

Forestry Outlook Study for Africa (FOSA)



The Gambia



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This paper has been minimally edited for clarity and style.

SUMMARY

Forest Management

The Forestry Department experiences low funding and inadequate staffing. The most serious staff shortages are at the field level. A policy change of state control to one of joint forest management with the rural communities has been adopted. Initial reports indicate that there has been reduction of bushfires in the trial areas. The concept focuses on communities that have already established their community forests.

About 93% of the country's forest cover is not under any controlled management by either the Forestry Department or the adjacent communities. These forests are undergoing deterioration.

There is also a relatively high proportion of deadwood in the "High Mangrove" due to the lack of knowledge in mangrove management coupled with inadequate access.

Due to the high costs of plantation establishment, management and protection, the Forestry Department in 1985 decided to focus more on natural forest management.

The majority of trees outside forests are protected by the communities mainly for their medicinal, food and fodder values.

Under the Biodiversity Strategy and Action Plan (BSAP), the area under wildlife conservation would be increased from 3.4% to 5% of the total land area.

Forest degradation

There is a high growth of human and livestock populations. There is no appropriate forest management system in place. Hence bushfires, the cutting of fuelwood, overgrazing and encroachments on the forest resource by shifting cultivation and human settlements are relatively uncontrolled.

It has been assessed that fuelwood demand is likely to be the single most important factor in forest degradation. Bushfires are also very important in this respect.

The mangrove forests are under threat from Oyster collectors who cut the aerial roots where they are anchored during the high tide in addition to clearing for rice farming.

Environmental Problems

Annual soil erosion is estimated at about 12tons/ha/yr.

Recurrent droughts are adversely affecting the country's water supplies. There is over-exploitation of the water resources that has caused a lowering of the water table. The latter is affecting the vegetation cover in the western part of the country.

Forest Industry

There are two private, two government sawmills and several re-saw machines. The current local supply of raw material to this industry cannot be sustained in the future.

MACRO-ENVIRONMENTAL FORCES

Land & Tree Tenure

Most of the forest reserves are located on customary lands.

Energy

90% of the population use fuelwood. The latter also forms about 85% of the domestic energy. Attempts to import butane gas from Senegal as an alternative to fuelwood did not succeed as it was not affordable by the average Gambian. The per capita consumption of fuelwood is estimated at about 0.44 m³. The current electricity generating capacity cannot meet the demand.

Deforestation

Agriculture

75-85% of the population is engaged in subsistence and cash crop farming. Considerable conversion of marginal lands and opening of forests for crop cultivation takes place.

Economic factors

Agriculture is the leading sector of the economy contributing about 25% of the GDP. The export of groundnuts accounts for 40% of the foreign exchange earnings. The export of this primary commodity is subject to price fluctuations in the external market as well as droughts. The contribution of the forestry sector to the GDP is estimated at about 1%.

The significant achievements of the Economic Recovery Programme (ERP: 1985-1990) intensified the exploitation of the natural resource base that continue to deteriorate. There was however virtually no investment in the forestry sector.

Poverty

The Gambia is one of the poorest countries in the world ranking 161 out of 174 countries in the 200 Human Development Report.

Demographic factors

High population growth

The Gambia has one of the highest population densities in sub-Saharan Africa with a population growth rate of 4.2%.

70% of the population lives in the rural areas. The literacy rate for women and men is about 16% and 39% respectively.

CHAPTER 1: INTRODUCTION

1.1. Objectives of the country paper

The country outlook paper for The Gambia is intended to project an outlook for the forest sector by analysing available information and to put in place appropriate measures for the realisation of sustainable forest management principles. The country outlook paper will determine the present status of forestry in The Gambia, and to predict the likely situation that is likely to develop in forestry in the next 20 years if those trends continue. The analysis will exclusively review the existing documentation on the sector. The analysis will finally include an assessment of the probable implications in economic, social and environmental terms. The findings of the exercises

hall be used to advice policy makers and would go a long way towards the formulation of appropriate strategies for the forest sector.

1.2. General background of the country

The Gambia is a country on the West-coast of Africa, lying between latitude 13 ° and 14 ° N. It extends inland for about 400 kilometres along the banks of the River Gambia at widths varying from 24 to 28 kilometres, covering an approximate land area of 11,000 square kilometres. It is bordered on the North, South and east by the Republic of Senegal and on the West by the Atlantic Ocean. With a population of about 1.1 million (1993 census), growing at a rate of 4.2 percent per annum, The Gambia is a multiethnic and multiracial society with an unparalleled degree of ethnic, racial and religious tolerance and civil tranquillity.

The Gambia is endowed with a very limited number of mineral resources of economic importance. The only mineral of great economic importance is sand (quartz or silica sand) whose demand is on the increase by the day especially in the urban areas. So far only traces of gold and tin have been discovered in the upper reaches in the river i.e. in Upper River Division (URL) and CD. The other economically viable minerals identified include heavy minerals (illuminate, retile, zircon), kaolinitic clay and plastic clay. All these deposits can support small - to medium - scale manufacturing industries for both domestic and foreign markets. Rutile is used mainly for the manufacture of welding electrodes and as a raw material for the pigment industry. Illuminate is used in the manufacture of titanium dioxide, titanium salts and titanium metal. Zircon is used in ceramics; refractors (high temperature clay bricks); foundries (high temperature castings).

The vegetation of the Gambia includes the southern Guinea Savannah in the West and the Open Sudano Savannah towards the East. The southern Guinea Savannah is rather an open woodland with tall grasses up to 5 meters high, trees and shrubs including broad - leafed species and forming a two stored canopy, broken and giving a light shade.

The Sudano Savannah which occupies the drier areas in the eastern and northern parts of the country, has lower grasses and trees the majority of which do not exceed 15 meter, and are mostly small - leafed and thorn bearing. It is characterised by extensive areas of marginal land with lateritic ridges and shallow soils.

There is relatively little undisturbed vegetation in The Gambia and the open parkland dominates much of the country, with small groups of well-grown trees. Elsewhere, the tall shrub and low tree canopy are secondary fallow vegetation and most canopies are secondary fallow vegetation and most often of less than twenty years growth.

The Gambia has a variety of habitats or unique sites of plant and animal species diversity, which is partly due to a constellation of physical factors. Being near the ocean, the country is subjected to tidal influences throughout most of it length, and thus carries salt water up to 240 km inland, depending upon the season and annul rainfall. This in turn allows the development of inland mangroves and often adjacent salt pans or salty swamp up river. Above the salt water boundary, strips of riverine forests and thickets fringe the river where they have not been subjected to human disturbance.

Forests and woodlands are an important natural resource base supporting a variety of life systems. Forty percent (40%) of the country's total land area is under forest with close and open woodland

accounting for 10% and the remainder consisting of Savannah woodland. But this resource is under severe pressure mainly from high growth of human and livestock population, lack of meaningful forest production and management system, uncontrolled bush fire and cutting of firewood, overgrazing and unplanned encroachment of cropping and human settlement.

The Gambia's forests can be divided into open and closed woodlands, though further distinction can be made based on composition and structure. Sudanian woodland dominates with Guinea woodland confined primarily to the southwestern part of the country. Guinea woodland now appears in small relic patches, which have considerable bio-diversity value for numerous species of flora and fauna (e.g. 26 species of birds are specifically associated with this closed canopy forest).

Forests in Gambia provide most of the wood products for local consumption. They provide 85% of the country's domestic energy in the form of fuel wood for over 90% of the population. They provide about 17% of the timber used in construction and are an important source of food, medicine, job opportunities and income. The coastal forests protect the coastal and riverbanks against erosion and are an important natural habitat and breeding grounds for various aquatic life and sanctuary for migratory birds. More generally, forests protect against soil desiccation and wind erosion, optimise rainfall percolation and distribution, as well as ameliorating temperature effects. They are critical for biological diversity conservation and sustainability.

Compared to other Sahelian countries, The Gambia is considered to have a significant forest cover, which has been estimated to cover about 40% of the total land area. The forested areas have been categorized into the following:

- National gazetted forest parks, spread all over the entire country, numbering 66 in total and constituting about 7% of the land area;
- Community forest reserves (300, 000 ha) of potentially suitable areas;
- Open access forests which are not managed at all;
- Coastal forests consisting entirely of mangroves of which there are about 66,000 ha; and
- Protected areas serving as wildlife sanctuaries, estimated to cover 3.4% of the land area

In The Gambia, forests play multiple functions including the provision of domestic energy for cooking, building materials in the form of poles and timber, medicinal products, wild fruits and nut, honey and other services. The environmental functions include soil erosion control, carbon sequestration and the enhancement of local climatic conditions.

CHAPTER 2. THE CHANGE DRIVERS

2.1. Economic and social context

The Gambia is a small country with a land area of about 11,000 km² located on the westernmost tip of Africa and mostly surrounded by The Republic of Senegal. The Gambia is located in the Sahel, a region characterised by recurrent droughts, loss of vegetative cover and rapid environmental degradation. The Gambia has one of the highest population density in Sub-Saharan Africa with a population of over 1,3 million and growing at an annual rate of 4.2%. The Gambian population is mainly rural, with an estimated 70% living in the rural areas. Agriculture represents the major employer with over 75% - 85% of the population engaged in subsistence and cash crops farming. Agriculture reportedly contributes somewhere between 25 % of GDP and is by far the leading sector of the economy.

The Gambia has been ranked among the least developed countries of the world with an annual per capital income of about US \$ 360 thus making it one of the poorest countries in the world. In the 2000 Human Development Report Gambia's ranking is 161 out of 174 countries.

Although recent significant gains in the education and health sectors have moved it up the index. Life expectancy is estimated to be 54 years for women and 44 years for men. The adult literacy rate stands at 16% for women and 39% for men.

The forestry sector is reported to contribute about 1% to GNP although this figure does not seem to include the other services such as the informal trade in minor forest produce, medicinal uses of the forest produce and other environmental and social functions which are often not valued monetarily.

As the population of The Gambia continues to grow, the role of the forestry sector in socio-economic development will assume greater significance. It is estimated that there has been a steady increase in the demand for forest products as a result of the increase in population. Fuelwood still remains the primary source for domestic energy in the country. The natural forests provide somewhere between 80 - 85% of the primary domestic energy for more that 90% of the population. The population - fuelwood demand factor is likely to be the single most important factor causing forest degradation, see Annex 1 which shows the population trend in The Gambia.

2.2. Economic Performance and policies

The Gambia economy is agrarian based and subject to wide fluctuations conditioned by external market situations. At the time of gaining independence in 1965, the economy was in a relatively health state with impressive growth rates of between 7 - 8% in real terms. The agricultural sector is characterise by the cultivation of groundnuts although there have been recent attempts at crop diversification in the recent past. The export of groundnuts accounts for over 40% of the foreign exchange earnings. The Gambia also relies heavily on re-export trade to neighbouring countries and the trade accounts for about 16% of the GDP. Industry, tourism and the service industry are the other leading sectors of the economy.

Following the impressive growth in the economy during the first two decades following independence. The Gambian economy went into a recession. The situation became so untenable

that the government with the assistance of the International Monetary Fund (IMF) embarked on a structural Adjustment Program known as the Economic recovery Program (ERP) from 1980 to 1985. At the peak of the economic crisis in 1985, the standard of living of the Gambian people had fallen by about 10% over the period from 1975 to 1985. The ERP was followed by the program for Sustained Development (PSD) from 1985 - 1990 which consolidated on the gains of the ERP and greatly reduced the sized of the public sector and instead put a great deal of emphasis on private sector participation in economic activities. Both structural adjustment programs registered significant achievement in the economy but the natural resource base, whose intensified exploitation made the economic recovery possible, continue to deteriorate sharply. The situation warrants the elaboration of a national environmental strategy, which was adopted for implementation by government in 1993.

Both the ERP and PSD programs witnessed a considerable down scaling of central government involvement in the affairs of the economy. Although the private sector did take up the challenges offered by the new frontiers in the economic sector, there is virtually no private sector investment in the forestry sector. The government releasing that it cannot do it alone in forest management initiated the community forest management approach in partnership with collaborating communities.

Government policies regarding the management of natural resources favour the exploitation of the natural resources for the provision of employment, that of meeting basic human needs and the generation of foreign exchange. Agriculture will continue to be the leading sector for sometime to come. Agricultural systems have evolved from extensive land use systems characterise by shifting cultivation to more intensive mono-cropping system due to land scarcity. Nonetheless, there is considerable conversion of marginal lands and the opening of forests for crop cultivation.

The structural Adjustment Programmers, which The Gambia was said to have successful implemented, sought to provide a regime of economic liberalisation with private sector participation being the cornerstone of the policies.

2.3. Policy and institutional changes in the forestry sector

The history of the forestry sector development in The Gambia has been marked by protection measures on the side of government regarding the management of forest resources. Recognising the important role that the forest sector plays in development, areas with promising forest cover were demarcated all over the county and designated as either forest parks or protected areas. The Forestry Department was upgraded form a unit of the Department of Agriculture and given a specific mandate in term of managing the forest resources. The central policy feature of The Department of Forestry is as follows:

- To maintain at least 30% of the total land area of the country under forest;
- To manage at least 75% of the forest lands according to scientific principles;
- To promote towards environmental protection, particularly soil erosion and soil desiccation; and
- To contribute to employment, the provision of basic necessities such as fuelwood supply and the generation of foreign earnings through the export of high quality forest products

As a government department, The Forestry Department continues to suffer from low funding, under-staffing and is therefore ill equipped to effectively manage the country's forest resources.

Given the limitations in resources, The Forestry Department was consequently given mandate to manage only the 66 national parks, which constitute only 7% of the land area. The rest of the areas under forest are managed by the local communities who often lack the technical capabilities to manage them according to scientific management principles.

Beginning in 1987, the government's forest policy changed from one of state control to that of joint management with rural communities. Based on the principles of partnership with the local communities, the Community Forestry Program model was introduced on a trial basis starting with a few communities in Western Gambia. The Community Forestry program adopts a bottom-up approach with partnership agreements between The Forestry Department and local communities. In the Communities Forestry Management model, the role of the Forestry Department is mainly restricted to providing advice and technical backstopping. The benefits accruing from the sale of forest products are shared between government and the local communities. Breaches of contracts by the local communities may lead to revoking the agreement by government. The Community Forestry Program has yielded impressive results and is currently being replicated in other regions of the country. There is a high demand of communities applying for this type of forest management, which is difficult to meet due to resource constraints on the side of The Forestry Department. Initial results of the program has reported improved status for the forest resources and the elimination of bush fire incidences, which is one of the leading causes of forest degradation in the country.

The Government of The Gambia has recently (1998) embarked on a program of decentralisation of decision making. Under the decentralisation program, power will be decentralised to local authorities that will be expected to be responsible for all aspects of decision making. The local government authorities in each region will be responsible for raising revenue through taxation and to be in charge of their own development agenda. These changes are likely to have major impacts on the way the forest resources will be managed.

Having ratified the 3 Rio conventions on the environment, The Gambia undertook the preparation of national action plans for the Convention on Biological Diversity (CBD), the UN Framework Convention on Climate Change (UNFCCC) and the Convention to Combat Desertification (CCD). The preparation of the above-mentioned action plans called for the elaboration's of appropriate framework including institutional and regulatory aspects. All three conventions are likely to have overlaps in many areas and the synergy between them has to be properly looked into.

2.4. Development in the agriculture sector

The Government of the Gambia affords a high priority to the development of the agricultural sector. Agriculture is important for the attainment of food security, employment and the generation of foreign exchange reserves. The agriculture sector policies are geared towards crop diversification, sustainable fisheries development and livestock development both for export and subsistence. Of recent, the sector has witnessed significant investments in vegetable production both for the home and European market. The latter trend is likely to increase given The Gambia nearness to Europe and ideal weather conditions for vegetable production.

Rice continues to be the staple food of Gambians and both irrigated and rainfed rice production has received substantial investments in the past. Rice is grown in about 20,000 ha of lowland, mostly under rainfed conditions. The Gambia continues to import about half of its rice requirements as local production levels are too low given available technology. The area under irrigated rice is

expected to increase though at a modest rate.

The cash crop sub-sector is dominated by the production of groundnuts (*Arachis hypogea*) which is grown mainly as an oilseeds and confectionery crop for export. Falling producer price and drought saw a dramatic drop in the production of groundnuts. Corresponding to the decline in groundnut production has been a marked increase in the production of coarse grains. The total area under crop farming in a given year is estimated to be slightly over 180,000 ha. Of this total, about 50% of the area (90,000 ha), is allocated to coarse grains.

For the foreseeable future, crop farming is likely to be the major preoccupation for the rural folk both for employment and income generation.

2.5. Industrial policy and developments

The draft National Industrial Policy (NIP, 1994) was articulated to provide a framework for industrial development in The Gambia. The policy urges government to provide a favourable environment to stimulate industrial development through the provision of incentive regimes for private investors, reducing custom tariffs and company taxes, reducing administrative bottlenecks, and investing in human resource development. Certain prime land areas (Kanifing Industrial Estate and the Tourism Development Area) have been set aside specifically for industrial development. Despite the development the NIP, the industrial sector remains underdeveloped due to a number of factors including institutional, infrastructure, administrative, legal, financial and others. The industrial sector is dominated by small-scale manufacturing, which contributes about 6.5% to GDP. The formal manufacturing sector is dominated by the food industry, which include beverage facilities, fish processing plants, abattoirs, sweets and milk processing plants.

2.6. Change in energy use

There are two main sources of energy in The Gambia, fuelwood and petroleum imports. Meeting the energy requirements of its population and industry are extremely difficulties that the country is faced with.

Fuelwood is the main source of primary energy for over 90% of the population accounting for more than 80% of the energy source. The increasing demand for fuelwood by the rapidly increasing population is the main cause of deforestation in The Gambia. Petroleum ranks as the second most important source of energy in the country accounting for about 11% of total primary energy requirements. The country imports all its petroleum requirements thus placing a burden on foreign exchange reserves. The country has limited electricity power generating capacity with frequent power cuts in the supply.

In an effort to finding alternatives to fossil-based energy supplies, the government of the Gambia implemented a CILLS Regional Butane gas project in 1989. The program was funded by the European Union (EU) and had limited initial success. Under the program, bottled (Butane) gas was introduced into the country on a big scale as a substitute for fuelwood and targeting mainly the urban areas. The bottled gas was imported from neighbouring Senegal where it is relatively cheap compared to prices prevailing in The Gambia. The Butane gas project did not provide an alternative to fuelwood, as its price tag was well beyond affordability for the average Gambian.

Other alternative sources of energy which have been tried in The Gambia include solar power, groundnut shell and saw dust briquette. In addition to promotion the use of LPG as a cooking fuel substitute, other measures such as the ban on the making of charcoal (1980), the introducing of improved cooking stoves and the creation of the Gambia Renewable Energy Centre (GREC) to carry out research into alternative forms of energy are important developments. Despite the constraints, there remain tremendous potentials in the areas of alternative sources of energy in the country.

2.7. Developments in infrastructure and communications

Road transport is the main means of transportation in the country. A major road network serves both banks of the country linking all major towns together. On the north bank of the country, the road network is generally poor and some areas could be inaccessible during the rains. There is a good network of telephone system and most towns and villages are served by telephones. The Gambia has severe constraints in terms of electricity supply and the generation capacity cannot meet the ever growing demand. There are good port facilities and the government has taken advantage of the comparative advantages offered by these facilities to vigorously promote trade with its neighbours.

2.8. Trade liberalisation

Building on the gains achieved by the economic reform measures undertaken between 1985 and 1995, government created an atmosphere conducive for private sector participation in the economic sector through major policy reforms and trade liberalisation measures. Recently, the Government of The Gambia has embarked on an ambitious program of promoting trade with its neighbours in the sub-region through the creation of an export-processing zone within the port vicinity and environs. This project, known as the Trade Gateway Project is likely to have an impact on the natural resources sector as it will be commodity-based export oriented. Overall, there are expected to be steady increases in private sector participation in the economy as government involvement in the public sector is being gradually reduced through privatisation.

CHAPTER 3. FORESTRY SECTOR IN 2020

The two national Forest inventories carried out in 1983 and 1997/98 respectively with assistance from the German Agency for Technical Co-operation (GTZ), through the Gambia German Forestry Project GGFP, European Union EU/EDF, Upper River Division Forest Project), KFW and USAID have provided forestry Department decision - makers and those national and international planners committed to Forestry development in The Gambia with relevant information about the states of the Gambian forests.

These inventories also provided a decisive time series analysis regarding the changes occurring in different types of land use and vegetation covers.

With a Forest cover of about 46% of the total land area, The Gambia has till a valuable forestry resources (Ludung and Bojang, 1998). These resources are central to the Gambian environment and economic development.

The forest cover includes woodland, Savannah woodland, tree and shrub Savannah and Mangroves. These forest types supply the majority of the Gambian population both rural and urban dwellers with raw materials such as firewood, charcoal, poles timber, tool handles, non timber forest products, e.g. fruits barks fibre, resins, roots/tubers, leaves honey and wax etc. used as food, beverage and medicine and a wide range of habitats for both the terrestrial and aquatic biodiversities.

The 1997/98-forest resource inventory provides valuable information about the description of the forest resource (area, stocking volume of different tree species etc.). It also indicated that, although the forest situation seems to reach a certain balance in-terms of total area, the most productive forest types in forms of biodiversity and tree species composition have been continuously altered for the last two decades, a trend which may continue into the next two decade or beyond.

3.1. State of Forests and Plantations

The Forest resources of the Gambia was first assessed in 1981/82 and the various land use types were mapped (Forester, 1983). This inventory provided the Forestry Department with a valuable database and gave a reliable idea about the conditions of the Gambian forests for necessary actions such as forest Policy formulation, planning etc.

In 1997/98, the second inventory was carried out to obtain accurate and quantitative estimates of the changes that occurred in our forests in the last fifteen years. It also helps the Forestry Department and its partners in gaining a better understanding of our intervention and the trend of the forests in the future.

Mangrove Forest

The area of high mangrove has decreased considerably from 30,000ha to 15,000ha. (Brent, 1959) however the total mangrove are constant as the low mangroves have increased 15,000ha. The delineation criterion low and high mangrove is the average stand height of 7m. Therefore it is easy to understand that a perfectly correct delineation of low and high mangrove is possible. The

highest ha - volume with $183.5 \text{ m}^3/\text{ha}$ is in the stratum “high mangrove” followed by that of the “closed woodland” with nearly $70 \text{ m}^3/\text{ha}$.

A very big saw timber reserve is the high mangrove where nearly half of the total saw timber vol. is concentrated. The main problem of the exploitation of the high mangrove is the access to the stands and consequently the felling and logging procedures. Concerning the land use strata a relatively high dead wood portion is recorded in the “High mangrove”. This is mainly due to lack of a comprehensive management plan.

Plantation Forestry

Plantation establishment, using *Gmelina aborea* was the main preoccupation of the Department of Forestry in the years between 1953 and 1985. A total of about 13000 hectares of monoculture of *Gmelina aborea* and very small amount of *Tectona grandis* were planted mainly in the Western Division. The high cost of plantation establishment and fire protection as well as to conserve biodiversity caused the Department to reconsider its forest management priorities and potentials and since 1985, a policy decision was reached to re-orient Forestry Department to focus more on natural forest management.

As comparison, the *Gmelina aborea* stands in The Gambia contain about $45,000 \text{ m}^3$, which represents 1.8% only. The percentage of decayed trees within these stands is only 2%. This can be explained by the fact that the *Gmelina* stands are well protected especially against annual bushfires.

The *Gmelina aborea* plantations have a very high stand density of 415 trees per hectare, almost the same as the mangrove with 416 trees per hectare. Though the *Gmelina aborea* stand density is almost the same as that of the mangroves the basal area is about half of the mangrove ($10.4 \text{ m}^3/\text{ha}$) with a smaller average diameter of about 19cm. The annual volume increment is $5.2 \text{ m}^3/\text{ha}$ (secured to the mangrove forest) with the regeneration of about 2,328 trees per hectare in a matured stand.

Trees Outside Forest (TOF)

The selection for protection of trees outside the forest depends on their socio-economic values and the Legislative protection accorded to them. Majority of these parkland species are protected not for their timber values but for their medicinal, food, fodder and nutrients values to satisfy the local demands of the population.

The common park land species in The Gambia are: *Cordyla pinnata*, *Parkia biglobosa*, *Pterocarpus erinaceas*, *Adansonia digitata*, *Borassus aethiopum*, *Khaya senegalensis*, *Ziziphus mauritania*, *Spondias mombin*, *Tamarindus indica*, *Vitex doniana* and *Cola cordifolia*.

The Gambia population especially the rural population know these species well. They have over time (because) specialised in the utilisation of these species in their own rights. The rural population know what tree species and which part of it offer and at what time of the year. A number of fruits are harvested from these parkland species both for edible fruit pulp, seeds, and young tender leaves which are used as green vegetables. Some of these species are planted around villages but the majority of them are found in the farmlands.

3.2. The Gambia's biodiversity: status and trends

The Gambia with its characteristic Sudano Savannah woodland vegetation type has different types of ecosystems, including close woodland, open woodland, plantation ecosystems, tree and shrubs savanna, wetland ecosystems, (marine, coastal and freshwater) and agriculture (cropland and ecosystems).

This section describes the status and trends in biological diversity in The Gambia and conservation technique. For convenience, the section is divided into sub sections on terrestrial biodiversity, forest biodiversity, freshwater biodiversity, marine and coastal biodiversity, and agricultural biodiversity.

Wildlife Protected Areas

The Wildlife Conservation et, 1977, has defined protected areas as any area of land set aside by the Government for purposes of preserving and managing the habitat and ecology, including any Forest park or local sanctuary. The current protected area system in The Gambia comprises six national parks and nature reserves under the mandate of the Department of Parks and Wildlife Management, DPWM covering a total land area of 39,772 ha i.e. about 3.7% of the Gambia's land area.

The DPWM plans to have at least 5% of the land area as protected area including representative samples of all major habitats that needs to be conserved. Three of the protected areas are currently open to the public namely Abuko Nature Reserve, Tanji Bird Reserve and Kiang West National Park (KWNP).

The National Parks and Reserves of The Gambia have been specifically selected for species richness, habitat fragility, the endangered nature of the habitat type and/or species found within them. The intention is to provide a safe haven for flora and fauna to flourish without undue interference from man (utilisation of natural resources within the protected areas may be carried out with express permission from DPWM). In practice only local communities peripheral to the Kiang West National Park, have been allowed to make use of limited range of natural resources within the park.

The Baobolon Wetland Reserve was designated as a Ramsar site upon The Gambia's ratification of the Ramsar Convention in 1996. A comprehensive study of Baobolon along with two additional sites, Nuimi National Park and the Tanji Wetland Complex, was conducted in 1997 with a view to designating them as Ramsar sites.

Table 3: National Parks And Nature Reserves In The Gambia

	NAME	DATE OF GAZETEMENT	AREA (ha)
1.	Abuko Nature Reserve	1968	105
2.	River Gambia Nat. Park	1976	589
3.	Nuimi National Park	1986	4,940
4.	Kiang West National Park	1987	11,526
5.	Tanji Coastal Park	1993	62
6.	Bao Bolon Wetland	Not yet	22,000
	TOTAL AREA		39,772

Table 4: Summary Of Number Of Fauna Species In Protected Areas

NAME	MAMILLA	REPTILES	AVES
Abuko Nature Reserve	23	37	270
River Gambia Nat. Park	38	*	245
Nuimi National Park	46	27	293
Kiang West National Park	42	20	305
Tanji Bird Reserve	29	*	295
Bao Bolon Wetland Reserve	40	10	266

*No species found/no research done

Wildlife species in the Gambia

Despite the small size of The Gambia, it has an impressive diversity of flora and fauna due to a combination of its geographical position and the presence of the River Gambia. However, to date there has been little investigation aimed at determining the abundance and distribution of most of the major groups and changes in abundance over time have been quantified. There remain considerable gaps in our knowledge regarding the diversity of many groups, though the piscifauna and avifauna have both received considerable attention. There are currently a number of studies in progress including an on-going bird ringing program in Nuimi National Park, a water fowl census, an assessment of sites for designation as important Bird Area (IBA), and research on Whales and Dolphins (Cetacean).

The following wildlife species are important:

- Vertebrates –Mammals; Birds (Avifauna); Amphibians and Reptiles (Heretpfaima)
- Mammals: A list of mammals compiled in the late 1960's indicated that there are 67 species of mammals but may have omitted many of the smaller Rodents (Rodentia) and bats (Chiroptera). The most recent assessment (Murphy, 1998), puts the total number of mammals at 99 including marine mammals recorded from Gambian waters.
- Birds (Avifauna): Core (1990) and Tanji Talk (1994) indicated that there are 525 species of birds recorded from The Gambia, but this list has recently been enlarged to 552 by Barlow et al (1997). This impressive list is represented by 75 families of bird and gives The Gambia one of the highest density of avian species per Kilometer Square in Africa. Over 220 species are known to breed within the country, while 150 species migrate to the Palearctic during the northern winter. There are many inter-African migrants also and the River Gambia appears to act as a flyway of considerable international importance. There remain however, major information gaps on the status and distribution of birds in The Gambia.
- Amphibians and Reptile (Heretpfaima): There has been limited and localised study of the

status and distribution of amphibians and reptiles in The Gambia. The most recent checklist of both groups compile indicated that there are 49 species of reptile and 30 species of amphibians (Lenz, 1974; Gruschwitz et al, 1991; Jones et al, 1991). A species of stink chalcids *armitagei*, was recorded for the first time at Cap St. Mary in 1990 and subsequently rediscovered in 1992 (et al 1991) on the coast within the Tanji Wetland complex, a proposed Ramsar Site. *C. armitager* appears to be endemic to The Gambia.

- Invertebrates: Most investigations today on invertebrates within The Gambia have focused primarily on pest species though the Odonata (Dragonflies and Damselflies) and Lepidoptera (Butterflies and Moths) have also attracted some attention. There have been 72 species of Dragon fly and Damsel fly recorded by Prendergast (1996) after only limited investigations. Newport (1997) indicated that 155 species of Butterfly have been observed in The Gambia. No estimation of the number of Moth species has been given. No reliable data for The Gambia exists on the other invertebrate phyla.
- Micro-organisms: There is no data available on the status and distribution of viruses, bacteria, fungi, lichens and algae.

Threatened and Declining Species

There is little hard data on threatened and declining species in The Gambia. There has been a considerable decline in the diversity of large mammalian species, which commenced during the latter part of the nineteenth century. From the species in The Gambia in the late 1960s, it was estimated that of the 67 species of mammals listed, 13 had become extinct and a similar number were threatened with extinction (DPWM 1991). A number of species of mammals still migrate into The Gambia including Roan antelope (*Hippotragus equinus*) and Campbell's Mona monkey (*Cercopithecus Mona Campbell*), Wild dogs (*Lycoon pitus*) and Lio (*Panthera Leo*) still infrequently enter the eastern end of The Gambia, invariably as vagrants from Niokolokoba National Park in Senegal.

Several of the remaining large mammals including hippopotamus (*Hippopotamus amphibius*), Sitatunga (*Taegelaphus splekei*) and West African manatee (*Trichechus senegalensis*) are present in scattered and small populations and are threatened with extirpation. Leopards (*Panthera pardus*) are extremely rare and breeding may not occur within The Gambia anymore. The major factors, which led to the loss of a large proportion of the large mammalian species, include the heavy hunting pressure and habitat destruction.

National Policies and Legislation Relevant to Biodiversity Conservation

Even though the importance of biodiversity cuts across many institutions and agencies in The Gambia, very few departments have clear policy statements on the protection and conservation of this natural heritage. Departments of Parks and Wildlife, Forestry (Forest Policy of 1995) and Fisheries along with other sectors continue to put emphasis on biodiversity conservation and sustainable use.

As the review of sectoral policies continues, there is an ample opportunity for harmonisation with a view to coming up with a clear biodiversity national policy to be backed by an enforceable legislation. This is important for proper management of our natural heritage - biodiversity. Similarly, The Gambia does not have a specific law on biological diversity.

Offenders of biodiversity - related laws are normally tried by the magistrate's courts or District Tribunals and since they mostly occur outside the city limits they are not usually handled by State Counsels. At the Department level, each Department has its own officers responsible for enforcement, for example the Director of Parks and Wildlife Management and his appointed subordinates (Wildlife Officers) have powers of arrest and search of persons found or suspected to be in illegal possession of any wild animal or its meat or trophy. Traditional Courts, presided over by chiefs and respected community elders, also handle major cases such as illegal felling of trees and starting of bush fires. With the on-going Local Government Reform and Decentralisation these traditional administrative structures and institutions will assume an indispensable role in biodiversity conservation.

State of management systems

The New Forest legislation (1998) distinguishes four broad forest categories state forests, community forest, private forests, and national parks/nature reserves. The latter category is administered and managed by the Department of Parks and Wildlife, see Table 5.

Table 5: Forest under controlled management and under no management protection (ha)

		Controlled management (ha)				No management protection (ha)		
division	forested land (ha)	forest parks	community forests	private forests	controlled management	forest parks	forest reserves	No management protection
					%			%
Western	73,300	3,355	6,203	100	13.2	512	63,130	86.8
Lower River	66,500	1,758	3,465	0	7.9	4,41	5,846	92.1
Central River	154,600	7,233	5,924	0	8.5	10,412	131,031	91.5
Upper River	113,200	858	1,565	0	2.1	2,178	108,599	97.9
North Bank	41,200	0	230	0	0.6	3,290	37,680	99.4
The Gambia	448,800	13,204	17,387	100	6.8	20,823	397,286	93.2

*No community controlled state forest

SOURCE: FD Statistics: Schindele and Bojang (1995; Teusan (1999)

State forests comprise of the gazetted forest parks and forest reserves. Some 13,204 ha or 39% of the total forest park area of 34,027 ha are at present under management, see Table 5. The managed forest park area includes some 2,135 ha of Gmelina plantations all located in the WD. According to the GFMC, at least a forest park area of some 17,000 ha is needed for demonstration and training purposes. The remaining forest park area shall be managed by pursuing other management objectives. GFMC implementation including the establishment of required physical infrastructure and logistics require considerable investments, which are to a large extent shouldered through foreign assisted projects.

Although private forest both natural and plantations are foreseen in the forest policy and legislation, to date only one private Gmelina plantation of about 100 ha exists which was even established before the new policy was formulated. At the moment the FD's highest priority is to

bring as much as possible of forest reserves under community management. Considering the increasing wood demand, however the FD should pay equal attention to promotion and supporting private woodlots.

International Conventions and Agreements

The Gambia is a signatory and a Party to several regional and international and treaties agreements related to biodiversity. The international conventions include, among others:

- Convention on Biological Diversity,
- Convention on International Trade Endangered Species of Wild Fauna and Flora (CITES),
- Convention on Water of International Importance Especially as Water Fowl Habitat (RAMSAR),
- Convention Coverage the Protection of the World Cultural and Natural Heritage,
- United Nations Convention on the Law of the Sea,
- United Nations Convention to Combat Desertification,
- United Nations Framework Convention on Climate Change,
- Vienna Convention for the Protection of the Ozone Layer the Algiers Convention,
- Montreal Protocol on Substances that Deplete the Ozone Layer,
- Basel Convention on the Control of transboundary Movement of Hazardous Wastes and their Disposal, and
- Treaty Banning Nuclear Weapon tests in the Atmosphere in Outer Space and under Water.

The regional agreements to which The Gambia is a Party include:

- Convention on the African Migratory Locust,
- Convention for Co-operation in the Protection and
- Development of the Marine and Coastal Environment of the West and Central African Region (WACAF),
- Protocol Concerning Co-operation in Combating Marine Pollution in cases of Emergency in West and Central African Region (WACAF),
- Bamako Convention on the Ban of the import into Africa and the Control of Transboundary Movement within Africa of Hazardous Wastes,
- Convention establish the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS).

All the above-mentioned legal instruments, offer protection to the forest ecosystems which serve as habitats to the various flora and fauna species.

3.3. State of Forest Industries

There are two categories of wood industries active in The Gambia Viz:

- Public wood industries
- Private wood industries

Only two government sawmills are operational in the country (Kafuta and Dumbutu sawmills) under the management of Forestry Department two private sawmills (Nyambai and Fass sawmills) are also actively operational.

In addition to the above mentioned several re-saw machines are installed and operational nation wide with greater concentration in the greater Banjul area.

According to Ludwig R. and Bojang L. (1998) inventory report, the overall average annual increment of $0.6\text{m}^3/\text{ha}$ for timber and firewood species indicates that for the time being the amount of sustainable harvestable timber is small. The changes observed in the species composition of woodlands and savannahs could result to more uniform stands of only few species, which will not provide the great variation of wood products as the local population is used to harvest. This will be catastrophic for the Gambia for at present over 90% of the population both rural and urban uses forest industrial products such as firewood and charcoal as domestic energy for cooking, heating, ironing etc.

Therefore the continuous supply of the commodity is a basic necessity for the population. Several studies; Openshaw 1973; CILSS 1977; Carlowitz 1980; Orgatec, 1982; Bulow 1983; Foley 1994 and Steina 1994 were conducted to estimate the fuelwood demand of the country. The results show a degree of disparity. However, going by the two closest results (Openshaw 1973 and Foley 1994), the estimated consumption rate per capital falls within the range of between 0.34m^3 and 0.44m^3 . Other recent studies (Danso et al 1994 and Jato 1999) carried out on detail supply and demand analyses came with a conclusion that if the present population growth rate (4.2%) continue it will exceed the available forest industrial wood supplies in both quantity and quality, even in optimistic scenarios. In the medium and long term, the Gambia's demand for all industrial wood products, firewood in particular must be augmented by using alternative energy resources and other substitutes. Other industrial wood products of very important economic value to the majority of the Gambia population are:

- Fence Post
- Poles for roofing
- Timber for construction
- Rhunpalm splits for roofing

However, the above mentioned industries will not operate at the present capacities in the future as a result of insufficient supply of raw materials

3.4. Social and Economic Implications

The Gambian forest contributes immensely to The Gambia's economy and the social well being of Gambia's population and provide several environmental services. In addition to maintaining the micro-climatic balance, the stabilisation of the river banks and providing life support systems to many other plants, animals and aquatic life, forests are important to the local communities who depend on them for food, medicines, wood products for construction and energy (particularly to women who rely on the forests for their subsistence). Particularly important forest products are for women.

The forestry sub-sector contributes an estimated 1% to GDP. This figure is said to be under estimation considering the illegal, and informal trade that takes place in both the timber industries and other by products of wood e.g. charcoal.

On the other hand, the quality of life for most rural communities is greatly dependent on access to forest resources. However, the problem is to be able to assign a monetary value to the social and

cultural benefits of forest, and such values are extremely important in determining appropriate forest uses.

Even with the optimistic scenarios, if the present rate of population growth is not checked, the institutional and technical support services for the conservation management and development of forestry resources will be inadequate. Failure to bring about affordable substitutes for the much needed forest products will contribute to policy failures. Perhaps the most urgent factor to get under control is bush fires. Bush fires lead to breakdown of the social and economic benefits of our forests and this is resulting in serious shortages of the very important life supporting system.

3.5. Forestry and the environment

Forest resources are a source of biological diversity in themselves. The forest resources are also important for the conservation of biological diversity and for overall environmental protection. A good amount of vegetative cover for the land provides a good measure against soil erosion and other forms of land degradation. The Gambia's biodiversity resources are under increasing pressures and there is an alarming decline in both faunal and floral specie numbers.

In The Gambia, forests play multiple functions including the provision of domestic energy for cooking, building materials in the form of poles and timber, medicinal products, wild fruits and nuts, honey and other services. The environmental functions include soil erosion control, carbon sequestration and the enhancement of local climatic conditions.

The Gambia has designated 6 protected areas for the conservation of wildlife resources. In addition to fulfilling that function, the protected areas also contain significant amounts of plant species, particularly the rare plant species. The total area under this form of land use currently stands at around 3.4% of The Gambia's total land area. Following the ratification of the international convention on Biological Diversity in 1994, The Government of The Gambia under the auspices of its Department of Parks and Wildlife Management elaborated the Biodiversity Strategy and Action Plan (BSAP). The BSAP provides a coherent framework for the management of The Gambia's biological resources on a sustainable basis as well as to ensure the fair and equitable sharing of the benefits arising. One of the policy objectives of the BSAP is to increase the area under wildlife to about 5% of the total land area of The Gambia. Furthermore, the policy also aims to involve local communities in the management of Biological resources. The implementation of such a policy is likely to promote to the better management and enhancement of forest-based biodiversity.

As indicated earlier, forests contribute a lot to environmental protection in terms of watershed protection where the water, soil, plant, animal and other resources are preserved. Forests are also important in arresting land degradation as they provide effective cover and protection against the impacts of rain and geological process of soil erosion. Other functions of forest include control of Desertification and carbon sequestration, which is an important means of reducing the concentration of CO₂ levels in the atmosphere. These important forest functions are likely to be affected adversely because the contributory factors are likely to be further aggravated by human activities in the quest for meeting their needs in terms of agricultural activities, housing and other needs.

3.6. Institutional Framework for Forestry

The new organisational structure has established clear line of commands and responsibilities from the FD headquarters down to the field operational level. It entrusted the divisional Forest officer with comprehensive management responsibilities within a division including staff posting and operation planning. However, an efficient M & E system in particular impact monitoring is not yet in place.

In order to cope with the integrate forest management approach of the GFMC and to decentralised forest administration from the national to the divisional and to the local level, the organisational set-up of the FD was restructured in 1995, see Annex 4. At the same time forestry administrative guidelines including a planning, monitoring and evaluation system were established. Without initial investment cost for physical and logistic infrastructure facilities such as buildings, physical forest infrastructures (roads, machinery inputs for fire break establishment, etc.) office equipment, vehicles the GFMC implementation will not succeed which could result to policy failure. (FD administrative circles, status and further demand of physical infrastructures)

According to the GFMC, forest administration within a division is subdivided into administrative circles. Each circle is managed from a forest station by a local forest officer or head of administrative circle that reports to the divisional forest officer. Administrative circles are further subdivided into implementation areas, which constitute either forest park or extension circuits. At present 11 forest stations/sub-stations are operational. Five field offices are temporarily rented with foreign assistance. Additional 14 stations/sub-stations would be required to cover the country with a network of offices providing mainly forest extension and support services to the local population and, probably, acting as focal point for land use planning at village level. In addition to forest stations, sub-stations or field offices are foreseen in large administrative circles, which are administratively under the forest station.

Although the FD staff situation has considerably improved during the past year, there is still a staff deficiency in terms of quantity and qualification. Out of actual staff number of 113 without auxiliary staff, there are only 8 forestry degree holders and just some 12 forest technicians holding diploma certificates. The most serious gap of available staff exists at forest station and field level. There, staff is needed with a technical knowledge in key disciplines such as social forestry, agroforestry, economy and socio-economy (primarily at station level) and sufficient experience in participatory learning and action (at field level).

The total staff demand was estimated based on the assumptions that the GFMC is implemented country-wide and that FD's administrative structure is further streamlined by putting afforestation under divisional management, abolishing the beekeeping section, up-grading training and adaptive research, merging the Extension Unit with the CF Unit, and by transferring management responsibilities to local communities represented by forest committees.

Forestry Departments personnel status and long term demand and the training demand and requirement are presented in Annex 2, 3 and 4.

CHAPTER 4. CHANGE FACILITATION

Factors that are required for improvement of forest and wildlife administration:

4.1. Forestry sector

Capacity building (training) for forestry staff and communities:

- Infrastructure development in terms of adequate office space for administration forestry headquarters.
- Mobility (transport facilities with adequate fuel supplies)
- Road worth vehicles for Divisional Forestry and Station Officers
- Motor bicycles for Community Forest (CF) and implementation Officers (I/As)
- Forest extension communication materials
- Video equipment, Radio cassette player cassettes with batteries
- Staff scheme of service against salary structure for Forestry officers down to the level of Scouts
- School of Forestry Kafuta to be affiliated with Gambia College for award of diploma certificate
- Plant Genetic Resource (PGR) conservation for gene banks
- Seed and other plant gene bank
- Field gene bank (Arboretum and Botanic gardens)

4.2. Policy and institutional arrangements required to address the following issues:

- Mechanise farming on marginal lands with expansive horticulture within virgin natural forests should be checked
- Land tenure arrangement and the utilisation of forest resources on these land
- Illicit forest resource exploitation
- Forest department exploitation permits
- Communities commercial and domestic use of forest resource for so called socio-economic improvement through unsustainable resource exploitations
- Other institutions for road building and residential expansions
- Low Government subvention for forest management.
- The department low revenue should not be based on the allocation of its subvention for it is working more on conservation rather than on commercialisation of the threatened resources
- Marginal lands/Watershed destruction
- Farming, Residential, Grazing, Mining, etc.
- River bank vegetation removal and erosion
- Construction material and fuelwood collection, Farming

4.3. Changes required within the forestry sector and outside the forestry sector

Policy and institutional change:

- Scheme of service for staff and present salary structure to be improved for all staff
- Training for staff at all levels particularly for higher professional OND, HND, B.Sc. MSc, and PHD for forestry staff
- Workshops, field days exchange visits etc. for communities
- Kafuta school offer Diploma course to staff and other interested persons
- More empowerment to local communities to control bush fires and illicit exploitation
- No permits to use marginal lands for residential purposes or for cultivation
- Forest marine patrol unit instituted under the Community Forestry or Natural forest unit for beach patrol to avoid vegetation destruction

4.4. Investment requirements in forestry

Timber supplies for construction purposes and factories required

- Pulp and paper mill/factory or factory for paper recycling
- Juice production for beverages
- Mangoes
- Baobab
- Tamarindus
- etc.

Private woodlots and plantation establish with the following species:

- Cashew
- Gmelina
- Oilpalm
- Coconut
- etc.

4.5. Technological Changes

- Manual to computerisation in both administration and research work
- Modern equipment for wood utilisation (sawmills, wood stoves etc.)
- A scientific method of international standard for forest gene conservation
- Mobility in terms of transport system, for example motorbikes could replace pedal bicycle for extension staff at implementation Areas (IAS)

4.6. Feasibility of the change

Training with emphasis on the following:

- Staff on professional forestry, conservation technologies and practice at BSC, MSc, Diploma and certificate levels
- Communities on forestry activities

- Community Forestry approaches and implementation procedures
- Emphasising on natural forest management with less public investment on forest monoculture
- Divorce from traditional forestry (foresters as policemen and communities as thieves) to communities
- Forest harvesting systems must follow silvicultural treatment methods and systems

4.7. Role and responsibilities

Government:

- Overall Co-ordinator of all Forest User Group (FUG)
- Provide the enabling environment for sustainable forest management by use of sound forest instrument (Policy and Legislation)
For sustainable forest management the Government has to find ways to allocate funds for Forestry and also allocate from its budget.

Private sector:

- Invest in forest enterprises such as plantation establishment of short rotation, pulp production and saw mills to convert dead wood for construction and furniture industry to satisfy local demand
- Provide funds for forest nurseries for plantation development to provide future timber and food fruit needs for their industries

NGOs;

- Support the communities by providing funds for their endeavour forest management
- Liase with government to take up other forest management interventions for which they have the expertise and the technical know how.

Civil society:

- To be involved in community forest management
- To protect the forest from annual bush fires and wanton destruction.

Donor agencies:

- Donors cannot be counted on continuous funding.
- To provide technical assistance for on the job training and facilitate technological transfers.

ANNEXES

Annex 1. The Population of The Gambia (1901 – 2027).

Year	Population	Average Annual Growth rate (%)	Total Increase
1901	90,404	-	-
1911	196,101	4.9	105,697
1921	210,611	3.7	14,510
1931	199,520	-0.6	- 11,091
1963	315,486	1.4	115,966
1973	493,499	4.6	178,013
1983	687,817	3.4	194,318
1993	1,038,145	4.2	350,328
2000	1,300,000	4.2	261,855
2010	2,076,290	4.2	776,290
2027	4,152,580	4.2	2,076,290

Source: Population/Social Dimensions of Desertification (Mr.Nyabally)

Annex 2. Personnel status and long-term demand

Level	No	Forest officer (M.Sc/BSc)			Senior forest ranger (Diploma)			Forest ranger/guard (Kafuta Forest Training Certificate)			Forest scout (in service training)			Total staff demand
		total demand	actual	needed	total demand	actual	needed	total demand	actual	needed	total demand	actual	needed	
Directorate	1	5	4	1	2	2	-	-	-	-	-	-	-	7
Training/research	1		-	1	1	1	-	-	-	-	-	-	-	2
Divisional forest office	5	7	4	3	3	3	-	-	-	-	-	-	-	10
Station/sub-station/field office	25	-	-	-	25	10	15	25	20	5	-	-	-	50
Field/village (implementation area)	75	-	-	-	-	-	-	75	17	58	0	52	0	75
Total		13	8	5	31	16	15	100	37	63	0	52	0	144

Annex 3. FD training demands and costs

Qualification	No. of persons	Training duration (month)	Total training person month
MSc. Tropical Forestry/Social Forestry (Europe, USA)	2	48	96
BSc. Tropical Forestry Social Forestry (Africa, Asia)	3	36	108
Diploma Certificate in Forestry/Agroforestry (Africa)	15	24	360
In-country training (Kafuta Forestry Training Certificate)	63	12	756

Annex 4. Organisational Chart of the Forestry Department

Forestry Department - Organization Chart

