



ECLAC Subregional Headquarters for the Caribbean

# ECLAC Training Course

## Natural Disasters Assessment Methodology

*April 19-21, The Cayman Islands*

# The Manufacturing and Commercial Sectors

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# Introduction

- To provide a general overview and evaluation of the effects of the damage.
- To formulate a general diagnosis of the sector.
- Commercial and manufacturing sector have similar methodologies for estimation.
- ✓ Similarities and differences in both sectors.
- ✓ Similarities: growth of small and mid-sized business.
- ✓ Differences: size of establishments, number of employees, weight of machinery and equipment and of inventories.

# Damage

- Refers to the damage suffered by productive assets, infrastructure and inventories. These are damages to stocks that occurred at the time of the disaster.
- The stocks include: physical infrastructure, buildings, installation, machinery and equipment, means of transportation, damages to stock of land.

# Losses

- Refers to the damage done to flows of goods and services and income. The damage results as a consequence of the interruption of production and distribution processes from the moment the disaster occurs.
- As a matter of convention the time domain for the estimation period is five years.

# Losses

- Losses in agricultural and industrial production.
- Increasing transport costs (longer or alternative routes).
- Lower incomes in service firms due to the interruption in the provision of services.
- Additional costs in the sector due to the need to use alternative means of production or service provision.

# Damage and losses

	Temporal dimension	Type of variable
Damage	At the time of the disaster	Stocks
Losses	Following the disaster	Flows

# Secondary effects

- Secondary effects are effects on macroeconomic aggregates. They reflect the repercussion of damage and losses and must not be added to direct and indirect damage.
- The macroeconomic aggregates include:
  - ✓ Economic growth
  - ✓ Public finance
  - ✓ Inflation
  - ✓ Unemployment
  - ✓ Debt
  - ✓ Balance of payments

# Comparison

- Value added is generated in establishments grouped into large, medium and small size.
- Large establishments concentrate a larger part of the capital stock and have insurance to cover the risks of damage.
- In some countries the importance of small establishments has declined over time.
- Small establishments still account for an important share of labour participation.

# Comparison

- Small establishments are more vulnerable to natural disasters but recover more quickly.
- Larger establishments require greater support for recovery following a natural disaster.

# Comparison

- Geographical location of establishments has implications for disaster evaluation.
- Commercial and manufacturing activities are located in cities.
- Commercial activities are not as polarized and can be found in medium-sized and small cities.
- The damage caused by a natural disaster is closely related to the urban nature of the establishments rather than to the event underlying the disaster.

# Comparison

- In general reliability and precision of information is better in the manufacturing sector.
- Some countries present the statistics of the commercial sector as part of tourism.
- The distribution sector appears in the national accounts with restaurants.

# The general aspects of the manufacturing and commercial sectors

- The approach to disaster evaluation follows the method of successive approximations.
  - Starting point is the collection of basic general information providing a general picture of the area affected.
  - Calculation of the specifics of the damage
  - Diagnosis of the situation establishing priorities for recovery activities and reconstruction projects and programmes.

# The general aspects of the manufacturing and commercial sectors

Data collection and sources of information

Description of the main sources of information.

- Industrial census
- Times series information
- Information in periodic bulletins
- Information from commerce or industrial chambers
- Micro and small enterprises groups
- Manufacturers group
- Promotion offices

# The general aspects of the manufacturing and commercial sectors

Description of the area affected and global damage.  
The description includes

- Estimation of establishments affected by the disaster
- Industries to which the establishments belong
- Employment creation in establishments affected
- Value added in establishments affected
- Informal survey to obtain a general picture of the magnitude of the damage.

# A global view

## Manufacturing

Light industry on a smaller scale.

Building materials

Jewellery

Printing

Baking

Furniture

Chemicals

Packaging

Bottling

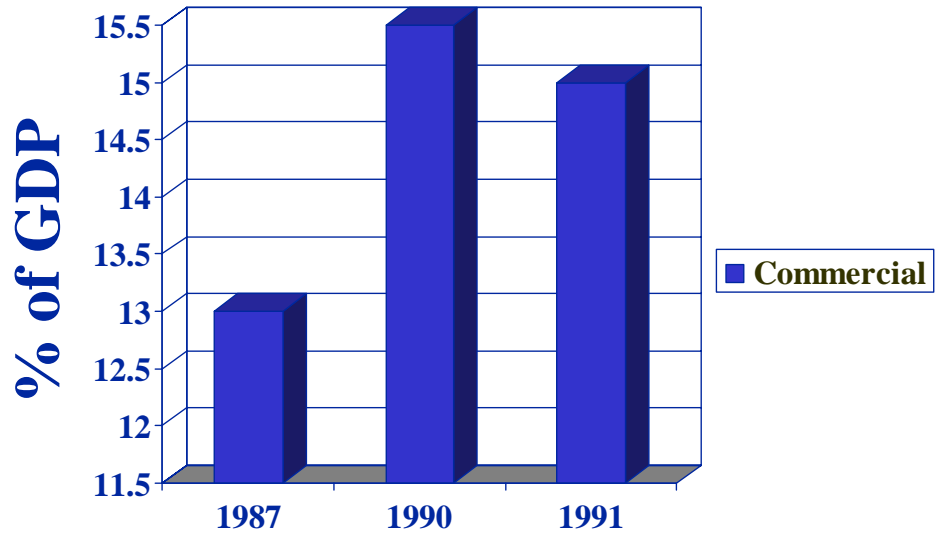
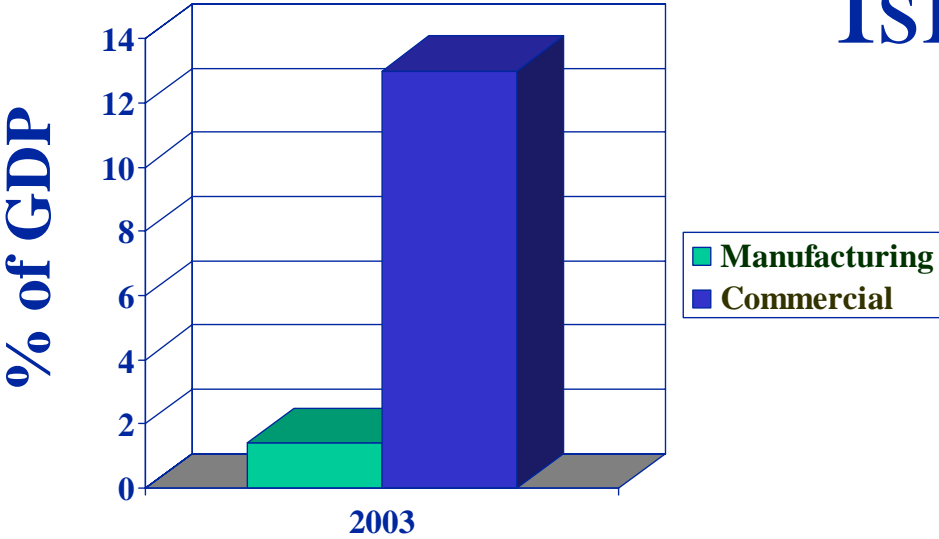
## Commercial

Entities involved in distribution range from individuals engaged in subsistence trading to large trading establishments.

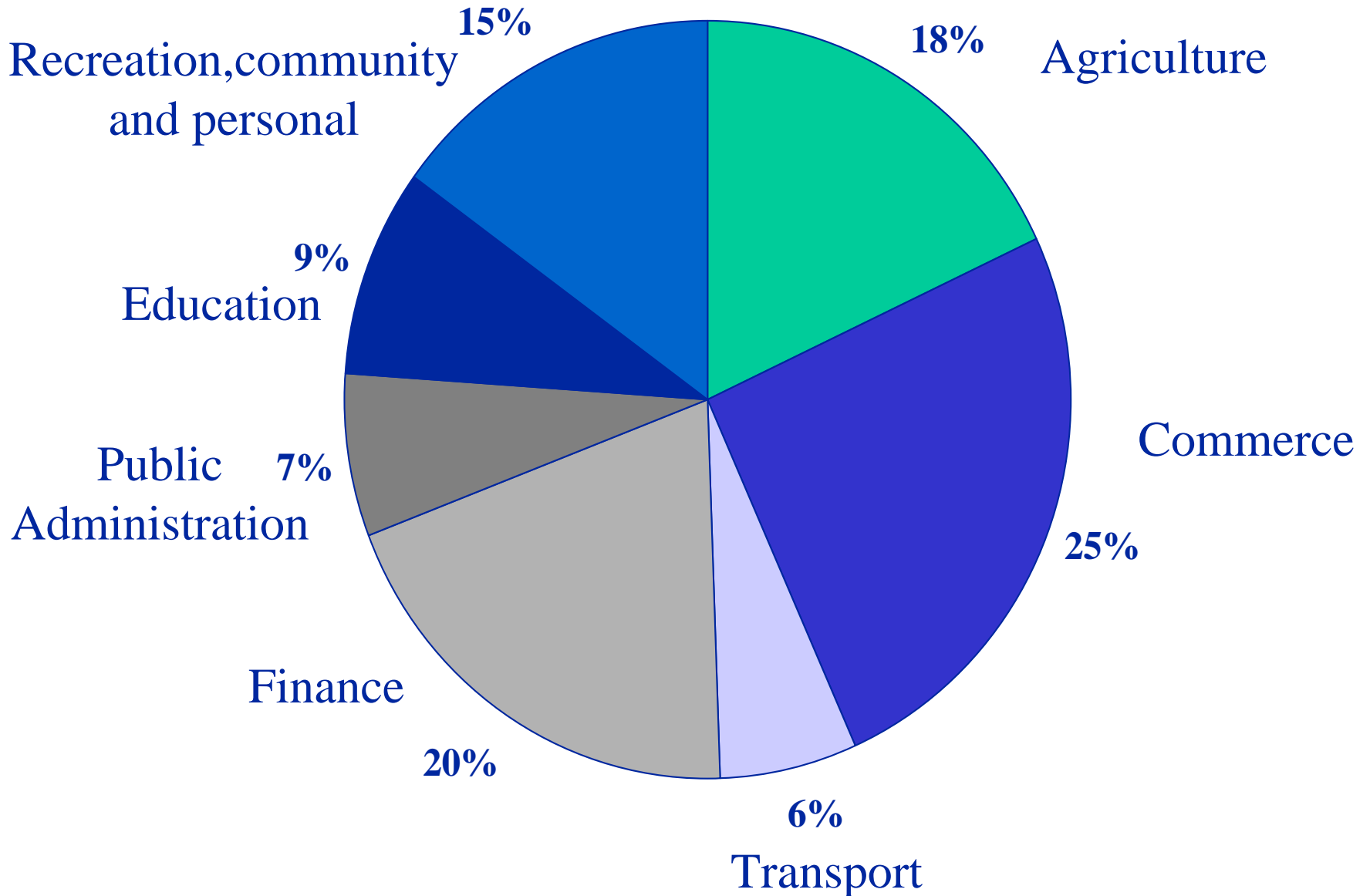
Variation in the level of formal status.

Smaller establishments employ 40% of the workforce .

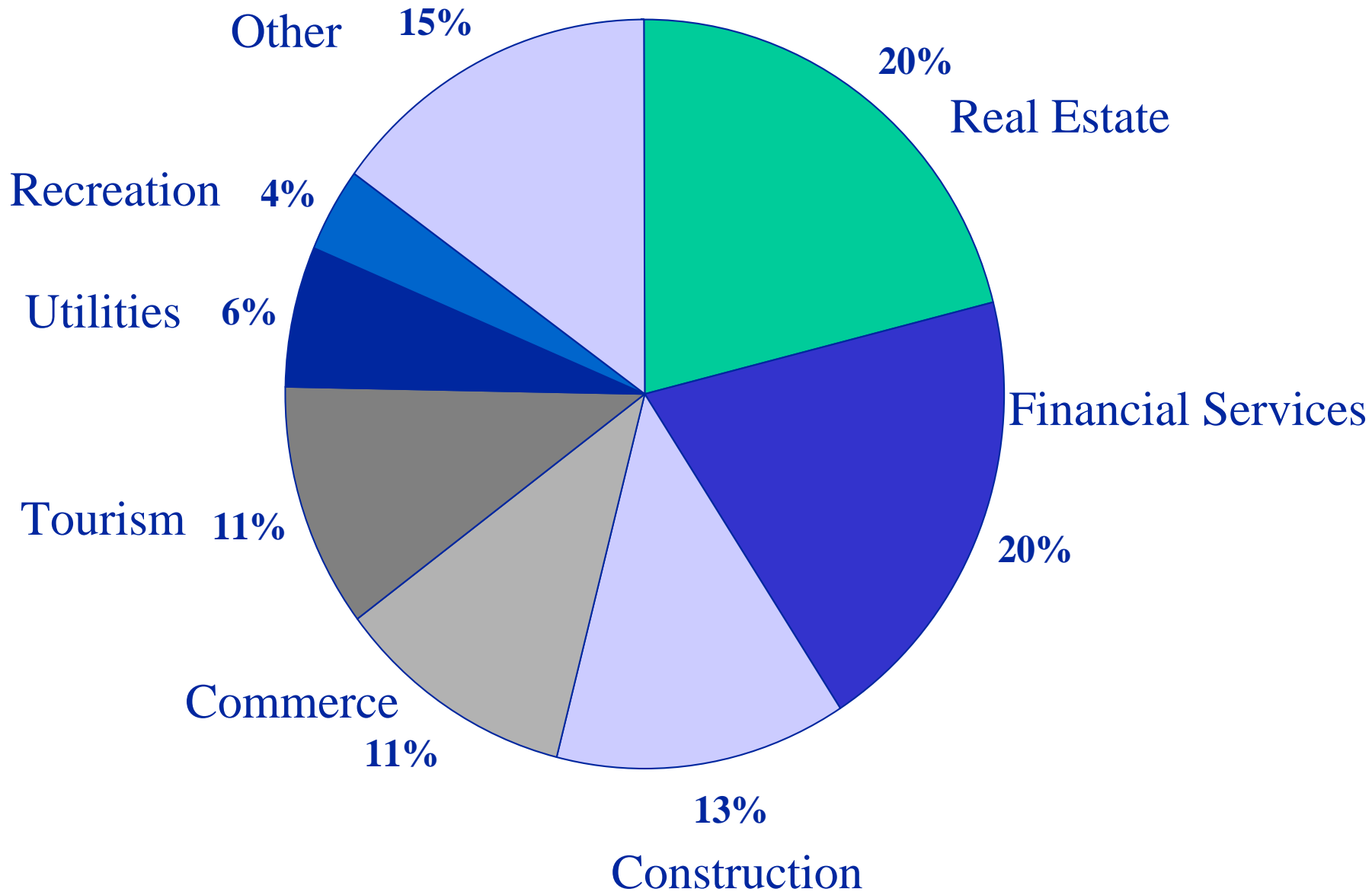
# A global view: manufacturing and commercial sectors in the Cayman Islands



# Employment by industry, 2002

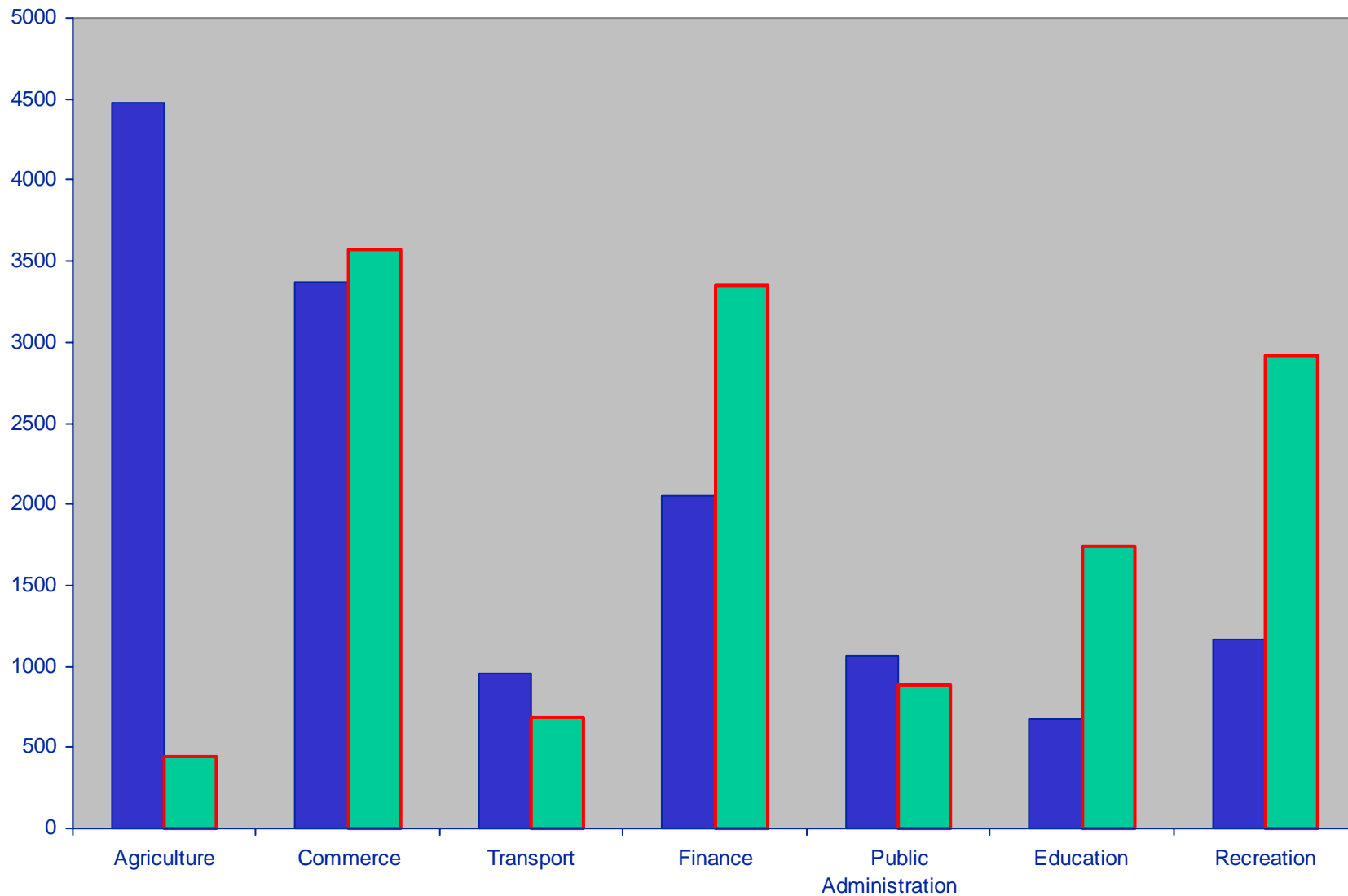


# Distribution of loans to business, 2003



# Male and female employment by industry

1993-2002



# Damage

The estimations for damage for the commercial and manufacturing sectors are grouped in categories.

- Buildings and installations
- Machinery and equipment
- Vehicles
- Inventories

# Damage

In each of those categories it is important to distinguish:

- Valuation at the pre-disaster stage
- Replacement costs of assets damaged or destroyed
- Costs of reconstruction including vulnerability-reduction components. The list of components should be jointly determined with the authorities.

# Damage

Buildings and installations.

Distinguish between different size of establishments.

The surface area destroyed or damaged

An estimate of the date of construction of the building

Value of a square meter of construction

# Damage

Machinery and equipment

The information requirements include replacement prices.

Information is provided on the basis of accounting records.

In the case of the commercial sector equipment accounts for lower weight within total assets. On the basis of past experience these represent 20% to 40% relative to buildings and installations.

# Damage

Buildings and machinery and equipment are considered fixed assets.

Fixed assets are defined as produced assets that are themselves used repeatedly or continuously in processes of production for more than a year (UN, SNA, 1993).

Fixed assets are generally valued at as if they were being acquired on the date to which the balance sheet relates.

# Damage

The principles for valuation of fixed assets:

- Transfer to the unit which intends to use them.
- New fixed assets are valued at producer prices.
- Purchases of existing fixed assets are valued including transport, installation and other costs of ownership transfer incurred by the purchaser.

Assets contribute to gross fixed capital formation.

Generally equals the price of an asset plus the total costs of ownership transfer.

# Damage

Inventories consist of:

Stocks of output still held by units that produced them prior to their being further processed, sold or delivered.

Stocks of products acquired from other units intended for use in intermediate consumption or for resale without further processing.

Transactions involving inventories are treated in the same way as transactions involving any other asset.

# Damage

Inventories produced as outputs or intended for intermediate consumption should be valued at the prices prevailing on the date to which the balance sheet relates and not at the prices at which the products were valued when they entered inventory.

Inventories of materials and supplies are valued at purchasers' prices and inventories of finished goods and work-in-progress are valued at basic prices.

Historic cost accounting.

# Losses

The damage suffered by manufacturing and industrial assets will have a negative effect on flow magnitudes mainly on production and income and also on capital formation.

Losses include:

- Shortage of inputs caused by the disruption and interruption in communications and sales channels.
- Higher transportation costs.
- Reduction in export potential
- Reduction in revenue and increase in expenditures

# Losses: Belize (Keith, 2000)

	Total damage	Damage	Losses
Total industry	48830	30660	15170
Free trade zone	128	60	68
Timber processing	3205	2925	280
Agroindustry commerce	41115	26293	14822
Loss of stock and inventory	1382	1382	.....

0000 of BZ\$

## Grenada: Summary of damage and losses. EC\$ Million

Millions of Eastern Caribbean Dollars

Sector	Damage	Losses	Total
Agriculture	54	46	100
Manufacturing	18	4	22
Wholesale and retail trade	...	11	11
Tourism	305	101	406
Electricity	70	21	91
Water/sewage	7	1	8
Telecommunications and broadcasting	77	62	139
Cable	8	5	13
Education	195	1	196
Transport	10	1	12
Housing	1,372	9	1,381
Health	11	0	11
<u>Total</u>	<u>2,127</u>	<u>263</u>	<u>2,390</u>

## Jamaica: Summary of damage and losses. J\$ Million

Millions of Eastern Caribbean Dollars

Sector	Damage	Losses	Total
Agriculture	3,407	5,143.0	8,550.0
Manufacturing	210.0	1,994.9	2,204.9
Wholesale and retail trade	...	...	...
Tourism	466.3	1,124.4	1,590.7
Electricity	589.0	808.9	1,397.9
Water/sewage	190.4	488.3	678.7
Telecommunications and broadcasting	198.6	1,336.7	11,535.3
Education	794.9	12.0	806.9
Transport	2,460.0	795.9	3,255.9
Housing	10,474.8	689.1	11,163.9
Health	718.2	40.2	11
<u>Total</u>	<u>22,226.8</u>	<u>13,704.1</u>	<u>35,930.9</u>

## The Cayman Islands: Summary of damage and losses. CI\$ Million

Millions of Eastern Caribbean Dollars

Sector	Damage	Losses	Total
Agriculture	0.4	5.2	5.6
Manufacturing	...	...	...
Wholesale and retail trade	429.0	34.4	463.4
Tourism	281.9	180.5	462.4
Electricity	33.9	35.0	68.9
Water/sewage	4.8	0.8	5.6
Telecommunications and broadcasting	48.1	31.7	79.2
Education	43.0	1.8	44.8
Transport	146.2	48.7	194.9
Housing	1,320.0	124.9	1,444.9
Health	9.6	9.3	18.9
<u>Total</u>	<u>2,369.6</u>	<u>491.7</u>	<u>2,861.1</u>

# Secondary effects

GDP. Estimate by computing the contribution of manufacturing and commercial sectors to GDP or by examining GDP by expenditure categories.

Balance of trade. Commercial and manufacturing activities comprise both economic activities related to domestic production and to trade.

Public finances. Commercial and manufacturing activities contribute to public finances by providing a solid tax base.

# Secondary effects: “probable effects”

GDP. Gross capital formation, reduction in consumption; higher government expenditure; lower taxes; fewer exports and greater imports.

Balance of trade. Increase in the balance of trade deficit.

Public finances. Increase in expenditure and decrease in revenues.

# Secondary effects

## Belize (Keith, 2000)

	1998	1999	2000 pre	2000 post
GDP	1097612	1165242	1234801	1223262
Manufa cturing	143484	150502	151016	155200
Sugar Citrus			24421	
Other manufa cturing			14174	

# Secondary effects

## Fiscal effects

- Expenditure

Goods and services

Wages and salaries

Interest payments

Transfers

- Revenue

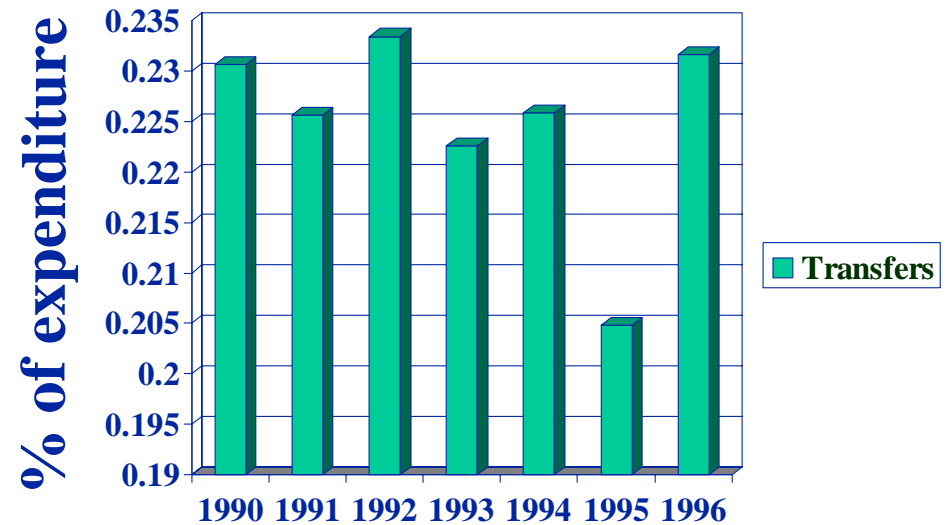
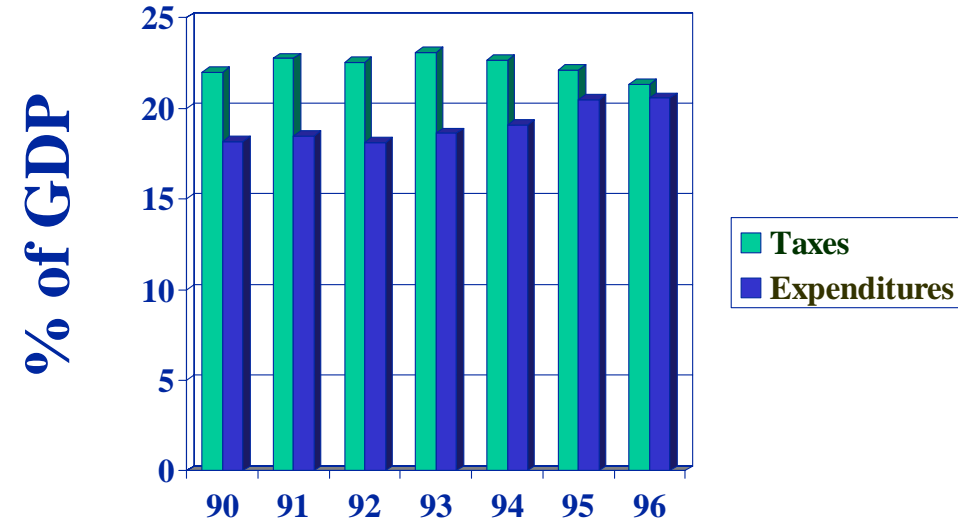
Income and profit

Property

Goods and services

International trade

# The fiscal impact St. Lucia



# Priorities for recovery and rehabilitation

- The evaluation should conclude with a list of priority actions.
- The list of priorities should be presented in a project like form.
- Objectives of the project are to:

Rebuild and improve destroyed and damaged assets

Re-establish productive and export processes of economic and social development.

Improve the living conditions of the conditions of the victims of the disaster.

Recover the material and economic losses.

Establish mechanisms to control and mitigate the damage.

# Establishment of an audit trail

- Provides a record to check estimates.
- Inspecting each step in the process of valuation and estimation.

## Hypothetical example

### General characteristics of the manufacturing sector

	Region	National	% of the total
No.	6081	119212	5.0
Employees 000	50	1747	3.0
Fixed Assets Mill.	9	171	5.4

# Establishment of an audit trail

Damage and losses. Millions of UDS dollars

	Damage	Losses	Total
Drugstores	80	83	163
Apparel factories	40	40	80
Beverages	12	12	24
Bakeries	50	16	66
Footwearshops	62	50	112
Mechanical workshops	59	80	139
Others	116	60	176
Total	431	341	772

# Requirements for a good evaluation

- ✓ Define clearly the geographical area of the damage .
- ✓ Define clearly the type of establishment affected.
- ✓ Define clearly the methodology underlying the evaluation.
- ✓ Distinguish between damage and loss.
- ✓ Keep a well-informed file of the sector affected by the damage.
- ✓ Check the consistency of the data.
- ✓ Keep in consideration the vulnerability mitigation components of replacement costs estimates.

# Self-assessment

- ✓ Try to verbalize the concepts describing all that they entail.
- ✓ What is damage and loss?. Provide examples with respect to the manufacturing and commercial sectors.
- ✓ What are secondary effects?.
- ✓ What are the different categories of assets?
- ✓ Enumerate different data sources. How would you use the sources selectively.
- ✓ What is an audit trail?.
- ✓ List the requirements of a good evaluation.

# Exercise

## Manufacturing Sector

	Number of companies	Employment	Buildings and installations (000')	Machinery and equipments (000')	Stocks and inventories (000')	Total	
Total	1064	6250	257.1	340.4	167.5	207	972
Large	14	1800	14.2	90.2	14.5	35	153.9
Medium size	400	1200	182	232.2	141	160	715.2
Small	650	3250	60.9	18	12	12	102.9

Production loss = 84.2

Ratio of gross value of production to value added=0.37

# Exercise

	Number of establishments	Number of employees per establishment	Total employment	Annual value added per worker	Accumulated losses
Small shops	1,500	5	7,500	560	4,200,000
Hand market stalls	500	3	1,500	340	510,000
Gas stations	50	15	750	1,120	840,000
Department stores	5	15	75	2,360	177,000
Total	2,055		9,825		5,727,000

# Exercise

- Using the information provided in tables 1 to 3:
- Estimate damage and losses to the manufacturing and commercial sector.
- Estimate its impact on GDP.
- Provide an overall assessment of the magnitude of the disaster.

# Exercise

- In the manufacturing sector the damage is equal to 972 dollars (thousands).
- Losses are equal to 84.2 dollars (thousands).
- Total damage is equal to damage plus losses.

# Exercise

- The GDP estimate for 2003 prior to the disaster was 43 million.
- The GDP estimate with the disaster is equal to 39.7 million (taking into account the losses in the manufacturing and commercial sectors in terms of value added which are equal to 5.6 million).
- The GDP rate of growth without the disaster is equal to 2.3% and taking into account the disaster is equal to -11%.