



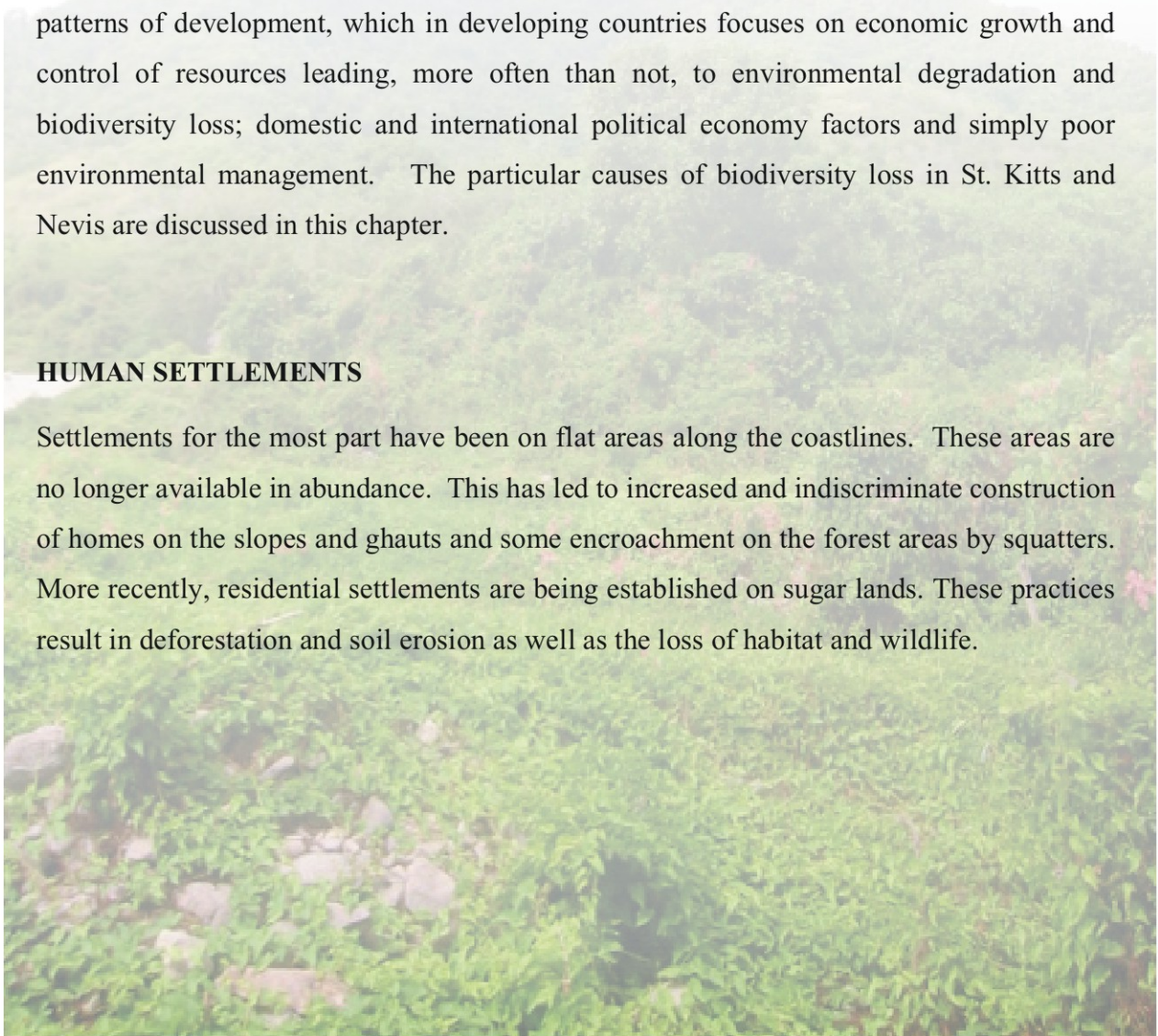
CHAPTER 4 PROXIMATE CAUSES OF THE LOSS OF BIODIVERSITY

INTRODUCTION

In order to find effective conservation solutions to the escalating global biodiversity loss a deeper understanding of the driving forces behind that loss is essential. Biodiversity loss in general is driven by a complex interplay of various forces operating at different scales. These being demographic changes; poverty and isolation; socio-economic factors; international pressures to liberalize markets; policy responses of the country; chosen patterns of development, which in developing countries focuses on economic growth and control of resources leading, more often than not, to environmental degradation and biodiversity loss; domestic and international political economy factors and simply poor environmental management. The particular causes of biodiversity loss in St. Kitts and Nevis are discussed in this chapter.

HUMAN SETTLEMENTS

Settlements for the most part have been on flat areas along the coastlines. These areas are no longer available in abundance. This has led to increased and indiscriminate construction of homes on the slopes and ghauts and some encroachment on the forest areas by squatters. More recently, residential settlements are being established on sugar lands. These practices result in deforestation and soil erosion as well as the loss of habitat and wildlife.





MINING



Figure 35: Sand mining

The mining of sand for construction purposes is another threat to bio-diversity. The majority of houses in the Federation are built from blocks and concrete. There is legislation in force that forbids large-scale sand removal from beaches. However, illegal sand removal has led to severe beach erosion in some areas and the loss of recreational areas in others. Indiscriminate removal of sand from beaches increases the level of exposure of the coastal lowlands to flooding from sea surges and hurricanes.

Population Size and Distribution

The growth of the population has the potential to adversely affect the environment, since a growing population creates pressure on the existing resources. In the Federation, the size of the population has been relatively stable. This does not mean however, that the existing population does not impact on the environment, as it is becoming more affluent, its expenditure patterns are changing and there is an increased demand for the importation of consumption of goods. Furthermore, more homes are being demanded due to a decreasing presence of the extended family structure. These developments result in the generation of more pollution and garbage for disposal, which puts additional strain on existing resources allocated to waste management.



Furthermore, the concentration of the population in the urban and semi-urban areas places additional stress on existing infrastructure, services and available resources in these areas.

ECONOMIC ACTIVITIES

Agriculture and Land Use

A significant amount of land on St. Kitts is allocated to sugar cane cultivation.



Figure 36: Acres of Sugarcane plants

Compared to other agricultural crops this crop conserves the land and protects it from erosion, though there is some pollution from pesticides and fertilizers. With the potential closure of the industry looming, there is need to consider alternative uses for sugar cane lands. The abandonment of sugar cane lands, or alternative utilization, can impact on biodiversity; as in the case of Nevis where cotton replaced cane sugar in the 1900s providing less of a cover to the soil. If the fields are left uncultivated, it can result in soil degradation, erosion and siltation of waterways. Poor agricultural practices can also reduce the soil quality and lead to the loss of valuable topsoil. Lands may also be used as dumping sites for garbage.



The seasonal nature of the sugar cane crop means that during the ‘off season’ alternative forms of employment have to be found. Many of the workers resort to fishing and farming. However, because the best lands are given to sugar cane cultivation, farming was done mainly on marginal lands and on upper slopes. Over time, this has caused soil erosions and a reduction of forest cover. These trends have been exacerbated by the emphasis placed on strategies for agricultural diversification. The increasing demand for agricultural land has resulted in many small farmers clearing forested land on the upper slopes for farming. Such encroachment results in deforestation, soil erosion, and pollution of streams, rivers and coastal waters.

Overgrazing

Land degradation is prevalent in low lying areas, especially Bath Village and Indian Castle in Nevis. These areas receive the lowest amounts of rainfall and also suffer through extensive livestock grazing. As a result there is a lack of vegetation leaving large tracts of land prone to erosion and high levels of sea blast.



Figure 37: Lands once covered in sugar now degraded due to overgrazing and wind erosion (Nevis)



Pollution



Figure 38: Cargo Vessel

The Caribbean sea is one of the most heavily traversed seas worldwide, and pollution from transboundary and extra-regional activities is significant. These activities include the passage through the region of oil tankers, nuclear waste laden vessels, cargo vessels, fishing trawlers, commercial vessels, cruise-liners, and pleasure-crafts; all of which generate pollution in the form of bilge water and garbage dumped into the ocean.



Figure 39: Cruise Ship & Yacht docked at Port Zante



Additionally, there is a considerable amount of pollution that originates from land based sources. Contaminants include sewage, solid waste leachate from landfills, industrial spills, agricultural run-off, and petroleum products. On St. Kitts, the Great Heeds Pond is under threat from the encroachment of the adjacent landfill and masonry plant. Consequently this endangers a large number of resident and migratory birds who depend on the mangroves for feeding and nesting (CCA 1990). The runoff of chemicals from the agricultural sector into the marine environment along with sewage from hotels and other such industries have been of particular concern to both the Fisheries Management Unit (FMU) and the Health Department. However, the monitoring of these has been on an intermittent basis at best in some areas and in others not at all.

Introduction of alien species

Alien species are organisms that have been transported by human and other activities into regions where they have not historically been found. Introductions may be accidental, for example when organisms are carried from one port to another on ships; or deliberate for food e.g. goats, cows, breadfruit etc. Introduced species are responsible for many recorded species extinctions. In an isolated environment such as that of the Caribbean islands, an introduced species, having left behind its native predators, can rapidly out-compete the native species with which it did not co-evolve. This has certainly occurred within St. Kitts and Nevis, although to what extent is not fully known.

Tourism

Tourism, like other sectors, uses resources, generates wastes and creates environmental, cultural and social costs and benefits in the process. Areas that are particularly appealing to tourists are often places with high biodiversity. Elements of the environment that were found to be most susceptible to tourism impacts included the coastal and marine resources, terrestrial vegetation and freshwater biodiversity.



Figure 40: Tourists snorkeling

In St. Kitts and Nevis, the impact has been particularly widespread and intensive in the coastal zone. The coastal zone is comprised of a complex mixture of ecological systems and hosts seasonally affected winds and wave regimes. It is also the zone where most of the islands' population reside and where tourism development is exerting a major influence.

The impacts include:

- Problems of beach erosion, damage to coral reefs, destruction of mangrove resources, and pollution of coastal waters as a result of the concentration of tourism development in coastal areas;
- Decline in the abundance of certain fishery species, for example, lobster and conch used in hotels and restaurants;
- Loss of habitat and species due to golf course development;
- Destruction of coral reefs, as refuse has been dumped into the sea;
- Destruction of reefs, sea grass beds and wildlife by filling, dredging and bulldozing from the construction of ports, marinas, mooring of vessels and as a result of run off from upland construction;
- The destruction of marine life, as a result of water sports activities that the tourists enjoy;



- Sand mining for construction, which causes the disappearance of beaches. In St. Kitts, this development is restricted mainly to one area, whilst in Nevis it is completely restricted. Sand is now imported into Nevis.

Natural Hazards

Natural hazards are generally unavoidable and potentially very destructive. The natural hazards of significance to St. Kitts and Nevis include:-

- Hurricanes
- Flooding
- Drought
- Bush fires
- Volcanic activity episodes



Figure 41: Major deposits of seagrass; damaged property and loss of sand due to a severe hurricane



Figure 42: Aftermath of Flooding

The Federation has experienced six major hurricanes during the end of the 1980s and the second half of the 1990's. These hurricanes caused extensive damage to mangroves also forests resulting in mudslides and flooding. The damage to forests in turn caused damage to the crop biodiversity, threatened rare species and altered the feeding patterns of more common ones. Additionally, it has been reported that as a result of the passage of Hurricane Hugo, Elkhorn Coral near Cades Bay, in Nevis, were shattered.

During 2001, a very extensive drought was experienced. This period was associated with an increase in the number of bushfires.

Socio-economic practices

Use of Wood and Charcoal for Cooking – To some extent wood and charcoal is still used as fuel for cooking. The 2001 census data indicated that 10 % of households use wood and charcoal as the main fuel for cooking. In other instances charcoal is used for the fuelling of barbeque grills, which in recent times has become a popular form of business enterprise within the Federation.



balance, especially as the frequency of storms and hurricanes no longer allows for natural restoration of the forest on a sustained basis. In some instances, the mangroves have also been cut to produce charcoal.

Hunting – Marine turtles, native birds and deer are the species most threatened by this practice. Turtles have been indiscriminately hunted for their eggs and meat. A closed season has now been imposed for a seven-month period each year. The deer, which were introduced as pets in the 19th century, are now listed as a protected species.

Over harvesting of resources - can also impact bio-diversity. For instance, over fishing of juvenile fishes in the nearby shores does not lend itself to sustainability of commercial fish species. Usually species are exploited for short-term gain, but this soon leads to complete depletion or extinction of that species for consumption. One example is that of the conch and lobster which have almost been eliminated from the shallow areas. The practice of dragging the fresh water ponds and catching the juvenile fish, especially on Nevis, does not promote sustained marine fish stocks.

The advancement in fishing technology is also a threat, as the indiscriminate use of seine nets have been the cause of untold damage to nursery stocks on the inshore grass beds and coral reefs. Fish traps being lost at sea can snare fish for months before they are destroyed, thus reducing the amount of fish available to be caught. To combat this, the Fishing Management Unit is investigating the use of biodegradable panels in fish traps.

Lack of Finance

Limited financial resources, has been a major hurdle to the ceasing of biodiversity loss within the Federation. The available financial resources are insufficient to afford tasks required for biodiversity conservation, such as: educating the public, training, hiring expert personnel, forest protection (area demarkation and management), monitoring resource use, rehabilitating damaged habitats, development of technologies and biosafety etc. Effective conservation will require substantial investment to deal with problems of the past and change behaviour into the future.



CONCLUSION

The loss of biodiversity is due to an array of social, economic and political factors at various levels. While any of the individual factors alone are sufficient to cause biodiversity loss, in reality, multiple factors are acting *simultaneously* to drive such loss.

