

Landscape Example

❖ Features and Sources of Impacts

- The characteristics and essential elements of a landscape determine its attraction and value to residents and visitors;
- Natural and human elements give landscapes their visual identity, strength of character and enduring appeal;
- Visual appreciation is often linked to form, line, colour and texture of the landscape;
- Adverse effects to colour and texture of a seasonal, cyclical nature are created by droughts but often in a less devastating manner than effects sustained by strong hurricanes;
- The gravest damage to a landscape is however from volcanoes, as the experienced of Montserrat shows;
- In the worst cases volcanoes transform the line, form, colour and texture of a landscape and may destroy picturesque views and distinct features of the landscape;

Photo 22
Landscape example



(Notes on Scenic Impacts)

- *Adverse impact on scenery from hurricanes are usually widespread. Scenic values can be assigned to different parts of a landscape prior to a hurricane or flood event and used to evaluate impacts after the event. Damage to scenery can impact tourism and the quality of life temporarily but for the most part scenic impacts are perceived subjectively)*

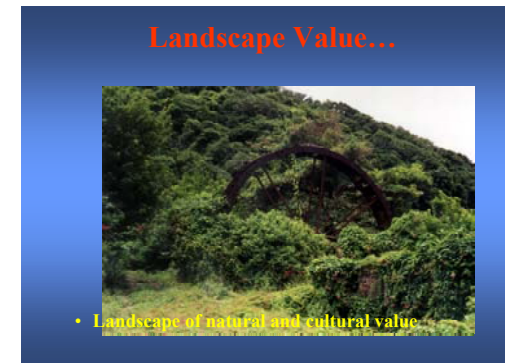
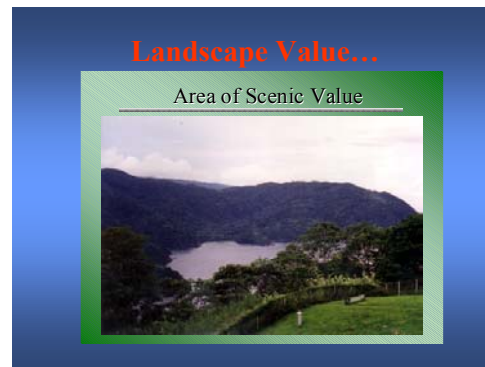


Photo 23
Examples of adverse effects

❖ Economic Value

- The economic value of a landscape attraction can be determined by:
 - □ Visitor levels and associated income to service providers (tour organizers, taxis, boats, guides);
 - □ Value its provides to other services (such as accommodation). Such value is sometimes defined as “economic rent”; for example, the Pitons of St. Lucia adds to the value of hotel and villa rentals for properties with views to these outstanding landscape heritage assets;
 - □ Land Value
- The willingness of day visitors (excursionists) to pay visitor fees to management agencies above the varying costs to service providers;
- Visitor fees paid in relation to the Pitons and other heritage assets can be considered a capture of part of the economic rent of the Pitons landscape and other natural attraction in the Soufriere area.

(Definition: Economic rent = the return for the productive value or service provided by a resource, ecosystem or more generally nature)

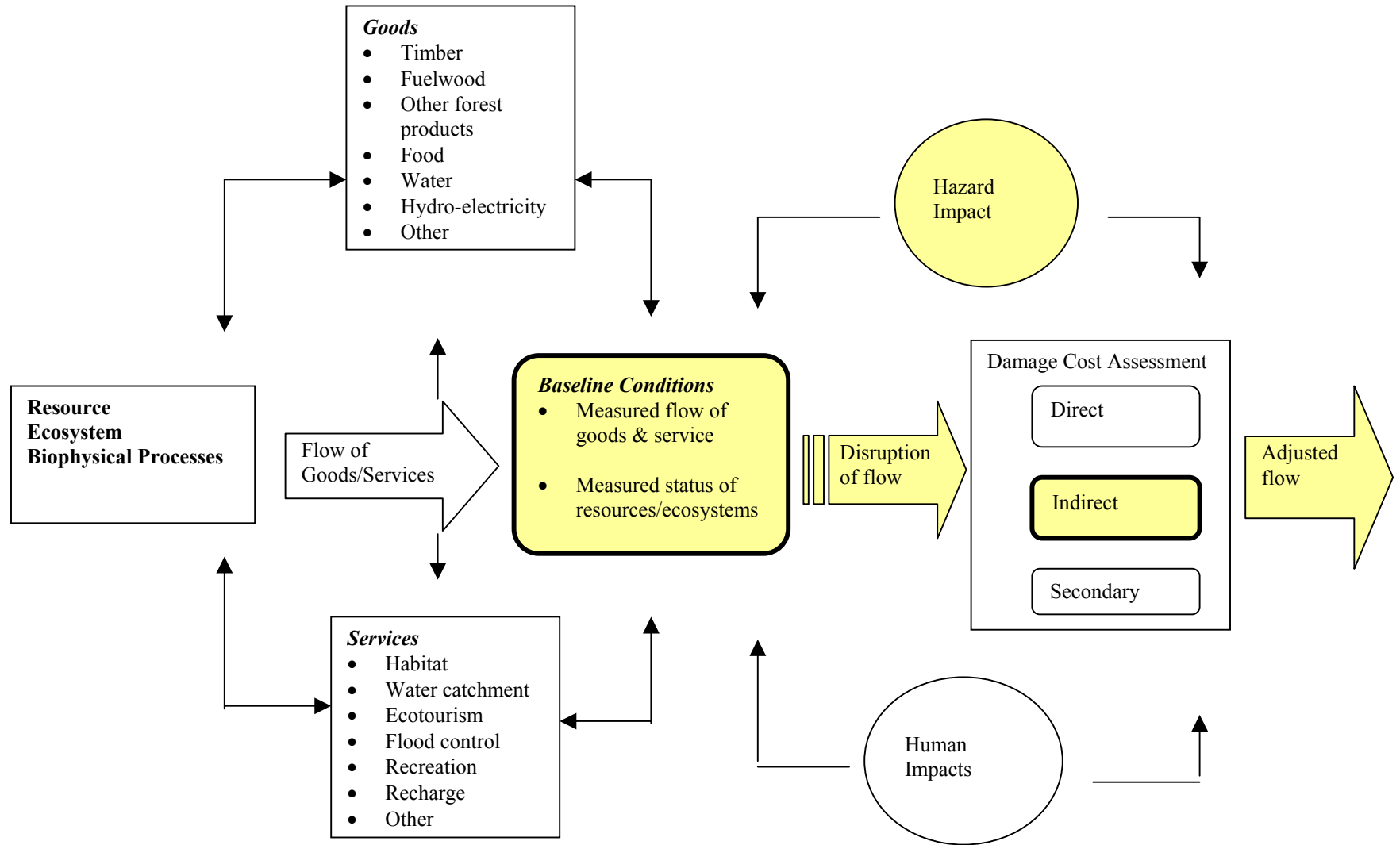
❖ Assessing Damages and Costs

- Assessing direct damages and related costs for outstanding landscapes is not suggested because it is difficult and in most cases rehabilitation should not occur;
- Primary attention should be given to indirect costs from the disruption or loss to the flow of goods or services and to secondary impacts and costs associated with social dislocation and relocation of affected persons in the case of volcanoes.

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Figure 17
Understanding Baseline Conditions on the Flow of Environmental Goods and Services



Establishment of an Audit Trail – Terrestrial Environment

An audit trail is essentially a record of data sources and methods used to arrive at damages and costs. It requires that references are made of and credit given to data sources, so that they can be confirmed if necessary. More importantly, the audit trail requires some indication of how the data was used in arriving at direct, indirect or secondary damages and costs.

Quantitative data for the environmental sector is often not available or in some cases is not reliable. This makes it all the more critical to reference data sources and to explain damage assessment and costing methodologies used.

Requirements for a good evaluation – Terrestrial Environment

- a) identify physical or natural environmental resources (eg, natural attractions, wildlife populations, soils, aquifers) that have been damaged
- b) determine critical environmental processes that have been damaged, impaired or disrupted (eg, streamflow, aquifer recharge, storage of flood waters)
- c) determine what economic goods or services have been impaired, halted or otherwise adversely impacted by (a) and/or (b) (eg, eco-tourism, fresh water supply, soil loss to agriculture)
- d) give priority to the assessment of indirect damages determined under (c) since direct damages identified under (a) and (b) are quite often not easily quantified
- e) If a decision is made to cost direct damages use methodologies of tested or proven effectiveness
- f) Preference should be given to costing of direct damages where human interventions are being suggested for restoring a resource (eg, restoring plants in a scenic area damaged by landslides)



- g) Where costs cannot be calculated for direct damages, it is still useful to describe such damages and where possible draw qualitative conclusions about their related socio-economic impacts
- h) Seek to secure adequate data from a variety of sources so as to make an accurate determination of baseline conditions that existed prior to the disaster for goods and services and for resources and ecosystems
- i) Check to ensure the reliability of your data sources and the data provided.

Self Assessment – Terrestrial Environment

You should now be able to:

- Identify goods and services provided by the terrestrial environment which could be damaged or disrupted by natural disasters
- Determine where to place priority in costing direct and indirect environmental damages
- Identify sources of baseline and post event data to be used in your assessment and costing of damages



Exercise - Measuring Impacts and Costs

❖ Aim

Participants are expected to be engaged in an exercise aimed at estimating costs from hurricane damage to an important wildlife habitat. The habitat is real but the damage is fictitious.

❖ Background

Mangroves in the Codrington Lagoon in Barbuda provide a habitat for nesting to a large number of Magnificent Frigate Birds. The red mangrove habitat is over 6 acres. The Magnificent Frigate Bird Sanctuary (MFBS) is considered the largest nesting habitat for the species in the Caribbean. For the first 9 months of 2000, 3003 persons visited the sanctuary paying an average of US\$10 per person per trip to about 6 full-time Water Taxis taking visitors to the site. Other service providers include:

- Airline transporting day excursionists from Antigua to Barbuda to visit the site (over 50 per cent of visitors to the Bird Sanctuary);
- Ferry service providing a package to excursionists costing about US\$120 per person;
- Restaurants offering lunches to visitors;
- Taxi drivers/tour operators;

The Barbuda Council captures revenue from visitors to the site by charging US\$2 per visitor.

❖ Tasks

We will assume that the MFBS was damaged by a hurricane of undetermined force. For the purpose you should assume that:

- 50% of the habitat was damaged;
- 50% of the birds were lost;
- a decline of 40% of visitors to the MFBS from the figure given for 2000.



Table 14: Exercise Table

Damage /Cost	Mangroves	Magnificent Frigate Birds	Service Providers						Total (US\$)
			Water Taxi Operators	Airline	Ferry Service	Restaurants	Taxis	Other	
Direct									
Indirect									
Secondary									
Total (US\$)									

❖ Conclusion

- The scope of damage impact assessment for the terrestrial environment should be determined by reliability of baseline data and available resources for coordinating secondary data (pre and post event) and for collecting primary data.

