

The roof of the Richmond home for the elderly, which cares for 110 aged and underprivileged citizens, was completely destroyed and the Carlton Drug Rehabilitation Centre suffered a similar fate resulting in an estimated cost of \$ 2.6 million

The damage to the community health institutions is of concern to the health sector as primary health care is a critical component of the health service. Of the country's total listing of thirty six health facilities, eight or 22 %, completely lost their roofs, and are dysfunctional. There was varying damage to the remaining peripheral clinics, ranging from partially destroyed roofs, broken doors and windows, and disrupted electricity lines.

The following buildings sustained heavy damage, mainly from damaged roofs : school of nursing , books and equipment; Vector control building , equipment and vaccines; and the project office building for the reconstruction of the general hospital

The ministry also incurred a variety of indirect cost consequent to the hurricane. In seeking to maintain optimal health service operations, care givers worked round the clock and ambulances and health vehicles were commandeered into rescue and relief efforts. An aggregate of the direct and indirect costs to the Ministry of Health was estimated at \$EC 10 7million dollars as presented in table 17.

	<u>Thousands</u> <u>EC Dollars</u>
Total	<u>10,782,150.00</u>
<u>Total Direct</u>	<u>10,599,500.00</u>
i Damages to Hospitals	8,110,000.00
ii. Damage to Community Health Centres	590,500.00
iii. Health Care Institutions	1,899,000.00
<u>Indirect Cost</u>	
i. Increased cost of Communications	60,000.00
ii. Increased work hours of health care professionals	68,400.00
iii. Increased use of health vehicles in rescue and relief efforts	54,250.00
<u>Total indirect cost</u>	<u>182,650.00</u>
<u>Imported component</u>	<u>8,479,600.00</u>

Table 17 Summary Effects on Health Sector²⁹

²⁹ Source OECS Estimates based on official sources and consultations with Government officials

In order to maintain the health status of the Grenadian population, the Government will find it necessary to reconstruct the damaged health institutions. Table 18, depicts the reconstruction costs for the various health institutions, which amounts to \$EC11 6 million dollars, representing an increase for mitigation and reduced vulnerability.

Thousands of EC Dollars	
Total	11,658,900
<u>Total Direct cost</u>	<u>11,658,900.00</u>
Reparation of damaged hospitals	8,921,000.00
Reparation of damaged community Health centres	649,000 00
Repair to Health care institutions	2,088900 00
Imported component	9,327,120.00

Table 18 Estimated Reconstructed costs for the Health Sector³⁰

2. Productive Sectors

2.1 Agriculture, Livestock and Fisheries Sector

2.1.1 Overview

The agriculture sector in Grenada is critical in maintaining an environment of social and economic stability. The sector plays a vital multi-functional role in generating foreign exchange, providing employment and contributing to food security.

Since 1997, the performance of the sector can be described as mixed. With a negative growth of 0.89 percent in 1997 followed by a negative 1.20 percent in 1998, the sector grew by 10.02 percent in 1999. The ensuing two years 2000 and 2001 registered negative growth of 2.15 and 2.85 percent respectively. In 2002, the sector again registered positive growth of 19.0 percent. These changes in the growth of the sector are closely related to the output of the principal crops cocoa, nutmeg and banana. This is exemplified in the 2.4 percent negative decline in 2003, which was attributed to a 7.9 percent fall in output in the main crops cocoa, nutmeg and banana. The production of nutmeg declined by 20.8 percent to 5.4m pounds. A 12 percent decline in mace output naturally accompanied the fall in nutmeg production. Cocoa continued its downward trend in 2003 to register a 29.4 percent fall in output. Banana output declined by 21.7 percent as very little is now produced for the export market.

³⁰ Source OECS Estimates based on official sources and consultations with Government officials

Prior to the disaster growth in the sector was projected to register positive growth in, at least the medium run. In 2004, the sector was expected to expand by 4% , by 12% in 2005 mainly due to the production cycle of traditional crops (and in particular of nutmeg) and stabilize around 4% for 2006 and 2007. . Livestock and forestry has been fairly steady since 1997, registering only positive growth. Fish output has been steadily increasing since 2000. The sector grew by 13.1 percent in 2003. The sector provides direct employment for 2200 fishermen and many more along the commodity chain as the product moves to the consumer. A wide range of non traditional crops are grown in Grenada. These range from roots and tubers, vegetables, brassicas, and cucurbits among others. The non traditional crops play a significant role in ensuring food security.

2.1.2 Description, analysis and estimation of the damage

The impact of hurricane Ivan was widespread throughout the island inflicting severe damage to the agriculture sector. The damage was most intense in the parish of St. Andrew accounting for 60 percent of total damage, followed by St. David with 20 percent, St. John's 10 percent, St. George's 5 percent with St. Mark, and St. Patrick sharing the remaining 5 percent. As a result of the high velocity winds experienced with hurricane Ivan, extensive losses were recorded in the crop sub sector, livestock, fisheries and in the seventy two (72) water catchments.

Table 19 provides a summary of the direct, indirect, and total damage to crops, livestock, fisheries, propagation units and nurseries, irrigation and drainage, and farm roads by parish. The total direct and indirect damages were estimated at 55 and 46 million EC\$ respectively.

Crops

The principal export crop nutmeg, which was concentrated in the north eastern parishes of St. Patrick and St. Andrew, was severely damaged as well as other crops ready for harvesting at the time of the disaster. The nature of the damage ranged from toppling to uprooting, snapping, defoliation and scorching.

The effects on the nutmeg sub-sector, which employs approximately 30,720 persons either directly or indirectly will deny the dependents of their livelihoods and may draw some closer or beyond the indigence curve. This situation will worsen unless steps are taken in the short run to replant and rehabilitate the production base which has declined by approximately 10 percent of the pre-disaster level. The new plantings must be encouraged in solid stands as this will allow for optimal use of the cultivable resource and the opportunity for diversifying the sector.

Direct damage	Crops	Livestock	Fisheries	Propagation units and private nurseries	Irrigation and drainage	Farm roads	Total
St. John	1,304,493	359,832	545,000	2,030,000.00	17,242	3,062,480	7,319,047
St George	1,455,336	1,863,137	1,535,000	727,115.00	25,763	3,758,540	9,364,891
St David	2,320,840	1,335,064	137,000	858,530.00	71,563	4,680,790	9,403,787
St Patrick	1,505,934	995,218	280,000	70,000.00	142,938	2,259,130	5,253,220
St. Mark	895,073	118,067	191,000	10,000.00	14,313	2,099,400	3,327,853
St. Andrew	5,044,351	1,949,862	468,000	2,262,760	114,500	10,170,460	20,009,933
Carriacou and Petite Martinique			20,000				20,000
Total	12,526,027	6,621,180	3,176,000	59,958,405	386,319	26,030,800	54,698,731
Indirect damage							
St. John	4,372,267	430,680	738,000	203,000	3485	306,248	6,053,680
St George	1,806,600	1,695,720	645,000	72,712	5153	375,584	4,600,769
St. David	4,842,740	2,329,216	120,000	85,853	14,313	468,079	7,860,201
St Patrick	3,708,334	565,770	248,000	7,000	28,588	225,913	4,783,605
St. Mark	2,694,494	114,142	247,500	1,000	2,863	209,940	3,269,939
St. Andrew	15,048,011	2,343,683	378,000	226,276	22,900	1,017,046	19,035,916
Carriacou and Petite Martinique			180,000				180,000
Total	32,472,446	7,479,211	2,556,500	595,841	77,302	2,602,810	45,784,100
Total damage							
St. John	5,676,760	790,512	1,283,000	2,233,000	20,727	3,368,728	13,372,727
St George	3,261,936	3,558,857	2,180,000	799,827	30,916	4,134,124	13,965,660
St David	7,163,580	3,664,280	257,000	944,383	85,876	5,148,869	17,263,988
St. Patrick	5,214,268	1,560,988	528,000	77,000	171,526	2,485,043	10,036,825
St Mark	3,589,567	232,209	438,500	11,000	17,176	2,309,340	6,597,792
St. Andrew	20,092,362	4,293,545	846,000		137,400	11,187,506	
Carriacou and Petite Martinique	0	0	200,000	0	0	0	200,000
Total	44,998,473	14,100,391	5,732,500	6,554,246	463,621	28,633,610	100,482,841

Table 19 Summary of Direct and Indirect Damage by Parish in Eastern Caribbean Dollars

Other negative implications of the disaster include a reduction in nutmeg production over the next five years and a concomitant reduction in foreign exchange earnings, which will decrease to about 8 percent once current stocks are exhausted.

Plant and building infrastructure also suffered from the onslaught of Ivan. Eleven on the nineteen stations sustained considerable damage at an estimated cost of EC \$5.7 million.

The distillation plant at Marli suffered significant damages and will require approximately EC\$150,000 to secure and repair the factory shell and another EC\$500,000 to return the plant to a desired level of operation. The reconditioning plant also suffered damages that will require repairs costing EC\$100,000. The organic plant, because of the extensive damages will have to be replaced. The replacement cost is estimated to be EC\$750,000.

Cocoa, another major contributor to the economy is grown on approximately 8000 acres of land. The sub-sector employs approximately 7,500 active farmers spread throughout the parishes. According to information sourced from the Grenada Cocoa Association, production in 2004 prior to the hurricane reached 1,800,000 lbs valued at EC\$5,580, 000. The extensive cocoa building infrastructure used for buying, propagation and servicing the industry suffered substantial damage. The estimated value of the damage, which includes the private operators, such as Belmont, which is also a tourist attraction is approximately EC\$1 8 million. The effect on employment is expected to be drastic on all dependents of the industry along the commodity chain.

The banana industry, which has some level of importance both for local consumption and export was demolished. The 350 acres grown throughout the parishes suffered 100 percent damage. The total estimated damage to the industry is estimated to be EC\$1,440,134

The minor fruits which include sapodilla, papaya, passion fruit, golden apple and others were demolished. They were either uprooted, toppled or scorched beyond regeneration. The damage to minor fruits is estimated at EC\$2,792,000.

Citrus also suffered similar type damage to the other tree crops. Of the 120 acres planted island-wide, 18.50 acres were destroyed. The estimate of direct and indirect cost for citrus is EC\$2,610,623.

The 114.5 acres of vegetables being cultivated at the time of the hurricane was completely wiped out. Tomatoes, cucurbits, brassicas, okra, sweet pepper, pigeon pigeons and corn were among the range of vegetables lost. The irrigation systems used in vegetable production was also badly damaged. The total estimated cost of the loss in vegetables is EC\$2,792,000

The category roots and tubers which comprise sweet potato, yams, dasheen and tannia also suffered damages. Of the 282 acres planted before the disaster, 66.47 acres was damaged. The estimated cost of the damages to roots and tubers is EC\$837,125.

The 41 propagation stations in the country have been severely damaged. These stations including the central propagation station and private stations have been severely destroyed and are non functional. The estimated cost of the damage to all these stations is EC\$6,554,246

Forestry

Ninety one percent of the forest lands and watershed now lay bare and stripped of the vegetation, which once supported an ecosystem where much fauna and flora benefited directly or indirectly. The 72 watersheds on the island have been devastated. A major concern remains over the level of water which the aquifers can now support and for how long. Urgent action needs to be taken in the very short run to ensure regeneration and growth of vegetation in the forest and watershed areas. This may mean introducing some fast growing species while the indigenous plants slowly emerge.

Livestock

The livestock sub-sector suffered damages to housing infrastructure of poultry and small ruminants and loss of stock of same. Losses linked to secondary effects resulting from stress and trauma were also recorded in livestock. The damage was most severe in poultry, pigs and sheep and goats.

Fisheries

The fisheries sub-sector suffered major damage to its fleet boat and equipment. The 2,200 fishermen in the sub-sector suffered loss to engines, hulls, gear, safety equipment, communicating facilities, seines and housing facilities. The damage to the fisheries sector is estimated to be EC\$5,732,500

Farm roads

150 miles of farm roads was damaged during hurricane Ivan. The damage resulted from blockage of trees, clogged drains and culverts, destruction of the road base and surface. The estimated value of reconstruction is EC\$28,633,610

2.2 Tourism

2.2.1 General Overview

Tourism is jointly with agriculture the major economic sector of Grenada. The sector has been an important contributor to the diversification of the economy which has taken place in recent years. It has also a significant source of foreign exchange and labor employment. Finally as pointed out in WTO (2002) the development of tourism has "helped cushion the effects of the decline in its exports, particularly bananas and cocoa.

Within CARICOM Grenada's market share has increased over time and currently represents 5% of the total. Contrarily within the OECS, Grenada's share has exhibited a declining trend (19% and 12% of the total in 1990 and 2003).

During the 1990's decade and until 2003, the year prior to the disaster, Grenadian tourism developed significantly. The contribution of tourism to the economy grew from 5.8% in 1990 to 9% in 2000 and has remained roughly at that level. The contribution of tourism

to the overall economy is even greater when measured through the tourism satellite accounts (28% in 2003). In the same vein, the number of visitor arrivals increased from 265,167 in 1990 to 316,158 in 2000. The evolution of arrivals from 2001 to 2003 reflects the September 11th effects and the consequent recovery of the tourism sector

In terms of its components cruiseship arrivals, which represented 63% of the total on average between 1990 and 2004, has expanded at an uneven pace. However, stayover arrivals saw a steady increase in its numbers from 76,447 to 133,724 for the same period. This translated in an increase in the contribution of stayovers visitors to the total (29% and 45% in 1990 and 2003). The rise in stayovers responded in part to the expansion of the country's hotel capacity and the upgrading of its tourist facilities during the 1990's decade. The number of rooms in tourist accommodation establishments rose from 1,115 in 1990 to 1,758 in 2003 (See table 20 below).

Revenues have risen as well. Available data for the hotel sector representing half of the saleable room stock shows that profit margins more than doubled between 1991 and 2003.

The growing number of stayover arrivals and the positive response of the Hotel Sector to satisfy the increasing demand has also had significant effects in the economy. Stay over arrivals account for 88% of total visitor expenditure (cruiseship and yacht tourist expenditure represent 8% and 3% of total expenditure respectively). In addition the sub Hotel Sector represents an important source of domestic employment (8% of the total if only direct employment is taken into account) and of domestic demand as most of its services are sourced from local products and sources.

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total visitors	300,602	317,315	369,346	386,013	368,417	391,680	378,952	316,528	277,000
Day-over visitors	31	34	29	28	30	30	33	41	41
United States	93,919	108,957	108,007	108,231	110,748	115,794	125,289	128,864	123,000
Canada	30,364	30,476	30,033	30,380	29,320	29,381	34,694	32,543	32,000
Europe	4,214	4,987	3,920	5,748	4,977	5,290	6,136	4,829	5,000
United Kingdom	...	...	...	...	...	...	...	43,862	40,000
Germany	11,217	17,740	18,480	16,780	21,350	23,311	26,234	32,236	28,000
Caribbean	...	...	...	...	...	...	...	4,586	3,000
Other Countries	13,692	14,729	14,615	14,357	16,407	18,636	22,204	24,112	27,000
Excursionists	34,432	41,025	40,959	40,966	38,694	...	36,021	23,518	17,000
Cruiseship	6,622	7,880	11,450	10,800	11,057	10,011	8,202	7,359	6,000
Total visitor expenditure (EC\$ m)	200,061	200,478	249,889	266,982	246,612	265,875	245,461	180,305	147,000
Day over visitors	130	158	156	160	399	415	458	481	...
Cruise ship passengers	120	148	143	147	379	394	438	466	...
Number of cruiseship calls	10	10	12	13	20	21	20	14	...
Number of yacht calls	382	420	448	392	323	328	369	360	...
Total number of tourist accommodations	4,267	5,413	5,314	5,355	5,292	4,583	5,354	5,361	5,000
Hotels	70	73	78	78	80	87	86	94	...
Apartments cottages and villages	28	27	27	27	27	28	27	30	...
Guest Houses	19	21	26	26	29	30	34	34	...
Total number of hotel rooms by tourist accommodation	23	25	25	25	24	29	25	30	...
Hotels	1,428	1,428	1,652	1,669	1,775	1,802	1,800	1,822	1,000
Apartments cottages and villages	1,027	1,012	1,064	1,066	1,136	1,146	1,200	1,197	1,000
Guest Houses	236	245	371	384	418	404	389	393	...
Total number of beds by tourist accommodations	165	171	217	219	221	252	211	232	...
Hotels	2,710	2,718	2,936	2,964	318	2,995	3,274	3,091	3,000
Apartments cottages and villages	1,975	1,960	1,961	1,964	2,047	1,925	2,240	1,998	2,000
Guest Houses	474	490	636	659	720	669	709	722	...
Employment	261	268	339	341	351	401	325	371	...
Number of employees in tourism establishments	1,528	1,528	1,768	1,786	1,899	1,928	1,926	1,950	1,000
Share bill as percentage of total revenue	...	...	...	...	...	...	31	30	...
Average occupancy rate	67.3	70.1	67.2	61.1	62.1	62.3	64.8	71.0	...
Per bed night	...	...	...	...	...	...	...	...	...
Per room night	...	...	...	...	...	...	...	...	...
Travel and tourism account (Satellite accounts)	...	...	...	...	...	...	21	21	...
Capital investment in tourism as % of total	...	...	...	...	...	...	30.2	29.36	30
Tourism exports as % of the total	...	...	...	...	...	...	...	...	...

Source: ECLAC, on the basis of official information and the Tourism Board of Grenada
a/ Preliminary figures

Table 20 Tourism Statistics

In 2004, the tourism sector noted a clear recovery from the effects of September 11th. As captured by national accounts the tourism industry (constituting namely the category of Hotels and Restaurants) was expected to grow by 8%. Stay over arrivals and cruiseship passengers grew by 11% and 79% in July 2004 in relation to the previous year.

On an annual basis tourist arrivals were projected to increase to 370 972 by 2004 and to 478 000 in 2006. Tourist expenditures had grown by 28% in the first semester of the year (45 and 58 million in January and July 2004 respectively) and were expected to increase by 8% for the whole year. At the broader level, if direct and indirect employment creation and the sectorial linkages between the tourism industry and the rest of the economy are considered, the travel and tourism industry was projected to account for 26% of total employment, 21% of total investment and 29% of total exports (See table above).

Hurricane Ivan severely affected the performance of the tourism industry. The sector suffered both direct and indirect damages. The former refer to damages suffered by productive assets, equipment, inventory and soft furnishings at the time of the disaster.

Indirect damages refer to damages that are a result of the interruption to the flows of goods and services and income. It is defined as the sum of income foregone and increases in costs and expenditures. More to the point indirect effects are a combination of supply side and demand side effects.

In the case of the Hotel subsector the former refers mainly to the contraction in the supply of tourist services by the host country due to the closure of hotels, the loss in room capacity, extra-costs incurred for the payment of utilities (water, electricity), making the hotel functional (i.e., the picking up of debris), security costs incurred due to the initial effects of the natural disaster on crime, and refunds for bookings that were made (whether for hotel services, tourism packages or Marina services prior to the disaster). The analogue of the loss in room capacity in the case of the yachting sector is the closure of Marinas and Harbours, and the loss in the number of slips in Marinas or the reduction of the number of stored yachts for repairs.

The main factor accounting for the demand side of the story is the change in the number of visitor arrivals due to the occurrence of the event.

Due to the importance of the tourism sector described above, the negative effects of the Hurricane on the sector are bound to be felt through out the economy in terms of: (i) loss of aggregate income and employment; (ii) its lower contribution and negative effect to the overall rate of growth of the economy, (iii) increase in imports due to the need to purchase intermediate goods and raw materials for repairs, (iv) increase in insurance flows, and (v) lower contribution to government revenue. These aggregate effects are termed secondary effects.

2.2.2 The Tourist Accommodation Subsector

a) Direct damages

By far the majority of the tourist accommodations have sustained significant direct damages. The damage is geographically concentrated in Grenada, and more specifically, in the capital St. Georges. Insignificant or no damage at all was registered in Carriacou and Petite Martinique. Within St. Georges, the damage is concentrated in the area of Grand Anse (The Hotel Belt). Damages were also reported in the area of Carenage which is located near the center of St. George. At the more detailed level direct damages have been reported in:

- Roofs and ceilings.

Damages to roofs and ceiling include the removal of roofs and the peeling of the aluminium steel sheeting that covers the roofs and also protects the furniture and equipment in the room from weather conditions

- Electrical wiring and installations

The damage to roofs has had an immediate implication for the functioning of the wiring of the infrastructure affected. The wiring has been damaged in all of these cases. As a result the electrical power has been shut down and tourist accommodations have been forced to rely on generators to provide minimum electrical power.

This has important implications for the computations of indirect cost as it forces the management to rely on an existing or newly bought electrical generator, purchase additional fuel, and in some cases reduce the number of hours during which electricity is available in order to recoup part of the additional costs incurred as a result of the damage of the Hurricane.

- Room appliances and accommodation equipment .

The damage and loss of part or whole roofs left the room equipment (air conditioning, televisions, lamps) and furniture vulnerable to the weather pattern of the hurricane. Besides equipment and furniture protruding from the wall, some equipment (fans and air conditioning) that was in rooms located near the sea were tarnished with salt particles causing rusting. In some cases the equipment was damaged by missile parts (including alumina pile and wood) that were flown in by the high speed of the wind. As rain was not an accompanying feature of Hurricane Ivan most of the rooms and equipment damaged did not register damages related exclusively to rain fall.

In some more dramatic cases small cottages, apartments and small restaurants that were located in separate locations from the main tourist accommodation were literally wiped out

As a result the damages have severely limited the supply capacity of tourist accommodations. A sample of the extent of the damage is provided in table 33 below. The table lists a sample of tourist accommodations, their geographical location, room capacity of the accommodation and the number of rooms that were reported damaged. The sample of hotels accounts for more than 60% of total saleable room capacity in Grenada. The information here presented was obtained through field work of the mission with direct interviews of owners or managers and is meant to provide an overall representative of an overall view of the damage to hotel capacity.

Name	Category	Geographical location	Capacity	Number of rooms damaged
Allamanda Beach Resort	Hotel	Grand Anse	50 Rooms	4 damaged
Blue Horizon Siesta Hotel	Hotel Siesta	Grand Anse	32 Rooms	All
			37 Rooms	11 damaged
Mariposa Beach Resort	Hotel	Morne Rouge	31 Rooms	6 destroyed
			15 Appartments	21 damaged
Gem Holiday Beach	Appartments, cottages and villas	Morne Rouge Bay	20 Rooms	2 damaged
				19 damaged
Grenada Grand Resort	Hotel	Grand Anse	212 Rooms	130 damaged
Coyaba Beach Resort	Hotel	Grans Anse	70 Rooms	
Grand View Inn	Appartments, cottages and villas	Morne Rouge	69 Rooms	51 rooms damaged
				10 destroyed
La Luna	Hotel	Morne Rouge	16 Cottages	All damaged
				5 cottages seriously damaged
True Blue Bay Resort	Hotel	True Blue	38 Rooms	1 cottage destroyed
				28 Rooms damaged
				12 badly damaged
				3 cottages destroyed
Rex Grenadian Resort	Hotel	Point Salines	212 Rooms	Most rooms damaged.
				127 badly damaged
La Source Resort	Hotels	Pink gin beach	100 Rooms	All rooms damaged
				23 rooms not significantly damaged.
				73 rooms with varying degrees of damage.
				4 rooms destroyed.
Lance aux epines cottage	Appartments, cottages and villas	L'Anse aux Epines	11 Rooms	All badly damaged
Calabash Hotel	Hotel	L'Anse aux Epines	30 Rooms	All damaged
				1 badly damaged.
Wave Crest Holiday Appartments	Appartments, cottages and villas	Grand Anse	22 Rooms	17 badly damaged
Roydon's	Appartments, cottages and villas	Grand Anse	6 Rooms	
			6 Appartments	3 rooms destroyed
St Ann's Guest house	Guest Houses	Paddock	12 Rooms	5 non-functional

Table 21 Sample of room damage by tourist accommodation

Name	Category	Geographical location	Capacity	Number of rooms damaged
Mamma's Lodge	Guest Houses		10 Rooms	All damaged and non-functional
Lexus Inn	Appartments, cottages and villas	Belmont	18 Rooms	All badly damaged and non-functional
Lazy Lagoon	Guest House	Lagoon Road	12 Rooms	All completely destroyed
Villamar Holiday Resort	Hotel	L'Anse aux Epinnes	20 Rooms	All badly damaged and non-functional
South Winds	Appartments, cottages and villas	Grand Anse	19 Rooms	Damage in most of the rooms

Source: On the basis of field interviews with owners/managers of the corresponding tourist accommodations.

Table 22 Sample of Room Damage by Tourist Accommodation

As a result of the damage many hotels have for all functional purposes shut down. At the current stage twenty-two tourist accommodations have functionally closed down their operations as a result of the phenomena. These represent 55% of the stock of saleable room capacity prior to Hurricane Ivan (See table 23 below).

Tourist accommodation	Percentage of total room capacity	Percentage of total bed capacity
Spice Island Beach Resort	4.3	2.1
Blue Horizons Cottage Hotel	2.1	1.7
Grand View Inn	4.5	2.0
Flamboyant Hotel	4.0	3.3
La Luna	1.0	0.4
Wave Crest Holiday Appartment	1.4	0.8
Palm Court Appartments	0.8	0.6
South Winds	1.2	1.0
Gem Holiday Beach Resort	1.0	1.2
Rex Granadian Resort	13.8	7.0
La Source Resort	6.5	5.2
Mariposa Beach Resort	2.7	1.6
Siesta Hotel	2.4	1.7
Lance Aux Epines Cottage	0.7	1.1
Roydon's Appartments	0.4	0.4
Villas of Grenada	1.0	2.1
Blue Orchid Hotel	1.0	0.8
Lazy Lagoon	0.4	0.2
Palm Grove Guest House	0.7	0.5
Coyaba Beach Resort	4.6	3.3
Winward Sands Inn	0.7	0.4
Villamar Holiday Resort	4.3	1.04
Percentage of the total	55.4	42

Source: Own estimations based on field interviews with owners and managers of tourist accommodations and on information provided by the Grenada Board of Tourism.

Table 23 Tourist accommodation functionally closed and number of room and beds

When valued in monetary terms tourist accommodations reported through their respective assessor's evaluations varying degrees of damages. A quick sample of a subset of tourist accommodations representing 38% of the saleable room capacity indicated that the extent of the damage ranged from 650,000 to 40 million EC\$. It was estimated by the mission that the direct losses born by tourist establishments to their buildings and infrastructure amount to 167 million EC\$ (See table 24 below). The figure was obtained on the basis on information provided by the bigger tourist accommodations (those with room capacity exceeding 50) on estimated losses to buildings and infrastructure, taking into account that the Hurricane affected close to 90% of the tourist accommodations; using, and assumptions, based on field work, that the damages to establishments with less than 30 bore losses on average of 300,000 EC\$ per establishment. Losses to restaurants and gift shops were estimated at 30 million EC\$.

Category	Millions of Eastern Caribbean Dollars
Total	196.7
Roofing and building structures (includes electricity repairs and plumbing)	166.7
Equipment and furniture	....
Restaurants	20
Gift shops	10

Source: Estimates based on field work, and meetings with the Grenada Board of Tourism and the Ministry of Finance.

Table 24 Tourist accommodation Subsector Direct damage by category

b) Indirect damages.

All hotel accommodations suffered and will continue to register indirect damages. Indirect damages are presented here under supply induced indirect damages and demand induced indirect damages.

The supply induced indirect damage refers mainly to the interruption of income flows or income foregone due to the loss in capacity (i.e., occupancy) resulting from the natural disasters. This follows from the type of information presented in table 24 above and considers in addition the rate of room occupancy, the realised room rate, and time during the year in which the disaster occurred. In the case of Grenada, Hurricane Ivan impacted one to two months before the high tourist season

Finally the estimations also take into account the period for which the rooms and in this case many hotels will not be functional. Thus it was necessary to include not only the period for which the rooms that were damaged will not be functional but also, when the tourist establishment had shut operations, the entire revenue obtained from the occupancy of all the establishment's rooms. The calculations ultimately depended on the period during which the establishment in question would remain closed.

The survey conducted by the mission on this particular issue yielded different answers. While forty percent of the establishments interviewed thought that they would be fully back in operations by December 15th, thirty percent was of the opinion that they would be back in operations in six months and the rest stated that their time frame was eight to twelve months. The full hotel infrastructure is expected to be operational in a year's time.

In addition supply induced indirect damages consider the higher rates of utility costs as a result of the interruption of electricity, drinking water and higher transportation costs. It also factors in security costs and the expenses associated with picking-up the debris which in some cases, namely in the case of the bigger hotels, has been substantial.

The interruption of electricity has forced many establishments to buy or rent a generator plant and incur into fuel, diesel fuel expenses. According to ground interviews and official sources of information, the indirect costs for diesel fuel were estimated on average at 1,625 EC\$ per day.

The absence of drinking water has also led establishments to pay for transportation costs to provide drinking water. When this was the case, the cost of water was factored into the calculations at 900 EC\$ per day.

The cost of operations associated with the picking-up of the debris varied according to the establishment in question. The mission found that in some cases the transactions associated with the picking up of debris were non-market transactions. In one case, the establishment owner/manager provided shelter for a group of workers of the hotel that had as a result of the hurricane lost their shelter in exchange for picking up the debris. In others hotel workers were re-hired at the wage of a laborer for cleaning up operations. The establishments at the higher end of the income strata contracted private firms to do the work.

The demand induced damages relate to income losses derived from the decline in tourist arrivals (in this particular case stayover) as a result of the passage of the Hurricane. The information here was obtained through tourist expenditure surveys (which provide level and composition by category of the expenditure) and airline and tour operator interviews.

The number of tourist stayover arrivals dropped to almost nil in September (the month in which the disaster took place). It is expected to remain close to that level for October and November. Some increase in stayover arrivals is expected in the month of December. In fact the pick up in stay-over arrivals will depend on the extent to which the tourist infrastructure has been repaired and is functional.

Contrarily at the time this report was drafted few cancellations were registered in the cruiseship industry. During the month of September two of the scheduled cruiseship calls were diverted to Dominica. In the month of October only one cruiseship liner will anchor in Dominica rather than in Grenada as scheduled (accounting for 2758 passengers). After the month of November a 10% o 15% drop in cruise-passengers is expected (See Figure 6). It has also been reported that one company, which accounts for 8% of the Cruiseship

industry is pulling its operations out of Grenada and will relocate to the neighbouring island of St. Vincent.

The disaster and the consequent drop in tourist arrivals has had devastating effects on tour operators. The larger tour operators have reported losses of 75,000 EC\$ on average per month starting in September and have projected that level of losses until November. The smaller tour operators have reported losses of 10,000 EC\$ on average per the months of September, October and November.

Table 25 provides estimates of the indirect damages sustained by the tourist accommodation sector. These are estimated at 68 million EC\$ for the three months following the natural disaster

The estimate combines both supply and demand induced effects. It was based on: (i) gross hotel revenues used in national accounts for the computation of the subsector contribution to GDP; (ii) interviews with tour operators, (iii) estimations of the decline in stay over arrivals; (vi) computations of the average gross revenue per room; (vii) the number of saleable rooms, (viii) energy costs (mainly diesel fuel) equivalent to 3,250 EC\$ per two-three days; (ix) water costs equivalent to 900 EC\$ per day, (x) a laborer's wage of 70 EC\$ per day; (xi) on the assumption that the disaster affected 90% of the tourist accommodations.³¹

	September-December
Total	67,580,285
Loss of gross revenue from occupancy of tourist accommodations	50,000,000
Loss of income of tour operators	2,475,000
Utilities	11,657,925
Electricity	7,502,625
Water	4,155,300
Security	600,000
Clean-up operations	3,447,360

Source. Estimated based on field interviews and information provided by the Grenada Hotel & Tourism Association and the Grenada Board of Tourism.

Table 25 Indirect damage for the last quarter of the year in Eastern Caribbean Dollars

After December it is expected that hotel accommodations will not incur in any additional utility costs or clean-up operations and that the hotel room capacity will be restored gradually. On the basis of an average revenue per room derived from national accounts statistics and considering that from December onwards 40% of the hotel capacity

³¹ An alternative method to calculate indirect costs at least for tourist accommodations consists in estimating the number of stay over visitors that will not be arriving due to the disaster. On this basis the loss of revenue from these non-arrivals can be obtained using the breakdown by type of tourist accommodation, the daily average expenditure and the weight of accommodation expenditures in total expenditures by type of accommodation. The result equaled 32.5 million for the months of September-December which is below the one obtained in Table 36 above which was arrived by analyzing hotel revenues. The available information however considers a sample representing less than 2% of stay over arrivals. See, The Grenada Board of Tourism, Grenada's Visitor, Expenditure and Motivation Survey (Winter 2003)