

**NATIONAL DEVELOPMENT STRATEGY
(2001-2010)**

A POLICY FRAMEWORK

ERADICATING POVERTY AND UNIFYING GUYANA

A CIVIL SOCIETY DOCUMENT

ANNEX 5

THE ENVIRONMENT

Date of publication: November 2000
Date finalised by Sectoral Committee: May 2000
Equivalent Chapter in Core Document: 5

The Annexes to the National Development Strategy: An Explanatory Note

In June 2000, the National Development Strategy (NDS) of Guyana was formally presented to the President of Guyana and the Leader of the Opposition in the form of a core document, a 348 page distillation of the main elements of the analysis of the Guyana situation and the resulting strategy for action drawn from material prepared by 24 sectoral committees of the National Development Strategy Committee (NDSC). While Chapter 1 of the core document provides an outline of the origins of the NDS and the methodology of its preparation, the purpose of the present note is to explain the Annexes to the core document.

The Annexes are edited versions of the original drafts that the sectoral committees prepared, using a format that facilitated systematic thinking, though at the cost of some repetition. They are therefore longer than the corresponding Chapters of the core document, and also differ from them in other ways:

1. While the Annexes were individually edited in terms of their content, in the core document, disagreements or dissonances between Chapters were removed; for example, if the Chapter on the Private Sector proposed a strategy for Education that was in contradiction with a strategy proposed in the Chapter on Education, the two were rationalised.
2. While the core document was updated with the most recent data where possible, the Annexes generally retain their original data; for recent economic and social statistics, the attention of readers is particularly drawn to the recently completed *1999 Guyana Survey of Living Conditions*. In addition, again because of differences in when they were prepared, what was a Bill at the time of the original draft may have become an Act by the time the core document was being edited. This type of difference may be footnoted in the Annexes.
3. The treatment of the Annexes as historical documents occasionally produced another kind of difference, the main example of which is the Annex on Energy which was written before the privatisation of the Guyana Electricity Corporation, and whose strategy was largely preempted by that privatisation; while the edited Annex deliberately relied on the original material, new material was developed for the core document. These differences may also be footnoted.

It is worth noting that the updates found in the core document usually demonstrate the soundness and continued applicability of assessments made on the basis of earlier data or other information.

There are fewer Annexes than there are Chapters in the core document. For various reasons, some sectoral committee drafts were finalised in the same format as the Chapters of the core document, and there would therefore be little difference between the Chapter and the corresponding Annex. (Examples of this are the Macro-Economic Strategies and the Management of the economy; Sugar; Urban Development; Land; Housing; and The Family). The core document also includes Chapters for which there were no corresponding sectoral committee drafts; the first three Chapters of the core document (Origins and Methodology, National Objectives and Governance) are examples.

For those sectors where there are both separate Annexes and core document Chapters, the titles and numbering of the two correspond except in two cases: one, the corresponding Annex for the Chapter on Manufacturing is titled Manufacturing and Technology and includes material on Science and Technology that the core document had placed elsewhere; and two, the corresponding Annex for Chapter 4, Macro-Economic Policy, is Annex 4, Financial Sector Policy, because the material prepared for the Financial Sector Policy Annex was incorporated into the Chapter on Macro-Economic Policy.

The National Development Strategy was published in summarised form (the core document) for the practical reason that few people would have the time to read the over 700 pages represented by the Annexes. Yet the Annexes have a clear value. They include background information and assessments that were too detailed for inclusion in the core document, but which trace the process that shaped the strategy. Above all, they preserve for us and for posterity the earlier thinking, and the full range of thinking, of the women and men whose work provided the foundation of the NDS. In doing so, they honour the labour which the sectoral committees put into distilling their own work and life experience and the views of the public they consulted in the process. It is this foundational material that is now being published, making the National Development Strategy of Guyana available in both summary and extended forms.

TABLE OF CONTENTS

	Page
List of Acronyms	5-iii
INTRODUCTION	5-1
I. The Concept Of Sustainable Development	5-1
II. Issues And Constraints.....	5-3
A. Resource Degradation and Contamination	5-3
B. Impacts of Human Activities on Natural Ecosystems	5-3
1. Marines and Coastal.....	5-3
2. Intermediate Savannahs	5-4
3. Forests.....	5-5
4. Non-Timber Forest Products.....	5-6
C. Impacts of Activities Which Are Not Ecosystem-Specific.....	5-6
1. Mining.....	5-6
2. Wildlife Trading.....	5-9
3. Transportation.....	5-10
D. Forestry, Biodiversity and National Parks and Protected Areas.....	5-12
1. Forestry	5-12
2. Biodiversity.....	5-13
3. National Parks and Protected Areas.....	5-13
E. International and National Legal Issues.....	5-15
1. International Agreements to Which Guyana Should Accede	5-16
2. The Legislative Reform Programme.....	5-16
3. The Institutional Reform Programme	5-17
E. International and National Legal Issues	5-19
IV. The Strategy.....	5-19
A. General.....	5-19
B. Agriculture	5-19
C. Industry	5-20
D. Fisheries	5-20
E. Dry Evergreen Forests	5-20
F. Swamp Forest.....	5-20
G. Non-Timber Forest Products.....	5-21

H. Mining.....	5-21
I. Bauxite	5-21
J. Gold.....	5-22
K. Wildlife Trading.....	5-22
L. Transportation.....	5-23
M. Forestry, Biodiversity, and National Parks and Protected Areas.....	5-26
N. Natural Parks and Protected Areas	5-26
O. International and National Legal Issues.....	5-27
P. The Institutional Reform Programme	5-28
V. LONGER-TERM STRATEGY	5-30

List of Acronyms

CITES	Convention on International Trade in Endangered Species
EIA	Environmental Impact Assessment
EIS	Environmental Impact Survey
EPA	Environmental Protection Act
GEF	Global Environmental Facility
GFC	Guyana Forestry Commission
GGMC	Guyana Geology and Mines Commission
GNRA	Guyana Natural Resources Agency
NPAS	National Protected Areas System
OGML	Omai Gold Mines Limited
SPAW	Specially Protected Areas and Wildlife
UK	United Kingdom
WWF	World Wildlife Fund

ANNEX 5

THE ENVIRONMENT

INTRODUCTION

The purpose of this Annex is to provide an overview of the environmental issues which need to be considered in the formulation of development policies and plans, and in the execution of programmes and projects likely to impact significantly on the environment. Since these impacts are broadly ecosystem-specific, the major ecosystem types must be identified and characterised; this is a necessary first step in predicting potential effects at different levels and varying intensities of activity. The approach adopted will permit a structured analysis of environmental impacts by identifying the vulnerabilities of specific environments and assessing their individual capacities to accommodate change. It will also allow for the application of general principles to individual sectors, in the context of their specific environmental features.

Environmental considerations should provide the underpinning for all development, whether physical or social; hence sectoral development strategies should be informed at the outset by such considerations. Among the principles of environmental management which should guide sectoral planning are:

- prevention of pollution and environmental degradation
- the polluter pays principle endorsed in the Environmental Protection Act, 1996
- the precautionary principle which is described in the same Act
- "Intergenerational equity"

Environmental protection is a matter of human survival. Each generation owes it to the next to act responsibly and to ensure that no irreversible damage is done to the environment. No generation has the right to leave future generations with a more limited choice. Such an approach must not only consider human beings but must recognise the complementary existence and needs of other species.

I. The Concept Of Sustainable Development

Life on earth depends ultimately on the support provided by the physical environment. This means that to maintain life, the integrity of the ecosystem must be preserved; that is, its capacity to accommodate changes in material conditions and in the processes which sustain it cannot be exceeded without causing it to collapse, or to lose its identity, with unpredictable consequences.

Historically, the development paradigm has focused on maximizing economic benefits, and the contemporary emphasis remains the same, though increasingly tempered by concessions to environmental concerns. The latter have arisen as a result of the growing recognition of environmental limits to development activity, and are embodied in the concept of sustainable development and variants such as sustainable livelihood, sustainable harvesting, and even sustainable mining.

Sustainable development has been defined in a variety of ways, but the most widely-used definition is: "... development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission, 1987). In an absolute sense, however, the concept of sustainable development is a myth, because economic development invariably exacts a toll on the physical environment in terms of loss of materials or disturbance in ecosystems. What is considered sustainable development is in reality a trade-off between environmental degradation on the one hand, and assumed economic benefits on the other, with the terms of the equation invariably weighted against the environment. (This view is implicitly shared by the EPA when it states: "What should be promoted therefore is the incorporation of the use of best available techniques in operations **to reduce environmental damage** and increase economic and social gains" (Emphasis added). From this perspective, therefore, environmental policy and practice must be aimed at reducing environmental damage to a minimum.

Sustainability is not merely a question of ethics. There are limits to the extent to which natural systems can be exploited. Beyond those limits their performance becomes impaired and they may even be destroyed. Environmental systems are complex and unpredictable. With our limited knowledge and understanding, we must exercise the utmost care in setting limits to our activities in order to avoid irreparable damage to the environment. Modern technology is still incapable of creating or even repairing natural systems.

Environmental problems arise because of the impact of human activities on natural resources, affecting both their quantity and their quality, and the consequent impact in the reverse direction that a degraded environment has on human health and on the economic costs of human activities. In general, environmental problems can be divided into two categories: resource degradation and resource contamination.

While certain general principles should inform the application of environmental criteria in the evaluation of proposed development projects, as stated or implied in the foregoing discussion, the characteristics of individual ecosystems or ecological zones will determine the possibilities and limits to such projects. The major ecosystems are marine and coastal ecosystems, intermediate savannahs, forests, and savannahs.

II. Issues And Constraints

A. Resource Degradation and Contamination

Examples of resource degradation or reduction in the availability of natural resources in Guyana include:

- overfishing, leading to depletion of stocks, especially breeding stocks of commercial species;
- deforestation of mangrove swamps, resulting in loss of habitats for juveniles of important marine species, and increased danger of flooding of coastal areas;
- over-harvesting of inland forests with consequential loss of habitats and hence reduction of species diversity; and soil erosion, with attendant reduction in water-holding capacity of watersheds, rendering the affected areas susceptible to episodes of flooding and siltation.

The most common examples of resource contamination or reduction in the quality of natural resources in Guyana are associated with water pollution: mercury, cyanide and other wastes from mining, untreated human and animal wastes, and agricultural and industrial wastes affecting water supplies. Air pollution is a public health concern, for example in Linden, where suspended mineral particulates have been implicated in certain human respiratory disorders.

B. Impacts of Human Activities on Natural Ecosystems

1. Marines and Coastal

The environmental problems in the coastal zone in Guyana are intimately linked to activities associated with human settlement. Apart from the general impacts such as destruction or displacement of wildlife/biodiversity by physical transformations leading, for example, to loss of habitat, specific effects related to population concentration and economic activity can be identified. These include waste generation - solid, liquid, gaseous, chemical, heat, for example, flooding from increased runoff caused by replacement of natural vegetation by built structures; coastal erosion aggravated by various types of engineered structures and destructive activities such as sand-mining; and the cumulative effect of all of these on the total environment.

Some of the more obvious environmental problems arising from specific areas of activity are elaborated below.

a. Agriculture

Land preparation generally results in exposure of soil to increased runoff and consequential erosion. The transported silt later blocks waterways.

Intensive cultivation requires use of fertilisers. Excess is carried by runoff or by leaching into waterways, and the resultant nutrient enrichment of the waters induces intense growth of aquatic vegetation (eutrophication) with further blockage and fouling of water courses, and a

changed ecology.

Monoculture (e.g., rice, sugar), by reducing biodiversity and hence the potential for natural control of pests, promotes the use of chemical pesticides. Inevitably, these percolate or are washed into streams where they may directly destroy aquatic life, or enter the food chain through the process of bioaccumulation, especially in the case of persistent pesticides, causing extermination or decline of wildlife (including predators and scavengers - note the virtual disappearance of the carrion crow in recent decades), and ultimately affecting human health.

b. Industry

Environmental issues of concern in industrial activity include:

- (i) air pollution caused by burning of fuel and wastes and from fugitive dust;
- (ii) water and soil pollution resulting from the release of chemically-contaminated effluent;
- (iii) noise pollution, and
- (iv) thermal pollution, e.g., from cooling water used in industrial plants.

c. Fisheries

Guyana's marine fishery resources have sustained artisanal fishing to meet domestic demands. Commercial fishing, which has intensified over recent decades to satisfy export markets, has threatened fish stocks. Additionally, shrimp trawling, with its attendant dumping of by-catch, has progressively altered the species composition of inshore marine fauna.

Fish farming in the littoral zone has been accompanied by clearing of mangrove stands, exposing the affected areas to erosion by wave and tidal forces, while destroying habitats for breeding and juvenile stocks.

2. Intermediate Savannahs

a. Agriculture

Soils in this region are generally sandy and fragile with a thin topsoil. They are expected, therefore, to be nutrient-poor as a result of leaching. The pursuit of agriculture in the intermediate savannahs will have to take two major constraints into account:

- (i) alteration of the physical structure of the soil as a result of tilling, rendering it more susceptible to erosion, and
- (ii) limitations on the use of fertilisers because of leaching, inflating costs and promoting contamination of streams and groundwater from run-off and leachates.

b. Road Building

Construction of roads in connection with development projects inevitably opens up the area concerned to a variety of other activities, with environmental implications:

- (i). displacement/destruction of wildlife as a direct consequence of construction and subsequent use of roads;
- (i) influx of settlers, with further destruction of habitats, waste generation, and pollution, and
- (ii) hunting and exploitation of wildlife.

3. Forests

a. Dry Evergreen Forest

The Dry Evergreen Forest which occupies the white sand belt behind the coastal plain in the eastern part of the country is also known as Wallaba Forest, because typically wallaba species dominate the vegetation. This forest is easily accessible from the major population centres along the coast and has therefore been subjected to intense exploitation over the years. Indeed, in some areas the wallaba forest has disappeared or is threatened as a result of over-logging. Soil conditions do not encourage regeneration, especially in the face of constant disturbance.

b. Swamp Forest

Extensive areas of forest in the Northwest of Guyana are characterised by swampy conditions, encompassing fragile ecosystems with relatively low productivity. Logging has to be controlled to accord with the productive and regenerative capacity of the forest.

An economically and socially significant recent development in that area, which has extended to other areas as well, is the heart-of-palm industry based on a non-timber forest product from the manicole palm (*Euterpe* spp), which inhabits mainly riverain swamps.

c. Mixed Rainforest

Most of the commercially-produced timber is derived from mixed rainforest which is characterised by great species diversity. Poor soil conditions have rendered these forests low in production and productivity, and the limited data available point to very low regeneration rates. As a consequence, logging has been and continues to be a Aforest mining≅ operation, with the constant removal of selected species of greatest commercial worth. It is claimed, for example, that some areas where logging occurred in relative abundance have been largely denuded of the most commercially valuable species, the Greenheart (*Chlorocardium rodiei*).

4. Non-Timber Forest Products

In addition to the timber products of Guyana's forests, a number of non-timber resources are also exploited. These consist of products obtained from the natural flora and fauna which are used mainly for local consumption but in some cases (e.g., heart-of-palm) for export, wildlife, and economically important minerals. The scenic beauty of forest landscapes based on the nature of the forest cover, and topographic and hydrologic features of different areas, both forest and non-forest, offer possibilities for tourism development which are being actively pursued.

Hunting, fishing and wildlife capture are activities which directly exploit the fauna of the rainforest, though not confined to that ecosystem. Absence or inadequacy of regulations and/or monitoring and control mechanisms has exposed these resources to over-exploitation and other abuses. A National Development Strategy needs to address this issue from the perspectives of environmental protection, economic development, including tourism, and, to a limited extent, recreational potential.

C. Impacts of Activities Which Are Not Ecosystem-Specific

The distribution of certain natural resources is determined by geological and related processes and is therefore not delimited by ecosystem boundaries, as in the case of minerals. It may also be influenced by the nature or habits of the resource, as exemplified by wildlife, though in the latter case other restrictions such as availability of specific food items may apply.

Exploitation of these resources engenders environmental consequences which, unless scrupulously contained, can compromise the integrity or viability of ecosystems or threaten the health and welfare of human communities. While some of these effects are easily detected because of their immediate visual impacts, others are more subtle and long-term, and require careful qualitative or quantitative investigation to establish their occurrence.

1. Mining

Responsible development requires good environmental stewardship in all mining activities, from exploration and processing to decommissioning and reclamation. Environmental concerns must be integrated in the decision-making process if Guyana is to achieve optimum economic benefits from its mineral sources. This requires political will from Government, and more responsible actions from the mining community.

Guyana must exploit its mineral wealth to develop, but this exploitation must be properly regulated. Standards which are set too lax in order to encourage development through mining may create large and lasting environmental damage in return for economic development which is merely transitory and limited.

New and stricter standards for mining in Guyana and better enforcement of legislation are needed. The GGMC is in the position of both promoting the exploitation of minerals and being responsible for regulating the industry in relation to the environment. This inherent conflict in its

mandate is unsatisfactory and has led to inadequate enforcement of environmental laws, as well as a reluctance to acknowledge the damage caused by mining.

a. Bauxite

The various phases of bauxite mining operations and their potential consequences for the environment are discussed below:

(i) Stripping and Mining

Mine clearing involves removal of forest cover in the target area to allow stripping to be carried out. This represents a direct destruction of portions of the ecosystem, the major casualties being elements of fauna and flora.

Stripping involves the removal of overburden. This process creates huge craters which eventually become receptacles of stagnant water. With the subsequent removal of the bauxite ore in the mining process, these pits are considerably deepened. The sediment released in these operations is transported in run-off and causes silting up of streams and rivers, affecting the drainage system in the area, with various ecological consequences.

(ii) Processing

In drying and calcining, bauxite ore is heated to remove moisture and to effect a limited degree of chemical transformation, respectively. Environmental impacts of this procedure include fugitive dust from the kilns, accidental oil spillage and accidental release of bauxite tailings.

(iii) Shipping

Loading and off-loading operations can be accompanied by severe dust discharge, accidental spillage, and fouling of river water through the emptying of bilge water.

b. Gold

Most of the current gold mining employs mechanical methods of different scales and levels of sophistication. The largest operation, Omai Gold Mines Limited (OGML), uses a process of electrolytic recovery from a cyanide solution prepared from crushed rock and saprolite.

A widely-used process is dredge mining with the so-called missile dredge, a diverless suction dredge which operates mainly along river banks for varying depths, often penetrating considerable distances inland in accordance with the distribution of the deposits.

A land-based method of gold recovery from similar deposits achieves essentially the same results as dredge mining, by using a powerful water jet to create a slurry from which the gold particles are recovered in a manner analogous to that employed in dredge-mining.

In all of these operations, the preparatory phase involves removal of vegetation cover and topsoil to permit access to the deposits or the gold-bearing rocks. This represents both a direct loss of biodiversity and a destruction of habitats, the cumulative impacts of which could be very significant.

Removal of gold-bearing material - parent rock, saprolite or sediment - for processing is accompanied by physical disturbance and/or transformation of the landscape. In the former case, noise created by blasting and by heavy vehicles and machinery have been demonstrated, in similar operations elsewhere, to displace animal populations. Dredge and land mining lay waste to large areas, and in the process create extensive swamps which provide additional breeding areas for mosquitoes, with potential consequences for the health and well-being of human communities.

Waste material from treatment of mined material - comminuted rock or residual sand/gravel - is discarded on the land or in rivers, with largely unknown consequences for the ecosystem or environmental services. Of immense ecological significance is the fouling of streams by colloidal clay suspensions produced by Ade-sliming[≡] of deposits in preparation for final recovery of the metal. The more obvious effects of this fouling are:

- prevention of the growth of aquatic plants as a result of light exclusion, leading to the “death” of streams;
- fouling of fish gills, causing death by asphyxiation;
- smothering of eggs of aquatic animals, further depopulating streams, and
- displacement of human communities due to a loss of domestic water supply from streams, and of fish and wildlife.

Final gold recovery involves chemical treatment - amalgamation with mercury and subsequent separation by heat in the case of dredge and land mining, and ‘dissolving’ in cyanide solution followed by electrolytic separation. In both cases, chemical pollution of the environment occurs, with serious and diverse long-term consequences. In the amalgamation procedure, mercury invariably escapes into the environment, polluting soil and water, and eventually entering the food chain and accumulating in human and other animal tissues, posing a threat of crippling disease. The cyanide recovery process involves planned release of spent cyanide solution into the Omai and Essequibo Rivers, resulting in chronic pollution of these waterways. In addition, the tailings stored in special ponds on site contain high concentrations of heavy metals many of which, like mercury, are harmful to metabolic processes.

2. Wildlife Trading

The lucrateness of the trade in wildlife has led to a ‘mining’ mentality in relation to this natural resource, and attempts to regulate the activity are often fiercely resisted by exporters who enlist the aid of the exploited trappers by pleading loss of livelihood through curtailment of the trade. What is generally overlooked in this ongoing debate is the critical ecological role of wildlife in their natural environment. This includes functions such as stabilisation of natural populations, (e.g., predator-prey relations), pollination of flowers, and dispersal of fruits and other propagules.

The wildlife trade plays a significant role in the national economy, mainly through revenue earned from levy on exports and employment opportunities provided. Bank of Guyana figures on revenue earned from the trade are given below:

1992	-	G\$181m
1993	-	91m
1994	-	44m
1995	-	49m
1996	-	55m
1997	-	71m

However, this represents only part of the income from wildlife. A more transparent system of granting permits and stricter monitoring of wildlife trading are needed. In addition, the trade itself should move from merely supplying large numbers of animals at relatively low prices to a greater share in the market price.

To ensure that wildlife harvests do not exceed sustainable levels, studies need to be undertaken to determine population levels, breeding habits and seasons. Only then will there be realistic national quotas for the various species. Steps must be taken to reduce the high rates of mortality among wildlife being traded.

Guyana signed the Convention on International Trade in Endangered Species in 1977, and all trade in wildlife is supposed to conform to the Convention’s Regulations. In October 1999, all wildlife trading from Guyana was suspended by the CITES Secretariat and shortly after that, the Government of Guyana submitted draft regulations which were accepted by CITES as meeting the minimum requirements. However, CITES has recommended that further improvements be made. The regulations themselves have been criticised by the wildlife trade both on economic grounds and for imposing requirements injurious to the health of the animals being traded. It has been argued that rather than seeking to meet minimum requirements, the Government should bring into effect and enforce, new legislation which reflects the economic and scientific realities of the existing wildlife trade.

Although Guyana’s tourism strategy is supposed to be based on eco-tourism, this will be difficult if not impossible to achieve as long as Guyana continues to permit the wildlife trade. Tourism is now the fastest growing industry in the world. The short-term profit through wildlife

trade has to be balanced against the long-term economic value of wildlife through eco-tourism (apart from the ecological implications discussed above).

The Draft Forests Bill contains provisions on wildlife which are not in keeping with current policy and will lead to institutional conflict.

It is the local communities, usually indigenous peoples, who bear the brunt of the social, cultural and economic costs when wildlife disappears. There needs to be increased cooperation and consultation between the communities and government agencies, with the communities having a greater say in the decisions that affect wildlife in their areas.

As well as recognising the knowledge and expertise of the local communities, it is essential to recognise the skills and knowledge of the wildlife traders and to ensure that they, too, have opportunities to benefit from eco-tourism and the protection of wildlife.

3. Transportation

a. Transportation, development, and the environment

Transportation is a basic requirement for development since it facilitates trade and the movement of goods and people both within Guyana and between Guyana and other countries. However, any transportation system must be environmentally sustainable; if not, the short-term benefits of increased trade will be outweighed by the long-term damage to and loss of our country's natural resources, and by the negative impact on the health of our citizens. These costs must be taken into account from the beginning and throughout each stage of the design process. Otherwise, the market will not reflect the true cost of providing transportation services, and the overall expense of transportation is likely to be higher as changes have to be made at the last minute.

b. Road Transportation

Motor vehicle transportation requires the conversion of fossil fuels in the form of petroleum products. Fossil fuels are non-renewable and their use is therefore unsustainable. The use of motor vehicles also results in noise and the emission of pollutants such as carbon dioxide, carbon monoxide, oxides of nitrogen, sulphur dioxide and lead compounds. The amounts and proportions of these pollutants depend on several factors including the engine design and size, the age and state of maintenance of the vehicle, the type of fuel and the manner in which the vehicle is driven.

While the existing fleet of motor vehicles in Guyana is relatively small, it is rapidly increasing, with a correspondingly negative impact on the environment and health.

People vary in their reactions to noise, and the World Health Organisation has recognised noise as a health hazard. The prolonged or repeated exposure to noise, including noise from transportation, has been linked to stress-related health problems including raised blood pressure and minor psychiatric illness.

Motor vehicles are at their most inefficient and therefore their most polluting on short journeys. Although there are no actual studies for Guyana, it is noticeable that cars are used for more and more journeys over short distances at the expense of walking or cycling. This trend is exacerbated by the fact that Guyana's roads are increasingly dangerous. Guyana's road fatality figures per capita are roughly seventeen times those of the United Kingdom. With safer roads, more people would be able to walk and cycle on shorter journeys, with a corresponding improvement in the environment and health, and an enhanced quality of life in the city centre.

All new roads should be built with separate lanes for cyclists and animal-drawn carts away from motor vehicles. All should have pavements for pedestrians, again physically separated from motor vehicle traffic and designed in such a way that it is safe to cross the road. The approach taken in countries such as the Netherlands, where cyclists are physically separated from motor vehicles, has led to increased use of cycles, a corresponding reduction in pollution from motor vehicles, and a safer road transportation system.

In Guyana, the use of private minibuses to provide the bulk of services for passengers has resulted in increased danger on the roads and a tremendous waste in man hours as people are forced to wait for the minibus. The development of a culture of private car ownership is partly due to the lack of alternatives.

We face a future of increased congestion and pollution unless the true costs of motor vehicular traffic is passed on to road users, rather than having those costs borne by society as a whole.

The construction of roads in the interior raises additional environmental-impact questions. For example, while the Lethem Road has been widely touted as necessary for the development of the South of Guyana, it has resulted in:

- (i) an increase in the wildlife trade;
 - (ii) increased illegal trading with Brazil for wildmeat, and over-exploitation of vulnerable species such as river turtles and arapaima;
 - (iii) an increase in hunting by urban Guyanese, particularly between Lethem and Kurupukari, the resurgence of spot-light hunting of deer and tapirs at night, and increased hunting of ducks which, according to local communities, has led to a decline in the numbers of these animals;
 - (iv) easier access to the interior for miners, including illegal miners such as Brazilian *garimpeiros* using environmentally destructive methods of mining; and
 - (v) easier access for illegal chain-saw operators who inflict serious damage on the forests.
- c. Air and River Transportation

Guyana's large size relative to its population means that air and river transportation are both necessary for our development. While air transportation is environmentally destructive, its negative impacts should be dealt with so that it can develop in a way which is both economically beneficial and environmentally sustainable. The draft Civil Aviation Bill ignores the impact of air transportation on the environment.

River transportation currently accounts for the bulk of movement of goods and persons in the hinterland away from the interior airstrips.

d. Rail Transportation

The current assumption that railways are not economical is based on out-of-date surveys and a lack of knowledge of developments in technology, particularly the development of light urban railways. According to the Chartered Institute of Transport (UK), towns of 200,000 create enough demand to justify a light rapid transit system. This improves the urban environment by reducing local noise and atmospheric pollution. Tram systems are also economically more efficient per passenger-kilometre, and with only 50 percent occupancy, they use 10 percent of the energy of a car (assuming 1.3 occupants per car).

Rail is also a more efficient transporter of freight than road: properly designed with modern technology, a high speed rail network would enable Guyana to transport goods swiftly from Brazil to the Atlantic coast without the secondary environmental risks of a road link.

Guyana's transport strategy must be sustainable if there are to be lasting economic and social benefits to the citizens of this country. A transport system that is economically unstable will not serve the needs of the people of Guyana and will have environmentally damaging consequences.

Guyana has the opportunity to develop an integrated and environmentally sustainable transport network, drawing on the lessons learned in other countries without paying the price of their mistakes. The transportation system must be designed to benefit not only the car-owning elite, but also the majority who do not own a vehicle and are forced to rely on an unsafe public transportation system.

D. Forestry, Biodiversity and National Parks and Protected Areas

1. Forestry

Any activity in the forestry sector must be environmentally sustainable, or it will have a negative impact on the natural resource base of our country. Certification of timber from sustainably managed forests could give Guyana an initial competitive edge, and is likely to become a market requirement before very long as consumers, (particularly those in Europe), become more demanding.

The draft Forests Act and the draft Guyana Forestry Commission Act do not contain adequate provision for conservation of scarce forest resources nor for sustainable economic

benefit from the exploitation of Guyana=s forests and forest resources. The legislation is deficient in the areas of economic policy and environmental sustainability, and does not establish a proper foundation for the development and wise use of Guyana=s forests.

2. Biodiversity

In recognition of the significance of its biodiversity assets, Guyana signed the UN Convention on Biological Diversity during the Earth Summit of 1992. The Convention commits signatories to adopt regulations to conserve their biological resources. To date, Guyana has taken few effective steps to protect its biodiversity.

Studies on various topics related to biodiversity have been conducted in specific areas by the World Wildlife Fund (WWF), Conservation International, the Smithsonian Institution, Global 2000, and the U.K. Natural Resources Institute.

3. National Parks and Protected Areas

Seven years after signing the Convention on Biological Diversity which commits Guyana to establishing a system of protected areas, the Government has not yet met this obligation. The Government and the World Bank have been in negotiation for five years over a GEF-funded project to establish a national protected areas system (NPAS). This project offers an excellent opportunity for Guyana to protect and benefit economically from its natural resources in non-destructive ways, but has been delayed by a failure to ensure that the rights of indigenous peoples will not be violated.

a. Kaieteur National Park

Kaieteur National Park was established in 1929 by the Kaieteur National Park Act. It is widely regarded as the Ajewel in the crown≅ and boasts a spectacular waterfall and rare species of plants; it is also the only known site in the world of the Agolden frog≅ (*Colestethys beebi*).

In March 1999 the then President, upon the recommendation of her Adviser on Science, Technology and the Environment, signed an order extending the park to approximately 264 square miles. This order, which applies the Kaieteur National Park Act to the extended area, had a damaging effect on the reputation of the Government and on the concept of protected areas. However, the Government has since committed itself to amending the Kaieteur National Park Act to recognise and protect the existing rights of the indigenous people. The extension will still remain in place, allowing a greater area to be protected.

The Park is currently served by no more than two wardens who lack radio communications or effective back-up. As a result, their effectiveness is limited. Moreover, the Park is not adequately maintained and is suffering damage from vehicular traffic, inappropriate cutting of vegetation, and to a lesser extent, litter from tourists. Of serious concern is the existence of a sizeable community at Menzies Landing where various shops and houses have been erected, and where residents are causing damage to the fragile park environment. Illegal timber and mining operations are also having a detrimental impact.

Operations outside of the Park also contribute to further damage to the Park and the surrounding environment, most noticeably in the increased turbidity of the rivers from mining operations upstream.

The National Parks Commission, which is designated as the Kaieteur National Park Board under the Act, appears to be institutionally weak and unclear about its role in relation to the Park. An application by a mining company to carry out research on rocks in the Kaieteur area has been referred to the GGMC for consideration rather than being rejected as incompatible with the strict protection philosophy of the Park. There is little enforcement of the Act, and the Board needs to more vigorously discharge its responsibilities.

b. Iwokrama

In 1995 at the Commonwealth Summit, in pursuit of an initiative set in place by former President H. D. Hoyte, the then President, Cheddi Jagan, signed an agreement by which Guyana agreed to create a reserve of 360,000 hectares to carry out research into the sustainable use of forests. The reserve is operated by a Centre run by a Director-General. There is a Board of Trustees which meets annually and oversees policies and programmes. Half of Iwokrama is to be demarcated for sustainable use; the other half is to be set aside as a wilderness preserve for conserving nature and maintaining natural processes in an undisturbed state in order to have ecologically representative examples of the natural environment available for scientific study, environmental education, and the maintenance of genetic resources in a dynamic and evolutionary state.

The Centre is required to implement the Iwokrama Rainforest Programme by undertaking research, training and the development of technologies; the aim is to promote the conservation and the sustainable and equitable use of tropical rain forests in a manner that will lead to lasting ecological, economic and social benefits to the people of Guyana and contribute to the world's knowledge of critical aspects of rainforest management and development.

The Centre is still establishing itself, and the Iwokrama business plan envisages US\$16,000,000 to be spent on offices and long-term staff (and certain short-term operating costs) over a period of 5 years.

It is planning to embark on extensive bio-prospecting with initial funding of US\$1.2m from the European Union. Under the Iwokrama legislation, all discoveries belong to the Centre, although Guyana has the right to use such discoveries. The benefits to the people of Guyana from Iwokrama's bio-prospecting in Guyana's forests are not sufficiently clear. In addition, the absence of an adequate institutional and legal framework and the reliance on contractual mechanisms make it difficult to ensure that Iwokrama will itself be able to obtain full benefits from discoveries or to adequately guard Guyana's biological resources against bio-piracy.

The Centre has stated that in its sustainable human development programmes, it will draw heavily on the knowledge and expertise of Amerindians, relying on protocols to protect intellectual rights. It is required to recognise, protect and reward the intellectual knowledge of the indigenous peoples through an appropriate intellectual property rights system. Unless such a

system is first put in place, Amerindians will be unable to protect their traditional knowledge and to ensure that they obtain the full benefits of sharing their knowledge and expertise.

The Centre has also said that it will continue to encourage outside research workers. While some research must be carried out by experts from outside, the sustainable human development programme should have a greater emphasis on encouraging Guyanese nationals, rather than non-Guyanese researchers.

The Centre is required to produce an annual report and accounts but these are not readily available. The closed nature of the Iwokrama reserve, and the lack of information about the Centre's finances and operations, create an unfortunate impression. This should be addressed by requiring the Centre to meet modern standards of transparency and accountability. The Government representatives on the Board of Trustees should also require the Centre to make information more widely available. Greater access by Guyanese civil society to information about the Centre is important in ensuring that the Iwokrama project does not become an isolated enclave.

Iwokrama has made some progress in establishing eco-tourism as a potential source of income. However, the cost is prohibitive for the average Guyanese (US\$500 for two nights and three days), although less so for eco-tourists from abroad.

c. Future protected areas

A national protected areas system is unlikely to succeed unless there is commitment from all citizens and unless benefits flow to Guyanese nationals. The perception that a national protected areas system means that development cannot take place, must be corrected. It is essential for people to realise that there are different categories of protected areas ranging from strict protection reserves to parks in which some natural resource exploitation (such as mining or forestry) may be allowed.

It is now a truism that protected areas do not succeed unless they have the full cooperation, support and participation of the local people. Consequently, the indigenous people of Guyana must be full partners in any national protected areas system and their existing rights and privileges must be recognised. There should be no attempt to create new areas or extend reserves without consultation, informed consent and, where appropriate, agreed compensation for loss of rights.

The establishment of a system of protected areas is an essential step towards the sustainable management of Guyana's natural resources and the optimising of economic benefits from non-exploitative use.

E. International and National Legal Issues

Protection of the environment is a global imperative as well as a necessity for national development. This section will look first at international law, including legislation required by Guyana's existing international obligations. It will also outline a legislative reform programme

that would enable Guyana to achieve a comprehensive legal framework for conservation and environmental protection.

1. International Agreements to Which Guyana Should Accede

Guyana should accede to the following:

- X The Ramsar Convention on Wetlands of International Significance
- X The London Guideline for the exchange of information on chemicals in international trade
- X The Cartagena Convention on the marine environment in the Wider Caribbean Region
- X The Kingston Protocol on Specially Protected Areas and Wildlife (SPAW)

2. The Legislative Reform Programme

Guyana has suffered from a tendency to have legislation prepared under projects by consultants who are not familiar with the laws and legal framework of Guyana. This has resulted in the submission of legislation which is technically inadequate or inappropriate for our country.

New legislation should reflect international best practice amended to suit Guyana's existing legal framework. Legislation which creates or amends institutions with a mandate over natural resources or the environment must establish standards of transparency and accountability and support the principle of good governance. Such legislation should also be consistent with the establishment and maintenance of a rational and effective system for environmental management. The confusion of regulatory and user functions within agencies such as GFC and GGMC, and the issue of areas of concurrent jurisdiction, are all matters which must be addressed urgently.

A major obstacle to the sustainable development and the wise use of our natural resources is the lack of a comprehensive land use planning system. The Guyana Lands and Surveys Commission Act 1999 is intended to establish a new Lands and Surveys Commission which will have responsibility for land use planning. However, the Act fails to put into place any provisions which will make this possible. It does not address the fundamental issues of multiple and conflicting use, nor establish the criteria and principles to be applied in land use planning, and it fails to create any statutory framework for land use planning.

A proper land use planning system should be established under which a national land use plan is developed which identifies areas for preservation or different classes of use and removes conflicting land uses. The plan should provide for the wise use of natural resources and the

protection of areas of particular environmental importance, such as the recharge area for the coastal aquifer, and areas of high biodiversity. This could be done through zoning and should be consistent with any national protected areas system. Any such land use plan should take priority over plans at regional, sectoral or local levels.

Work remains to be done on legislation and regulations for the protection of wildlife, the designation and management of protected areas, the preparation of plans for control of municipal and industrial pollution and their enforcement (particularly in the coastal zone), and the handling of agrochemicals. Regulations are also needed to establish environmental standards and the procedures for environmental impact assessments in different sectors.

Finally, it should always be borne in mind that legislation can have an impact on the environment even when it is aimed at regulating some other sector of society.

3. The Institutional Reform Programme

(i) The key to successful development is the wise use of resources rather than the continuation of unrestrained exploitation of our natural resources. In order to achieve this, Guyana must establish a proper system for the management (including conservation and exploitation) of natural resources and the environment. The multiplicity of institutions, agencies, committees and other entities dealing with natural resources and the environment should be reduced and the system rationalised.

Duplication of functions and the overlapping of responsibilities result in the waste of scarce human and financial resources while creating confusion over who has authority for decisions. Reform of the system through more open procedures and less bureaucracy will lead to better use of our national resources for the benefit of Guyana's citizens.

a. The Environmental Protection Agency

The EPA has an extensive list of functions and responsibilities. These include:

(i) taking such steps as are necessary for the effective management of the natural environment so as to ensure conservation, protection, and sustainable use of its natural resources;

(ii) coordinating the environmental management activities of all persons, organisations and agencies, establishing and coordinating institutional linkages and playing a coordinating role in the preparation and implementation of cross-sectoral programmes with environmental content;

(iii) coordinating coastal zone management, the sustainable use of biological diversity, a national parks and protected areas system, and a wildlife protection management programme;

(iv) exercising responsibility for public participation in development and education on environmental matters;

(v) ensuring prevention and control of pollution;

- (vi) providing environmental impact assessments, permits, and licences, etc., and
- (vii) advising the Minister on general environmental policy and the impact of development on the environment.

The EPA also has certain statutory duties which are:

- (i) to produce physical accounts of Guyana=s natural capital;
- (ii) to carry out surveys and obtain baseline information on natural resources;
- (iii) to make the surveys and information available to members of the public;
- (iv) to provide general information on the state of the environment by regular annual reports, and
- (v) to maintain registers of information which are made available to the general public on such matters as the environmental impact assessments carried out, environmental authorisations granted or cancelled, and prosecutions brought.

To date, physical accounts and surveys have not been carried out. An annual report has been produced for 1998 but this does not provide general information on the state of the environment.

The EPA suffers from a lack of resources and a lack of expertise at various levels, and consequently it has not been able to carry out its mandate effectively.

The use of the sectoral agencies to enforce environmental protection reinforces the conflict in these agencies= mandates and has not resulted in a significant increase in the level of environmental protection.

b. The Environmental Assessment Board

The functions of the Board include conducting public hearings into all EIAs and EISs as well as appeals from the EPA.

The Board has recently been provided with detailed rules which should enable it to better carry out its functions, and which should also ensure consistency of approach towards all developers and investors.

c. The Environmental Tribunal

The Tribunal is a superior court of record and has power to hear appeals against the refusal, cancellation or suspension of environmental authorisations, conditions in permits or licences and enforcement or prohibition notices.

d. The Guyana Forestry Commission

The GFC is responsible for forest policy and management and control of the exploitation of forests. The existing Guyana Forestry Commission Act is to be replaced by a new Act which is still in draft. This draft requires amendment to ensure that the GFC meets modern standards of transparency and accountability and has the powers it requires to carry out its functions. Provisions allowing the GFC to accept funds from private individuals and to set up special accounts should be removed.

e. The Guyana Geology and Mines Commission

The GGMC is responsible for promoting mining and mineral exploitation. It is also responsible for monitoring compliance with mining permits and enforcing some level of environmental protection.

f. The Guyana Natural Resources Agency

The rationale for the continued existence of the GNRA is difficult to find. Its functions in relation to macro policy are best exercised by the EPA, while its sectoral policy functions should be devolved back to the sectoral agencies. Similarly, other sectoral responsibilities, (e.g., technical assistance and financial assistance) should be returned to the relevant sectoral agencies.

III. Sectoral Objectives

In the light of the problems which have been documented or otherwise identified, the National Development Strategy must be premised on the basic principle that development must not pose an undue threat to the integrity of the environment, and that while no development can take place without alteration of some aspect of the natural environment, such impacts must be restricted to the absolute minimum. In other words, in keeping with the philosophy of the EPA Act, 1996, the approach to development has to be prevention of environmental degradation, rather than the application of remedial measures of doubtful efficacy. The environmental implications and costs of development projects must at all times be factored into their overall economic analysis.

IV. The Strategy

A. General

1. Provisions of the Environmental Protection Act will be rigorously enforced by the Environmental Protection Agency.

2. Programmes and projects aimed at promoting public awareness and environmental education will be systematically pursued among broad sections of the population, especially persons involved in development activity.

B. Agriculture

1. The EPA will monitor the importation and use of agricultural chemicals. Chemicals banned in other countries will on no account be allowed into, or used within, Guyana.

1. Agricultural techniques which minimise soil erosion will be promoted.

C. Industry

The strategy for industry includes four main elements to be addressed by the EPA:

1. Setting, monitoring and enforcing standards for air emissions, effluent discharge and noise levels for industries.
2. Ensuring strict compliance with environmental management plans.
3. Conducting regular environmental audits.
4. Promoting, in collaboration with industry, the training of adequate numbers of technicians to monitor environmental parameters.

D. Fisheries

1. Conservation measures in marine fisheries will be enforced.
2. Adequate reserve zones against clearing of mangroves, farming, and sand-mining will be instituted.

E. Dry Evergreen Forests

Development policies for the wallaba forests will take into account the vulnerability of that environment in relation to the following activities:

1. Charcoal burning, leading to uncontrolled felling and consequent loss of forest cover, exposing the soil to erosion, and in the process destroying habitats and promoting loss of biodiversity.
2. Sand mining, which has similar consequences.
3. Logging for timber and timber products such as posts, staves and shingles.

F. Swamp Forest

Specific environmental problems associated with exploitation of the manicole palm which need to be addressed include :

1. Population decline resulting from over-harvesting, loss of vigour or mortality of residual shoots in harvested clumps, and reduced yield of palm heart.

2. Reduction in yield of fruits which are a source of food for fish, birds and other animals.

G. Non-Timber Forest Products

See the recommendations under “Wildlife Trading”.

H. Mining

1. The principles developed by international mining companies at the International Round Table on Mining (Berlin 1991) will be adopted in Guyana. Government and mining companies will, as a minimum:

a. recognise environmental management as a high priority, notably during the licensing process and through the development and implementation of environmental management systems. These should include early and comprehensive environmental impact assessments, pollution control and other preventive and mitigative measures, monitoring and auditing activities, and emergency response procedures;

b. establish environmental accountability in industry and government at the highest management and policy-making levels;

c. adopt best practices to minimise environmental degradation, notably in the absence of specific environmental regulations;

d. adopt environmentally sound technologies in all phases of mining activities and increase the emphasis on the transfer of appropriate technologies which mitigate environmental impacts, including those from small-scale mining operations;

e. encourage long-term mining investment by having clear environmental standards with stable and predictable environmental criteria and procedures.

2. The environmental regulatory functions of the GGMC will be transferred to the EPA.

I. Bauxite

1. There will be mandatory backfilling of excavations and re-vegetation of site (under supervision of GFC personnel) as mining operations proceed.

2. Run-off from de-watering activities in the mines will be channelled initially into settling ponds and not directly into rivers and creeks.

3. Maximum allowable dust emission levels will be established and enforced by the EPA.

4. Operating entities will be legally required to equip themselves with the necessary equipment/tools to deal effectively with accidental spillages.

J. Gold

1. Replacement of topsoil in mined-out areas will be an essential part of site restoration to permit regrowth of vegetation.
2. Methods of mining that are both feasible and least destructive to the environment will be enforced by the mining authority.
3. Regulations on the handling of waste will be established, and waste disposal practices monitored for compliance.
4. Alternatives to the use of highly toxic materials in the recovery process will be introduced. In the interim, storage, usage and eventual disposal of these materials will be carefully managed and scrupulously monitored to avoid serious damage to the environment.
5. The number of operators will be strictly controlled, and environmentally responsible mining techniques substituted for current methods.

K. Wildlife Trading

1. The existing regulations will be replaced by new legislation which reflects international best practice and establishes a comprehensive system for the management, use and conservation of wildlife and the protection of biodiversity.
2. The institutional arrangements are unclear under the new regulations. Any wildlife authority will be properly established by statute and will meet modern standards of accountability, transparency and good governance.
3. A new wildlife commission separate from the EPA will be established by statute.
4. Wildlife trading will be rigorously controlled in accordance with CITES requirements. The illegal trade in wildlife will be shut down.
5. Wildlife hunting (except for subsistence hunting by indigenous peoples) will be banned until proper inventories have been carried out.
6. Provisions in the Forests Bill which are not in keeping with current policy will be deleted, and wildlife dealt with under one comprehensive system.
7. Community-based wildlife management programmes will be established.

L. Transportation

1. For environmental sustainability, a national transportation strategy will address the following issues:

- a. establishment of a safety programme which meets objective standards, particularly in road transport;
- b. introduction of standards for cleaner fuels to eliminate lead and sulfur emissions;
- c. introduction of pricing policies that will encourage the use of cleaner fuels;
- d. integration of environmental and economic elements in project appraisal;
- e. consideration of the environmental and economic implications of all proposals on transportation;
- f. regular monitoring of the impact of transport programs and projects, especially their impact on safety, and their secondary impact on wildlife and habitats;
- g. the effects of transport projects (road and rail) on non-motorised transport;
- h. protection of forests, wetlands, and other natural habitats as well as of cultural heritage sites, against the adverse environmental impact of developments induced by roads and other transport networks, to be achieved by requiring that the correct framework for protection be in place before any project is implemented;
- i. the need to distinguish between and make provision for the different needs of rural and urban populations;
- j. development of strategies that enable urban mass rapid transit projects to be incorporated, in a cost-effective way, in the long-term development of growing areas;
- k. establishment of road-user charges that reflect externalities (road damage, air and noise pollution, congestion, and safety);
- l. avoidance of rapid motorisation and provision for pedestrian and non-vehicular traffic;
- m. reduction of congestion in Georgetown by restricting the use of cars and parking;
- n. ensuring that urban public transport fares, services and finance policies create and maintain a balanced, sustainable urban transport system, which avoids a shift to private cars;
- o. enabling greater use of non-motorized transport by improving rights-of-way;

p. emphasising access (for example, by ensuring that bridges and culverts are durable and do not collapse or wash out) rather than high standards of performance (for example, by paving surfaces to increase speed) in rural transport networks;

q. ensuring community participation in decision-making on local transport investment and maintenance;

r. development of efficient subsidy schemes for Asocial service≅ public transport.

2. In relation to road transportation,

a. Emission standards will be set for all vehicles as a matter of urgency. Vehicles which meet emission standards tend to be more expensive. The Government will encourage the purchase of vehicles which are more efficient by reducing the taxes on the importation of such vehicles. The Government will set the example by phasing out its current fleet of vehicles and replacing it with vehicles which meet the required standard. Vehicles which are imported into Guyana by international agencies will also be required to meet the standards set in the agencies= home countries as well as the emission standards of this country. The current practice of importing reconditioned vehicles into Guyana will be stopped.

b. Standards will be set for the maximum levels of noise. In addition, all new road building will be done in such a way that there is an increased gap between houses and the road in order to reduce the amount of noise in the home, and trees will be planted along the roads as natural sound barriers to further deaden the noise. Grass verges along the roadside provide additional space for small wildlife and improve the appearance of the area.

c. The following actions will also be taken:

X enforcement of the speed limit;

X creation of separate lanes for cyclists on existing main roads;

X addition of pavements for pedestrians;

X exclusion of motor vehicle traffic from the centre of Georgetown, except for specific times for commercial deliveries. (Some cities in Europe have gone further and banned all motor vehicle traffic within the city limits).

d. The development of a viable public transportation will also be a priority.

e. Any future road building programme will be subject to a proper environmental impact assessment which takes into account all negative environmental impacts.

f. Road charges, tolls, parking fees, increased vehicle licence fees and weight charges for heavy duty lorries will be brought in, with the revenue allocated to the provision of

alternative transportation - public transportation (bus and rail), and proper paths for cycling and walking, thereby enabling citizens to make a free choice.

3. In relation to air and river transportation,
 - a. The draft Civil Aviation Bill will be re-drafted to establish principles for protection of the environment, including the reduction of noise and the preservation of biodiversity, with the detailed levels being set in regulations.
 - b. Increased use of river transportation for bulk cargo, e.g., lumber and fuel, will be seriously encouraged, to help to reduce the negative social and environmental impacts of motorised road transport.
4. In relation to rail transportation, a feasibility study on the re-introduction of railways will be undertaken.
5. The elements of a sustainable transport strategy will include:
 - a. the integration of the transportation system with a land use policy.
 - b. priority to increasing the proportion of journeys made by less damaging modes of travel.
 - c. adopting, by the year 2005, air quality and emission standards to protect human health and the environment.
 - d. designing transport systems in such a way as to minimise the negative impacts on the environment.
 - e. using fiscal incentives to encourage the use of more environmentally-friendly means of transportation.
 - f. phasing out the importation of reconditioned cars by 2005.
 - g. considering the introduction of a light railway system for moving people.
 - h. assessment of the impacts of transportation through a strategic environmental assessment, looking at macro-scale development alternatives and the benefits and costs of sector-wide action.
 - i. preparation of regulations for project EIAs to enable impacts on land, water, air, habitats and wildlife to be accurately assessed and mitigated (or removed altogether) by proper planning and implementation.

M. Forestry, Biodiversity, and National Parks and Protected Areas

1. The draft forest legislation will be abandoned and new legislation produced which establishes a comprehensive framework for the development of the forestry sector on the basis of environmental sustainability and economic benefit.

2. In relation to the conservation of Guyana's biological resources, the following actions are urgently needed:

- a. the establishment of a national protected areas system.
- b. adequate legislation to give effect to CITES.
- c. a complete revision and rationalisation of the laws relating to wildlife and biodiversity.
- d. a ban on bioprospecting until such time as Guyana has in place adequate legislation and effective systems for monitoring compliance.
- e. arrangements for ready availability of copies of all studies, reports and surveys carried out by institutions such as Smithsonian and Tropenbos.
- f. an independent and annual audit of the activities of all organisations and institutions which are carrying out research into Guyana's biodiversity;
- g. enforcement of the requirement that all researchers coming to Guyana must train a local counterpart.

3. The recommendation made in a number of studies for an established system of national parks by which the extensive biodiversity resources can be nurtured and protected, will be taken on board.

N. Natural Parks and Protected Areas

1. The community at Menzies Landing will be closed down and the area rehabilitated and restored.

2. All timber and mining operations within the park area will be closed down.

3. Mining operations outside the park area will be carried out in such a way as to prevent damage to the park environment or, where this is not possible, closed down.

4. The amendment to the Kaieteur National Park Act to recognise and protect the existing rights of Amerindians will be brought into effect without further delay.

5. The clearance of wide trails will be stopped and access in the park restricted to footpaths.

6. No bio-prospecting will be permitted at Iwokrama until and unless there is in place an adequate legal and institutional framework developed in consultation with stakeholders.

7. Amerindian intellectual property will be recognised and protected by law. The sharing of traditional knowledge should take place only on the basis of informed consent and a fair share of the benefits for the communities.

8. Iwokrama will be asked to develop and implement a programme to recruit and train Guyanese nationals for all research projects and all positions within Iwokrama.

9. Iwokrama will also be asked to remove differentials in fees between Guyanese.

10. As a matter of urgency, a small independent and national body will be established by civil society to carry out a regular audit of the Centre responsible for Iwokrama. This body will have access to all pertinent information about the Centre's activities including research, funding, training and personnel policies and will meet as appropriate with the Centre's managers. Their findings will be publicly reported. There also needs to be a greater demonstration from Iwokrama of its commitment to providing benefits to the people of Guyana.

11. Iwokrama will be expected to hold a general meeting twice yearly at which members of the public are able to question the Centre's directors and managers about the Programme.

12. Detailed annual reports of Iwokrama's activities and of its accounts will be available to the general public. The annual report will set out the extent to which Centre has met its obligations to provide benefits to the people of Guyana.

13. Iwokrama will also be expected to reduce its fees for Guyanese nationals and actively encourage Guyanese nationals to visit the reserve. As part of such a programme, it should target students and young persons and reduce their fees substantially.

14. The establishment of a National Protected Areas System will begin in the year 2000.

O. International and National Legal Issues

1. Guyana will accede to the Conventions, Guidelines and Protocol listed in Section II, E under the discussion of international legal issues.

2. There will be greater public consultation on draft legislation.

3. All draft legislation will be scrutinised by the Attorney-General's Chambers for its impact on the environment and provisions will be included as appropriate for protection of the

environment.

4. The Guyana Lands and Surveys Commission Act will be thoroughly amended to establish a proper national land use planning system.

5. The Land Use Planning Unit which is currently in existence will be disbanded and its resources transferred to the new Commission.

6. The following existing bills will be reviewed and amended to achieve consistency with the national commitment to environmentally-sound development.

a. The Guyana Biosphere Reserves Bill, authorising the establishment and management of biosphere reserves in Guyana.

b. The Conservation and Wildlife Bill, providing for the establishment of wildlife sanctuaries and the protection of listed wild animals and birds.

c. The Forestry Bill and the Guyana Forestry Commission Bill.

d. The Drainage and Irrigation Bill.

e. The Civil Aviation Bill.

7. In addition to the Bills listed in 6 above, a thorough review will be carried out of existing legislation relating to natural resources and the environment with a view to harmonisation and rationalisation in keeping with national priorities. This should result in a comprehensive legal framework for the management of the environment and natural resources. The following are areas in which legislative changes are necessary:

a. Consolidation and revision of existing legislation in the various sectors, incorporating new environmental protection provisions.

b. Preparation of consequential amendments to related legislation.

P. The Institutional Reform Programme

The EPA will be institutionally strengthened by the provision of additional funds, training and expert direction.

1. The environmental regulatory functions of the sectoral agencies will be transferred to the EPA.

2. The EPA will regularly monitor operations which affect the environment and prosecute for breaches of the Environmental Protection Act.

3. The environmental protection functions of the GFC will be transferred to the EPA.
4. The forest policy functions of the GNRA will be transferred to the GFC.
5. The environmental protection functions of the GGMC will be transferred to the EPA.
6. The mining policy functions of the GNRA will be transferred to the GGMC.
7. The GNRA will be dissolved and its functions and resources transferred to the other agencies.

LONGER-TERM STRATEGY

While the rationalisation of legislation and institutions should be done without delay, a further shift in thinking is needed if our natural resources and environment are to be used wisely for development to benefit the nation as a whole.

There needs to be greater consultation, more transparent decision-making and greater accountability by Government. Decisions by technical agencies should not only be made on scientific and technical grounds but must be transparent so that they can be seen to be free of political interference.

In the long-term, the EPA should be removed from the influence of the Office of the President which should retain an adviser on Science, Technology and the Environment.

A new Ministry should be created which would include the EPA, the new Guyana Lands and Surveys Commission, the Board responsible for the Kaieteur National Park, and any other agency or unit which is responsible for environmental protection. Agencies which are involved in promoting exploitation (e.g. tourism, agriculture, mining, forestry) would remain with their subject Ministries but would have their environmental protection functions transferred to the EPA. The new Ministry should be open, transparent and accountable.

Access to information about the environment is crucial if market mechanisms are to work in allocating resources for development and if citizens are to enforce their rights.

A greater commitment and more action from Government to protect the environment and a better understanding of the use of natural resources for development also need to be demonstrated. International agencies involved in projects with an impact on the environment must also be held to account by the Government on behalf of the people of Guyana. The design, management, monitoring and evaluation of projects must be done openly and information made readily

available to the people of Guyana, who are the intended beneficiaries.

The conflict between protection of the environment and the use of natural resources for development is an ongoing and at times, a difficult one. By putting in place adequate processes, by holding Government accountable, and by ensuring that citizens have access to information, we may be able to improve the quality of our decisions. It is our responsibility not to foreclose the options of the next generation.