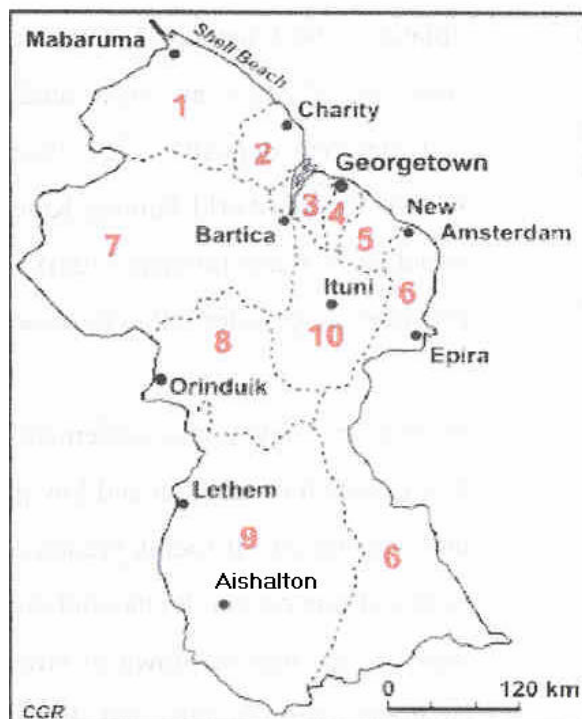


CHAPTER THREE

NATIONAL CIRCUMSTANCES 1994



Administrative Regions

3.1 GEOGRAPHY

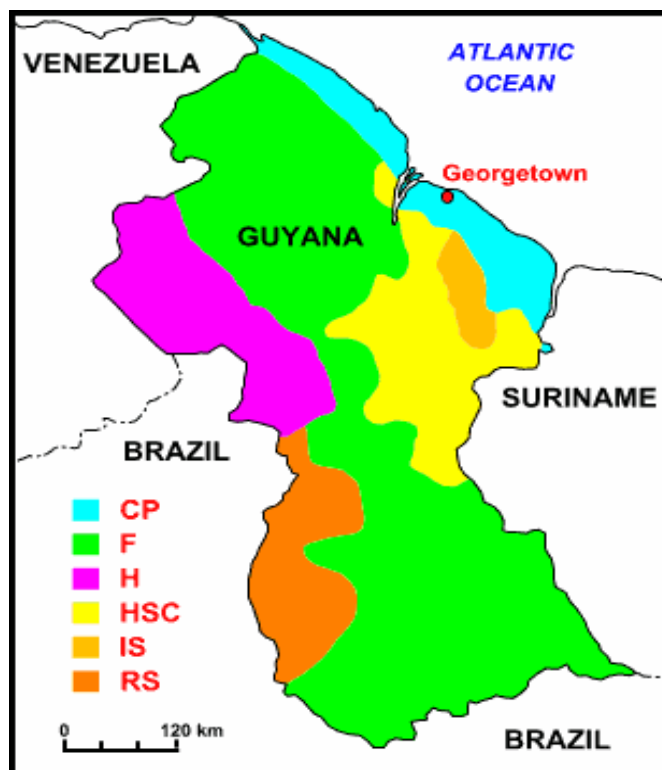
3.1.1 General

Guyana is a tropical country, situated on the northeastern coast of the continent of South America between 1 degree and 9 degrees north latitudes, and 56 degrees and 62 degrees west longitudes. It is bounded on the north by the Atlantic Ocean, on the east by Suriname, on the south and southwest by Brazil and on the west by Venezuela. It occupies a total landmass of approximately 216,000 km² and has a coastline that is about 434 km long and a continental extent of about 724 km. About 35 percent of the country - the area approximately below 4 degrees north latitude - lies within the Amazon Basin. There are three main rivers - the Essequibo, Demerara and Berbice - which all drain into the Atlantic Ocean. Noteworthy, is that the three counties - Essequibo, Demerara and Berbice derive their names from them.

Guyana has close relations with the Caribbean countries because of its similarities due to its past British Colonial influence and is a member of the Caribbean Community (CARICOM), which is headquartered in Georgetown, the Capital City.

Guyana has five (5) natural geographic regions:

- The Coastal Plain (CP)
- The Hilly Sand and Clay Region (HSC)
- The Highland Region (H)
- The Forested Region (F)
- The Savannah Regions (IS & RS)



Geographical Regions

3.1.1.1 The Coastal Plain (CP):

The Coastal Plain lies on the northern edge of the country. The width of this region varies from 77 km in the east to a mere 26 km in the western Essequibo region. Topographically this region is virtually flat and, comprising heavy (Holocene - Pliocene age) fluvio-marine clays, is prone to flooding during the rainy season. A series of sand ridges (0.5m to 2.5m high and between 10m to 600m wide) running almost parallel to the existing coastline are the main relief variation, often impeding drainage to create pegasse swamps and, in the case of western Essequibo coast, lakes. Sand ridges (or possible geologic fault) may also be responsible for the orientation of the many rivers which dissect the coast. A cyclical process of erosion and accretion, related to the Equatorial and Guiana currents off-shore and to local longshore drift, has led to the build-up of submarine bars across the mouths of the rivers requiring

periodical dredging to clear siltation.

A complex system of drainage and irrigation canals allow the fertile clays to be utilised for sugarcane and rice cultivation; cattle ranching; and coconut, vegetable and fruit production which all add to the hub of economic activities supporting the 90 percent of the total population that inhabit this region. The main urban centres are found within the Coastal Plain and most commercial activities are concentrated there.

3.1.1.2 The Hilly Sand and Clay Region (HSC):

Occupying the northeastern section of Guyana, this undulating upland varies in height from 2 m to 400 m. This geosynclinal trough of sediment is thickest (2000m) in the Berbice Region, increasing towards the Corentyne River and continues into Suriname. Of Pliocene-Pleistocene age, the unconsolidated material comprises 85 percent white quartz sand with pockets of brown and yellow sand. The high porosity enhances infiltration and leaching of the thin layer of dark humus of the topsoil, giving stream water a reddish tint.

Despite low drainage density relative to other regions, four relatively small rivers originate in the HSC: Abary, Mahaicony, Mahaica and Canje. In some areas, the crystalline basement rock outcrops to create hills, as well as falls and rapids across rivers.

Dry evergreen climax vegetation includes species such as dakama (*Dimorphandra conjugata*) and wallaba (*Epeura falcata*), widely used in Guyana and the Caribbean as electricity and fencing poles. A Savannah belt, 95 km from the coast towards Orealla, is mainly used for cattle ranching and citrus. Economically, the HSC is home to bauxite deposits that have been mined for most of this century. Major mining centers: Linden, Kwakwani and Ituni have high population density in comparison with agricultural settlements.

3.1.1.3 The Highland Region (H)

The Pakaraima Mountains form a part of the extensive Guiana Highlands that covers an area of 1,300,000 km² in Guyana, Venezuela and Brazil. It comprises a series of horizontal beds of quartzitic sandstone, conglomerate and intrusive rocks of almost Pre-Cambrian age. Varying in height from 500 m to 2777 m at Mt. Roraima, this formation comprises a series of plateaux and tablelands with sharp edges and precipitous escarpments. The plateaux are dissected by many streams and gullies thereby creating deep gorges and waterfalls.

Large tributaries of the Essequibo rise in this upland namely the Cuyuni, Mazaruni and Potaro Rivers which have gold and diamond deposits. The Potaro is well known for the world-famous Kaieteur Falls, which at 225 m is the highest sheer-drop waterfall in the world.

There are small settlements in this region of thin soil and low-grade montane vegetation. Communities are small and may be temporary mining sites or indigenous in nature. Government centres provide basic services such as health and education.

3.1.1.4 The Forested Region (F)

This large physiographic region almost spans the entire length of the country with elevation increasing southwards from 90 m to about 210 m culminating in the Akarai Mountains. Its geomorphology is closely associated with differential weathering of rocks, vulcanicity and structural patterns. Geologically the region forms part of the Pre-Cambrian Brazilian Shield with varied rock types including granite, gneiss, amphibolite, shale and quartzite. Latosols and numerous laterite-capped hills and ridges, typical of equatorial areas, are common. This is also the tropical rainforest region of Guyana, a continuation of the Amazon Forest. Among the vast untapped forest resources, wood species include the highly commercially valuable greenheart (*Chlorocardium rodiaei*), crabwood (*Carapa guianensis*) and purpleheart (*Peltogyne venosa*). Selective logging is done in a sustainable manner in the forest. This region is also rich in minerals and gold deposits. Mining of gold also occurs in this region.

3.1.1.5 The Rupununi Savannah (RS) and Intermediate Savannah (IS)

The Savannahs consist of the Intermediate Savannah and the hinterland or Rupununi Savannah. The Intermediate Savannah (IS), in the eastern part of the country, lies between the Coastal Plain and the Hilly Sand and Clay region. The larger interior or Rupununi Savannah (RS) is located in the southwest and is divided into the North and South Savannahs by the Kanuku mountains. The North Savannah is more hilly than the South Savannah and grasslands characterize both areas. Cattle ranching and farming are two of the main activities in the Interior Savannah.

3.1.2 The Geology of Guyana

The geology of Guyana gives insight into the lack of present day tectonic activity in Guyana and indicates that Guyana is not affected whatsoever from the Caribbean, North, Central and South American plates, and the Atlantic and Pacific Oceanic plates.

British Guiana is a country of humid tropical climate situated on the northern coast of South America and forms part of the ancient Guyana Shield (Bleakley 1964). It lies between 2-9° N Latitude and 56-62° W Longitude. The Guiana Shield is composed of Pre-Cambrian gneisses, schists, meta-sediments, and meta-volcanics and associated granites.

The Pakaraima Mountains, in the hinterland region was formed by early volcanic activity, is composed of a tabular sandstone formation and intruded by thick sills of dolerite. Sills and dykes of dolerite are also found throughout the Pre-Cambrian basement rocks while a fringe of tertiary and recent sediments extend along the Atlantic Coast.

3.1.2.1 Plate Tectonics

The theory of Plate Tectonics is principally a description of the geometry and kinematics by which the earth's lithosphere experiences displacements.

3.1.2.2 Evidence of Present Tectonic Activity

The present tectonic activity of the Caribbean region is evidenced by large variations in topographic elevations from deep sea trenches to high mountains, by linear chains of volcanoes, by a high degree of seismicity, by large negative and positive free-air gravity anomalies, and by high heat flow in some localised areas" (Bowin 1976).

The active zones of the Caribbean region indicate that there are at least three zones of underthrusting at present. . Chase and Bunce, 1969, Bunce and others, 1970, Bowin, 1973 have all documented this zone of underthrusting.

If the Caribbean and South American Plates converge at a rate of 2 cm/yr, the South and North American plates might converge along the northwest to the Gulf of Mexico area at a rate of about 0.35 cm/yr without affecting the Guiana shield and the coastline in particular.

3.1.2.3 Coastal Subsidence

There is a hypothesis that the coastal area of Guyana may be subsiding. This hypothesis is based on the fact that ground water on the coast is being withdrawn at a faster rate than the aquifer can be recharged, resulting in a loss of head in some areas (over 14 m in Georgetown) due to the high density of wells. Hence the resulting postulate. Therefore, sea level rise would be accentuated as a result of subsidence occurring on the coastal area. There has been no scientific study into the recharge of coastal aquifers and the hypothesis needs to be investigated.

3.2 CLIMATE

3.2.1 General

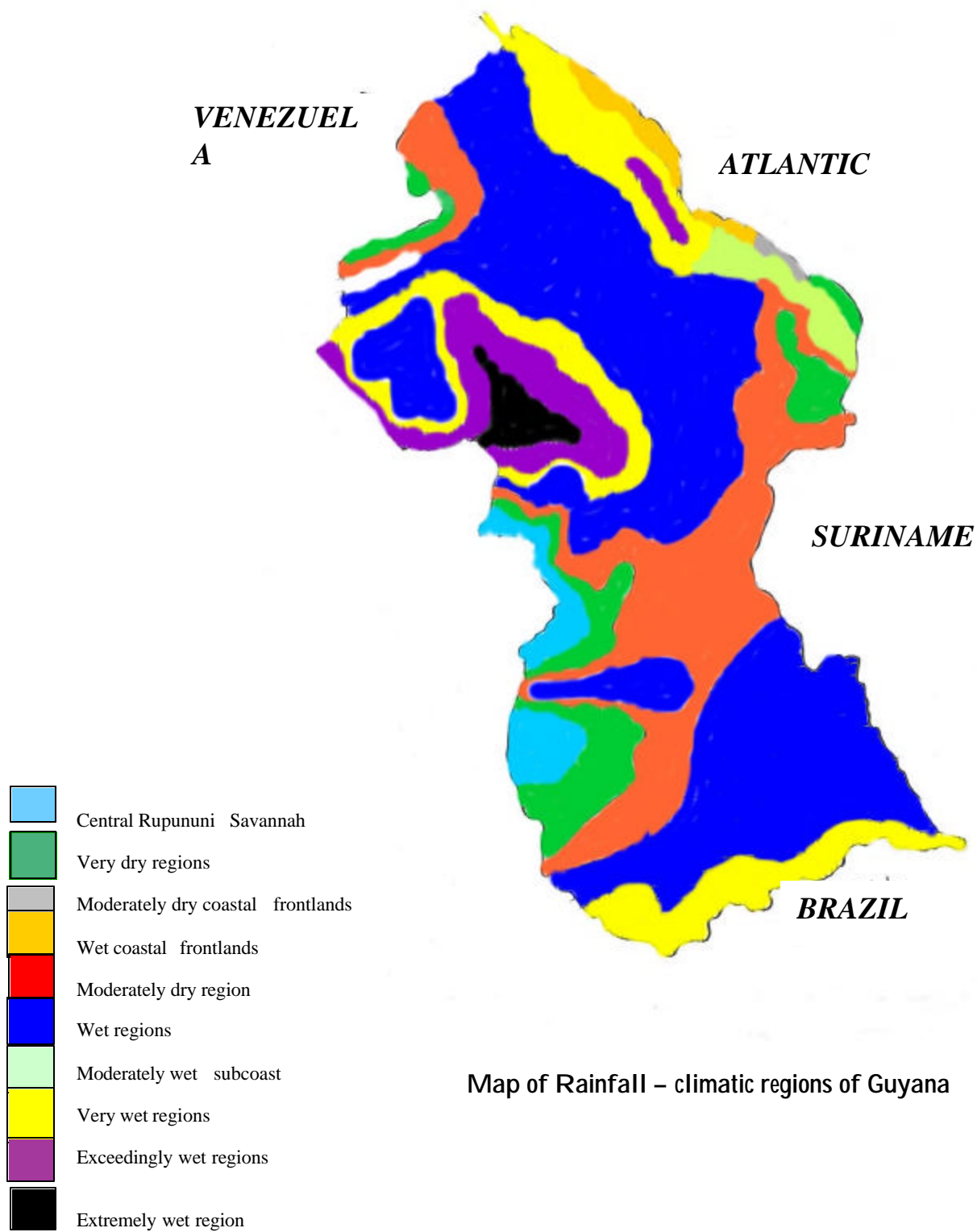
Guyana lies within the equatorial trough zone and the climate is influenced primarily by the seasonal shifts of the Inter-Tropical Convergence Zone (ITCZ). The seasons and climate are determined mainly by the variation in rainfall patterns. This is so because the spatial and temporal variations of other meteorological parameters are relatively small.

3.2.2 Different Seasons of the Year

Seasons in Guyana are identified by rainfall amounts resulting from the north/south movement of the Inter-Tropical Convergence Zone (ITCZ). There are two wet and two dry seasons in a calendar year:

SEASON	PERIOD
1. First dry season (FDS)	Late January to early April
2. First wet season (FWS)	Late April to early July
3. Second dry season (SDS)	Late July to early November
4. Second wet season (SWS)	Late November to early January

The duration of the seasons can be contracted or extended depending on the regional climate systems which are prevailing at the time. The intensity of rainfall in a season can decrease or increase as a consequence of the intensity of the ITCZ or other weather system influencing Guyana at the time.



3.2.3 Rainfall

On the macro-scale Guyana can be described as having a Wet Tropical Climate. However, due to geographical influences such as mountains, ocean, etc. there is spatial variability of rainfall resulting in three major climate types on the meso-scale. These, based on our local classification are as follows:

- **Very Dry** – Areas with annual rainfall less than or equal to 1788 mm. Such areas are the Rupununi Savannah, the Intermediate Savannah, the Upper Cuyuni and the East Berbice Coast. The Secondary Wet Season is absent in the Rupununi Savannah and often absent in the Intermediate Savannah.
- **Wet-Dry** – These are areas with rainfall between 1778 mm and 2800 mm. This climate type is the most widely experienced one in the country and can be further subdivided into *Moderately Dry*, *Moderately Wet* and *Wet*.
- **Very Wet** – areas with annual rainfall above 2800 mm. This climate type can be subdivided into *Exclusively Wet*, *Exceedingly Wet* and *Extremely Wet*.

3.2.4 Duration of Sunshine

As a result of Guyana's proximity to the equator there is little variation in the hours of daylight. It varies from a minimum of 11.6 hours per day in December to a maximum of 12.5 hours per day in June. Bright sunshine is inversely proportional to rainfall. It therefore varies from an annual average of 4.5 hours per day in the Pakaraima Mountains to 7.0 hours per day on the coast. During the Wet Seasons, it can average as low as 3.0 hours and 6.0 hours per day respectively at these locations.

3.2.5 Temperature, Relative Humidity and Wind

Diurnal variation of temperature is smallest on the coast where the maritime effect is most pronounced. In that area daily maximum temperatures average 29.6 °C while daily minimum temperatures average 24.0 °C. However, the lowest temperatures occur in the mountainous regions. At Kamarang, daily maximum average 28.6 °C and daily minimum 19.6 °C. At the peak of Mount Roraima daily minimum temperatures are expected to average about 5.0 °C.

Seasonally, temperatures are higher in the dry periods with the highest temperatures occurring in September/October and the lowest in January/February. The October average daily maximum temperature ranges from 34 °C in the Savannahs to 30 °C at Kamarang and less in the higher regions. The January average daily maximum temperature ranges from 32 °C in the Savannahs to 27 °C at Kamarang while the daily minimum ranges from 23 °C in Georgetown to 19 °C at Kamarang. Relative humidity is high averaging about 70 percent in the Savannahs, 80 percent on the coast and 88 percent in the rainforest. Morning fog can be widespread and persistent in the hinterland districts.

Guyana's coast is subject to the northeasterly trade winds with speeds of about 6 meters per second decreasing further inland where light winds generally prevail. However, in the Rupununi Savannahs the wind speeds approach that on the coast.

3.3 CLIMATE AND WEATHER SYSTEMS

There are many tropical and extra-tropical weather systems which influence Guyana's weather. The major ones are:

- **Inter Tropical Convergence Zone (ITCZ):** This convergence area is brought about by the confluence of the Northeast and Southeast Trade Winds. When the convergence is strong, copious rainfall is experienced but when it is weak rainfall may even be absent.

- **Tropical Waves:** During the hurricane season, these precursors of the hurricane can affect Guyana's coastal and inland areas particularly west of the Demerara River. It is the system which is responsible for larger rainfall amounts in the northwestern parts of the coast and is often the cause of the extension of the First Wet Season into the Second Dry Season.
- **Upper Level Troughs:** Especially during the Northern Hemisphere winter season, extra-tropical troughs in the upper Westerlies can push southward and create divergence zones which produce moderate to heavy rainfall especially when they interact with the ITCZ.
- **Southern Hemisphere Upper Troughs:** During the Southern Hemisphere winter, these troughs in the Westerlies produce cloud blow-ups in Amazonia and copious rainfall in Guyana's rain forest, inland areas and coast.
- **ENSO Events:** These are equatorial Pacific climate events that have dramatic effects on Guyana's seasons. When the Pacific is in the El Niño mode, as in 1997 - 1998, drought conditions can affect Guyana. When it is in the La Niña mode, as in 1996, flood conditions can affect Guyana. ENSO (El Niño/Southern Oscillation) events significantly change the intensity and duration of the traditional seasons and, in recent years the El Niño/La Niña modes have been alternating much more frequently.

3.4 HISTORY AND DEMOGRAPHY

3.4.1 History

“Guiana” was the name given to the land sighted by Columbus in 1498, and comprised modern Guyana, Suriname, French Guiana and parts of Brazil and Venezuela. It was not until a century later that the first Europeans settled in this area. Sir Walter Raleigh visited in 1595, after which several unsuccessful attempts to establish permanent settlements followed. The Dutch finally succeeded in the late 16th century with a settlement at Kyk-over-all on an island in the Essequibo River, when the Amerindians welcomed them as trading partners. Subsequently, colonies were set up in Berbice and Demerara too.

The establishment of these colonies led to the exploitation of the Amerindians and subsequently the African slaves that followed. During the 18th and 19th centuries, the three colonies changed hands several times. The British seized them from the Dutch but then lost them to the French who restored the colonies to the Dutch in 1783. The Dutch control ended when the British became the rulers in 1796. In 1815, the colonies of Essequibo, Berbice and Demerara were officially ceded to Great Britain at the Congress of Vienna and, in 1831, were consolidated as British Guiana.

Following the abolition of slavery in 1834, indentured labourers were brought to Guyana to work on the sugar plantations. They came primarily from India but also from Portugal, China and the Caribbean, this practice was discontinued by the British in 1917.

Many of the freed slaves settled in coastal villages and later moved to the towns as they developed. They became the majority of the urban population. The indentured labourers remained predominantly rural. The Amerindian population continued to live in the communal settlements in the hinterland.

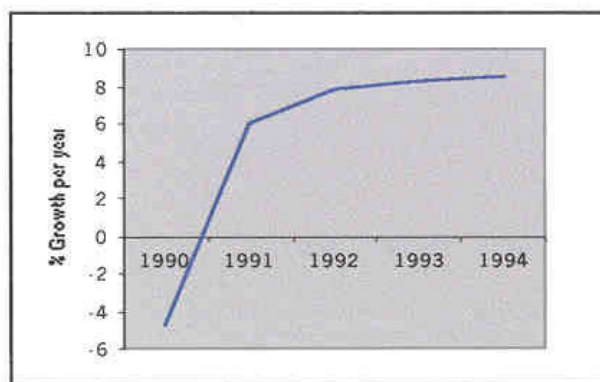
Guyana attained independence from Britain on May 26, 1966, and became a Republic within the Commonwealth four years later on February 23, 1970.

3.4.2 Demography

Guyana's population is approximately 750,000 and comprises six main ethnic groups:- East Indian, Africans, Amerindians, Chinese, Portuguese and Europeans. There are also a significant percentage of peoples of mixed race. East Indians and Africans comprise the majority of the population and originated from India and

Africa respectively. Compared to its present land area (214,970 km²) the population of Guyana is relatively small – a population density which is less than four persons per km² of land area.

At the end of 1994, the population was estimated at 763,687 of which 376,269 were males and 387,418 females. Urban population represents about 33 percent of the total population. Life expectancy at birth for the year 1995 was 64 years, with males reaching 60 years and female 67 years. The death rate continues to decrease due to improved health care facilities and public awareness of health issues. It was 7.1 per thousand in 1994.



3.5 THE ECONOMY

With a Gross Domestic Product (GDP) per capita of US \$528 in 1990, Guyana was the second poorest country in the Western Hemisphere, after Haiti. Guyana's economy was responsive to structural adjustment measures, with real GDP growing by 8.5 percent in 1994. Since 1991, this positive growth rate reflected the effects of price liberalization, a market-determined exchange rate and the positive results of private sector investment in the gold, timber

GDP growth rate

and rice industries. The consumer price level rose by 16.1 percent during 1994 after rising by 7.7 percent in 1993.

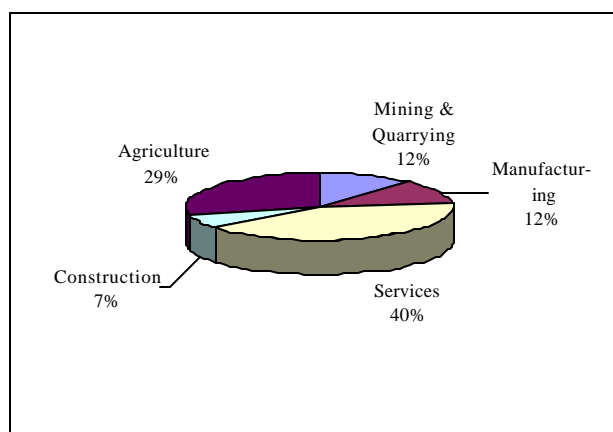
The overall deficit of balance of payments rose to US M\$63.9 in 1994 from US M\$49.7 in 1993.

Guyana remained committed to a market-determined exchange rate. During the year 1994, the exchange rate depreciated by 9 percent to reach G\$142.50 per US dollar in December 1994. All five sectors of Guyana's economy have special relevance to climate change issues. These are the agriculture, forestry and fishing sectors which made up 29.2 percent of the GDP in 1994, the manufacturing sector 12 percent, the services sector 39.6 percent, the mining and quarrying sector 12 percent and the construction sector 7 percent.

3.5.1 Agriculture, Forestry and Fishing Sector

The agriculture sector is the single most important sector of Guyana's economy, both in terms of foreign exchange generation and the number of persons employed. In 1994, this sector increased by 12 percent, compared with 6 percent recorded during 1993. This improvement reflected the recovery of sugar output and the expansion of rice, timber and other crop production.

The sugar industry is expected to continue to



Sector Contribution to GDP

be one of the important engines of growth in the future especially since it gained access to non-traditional regional markets in addition to traditional markets. Output of sugar for 1994 was 256,669 tonnes, 4 percent above the 246,528 tonnes recorded for 1993. This additional production reflected the impact of a stable political climate and good weather conditions experienced in the year.

Despite the constraints in irrigation, drainage and the poor state of access roads, rice output for 1994 was 233,435 tonnes, which was 11 percent higher than in 1993. The liberalization of the rice market, and the continuous rise in the price of paddy resulting from a strong external demand for rice affected the strong supply response in the year.

After declining for several years, livestock output recorded a positive growth for 1994. The growth for this sector rose by 15 percent compared with 11 percent for 1993. The principal contributors to this performance were poultry and eggs, increasing by 53 to 112 percent respectively.

The output of the forestry sector continued to be influenced by the new governmental policies, which facilitated significant foreign investment. These investments, the ability to pay higher wages, training and the exploitation of new markets induced higher production. Output of timber increased to 469,557 cubic meters or 98 percent over that of 1993.

Value added in the fishing industry increased by 7 percent during 1994. Gross output of fish, small shrimp and prawns increased in 1994.

3.5.2 Manufacturing and Service Sector

Growth in output in the manufacturing sector during 1994 was 6 percent compared with 3 percent during 1993. This resulted primarily from the 11 percent expansion of rice sector. There were also encouraging trends in other manufacturing activities, primarily consumer non-durables and sugar processing, which grew by 6 and 4 percent respectively during 1994. The growth in non-durables was explained by significant increases in pharmaceuticals, garments, soft drinks, alcoholic beverages, margarine and edible oil production. The production of consumer durable and semi-durable goods, including that of stoves, refrigerators and textiles declined during 1994.

During 1994, the services sector grew by 6 percent compared with 3 percent in 1993. The performance of distribution and transportation paralleled the increased activity observed in physical production. During this year, there was stronger growth in the financial services industry reflecting the establishment of two new banks.

3.5.3 Mining & Quarrying

The output of this sector continued to be encouraging mainly on account of the good performance of the gold industry. Value added increased by 7 percent in 1994.

Gold declaration for 1994 was 375,618 ounces, 65,846 ounces more in comparison to 1993. The increase in declaration arose primarily from OMAI's output of 276,464 ounces compared with 222,676 ounces during 1993. The declared output of diamond declined by 12,141 metric carats or 28 percent compared with 1993 level to reach 36,792 carats. This may have been the result of a decline in quality and size of diamonds found and the consequent lower returns to diamond mining relative to gold mining.

3.5.4 Construction

Available data on application for new residential housing, developments in road building, trends in cement imports and production of stone all support the 20 percent expansion in the construction sector during 1994.

3.5.6 Tourism

Guyana possesses a vast interior area, that is pristine, and untouched forests that are so diverse they can

show the entire spectrum of tropical rainforest at its best. The potential for a thriving Eco-tourism industry is promising but several key constraints to the sector's development must first be addressed. In 1994, one hundred and thirteen thousand visitors arrived in Guyana. New efforts are now directed towards attracting more visitors to the country.

Guyana will continue to promote its 276 waterfalls including the Kaieteur Falls, with a sheer-drop height of 225 meters. This fall is located in thick jungle in the hinterland but is easily reached by small aircraft, which are chartered by travel agencies.

The Orinduik Falls is a cataract of ten, visited by vacationers. The Ireng River, which forms the border between Guyana and Brazil, thunders over steps and terraces of solid jasper. In the distance is the Pakarima Mountain.



The Kaieteur Falls

In the Savannah plains of the Rupununi, riding, hunting, fishing and swimming are available. There are several tourist lodges in the hinterland and on the banks of Guyana's main rivers.

3.6 ENERGY

The energy sector is receiving extensive focus from the government because energy is seen as an important driving force for growth and development. Consequently, there was a preparation of a National Energy Policy in 1994. The objectives of this policy are to provide stable, reliable and economic supply of energy; to reduce dependency on imported fuels; to promote, where possible, the increased utilization of domestic resources; to ensure that energy is used in an environmentally sound and sustainable manner. The

National Energy Policy is supplemented by a National Development Strategy Chapter on Energy. In Guyana the

primary sources of energy are petroleum products, bagasse and fuelwood. Currently all petroleum products are being imported. Fuel and lubricant imports accounted for 16 percent of the total imports of 1994.

3.6.1 Imported Petroleum

Imported petroleum, taken together, form the major source of energy in Guyana. Seven products were imported in 1994. These were leaded gasoline, unleaded gasoline, dual-purpose kerosene, diesel/gasoil, No.6 fuel oil (Bunker 'C'), Liquefied Petroleum Gas (LPG) and aviation fuel.

3.6.2 Bagasse and Fuelwood

The other main sources of energy in Guyana are bagasse, a by-product of sugar production, and fuelwood. Bagasse is used for the co-generation of steam and electricity in the sugar industry. Fuelwood becomes available from direct forest harvesting, timber industry waste, 'slash and burn' operations associated with land clearing for agriculture, and from self gathering. Some types of woods are transformed into charcoal.

3.6.3 Other Sources

Guyana is well endowed with other indigenous energy resources, apart from bagasse and fuel-wood. With its many rivers and waterfalls, the country has significant hydropower potential. Construction of the Moco-

Moco hydro power station has been completed and it is operational with an installed capacity of (2*250 kW), and annual energy of (3*10) kWh. The power will be transmitted from Moco-Moco via a 13.8kv transmission line to Lethem and the surrounding communities.

In order to further the development of the Energy Sector, a letter of intent was signed for the Tumatumari Hydro power project on March 5, 1998. The installed capacity is expected to be 45MW. The power will be transmitted to the load center at Omai Gold Mines Limited. For the Amaila Hydropower project, a Memorandum of Understanding for a feasibility study was signed on April 24, 1998. This project, when implemented, will produce under 106 MW in the first place. Hydropower is estimated to be in the region of 7000 MW and is seen as a potential source of energy in the long run.

**ELECTRICITY GENERATION
INSTALLED CAPACITY OF MAJOR PRODUCERS**

Guyana Electricity Corporation	-	130.MW
Linden Mining Enterprise	-	25.0MW
Berbice Mining Enterprise	-	6.0MW
Guyana Sugar Corporation	-	30.6MW
Omai Gold Mines	-	47.0MW

Source: G.E.A. Bulletin, 1997.

Rice chaff also has considerable potential as a source of energy but currently minimal use is being made of this resource. Animal waste is used to generate biogas. There are approximately 10 operational biogas plants in the country.

Wind so far plays an extremely small part in the energy spectrum. Small-scale application is being encouraged. A feasibility study is necessary to determine its viability.

Solar energy is still being promoted in the hinterland areas of Guyana. Photovoltaics systems are being increasingly used mainly by hospitals for lighting and refrigeration. There are other plans for the increased use and development of other supplies of energy sources. Total electricity generation capacity in Guyana is placed in the vicinity of 300 MW.

3.7 TRANSPORTATION

The transportation sector can be divided into three main categories namely: land, air and water. A number of

factors (such as increased availability of credit facilities and easy access to suppliers), have led to more persons being able to acquire their own vehicles. Consequently, there has been an increase in the number of registered vehicles in 1994 to 6898 from 6535 in 1993.

DISTRIBUTION OF VEHICLES, 1994

Type of Vehicle	Number
Private Cars	1821
Hire Cars	236
Lorries	676
Buses	850
Station Wagon	153
Vans	301
Tractors	699
Trailers	258
Motor Cycles	1801
Others ²	103
<i>Source: Guyana Statistical Bulletin, December 1997.</i>	

¹ Includes Station Wagons, Land Cruisers and Land Rovers.

² Includes Trucks, Jeeps, Pick-ups, Articulate Vehicles, Water Tenders and Hearses.

3.8 LAND USE AND FORESTRY

3.8.1 Land Use

Guyana's coast accounts for almost all of the commercial agriculture and the hinterland contains the vast natural resource wealth of the country. Three quarters of the country, or 164,500 km², are covered by tropical moist evergreen rainforest, containing over 1,000 known species.

The hinterland is also rich in minerals. Being part of the Pre-Cambrian shield, the western area has rich deposits of gold and diamonds, with the south and center having good mining potential also. Large deposits of bauxite and kaolin are found in the southeast – northwest belt just behind the coast. Petroleum is also known to exist in scattered locations.

The hinterland possesses many waterfalls with potential for hydroelectric power generation. This area is also rich in biodiversity, with thousands of species of flora and fauna, which exist in a pristine environment. This, together with the magnificent waterfalls and varied topography, lend itself to almost limitless eco-tourism potential.

3.8.1.1 Spatial Pattern of Land Use

Guyana has a very low overall population density – less than 4 persons per km². However, the spatial

pattern of the population and development is not uniform. The spatial distribution of natural resources, the pattern of climate sub-regimes and the pattern of resource utilization have influenced the geography of population, settlement and development. About 90 percent of the country's population live on the coastal plain, with occupations tied to agriculture in the rural areas, and manufacturing and services in the urban areas. This relatively small strip of land has therefore been the recipient of most of the physical and social infrastructural development of the country, and has become the geographic locus of economic and political power.

The remainder of the population live and work in the hinterland, where the vast wealth of the country lies. Most of the hinterland wage earners are employed in logging, saw milling, gold, bauxite mining and processing and cattle ranching.

Most of the hinterland residents are Amerindians who number some 45,000 and are spread among some 150 villages. Characteristically traditional in lifestyle, this segment of the population has fallen out of stride with mainstream development. The principal economic activity in these areas is mixed subsistence farming. Some communities, particularly those in proximity to mining or forestry operations, have been turning to wage labor.

3.8.1.2 Status of Land Use Planning

National land use planning was limited in Guyana. Land-use planning in relation to human settlements on the coast was being practised. However, with the upswing in the economy in the last few years, and the concomitant agricultural expansion and increase in natural resources utilization, several problems have manifested themselves:

- Illegal resources extraction
- Inadequate coordination of land use policies and regulations
- Multiple use conflicts both in the hinterland and on the coast
- Environmental degradation and pollution

Government, in recognition of this situation, engaged two major efforts.

In 1994 the Government of Guyana and the Federal Republic of Germany entered into a technical cooperation agreement for the establishment of a Natural Resources Management Project (NRMP). This project has several components including the building of institutional and human capacity, legislative reform and land use planning, utilizing a Geographic Information System (GIS). Under the land use planning component, a Geographic Information System (GIS) for natural resources management has been established, and a Land Use Action Plan has been prepared.

At the present time, work is under way to perform a pilot regional land use planning exercise. This exercise is intended to produce a regional level land use plan, and to distill a planning methodology that can be utilized in other regions of the country.

Secondly, the land-use planning component of the NRMP also had a provision for groundwork studies aimed at laying the foundation for development of land use policy. In 1995, the Government of Guyana, the University of Guyana, The Guyana Environmental Monitoring and Conservation Organization, World Resources Institute and the Carter Center came together as the key partners on a project aimed at producing a baseline land use policy document for the Government of Guyana.

Under this project a baseline document was prepared under the guidance of a broad-based National Steering Committee, and benefited from countrywide stakeholder consultations.

In 1996, the final version of the baseline document was completed and presented to Government.

With the land use baseline report completed and a pilot land use planning process in progress, a decision

has been taken to expedite the preparation of a national land use policy. This process will utilise existing, approved policies and strategies and useful outputs from the NRMP.

While policies have been formulated at the sectoral level, a comprehensive national land use policy had eluded previous administrations. Under ideal circumstances, a land use policy guides the formulation or amendment of sectoral policies. In Guyana, as in many other countries, development often tended to precede a national land use policy. Given this situation, a conscious strategy has been adopted whereby the land use policy will recognize and be consistent with all existing and recently approved sector policies and strategies, and will also set the stage for informing future policy development in all related sectors.

3.8.2 Forestry

Guyana is at the heart of the Guiana Shield, contiguous to the Amazon Basin and represents one of the best, conserved areas of the region. Approximately seventy-six percent (76%) of Guyana's land area, is covered with forest. Of this, 135,800 km² is classified as State Forest. The remainder is classified as State Lands, Amerindian lands, and private property. Approximately 47 per cent of the State Forests have been allocated to logging concessions, in a zone parallel to the coast.

Guyana's forest types include rain forest, seasonal forest, dry evergreen forest, marsh forest, swamp forest, montane forest, and mangrove forest. Guyana has over 1000 tree species, thousands of other plant species and innumerable animal species. Selective logging has been the traditional approach to timber harvesting, where an identified number of commercial species above a specific diameter breast height (DBH) are extracted per hectare with little effect on the forest canopy.

Forestry, along with rice, sugar, fisheries, bauxite, gold and diamond mining, constitute the main components of the economy as sources of foreign currency earnings. In 1994, forestry contributed 4.42 percent of Gross Domestic Product. The performance of the forestry sector has continued to improve significantly. The average contribution of the forest sector to GDP for the period 1994 to 1997 was 4.69 per cent, as compared with the average for the preceding 5 years of 2.29 per cent. The improved performance in the sector is due primarily to an increase in plywood exports as a result of foreign owned Barama Company Limited entering the industry in 1992.

3.9. BIODIVERSITY

While Guyana is one of the smaller countries of the wider Amazon region, it contributes significantly to the biodiversity, both in terms of number of species and number of endemics. Its natural ecosystems are relatively intact due mainly to low population pressure and to limited commercial activity. The importance of the Amazon basin lies in its holding of more than half of the world's biodiversity, its collective magnitude of endemism, its role in ameliorating global climate and in the hydrology of a large part of South America.

There is insufficient knowledge of Guyana's biodiversity richness, but it is relatively safe to suggest that this has been well preserved/conserved. However, current increase in entrepreneurial activity in the natural resources sectors places pressure on the biological resource base and raises real possibilities of increased threat to biodiversity. This is even more critical based on our limited knowledge of our animal species, some of which may be threatened with extinction. Present initiatives, such as the National Wildlife Surveys are intended to provide relevant data required to serve as a guide in the effective management of this resource. Additionally, there are some plant species that are rare but current information in relation to their status is not available.

Recent policies and practices in Guyana are leading to the building of a tradition in support of participatory decision-making and establishment of a policy to conserve and sustainably use the country's natural resources. These policies are reflected at the international level in the signing of a number of international and regional treaties, conventions and other instruments relating to the conservation and sustainable use of

natural resources. In keeping with this, Cabinet recently approved a National Biodiversity Plan, which seeks to promote conservation and sustainable use of Guyana's biodiversity. In addition, the continued strengthening of the Environmental Protection Agency must be seen as a concerted effort to ensure the conservation of Guyana's rich biodiversity.

3.10 INSTITUTIONAL ARRANGEMENTS FOR GHG INVENTORY PREPARATION

3.10.1 Existing Arrangements

The President of Guyana has the mandate for environmental issues including climate change. There is an Adviser to the President on the environment who reports to him on climate change matters.

A Natural Resources and Environment Advisory Committee (NREAC) which comprises of the heads of the relevant agencies is chaired by the Adviser to the President. All Climate Change matters are discussed at this committee level before being taken to the President or Cabinet.

The National Climate Committee (NCC) oversees all activities relating to Climate, ozone depletion and desertification and reports to the Chairman of the NREAC. Its current chairman is the Chief Hydrometeorological Officer and its membership comprises all agencies which are relevant to climate issues.

Data gathering was accomplished by the staff of the Enabling Activity Project mentioned in the Introduction Chapter while the GEA provided relevant data for energy sector

3.10.2 Deficiencies in Institutional Strengthening

The Environmental Protection Agency is responsible for co-ordinating activities related to environment protection. The Office of the President is the focal point for the climate conventions and has the responsibility to ensure that Guyana complies with its commitments under the Conventions. However, staff, equipment and other resources must be provided

The sector agencies also do not have staff and/or equipment to do the required tasks. In the current situation staff on routine non-climate change assignments, are asked to take on the additional responsibilities.

In order to put in place an institutional arrangement which will permit inventory preparation on a continuous basis, the following should be done:

- Establish a unit in an existing department/agency to address Guyana's commitments to the Convention and to coordinate the Country's Programme to adapt and to mitigate anthropogenic climate change. Provide adequate staff and equipment for this unit.
- Provide a budget for data collection in each sector agency to deal with inventory data collection and analyses.
- Provide computer systems and relevant software to each sector agency so that the inventory can be computerized. Also ensure a networking system between the unit in the lead agency and the units in the sector agencies so that data can be efficiently transferred.
- Provide training for staff in the lead agency and in sector agencies in GHG Inventory, Vulnerability Analysis and Mitigation Analysis.