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Government of Kiribati National Report

To the

United Nations Convention to Combat Desertification

Prepared by the Environment and Conservation Division

Ministry of Environment and Social Development

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Introduction.

One of the most oppressive and catastrophic experiences is to be trapped in a desert for some time without water and cover. The search for water to quench a lingering thirst can be a misery. Water obviously is a necessity for life. Water in its various forms is an essential media for transport, trade, and communication apart from other uses such as for drinking, cooking, bathing, washing, gardening, fire fighting, and manufacturing processes. The quality as well as the adequacy of water has a significant impact on the level of sanitation, personal hygiene and economic status of a locality. Water shortage in drought stricken areas is the root cause of poor sanitation and consequently the occurrence of water-borne diseases and epidemics.

Water is required for the growth of trees and plants and for irrigation schemes where water is inadequate. A great many industrial processes depend on water for their successful operation. Water is a resource that must be made available in a sustainable manner in order to make other resources sustainable. Owing to its universal importance water has become the focus of many World Summits.

Plants, tree, and other forms of vegetation constitute the natural ground cover besides providing material needs such as food, medicine, fuel wood, timber, handicrafts, dyes and ceremonial items. They serve the purpose of being wind barriers, provide shade and are natural nesting places for birds, habitat for insects, and other lower forms of life. A considerable number of ecosystems exist on trees and plants. The destruction of trees in forests in many parts of the world as a result of logging creates a worldwide problem that is currently addressed through a global effort. Logging as well as extended agricultural schemes are known causes of deforestation and desertification. In response to this problem much vigilant effort has been placed in the direction of revitalizing devastated and suppressed forests. Conscious of their enormous value to the environment, forests are targeted for restoration and rehabilitation programmes.

It is generally believed that there can be no progressive economic development without the existence of natural resources conservation. An important ingredient of conserving biodiversity is embedded in the maintenance of diverse cultures, beliefs, races, social organizations, knowledge and skills.

As party to the United Nations Convention to Combat Desertification, Kiribati is obliged to submit a national report on the implementation of the convention. The report will, in essence, be focused on the national implementation strategies, action plans, legislative instrument, and achievements relative to the convention. The national plan of implementing the convention will be subjected to review by the Committee. It is envisaged that the output of the review will culminate in the recommendations put forward for further national commitments to strengthen activities and actions to fulfill the objectives of the Convention. Kiribati is looking forward to a more realistic and efficient implementation of the convention in future with the realization for a more streamlined planned activities derived from a comprehensive action plan.

Kiribati anticipates active participation in the upcoming Johannesburg conference in which a multitude of issues on desertification will be discussed in great detail. A better understanding of the roles each participating country should undertake towards the implementation of a global strife against desertification will be achieved during the conference.

The National Report to the United Nations Convention To Combat Desertification.

E x e c u t i v e S u m m a r y.

The National Setting.

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Geography, Location and Topography.

The island nation of Kiribati is comprised of three main groups of coral atolls and islands, namely the Gilbert Islands, the Phoenix Islands and the Line Islands.

The three groups of islands are located within the area where the Equator crosses the International Date Line and between Longitude 170 degrees East and 150 degrees West.

The total land area is 823 square Kilometres scattered across 13 million square Kilometres of the Pacific Ocean.

The geographical position of Kiribati somewhat determines the climatic characteristics. The equatorial tropical climate characterized by hot and dry spells with ambient temperatures ranging between 22 degrees and 36 degrees Celsius almost all the year round prevails. The cool breezes originating from the prevailing South Easterly winds maintain a pleasant tropical atmosphere .

Natural Resources.

The poor and infertile nature of the soil due to its alkalinity, porosity and lack of essential elements makes it unable to support plant life. Consequently it is incapable of supporting intensive agricultural activities. Notwithstanding the aforementioned reasons, with the adoption of the integrated traditional and modern methods of agriculture, land natural resources are considerably improved.

The principal source of fresh water in Kiribati is underground water existing in the form of a convex lens floating above salt water. Due to its limitation, fresh water has to be conserved and supplemented by stored rainwater under the worst circumstances.

Opening more sanitary wells to increase the yield for individual household and communal use is a process of developing the supply of underground fresh water. Urban water resources are undergoing rapid improvement through an improved water, sanitation and electricity project (SAPHE) now in operation. Rainwater harvesting and conservation in tanks is part of the same project to improve the water supply system for urban communities.

Coastal resources are vulnerable to natural and human induced activities. It follows that they must be protected so that they continue to provide for our daily needs. The abundance of coastal resources enables island populations to harvest seafoods such as fish, crabs, shellfish, and prawns. Coastal areas provide much needed materials for example, sand, aggregates, gravel for construction purposes, and white sandy beaches for recreation. Coastal zones are important as spawning and nursery areas for fish and other marine micro-organisms.

Vegetation is generally composed of a variety of trees, plants and undergrowth to constantly supply and satisfy the people's needs in terms of food, firewood, building materials, medicine, dye, and compost materials for gardening.

The vast area of ocean surrounding Kiribati is an indication of the rich marine resources that are available for use by the population. With the proper use of available traditional methods of harvesting these resources, there is no doubt that the resources are abundant. In fact a large constituent of an I-Kiribati's diet is from the sea. Life of an atoll dweller is partly dependent on the sea's wealth. Marine resources can be lasting and sustainable only if efforts were made to conserve and use them in a sustainable fashion.

A large part of Kiribati rural population is leading a subsistence way of life, whereas in the urban areas, a mixture of subsistence and cash economy is the case.

Vegetation and Biodiversity Resources.

Forests.

Forests importance in relation to ecological, social, cultural and commercial part of atoll life is undoubtedly recognized. Apart from mangrove forests in coastal areas and lowland, salt-water swamps, forests are not common due to the cultural attitude of landowners to clear their land plots of wild growing bushes and useless trees and plants. Bushes exist in neglected lands as the owners are temporarily residing on another island for several years. In places where land is owned by the state, forests exist such as the Pisonia forest on Washington Island and others in the uninhabited Phoenix Islands. In spite of their importance in providing timber, fuel wood, medicine, and food, forest are regarded as the sign of land wastage or under utilization. Every piece of land is utilized to grow fruit bearing trees particularly the coconut trees, pandanus of screw pine, breadfruit, the native fig and the giant taro.

One way of conserving biodiversity is by implementing or establishing conservation area projects. Conservation areas allow marine as well as terrestrial trees and plants to grow undisturbed by human destructive activities. Conservation areas have been established in North Tarawa and Kiritimati as a result of a long SPREP conservation area project. The underlying concept for conservation areas besides conserving biodiversity is to offer training of local communities in conserving natural resources.

Marine Resources.

The vast area of ocean has a corresponding influence on the great diversity of marine resources. Naturally a high proportion of the I-Kiribati protein diet is derived from the sea. The great diversity of marine resources is derived from the nation's vast exclusive economic zone.

Marine resources have an array of uses ranging from providing protein diet to providing items for trade, recreation and ceremonies. Of the total Gross Domestic Product (GDP) marine products account for 14 per cent.

Game fishing for bone fish (Albula vulpes), and for other deep sea fishes such as yellow fin, skipjack tuna, sail fish, sword fish, yahoo, and others are possible in the islands for tourists and local enthusiasts. The traditional value of turtles in connection with ceremonial feasts makes them severely threatened. Aquarium fish export is a recent development producing great national revenue earnings. Sea cucumbers and seaweed are among the marketable marine resources produced. The danger in view of over exploitation of the marine resources is a matter that must be guarded against for the national interest. As a counteracting measure, enhancement regime and initiatives can be looked at in all possibilities and appropriateness.

Economy.

Disregarding the infertile soil of atolls, survival has been maintained through the traditional agricultural and fishing knowledge and experiences. Whilst agriculture provides the mainstay of island people, marine resources constitute a great deal in supplementing the natural diet. Agricultural products contribute to a certain extent towards the supply of marketable commodities as in the way of handicrafts. The disadvantages that can be seen are the isolation and great distances of the country from world markets. Nevertheless, the country is involved to some degree in international market activity. Trade in locally produced items for example, handicrafts, copra, and marine products is taking place.

Capacity, Education and Training.

Developing the national capacity in the area of environmental improvement needs priority consideration in the light of personnel skill, institutional, legal, financial, economic and social strengthening and upgrading. Kiribati acknowledges the regional endeavour to focus developmental processes on building capacity of Pacific nations in all areas of environmental concern.

National Position to Combat Land Degradation (Desertification)

Taking into consideration the national vulnerability by external forces namely, strong winds, floods, fire, drought, it is in the national interest to adopt a regional or international conventions on desertification. An immediate step to expedite the process is to formulate a national workable and practicable plan. Land is a resource that must be protected from degradation and deterioration.

Water is a resource that is most essential for life maintenance. Its adequacy and quantity are critical and foremost in the consideration of future natural disasters. Water supply improvement programmes are considered essential components for counteracting the effects of drought.

The establishment of a biodiversity section within the Environment and Conservation Division.

Biodiversity conservation is further underpinned or supported by the creation of conservation areas as in Naa North Tarawa, and Cook islet in Kiritimati. Forests in a way, constitute an area for conservation of natural resources especially trees, plants and forest ecosystems.

The overall future national obligation is in the formulation of a national action plan to combat desertification.

Land Evaluation and Appraisal.

Land use management can be adequately handled by the Land Management Division of the Ministry of Home Affairs and Rural Development. Recent upgrading of the Division will enable it to perform proficient tasks related to land evaluation. Services in the field of Geographical information system(GIS) and satellite mapping is being improved in parallel with staff training.

Strategies and Priorities Established Within the Framework of Sustainable Development Plans and Policies.

The national strategic plan lists a number of strategies to be implemented in order to achieve sustainable development. Strategies are listed as follows: -

- Adopt an integrated approach for environmental planning.
- Submit proposed policies and proposed developments to EIA
- Introduce a comprehensive framework for national environmental laws.
- Institute resource pricing in national accounts
- Review and upgrade the state of environmental education
- Preserve and apply traditional knowledge and management systems.
- Improve management of waste management.
- Control of hazardous wastes
- Control of marine pollution
- Commitment to international pollution control
- Population policy
- Planned urbanization.

The above strategies are further strengthened by devising priorities as listed : -

- To establish government organization to coordinate activities and initiatives aimed at achieving sustainable development.

- Expanding and strengthening legislative framework including enforcement policies.

- Developing institutional arrangements and methods of approach. An integrated approach has been adopted in planning and formulation of strategies.

- Reviewing the status of environmental education in respect of child and adult education.

- Attaining an integrated approach in all nationally and regionally implemented projects.

- Integration of traditional with modern methods and skills in the project implementation processes.

- Protection against external influences.

- Inclusion of economic planning in national strategies.

- Land use management to be upgraded to meet the need for implementation of plan

- Monitoring and assessment of the progress of implementation at various stages of the projects development.

- Assessing the effect of drought and to counteract them at a national, and regional level.

- Financial support to be ascertained through possible channels both local and overseas.

- Establishment and use of indicators to monitor the progress of projects.

- Provision of research programmes in respect of projects improvement.

In addition, each Government ministry has a separate development plan consisting of strategies, objectives, inputs, expected outputs, implementation policies, capacity building, finance, data collection and processing. From all ministries' plans, a national strategic plan is compiled by the Economic Planning Division of the Ministry of Finance and Economic Planning.

Plans and strategies for the Ministry of Environment and Social Development and in particular the Environment Division, are translated into programmes that will consequently achieve the desired objectives. The implementation of strategies is carried out in a integrated approach involving civil, and private sectors.

2.0. The National Setting

2.1. Location and Geography

Kiribati is composed of small islands located between Longitude 170 degrees East and 150 degrees West in the Central Pacific Ocean, on either side of the Equator at the intersection of the International Dateline and the Equator.

The three groups of islands namely the Gilberts, the Line and the Phoenix are either coral atolls or coral islands with the exception of Banaba which is a raised or elevated lime stone. Of the 33 islands comprising the Republic of Kiribati only 18 are inhabited. Kiribati became an independent republic in 1979. The Maneaba ni Maungatabu is the law-making body (Legislature) while the Cabinet is the executive instrument.

The Gilbert Group which is comprised of 17 islands has a total land area of 286 square Kilometres. Tarawa an atoll in this group is where the seat of government, the port of entry, and the international airport are located.

The 8 islands and atolls constitute the Phoenix Group. Only one of the islands (Kanton) is inhabited by government employees engaged in providing administrative and essential services. The island has a deep natural harbour and airport that was once used for international air traffic.

The Line Islands consists of a total of 8 islands and atolls covering an area of 497 square Kilometres. Kiritimati with a land area of 384.5 square Kilometres, believed to be the largest atoll in the world is in this group.

Whilst Banaba (Ocean Island) rises some 78 metres above sea level, the rest of the islands are not more than 3 metres above sea level.

Despite the fact that the country has a small total landmass of 823 square Kilometres, within an Ocean area of 13 million square Kilometres, Kiribati is naturally rich in marine resources principally pelagic fisheries.

The national capital Bairiki is located on Tarawa atoll. Betio is the port of entry while Bonriki is the international airport.

The population according to 2000 census is 84,494. The life expectancy at birth for males is 58.5 years while for females it is 64.7. The population movement is characterized by internal migration flows to the Line Islands (after the established resettlement scheme) and South Tarawa.

Kiribati population has a very young age structure. The current rate of annual population growth is 2.5 per cent per year. (Kiribati Population Profile1998)


World War 2 relics at Butaritari.(photo: John)

2.2. Climate and Weather.

Due to its geographical location Kiribati has a predominantly dry equatorial climatic conditions characterized by a hot dry climate with prevailing South Easterly winds most of the year, with average temperatures varying between 22° C and37°C.

Rainfall differs from year to year and from island to island. The drier Southern islands have an average yearly rainfall of 1000 mm while that of the Northern part is 3000mm(see Appendix 2). The Phoenix Group has an average of 2000mm while the Line Islands experiences an annual average of 4000mm. Part of the Line Islands, Teraina has a comparatively high annual rainfall of 4000mm. The wetter part of the year that is June to November is marked by the North Westerly winds virtually accompanied by frequent heavy showers. The dry season extends from December to June characterized by prevailing South Easterly winds. Low temperatures are experienced during heavy downpours accompanied by strong winds over long periods.

Prolonged drought periods were encountered in 1988to early 1989 and followed by another in 1998extending into mid 1999 and resulting in the loss of many valuable food crops including coconuts (*Cocos nucifera*) and breadfruits (*artocarpus species*).

2.3. Natural Resources. (Geological, Geomorphologic and Soil description)

2.3.1 Soil Resources.

Like other coral atolls and islands, the nature of the soil is derived from limestone which has been formed as a result of coral formation over thousands of years. It is obvious that the nature of the soil is unmistakably alkaline and therefore it will not support the growth of certain plants and trees. The topsoil which is composed of decaying or composted organic matter mainly decaying leaves and plant materials is thinly spread over most of the area within forest regions and other areas that have been covered with wild growing bushes. Economically and environmentally sustainable agriculture recommends that farmers improve their soil condition by protecting it from surface erosion and by burying organic refuse instead of burning it.

Due to their ability to withstand the harsh atoll conditions the predominant plants species that can survive are coconuts (Cocos nucifera), pandanus or screw pine (Pandanus tectorius), salt bush (Scaevola sericea), and other tolerant indigenous plants and trees. The knowledge of composting organic matter for use in enriching the soil has contributed greatly towards improvement of agricultural products.

Coastal erosion due to sea level rise (photo: ECD)

2.3.2. Water Resources.

2.3.2.1. Underground Water

Fresh water resources exist underground as water lenses floating on seawater derived from the infiltration of rainwater into the water table below the ground. The lens resembles the appearance of a convex lens which is thickest at the center and thinnest on the sides facing the ocean or lagoon throughout the length of the atoll or island (see Figure 1.). The lens is formed where the width of the island is sufficiently wide as to reduce the outward flow of the accumulated underground lens. The fresh water lenses in low coral atoll and islands are extremely vulnerable to occasional environmental influences (Falkland 2000)

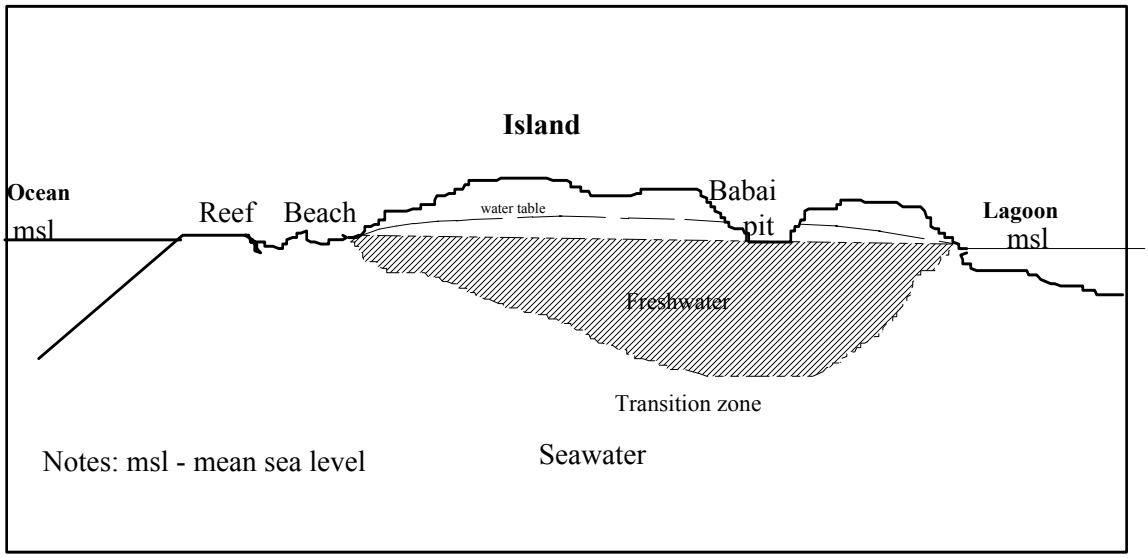

Fig. 1. Typical Cross-Section of Freshwater Lens on a Coral Island
(Source: Ministry of Works and Energy)

Ground water is the principal source of fresh water in invariably all coral atolls and islands including those that comprise the Republic of Kiribati. Urban or South Tarawa water supply originates from sanitary wells located in water reserve areas with restricted use and access in Bonriki and Buota villages. Well water is pumped from wells and conveyed through a system of pipes to consumers. Water usage is chargeable so that revenue is used for maintenance and upgrading. Chlorination without preliminary treatment of urban water supply is done at the source.

Water for rural areas is derived in most cases from wells sunk to tap underground fresh water lens and drawn by containers tied to a string. The salinity of most drinking wells is within the range of 100- 150 parts per million (mgs/l) of Nacl. Underground water of higher salinity can be tolerated by rural communities in times of drought.

Well water is susceptible to access of impurities originating from underlying rocks. Impurities may include or contain hardening substances making it undesirable for washing and cooking as it causes ‘scaling’ in cooking pots resulting from deposits of lime. Hard water does not produce good lather with soap. Well water is normally polluted and contaminated by seepage from nearby rubbish heaps, piggeries, latrines and other sources. Laboratory test results commonly

reveal bacterial and viral contamination including worm cysts and ova. The bacterial standard for rural water supply is usually exceeded in most of the samples tested. The coliform total count is usually within the vicinity of 300 per 100 millilitres of the sample.(300/100mL). To render well water safe, sterilization is applied using chlorine in the form of calcium hypochlorites. This chemical sterilization is done when there is a threat of a water-borne disease epidemic. Boiling of water is a physical sterilizing method that is recommended and done in the homes. Municipal or urban water supply is sometimes sterilized using chlorine gas via chlorine applicators that inject appropriate dosage. Adequately chlorinated water should contain approved quantity of residual chlorine at the consumers' point of intake.

A national Water Master Plan covering the period of ten years (1995 to 2004) identifies inter alia, key problems existing in the water sector as well as identifying a variety of legislative and institutional transition in connection with the improvement of water supply in the Republic.


Unprotected well fitted with hand pump (photo: Mark)

2.3.2.2 Stored Rainwater.

Stored rainwater is water supply obtained by means of catching rain on impervious roofs, draining it in gutters and collecting it in tanks or large containers. Water tanks manufactured using different technologies have been used for rainwater storage.

The importance of conserving rainwater has been illustrated and substantiated by the enactment of regulations whereby all houses constructed must have rainwater collection and storage systems. Rainwater is comparatively 'soft' as it does not contain water-hardening salts (Calcium and Magnesium carbonates and sulphates) and therefore gives good lather with soap when used for washing.

The construction of reinforced concrete rainwater tanks is a significant component of water supply improvement projects on outer islands. Although both hand dug well improvement and rainwater storage are promoted simultaneously on outer islands rainwater catchment systems are not very promising due to the high cost of materials involved. Installing water reticulation systems operated by photovoltaic cells for villages is considerably alleviating water problems in rural areas.

The Sanitation Public Health and Environment Project for South Tarawa is overwhelmingly concerned with the improvement of the water supply, garbage disposal and sewage disposal for urban dwellers. The project is funded by government but implemented by overseas contract companies. At the completion of the project, much improvement is expected to environmental situation in Kiribati. Being slightly acidic, rainwater has some limitations concerning its domestic uses. Locally produced toddy when mixed with rainwater has a slightly objectionable taste.

2.3.3.3. Desalination of Sea water.

Desalination plants to supplement water supply in urban areas had been installed in places close to the sea along the shores. Notwithstanding their high running costs, they are considered useful in increasing the quantity of fresh water supply which is in great demand to supply the need of urban populations. Where rainfall is considerably low, and water shortage is experienced, desalination plants are installed to ameliorate the situation. Seawater desalination is considered a supplementary source of water supply despite the high cost involved in the installation and maintenance. The disadvantage related to the process is the apparent increase in the salt content of seawater. Presumably the operation will have to undergo assessment to determine its sustainability. Studies are being undertaken to verify the belief that desalination plants are extracting underground water instead of seawater causing depletion of freshwater lens in areas where the desalination plants are located.

2.3.3.Coastal Resources.

The coastal areas of Kiribati are characterized by white sandy beaches, reef flats, reef patches, lagoons, mangrove forests, extensive reef mud flats and sea grass beds. These areas contain a variety of habitats, and numerous eco systems and marine organisms. Coastal areas are venues of activities including fishing, recreation, trade and communication. A significant use of coastal areas is concerned with the provision of building materials, (mangrove swamps) and handicrafts (shells and coastal bushes). Harvesting of marine produce from mudflats and fringing reef (such as shellfish) are of significant importance as regards subsistence activities.

Soft white sandy beaches are popular play areas for children. The importance of mangrove forests to marine organisms and coastal populace has been widely accepted. As a safeguard against over exploiting mangroves, conservation programmes are in progress in the country.

With the constant mining of beach sand, gravel and other aggregates for construction purposes the coastal areas are immensely threatened. In order to mitigate the situation, preventative measures are in place with the help of legislative provisions and the establishment of environmental inspection processes. A coastal zone management plan is prepared by the Climate Change study team.

Coastal erosion is brought about by the action of the tide, waves and near shore currents. Human induced coastal erosion is associated with the building of sea walls. Mining of sand and aggregates for construction purposes is a common hazardous activity creating coastal erosion in many areas along the shoreline. Pollution of coastal regions by land-based sources requires priority actions. Preventative measures should be mounted against land surface drainage, seepage from latrines, piggeries, and discharges from sewerage outfalls. Chemical pollution from agricultural plots must be curtailed. Recent surveys reveal that likely pollution may be caused by persistent organic pollutants (POPs) which have been found to exist at various places on Tarawa and Kiritimati. Pollution by these chemicals poses considerable threat to the environment as they do not readily disintegrate under natural conditions.

2.3.4. 1. Forests

Forests are of ecological, social, cultural and commercial importance (SPREP 1999).
The restricted land area and the land tenure complexity are some of the hindrances to forest creation. Most of the land is privately owned apart from government owned or government leased lands. As such, privately owned or customary lands are densely planted with coconut trees, pandanus, native fig, breadfruits and other essential tree crops. Except for a few uninhabited islands in the Northern Line Islands, and the Phoenix Group there can be found “te buka”(Pisonia grandis) and other wild growing trees. There are no natural forest of major significance in terms of size, age and biological diversity. Forests in the Lines and Phoenix are becoming resting and nesting places for long distance flying migratory birds all the year round.

A reasonable use of the forest is a natural habitat of birds, insects, worms and many organisms that find food in the forests. Forests provide building materials, food, fuel wood, medicinal ingredients, and ceremonial items. A rainforest, if it could be classified as such exists in Teraina, in the Line Islands. A major portion of this forest is occupied by te buka and it is known as te buka forest. Due to high rainfall in this particular island, there is a possibility of maintaining the existing “ buka” forest and expanding it by growing other indigenous trees.
A common natural forest in Kiribati is the mangrove forest existing in some coastal and wetland areas especially those located adjacent to the sea particularly along the coasts.

Mangrove forests also exist on muddy shores and coastal beaches where water is calm and in areas that are protected from waves and strong currents. Several types of the mangroves are found in Kiribatil namely the white mangroves (Sonneratio alba), the tongo buangui (Bruguiera gymnorhiza), te aitoa (Lumnitzera littores), and the red mangrove (Rhizophora stylosa).

The introduction of exotic trees will, undoubtedly add to the variety of forest trees and the development of terrestrial resources. It is envisaged that people’s knowledge on the role of forests in sustaining life will be promoted as a result of community awareness programme. Planning and implementing forest management is a high priority area for a national action.

Technical consultation on sustainable development in agriculture, forestry and fisheries was organized by FAO which Kiribati delegates attended. The consultation dealt broadly with human and institutional capacity building, research information, technological and infrastructure requirements. Assistance in these areas by the more advanced countries in terms of technology transfer, financial and human resources can greatly improve measures for the sustainability of these sectors.

Kiribati ratifies the convention on Biological Diversity, and the Cartagena Protocol on Biodiversity. The National Biodiversity Strategy Team has prepared a National Biodiversity Strategic Plan 2000 which has been endorsed by Cabinet.

Biodiversity around houses(photo: Mark)

2.3.4.2. Conservation Areas.

The creation of the Ministry of Environment and Social Development has culminated in a number of environmental development projects. One of these is the designation of conservation areas within the republic.

Conservation area programme is a significant portion or essential component of the South Pacific Biodiversity Conservation Programme (SPBCP).
Having the aim of protecting biodiversity and conservation of natural resources, conservation areas have accordingly been established in Naa (North Tarawa) and the Cook islet, an uninhabited islet in Kiritimati.

The fundamental concept underlying the implementation of conservation areas is to make people aware of the need to conserve natural resources in a sustainable manner. Funding for the project is provided by the South Pacific Regional Environment Programme (SPREP).

The Conservation Support Officer (CASO) has been appointed to oversee the implementation of the project. It is anticipated that additional conservation areas will be designated within the country in future. A natural resource management and protection project will no doubt provide a comprehensive and holistic approach to natural resource conservation and environmental protection.

Conservation areas are selected on account of their ecological uniqueness and their suitability in relation to their geographical standing and other considerations. There is considerable evidence to suggest that local councils should undertake management of conservation areas for several reasons. This will alleviate the problem connected with supervisory trips by responsible personnel.

2.3.4.3.Marine resources.

By virtue of Kiribati's extensive exclusive economic zone (EEZ) of 3.5 square Kilometres, marine resources are abundant and of great diversity. Fisheries resources provide not only protein in the diet but also source of income, recreation, and security to the local populace. The marine sector contributes about 14% of the total Gross Domestic Product (GDP) (Tekinaiti 2000). Seafoods provide about a quarter of the animal protein in the natural diet of an I-Kiribati.

Marine resources have a diversity of uses. Game fishing for bonefish in Kiritimati attracts large numbers of tourist from Asia, Europe, and America. Fishing licences by foreign fishing companies provide substantial revenue for the country including fines for illegal fishing in Kiribati's exclusive economic zone. The export of aquarium fishes is a new form of trade that is becoming prosperous and providing attractive income to the country. Pelagic species of fish such as skipjack tuna, yellow fin tuna, big-eye scad, rainbow runner are among the commercially important species known. Turtles, lobsters, prawns and other crustaceans and shellfish are of great demand for hotel catering and traditional feasts. Shellfish such as arc shell, trochus and kauri shells are important for handicraft production and decorations.

Turtles and rays are found in offshore waters including lagoons and ocean. They are caught and used as food during feasts and other ceremonial occasions. There is constant demand for turtle shells for use as souvenirs and for the production of home decorative articles.

Shellfish meat is part of the daily diet of the island populations. Shellfish is collected at low tide on mud flats and fringing reefs. The culture of seaweed has become one of the leading occupations of people in areas where this type of fund generating activity is profitable. Seaweed is grown in undisturbed lagoon water for export to several countries in Asia and Europe. Aquarium fish collection in deep waters is attracting local businessmen as a popular trade item with a potential advancement. Marine fishes are sometimes causing ciguatera fish poisoning. Identified species of fish that cause ciguatera poisoning are mangrove red snapper (Lutjanus argentimaculatus), barracuda (Sphyraena barracuda), some types of surgeonfishes, and snappers. Scombroid fish poisoning is occasionally encountered but it is not considered a major problem.

At present, owing to over harvesting of marine resources by the local communities, noticeable decline in the number of species is occurring. It can be argued that although marine resources are renewable they are not infinite and therefore they must be economically managed. Steps to safeguard the riches of the ocean must be taken as in the case of controlling harvesting of fish by means of trawling and other destructive commercial fishing methods. Catching undersize fish and during spawning runs must be discouraged or declared illegal.

Preventing the destruction of marine resources including coral reefs as the topic in community awareness programmes has been recommended. Pollution, increase in seawater temperatures, and the use of destructive fishing methods are the main causes of coral damage. Coral bleaching has gradually taken place in some areas due to increase in seawater temperatures and pollution. The causes are in the process of being further investigated.

Marine resources enhancement by means of aquaculture has been initiated by the Fisheries Division of the Ministry of Natural Resources Development. Marine stock with potential economic status will undergo enhancement process and development. The project will hopefully ensure a stable supply of marine resources as well as developing and improving biodiversity of marine organisms. Eventually the enhancement programme will be extended to all islands in the country after determining the success of the pilot projects undertaken on several islands.

Knowing the benefits of research in some areas, it has been anticipated that research must be pursued in an attempt to expedite data collection and other useful parameters needed to guide decision makers in determining sustainable management of marine resources for future generations.

Building capacity of users of coastal resources is of paramount importance if sustainability of coastal marine supplies were to be achieved. Their knowledge and skill in conserving and sustainably utilizing resources must be developed. In addition their traditional conservation knowledge must be integrated with modern or scientific knowledge.

Kiribati is currently adopting strategic procedures that will ensure the protection of her exclusive economic zone against illegal fishing by foreign fishing companies. Assistance has been offered by developing and developed countries by providing in- kind and financial help. A pronounced example is a patrol boat donated by Australia.

2.4.Economy.

2.4.1. Agriculture.

As previously mentioned Kiribati is among the Pacific countries with poor soils, typical of atolls with limited supply of underground water and hot dry climatic conditions, thereby unable to support intensive agricultural programmes. Deficiency in plant nutrients in the soil is the principal factor that determines the infertility of an atoll soil. Nevertheless, since the main activity of island population is agriculture and fishing, agriculture must not be made stagnant because if allowed to be so, it will inhibit the growth of the country's economy. Despite the poor nature of the soil, the atoll populations persevere under these conditions. This has been possible by innovating activities that will support agriculture programmes using traditional methods of growing indigenous plants and trees to sustain life on atolls. Together with these, modern agricultural methods are being integrated into traditional methods resulting in better crop production and improved agricultural standards. Committed to this task, the Agricultural Division is promoting agriculture sector in various forms ranging from government funded agricultural schemes to individual home agricultural plots.

Although agricultural products are increasingly improved in both quantity and quality, they are just sufficient to cater for home consumption and the local market. One exception is copra which is exported to overseas buyers for processing. With the establishment of a copra mill in Kiribati copra will in future be exported in restricted quantities to selected customers.

Due to her geographical location and distribution, (widely dispersed or isolated) this island nation, bears the disadvantage of being located at a vast distance from industrialized countries, and world market. Kiribati is regarded as one of the least developed countries in terms of economy and trade. Kiribati economy is quite vulnerable and fluctuating. In order to establish a sound financial grounding, government has ventured into overseas investment that will create increased financial returns upon which the national fiscal stability can be assured. Notwithstanding the fact that Kiribati has a narrow range of export, she is vigorously attempting to upgrade the production rate of commodities for trade and consequently improve economic standards. Seaweed, handicrafts, fishing licences, tourism, besides copra are continually developed with the aim of increasing quantities as well as quality.

2.4.2.Forest Sector.

Low rainfall, limited land area and traditional land tenure do not favour the existence of forests of appreciable size. Private land plots are generally cleared of useless shrubs to give space for planting useful trees. Places where forests will eventuate are inhabited islands in the Phoenix Group and areas remote from settlements as in the Line Islands (Teraina). Te " buka" forest comprising of te buka trees(Pisonia grandis) is a classic example. In the Phoenix Group on some of the islands, forests of mixed varieties of local tees grow in great numbers to constitute what can be regarded as forest. Within these forests can be found hermit crabs, land crabs, coconut crabs, rodents, insects of various types and a myriad of other forest inhabiting birds and insects are found.

Forests of this type though comparatively small, serve as a useful habitat of insects, arthropods, and birds. They do in addition provide avenues for the growth of rare trees such as the sea trumpet (Cordia subcordata) and te "itai"which are threatened due to overexploitation for construction purposes.

An agroforestry project implemented by the Foundation for the Peoples of the South Pacific focuses on the rehabilitation and recovery of indigenous trees. The project's assessment and evaluation indicate that it has been a success in terms of the number of local trees that have been obtained from the nursery for replanting . There are plans to promote forestry in future, having realized its importance to the environment and the populace.

2.4.3. Trade

Copra, handicrafts, seaweed, and fish are among the commodities for trade. Owing to the lack of copra processing plant, copra is exported to European and Asian countries for milling. Handicrafts, seaweed and fish find market outlets in Japan and South East Asian countries. Tourism is a new venture which is being promoted in the Line Islands and to a lesser extent in the Gilbert Group. Seaweed farming is comparatively achieving momentum and is one of the most promising on going fund-generating activities. It is entering Asian markets with at a good price. Fish demand is increasing especially in America and Europe. In a frozen state fish is shipped to overseas destinations in great quantities.

The increase in imports of consumer items is in line with the change in lifestyle and modern living standards. Most of the consumer articles are packed or wrapped in plastic or polyethylene wrappers thus increasing the bulk of non-biodegradable material as domestic or commercial waste.

The Ministry of Commerce Industry and Tourism is promoting trade with other countries by identifying export markets for locally produced items. Trading partners are Australia, New Zealand, United Kingdom, Japan and industrialized countries in Asia. (Thaman 1992)

Although ecological consideration must be adopted to ensure the protection of the environment, economic criteria is decisive as far as the activity is concerned. Legislative and economic viability must be looked at in parallel to the sustainable development of the natural environment.

2.5.Capacity, Education and Training.

Capacity development can be afforded through provision of essential equipment, personnel, facilities, knowledge and skill. Building the capacity for combating desertification can be done if need arises during the implementation of the project. An effective element of capacity building is raising public awareness using known approved methods.
Education of youth and children of school age is conveniently done in schools. The task will be better performed with the adoption of an upgraded school curriculum. Exposing school children to environmental knowledge is an investment for future national advancement. Developing environmental awareness in communities including civil and private sectors can do much in encouraging and educating people to manage and protect the natural environment.

A more differentiated and coordinated approach to protecting national environment is a wise paradigm in relation to development. As Kiribati is in the process of improving capacity building framework, elements that are responsive to the initiative are carefully incorporated. The elements will necessarily include public awareness, strengthening technical capacity, stakeholders' full participatory approach, strengthening of institutional parameters, mobilization of human resources, promoting gender equity, upgrade communication links, and strengthening legislative enforcement.

Capacity building is aimed at all community levels and sectors with preference to agriculture, forestry, water supply agencies, rural communities, education, national planning, and NGOs.

Training of personnel involved in the management of environment is an important element in developing the skill and knowledge of personnel and consequently increasing environmental awareness in Kiribati. Training in a variety of ways has taken place with concerned organizations and institutional establishment. Capacity building is an area of particular relevance to any project, so much so that any project is preceded by community awareness raising. This notion is well established in the minds of policy makers and administrators.

2.6.National Position to Combating Land Degradation (Desertification)

Within the desertification convention (UNCCD) desertification means, " land degradation in arid, semi arid, and dry sub humid areas resulting from various factors including climate variations and human activities.

A desert in a local context is viewed as a dry area with few plants widely scattered over the entire area. Tidal mud flats partially enclosed by dry land can be classified as deserts.

Land degradation is the outcome of multifarious elements or factors including climatic change variation, sea level rise and a number of human activities. Human activity through land use change (inclusive of coastal construction) is one of the primary causes of land degradation.

2.7.Overview of the Critical Land Degradation Issues.

Owing to the fact that atoll soil is alkaline in nature, it is incapable of supporting plant growth. Shortage of water and the great depth of the water table from ground surface further exacerbate the problem in that moisture is greatly reduced. Water cannot be used for watering plants in an effort to conserve it. According to the aforementioned reasons, land is deprived of vegetation and hence land degradation is implied. Land erosion caused by surface drainage during heavy rain is worsened by the attitude of people to clear ground cover as a process for clearing land. Prolific community education will be a long-term solution to the problem.

2.8. Improved Management & Technological Alternatives.

2.8.1. Planning and Resource Management (Sustainable Development)

An urgent measure to combat desertification in Kiribati is to improvise plans as a participatory task among different governmental and non-governmental organizations. The national government can assist in providing monetary support. The plan should be focused on the management of intricate framework with which to implement sustainable development and in particular, activities to combat desertification. Immediate actions directed at improving management of programmes related to sustainable development must be performed at a national level.

2.8.2. Alternatives and Improved Implementation Mechanisms.

The improvement of implementation mechanisms can be greatly streamlined and improved keeping in mind the faults and loop holes in the previously defined mechanisms. The success of implementation process depends considerably on the carefully devised and improved strategies and action plans that are subjected to occasional review and amendments. This is of prime importance as attitudes and resources undergo constant change from time to time.

An element of change followed by a parallel assessment, monitoring and review should be an integral part of project implementation process. Traditional and cultural parameters, in particular, beliefs and customs of involved communities should be part of the overall exercise.

2.8.3. Land Evaluation & Appraisal.

Land is a resource, as many resource economists will say. This cannot be denied in Kiribati where land is a cultural identity. Furthermore, land is a source of life maintaining ingredients such as food, building materials, and others. Land provides avenues for agricultural undertakings for subsistence and cash economy. The cultural and economic value of land to an I-Kiribati need not be overemphasized. Land management therefore should be a well organized and maintained sector so that land matters can be settled in the most efficient and satisfactory manner. The Land Management Division of the Ministry of Home Affairs and Rural Development can deal with land issues proficiently as it has undergone development and capacity building. Upgrading of the Land Management Division in the area of urban development is taking place with the assistance of overseas aid. The need for Geographical Information System (GIS) is of the utmost importance.

2.8.4. Water Management.

The scarcity of water necessitates the improvement of water management at a national level. Water in Kiribati, especially in urban areas is a scarce resource and as such it is regarded as precious.

The management of water supply is the responsibility of government that has been delegated to several ministries namely the Ministry of Works and Energy to manage design, planning and

implementation, while the Ministry of Environment looks after water conservation and pollution aspects. Monitoring and quality control becomes the mandate of the Ministry of Health. The coordination of efforts and activities is shouldered by the Ministry of Environment. Minor water related programmes are undertaken by NGOs such as community mobilization, motivation and awareness raising. Water management although is embedded in the government ministries, it is in fact a community oriented responsibility. Providing that public awareness is adequately done,it will be possible to believe that water management can be done by communities. In this way water conservation would be ascertained and done more effectively.

Water supply system for urban Tarawa and Betio is composed of a number of sanitary wells located at the water reserve areas in Buota and Bonriki. Well water is reticulated through a system of underground pipes feeding overhead tanks at designated areas along the island. Water is drawn at various points to consumers at rationed rate. Water at the moment is not chlorinated but consumers are advised to boil water before drinking it. Previously water rate was charged to consumers having their water metered as they draw water through their individual supply line. The original management system was changed over time until the present set up that is being renovated by the SAPHE project now in operation.

The SAPHE project is in the process of renovating the water supply system in addition to upgrading the sewerage system, solid waste disposal and electricity supply for South Tarawa. At the completion of the project, sanitation, water supply and electricity will be greatly improved in various aspects including the infrastructures and maintenance.

As a significant component of the SAPHE project loans are offered to households for the procurement of rainwater tanks and human disposal facilities. In this way water supply in individual homes can be improved considerably both in adequacy and wholesomeness. Excreta disposal systems will definitely be of better design and efficiency thereby creating better sanitary conditions in rural as well as in urban areas.

The Basal Convention is being ratified by Kiribati as well as the London Dumping Convention. The Waigani and Stockholm Conventions are adopted.

3.0 Strategies and Priorities Established within the Framework of Sustainable Development Plans and/ or Policies.

As explicitly mentioned in the National Development Plan of 1992-1995, Kiribati government recognizes the need for sustainable development as a national goal to be achieved in years to come. The national strategic plan signifies that the nation is committed to protect the natural environment against pollution, degradation and environmental damage by external natural forces. The development of environmental conditions will be linked with the mobilization of resources to achieve that national target.

In pursuit of sustainable development, it is pertinent to promulgate strategies, priorities and policies that will guide or steer activities and actions to produce proposed end results.

It is in this context that a number of Nation Environmental Strategies are developed as a integrated programme between the South Pacific Regional Environment Programme and the Kiribati government facilitated through seminars and workshops. The key elements have been

the national environment legislative tool, the conservation of marine resources and the inception of Environmental Impact Assessment. Strategies are formulated to achieve certain objectives. Strategies are desired to address environmental problems encountered in Kiribati. The many facets of strategy implementation are afforded in the initiation of related programmes. In the National Environment Strategy the priority strategies were identified as follows: -

- Adoption of integrated approach to environmental policy and planning.
- Submission of proposed policies, development programmes and projects to Environmental Impact Assessment. (EIA).
- Introduction of a comprehensive framework of national and local environmental law that are socially and culturally acceptable.
- Institution of resource pricing in national accounts and other economic policy for achieving sustainability.
- Review and upgrading of the status of environmental education.
- Preservation and application of traditional knowledge and management systems.
- Improved management and disposal of solid waste and sewage.
- Control of hazardous chemicals.
- Control of marine pollution.
- Commitment to international pollution control.
- Population policy
- Planned urbanization and balanced development.

The National Environment Management Strategy (NEMS) is to be modified and updated every five years. This is to be done in the near future in line with the modification of the National State of the Environment Report (SOE).

3.1. Establishment of a Government Organization to Manage and Coordinate Actions Conducive to Sustainable Development.

Subsequent steps were taken to establish the Ministry of Environment with mandates to coordinate sustainable development undertakings geared at achieving sustainable goals. An Environment Division with established staff under the supervision of an Environmental Coordinator was instituted to manage environmental control programmes.

The elements of sustainable development were identified and implemented as follows: -

- Biodiversity conservation

- Pollution control
- Environmental Impact Assessment
- Climate change and sea level rise.
- Environmental inspection
- Capacity Building for Environmental Management.
- Economic Development .
- Promotion of national health
- Integration of traditional conservation methods to modern methods
- Strengthening of institutional arrangement.
- Widening the scope of legislative instrument.

The success of implementing the strategies depends to a great degree on financial resource that can be committed for the purpose. With bilateral aid much can be done towards reaching the national goals even if it would be a matter of time and resources.

3.2. Biodiversity Conservation.

Biological diversity is preceded by the conservation of biological ecosystems in a way that will not cause extinction, unnecessary loss, damage or wastage. The conservation of biodiversity is fundamental to the success of the development process (Speth 1992). Mainstreaming the activities for conservation of natural resources remains the national obligation to future generations. The biodiversity of Kiribati is severely threatened by human activities and invading external forces attributed to climate change and sea level rise.

Realizing the existence of ecological diversity in relation to land and marine resources, it is of paramount importance that every effort is made to preserve and conserve it. The South Pacific Regional Environment Programme (SPREP) is inducing a specific programme to manage the conservation of biodiversity in the South Pacific Region. (SPBCP). A national project is ongoing having other supporting programmes namely

Within the Environment Division of the Ministry of Environment and Social Development, a biodiversity section exists, handling duties and responsibilities relevant to the conservation of biodiversity. Related to this, two conservation areas have been designated in North Tarawa and Kiritimati Island (Cook Islet.).In addition a Biodiversity Strategy Action Plan for Kiribati was developed in 2000 by the BSAP Steering and Working committees. The implementation of the action plan is underway in the country with the understanding that every member of the community is embroiled in. The successful management of Kiribati natural resources is definitely dependent on local communities' participation. The decisive factor is the support of the national government in specific areas such as finance, human resources, moreover, decision makers'full commitment.

A great deal has been covered in the project's implementation as it has been in operation for a period of approximately a decade.

3.3. Pollution Control.

An efficient pollution control programme is an indication of the desire to maintain a clean and pollution free environment. Eventhough pollution is not necessarily a critical problem in Kiribati; it is on the verge of becoming crucial especially in urbanized areas where the influx of the rural communities is increasing. Land based pollution is created by surface drainage, discharges from latrines, piggeries, refuse tips, chemical industries and manufacturing processes.

A pollution control officer takes on the task of controlling pollution with emphasis on the control of pollution by waste either of organic or chemical nature. Land based pollution is one of the commonest occurrences due to indiscriminate dumping of domestic refuse or uncontrolled tipping of industrial and commercial wastes. Chemical pollution affecting underground and coastal waters is derived from discharges associated with sewerage systems, agricultural and pest control activities. The presence of persistent organic pollutants (POPs) is raising great concern, however identification of polluted sites and subsequent disposal programmes are forthcoming under the auspice of the South Pacific Regional Environment Programme (SPREP). Marine pollution is exceptionally understood as a threat to coastal and ocean ecosystems. Whilst the Pacific Ocean can contain so much pollutant it is undesirable to experience localized pollution in any part of it. Oil spills can however be widely dispersed resulting in a generalized condition producing a global effect.

3.4. Environmental Impact Assessment.

All developments are controlled by an Environmental Impact Assessment process. Their likely effects on environment are assessed so that they will not cause detrimental impact on the environment. Competent EIA officers are always busy evaluating all developments that are currently undertaken. No development can proceed without an EIA recommendations. Environmental Impact Assessment activities are securely supported by the Environment Act and Regulations. Environment Impact Assessment is a development control mechanism that considers many aspects of development principally its related environmental impacts. In this context there is an urgent need to make the staff members mobile so as to institute their much required responsibility. This section must be fully developed in order to cope with pressing need for rapid urban and national developments.

3.5. Climate Change and Sea level Rise.

Global warming of the earth's atmosphere will certainly affect environmentally vulnerable areas. Global warming can have deleterious effect on the terrestrial and marine ecosystems. Since Kiribati is vulnerable to the impacts of climate change, a Climate Change Assessment project (PICCAP) is ongoing coordinated by a local coordinator, and in addition a Climate Change officer has been appointed to carry out the duties inherent in this position. Moreover,

Kiribati is party to the United Nations Framework on Climate Change and has adopted the international agreements such as the Kyoto Protocol. A recent development is the completion of the National Implementation Strategy for Climate Change Assessment Implementation. An Adaptation Plan for Kiribati is being prepared.

3.6. Environmental Inspection.

Environment inspectors are appointed under the Environment Act, with the responsibility of monitoring, auditing and minimizing environmental pollution, illegal dumping of waste, illegal mining of sand and gravel, and any other activities that are likely to cause environmental threat and degradation as stipulated in the Environment Act and Regulations. In order to facilitate the work of environment inspectors, transport must be provided and made available for their use. In addition, essential equipment and monitoring facilities are needed for this type of operation. Training of inspectors in the field of monitoring especially the skill to use monitoring equipment is foremost. Record keeping is part of the overall responsibility of inspectors when there is a need for legal proceedings in court.

3.7. Legislative Strengthening.

The drafting of the Environmental Act and its endorsement followed by enforcement in 2000 paved the way to a better control of environmental issues. The Environmental Regulations further strengthens the actions required to remedy the situations that will harm the environment. Legislation will no doubt substantiate the actions that are conducive to environmental control schedule. The application of law ensures mandatory compliance with strict guidelines to minimize environmental degradation. Other existing laws for example the Public Health Ordinance, the Pharmacy and Poisons Ordinance, can be effectively used in controlling environmental issues.

Other ministries participate in the national effort towards sustainable development and therefore take their share by implementing the core elements. An example is health promotion which is sanctioned by the Ministry of Health. Likewise the economic development element is jointly done by the Ministry of Finance and the Ministry of Commerce, Industry and Tourism.

4.Integrated Approach.

Implementing projects in an integrated manner has many advantages and the success of projects implemented using this approach has been verified in a number of cases. It is therefore a strategy worth pursuing in virtually all projects unless recommended otherwise in certain circumstances. Integration of efforts has always been obtained through creating coordinating or steering committees consisting of representatives of the implementing agencies. The committee's main responsibility is to oversee the implementation of a programme and development project..

5. Reviewing the Adequacy of Institutional Mechanisms and Administrative Controls and Strengthening them as Necessary.

The process will involve the development of specific environmental legislation together with socially acceptable and culturally sensitive penalties for breaches of its provisions. Indirectly it will include the strengthening of awareness raising programmes, data collection and analysis capabilities. Data storage and access to other informations through Internet has to be considered. Institutional mechanisms and implementation framework will be reviewed and improved.

6. Review and Upgrade the Status of Environmental Education.

. Steps have been taken to upgrade the teaching of environmental subjects in schools by reviewing the primary school syllabus. The underlying idea associated with the operation is to offer a more in depth understanding of environmental knowledge. In secondary schools students are given the opportunity to carry out simple research into environmental issues. In a simpler form education is offered to the general public as awareness raising presentation in workshops and seminars. The need for a participatory involvement can be acquired by the involvement of the Ministry of Education, the USP centre and the Ministry of Environment.

7. Preserve and Apply Traditional Knowledge and Management System.

Certain portions of traditional knowledge are applicable or are relevant to the conservation of natural resources. This is conveniently supported by the fact that atoll dwellers have survived on atolls for decades leading normal lives. The traditional conservation skills can possibly be intertwined with modern knowledge to mould an integrated management system. This idea is well entertained in the Capacity Building Project whereby traditional environmental management methods are recorded as part of the research programme. The idea that prevails is that the traditional knowledge can be utilized in future management activities where they are applicable and practicable.

8. Protection Against External Influences that will Threaten the Resource Base.

8.1. Vulnerability Assessment and Coastal Zone Protection.

A National Implementation Strategy (NIS) has been drafted by the Environment and Conservation Division to cover the period 2002-2007. The Implementation Strategy outlines the actions that should be taken in order to alleviate the problems created by climate change and to devise measures that can be instituted to lessen the effects of sea level rise.

One of the many coastal protection strategies is the replanting of shore vegetation. The ability to issue climate change warning and related disaster is an asset worth pursuing.

Kiribati is naturally vulnerable to climate change and sea level rise. The cultural, economic and infrastructural impact of climate change and sea level rise will be felt in future. Water resources, agriculture, foreshore, and fisheries will be appreciably affected.

8.2. Economic Planning.

The Ministry of Finance through its National Economic Planning Office (NEPO) is vested with the duties of economic planning for the country. The scrutnization of national projects whether internally or externally funded is processed here.

Trade development is considered a forerunner of economic development. It includes the improvement of information management and services, for example imports, exports and will also involve developing policies, regulations and agreements.

8.3 Land Use and Land Management.

Land use management is referred to as the core ingredient in an urban development. Determining the use of a plot of land or a particular area is one of the many aspects of any development. All developments are considered in terms of their location, purpose, and their environment impacts. The need to determine land use is critical in densely populated areas such as urban areas. Without land use management, town or city proper layout and proper development cannot be attained resulting in undesirable consequences. Traumatic conditions existing in most illegal squatter settlements are the outcome of unplanned land use.

Land use management is under the control of the staff of the Lands Management Division of the Ministry of Home Affairs and Rural Development. Developments of all sorts must be accompanied by application forms to be filled and submitted to several government ministries for scrutiny and approval. One of these is the Lands Division.

9.The Institutional Measures taken to Implement the Convention.

For the sake of implementing the convention government has the responsibility entrusted on the Ministry of Environment to carry out the function related to fulfilling obligations of Contracting Parties to the United Nations Convention to Combat Desertification (UNCCD). Together with other involved ministries, the coordination of implementation activities can be performed in a more integrated manner. As a means of implementing the convention at a community level, communities are encouraged to take an active role. A community education, training and awareness promotion is an undisputable means of activating potential and interest. The Environment Act and Regulations are conveniently viewed as supportive elements that have important parts to play in the national implementation process.

10. The Participatory Process in Support of the Preparation and Implementation of the National Action Plan and the Partnership Agreement with Developed Country Parties and Other Interested Entities.

Should a need arise in the way of consultations; there are established ways and channels for consultations both locally and overseas. Willingness to help in this regard has been expressed by SPREP, Forum Secretariat, USP and many more in neighbouring countries.

Local experts are available for consultation. Additionally developed countries always provide assistance to the less developed countries in many respects as they have a greater technological capability and resources. The realization that much can be gained through implementing projects in a joint effort, maintains the tendency of all countries to act in partnership. This is an approach to globalization. In response to the need to foster globalization in the various international projects and conventions, Kiribati is committed to the principle of common but differentiated responsibilities.

11. The Measures Taken or Planned within the Framework of the National Action Programme Including Measures to Improve the Economic Environment, to Conserve Natural Resources, to Improve Institutional Organization, to Improve Knowledge of Desertification and, to Monitor and Assess the Effects of Drought.

A series of actions will be taken within the framework of the national action programme. These are:

1. Identification of the government ministry to coordinate the formulation of the national action programme.

2. Formation of the national task force or working committee/ steering committee.

3. Formulation of the action plan including strategies, targets/goals, monitoring mechanisms.

4. Delegation of responsibilities and duties (Terms of reference) to the various organizations during the committee's meeting.

5. Endorsement of action programme by the committee and through a national multi-stakeholders' workshop.

6. Approval of action plan by Cabinet.

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Measures taken to improve the economic environment will include a series of actions to be done at the national level namely:-

- Strengthen and improve natural resources improvement schemes including agriculture. improvements should involve introduction of better fruit bearing species of trees. More valuable plants should be produced in line with a better knowledge of growing local or indigenous trees.

- Promoting and enhancing marine resources by undertaking enhancement programmes for threatened species of marine flora and fauna, in particular turtles, whales sea cucumbers, giant clams and other living marine resources that are harvested for trade.

- Improve health status of the population by providing better health care so as to improve sanitation, infant mortality rate, morbidity rate, life expectancy and other health improvement indicators.

- Improve national fiscal policy.

- Improve trade environment.
- Encourage the integration of traditional skills with modern techniques in the implementation of national projects.

The conservation of natural resources has the following measure to be taken:

- Water resources conservation – fresh water and rainwater.
- Conservation of soil resources – prevent erosion by providing ground cover, and by Replanting of trees in areas which have been deforested. .
- Conserve land resources - Prevent over-harvesting, replacement of lost trees, control of parasites and pests using biological control methods.
- Conserve marine resources – Minimize over exploitation and destruction of marine life habitats (corals)
- Contingency planning – adaptation and preparedness to external natural forces such as for climate change and sea level rise, strong gales, and others.
- Strengthen public awareness and participation.
- Enforcement of relevant acts and regulation.
- Improve knowledge on natural resources conservation through strict observation.
- Encourage research studies and data collection.
- Capacity building for monitoring conservation programmes.
- Provide financial resources to support conservation projects.

Improving Institutional Organization warrants the following steps to be taken:

1.Cabinet's decision in identifying appropriate government organization to coordinate the implementation and monitoring procedures.

2.Meeting of involved organizations including government, non- government stakeholders to discuss as well as assign responsibilities and individual tasks.

3,Develop legislative instrument to uphold and maintain programme implementation.

4.Provide sufficient financial support through national budgetary allocation and/or by means of external assistance.

Improving the Knowledge of Desertification is a process that should include the following :-

- Identifying a coordinating body to plan activities related to improving knowledge on desertification

- Convening desertification workshops for key people to introduce them to the knowledge on desertification. They will in turn conduct community workshops in their respective areas utilizing funds provided for the project.

- Mounting media use for propagating knowledge and information for example radio, newspapers, promotional activities including drama, video, banners, sign boards, and theme song competition .

- Community education talks and dialogues in meeting venues and in individual homes.

- Inclusion of desertification topics in environmental school syllabus.

12. Monitoring and Assessing the Effects of Drought.

Extended dry periods affect the hydrology of low coral islands. The high permeability of coral sand and narrow formation of atolls permit rapid drainage of rainwater to the surrounding lagoon in the case of an atoll or the ocean as in an island. Much of the vegetation mainly coconut trees and tall native trees depend on rainwater for their growth. As for humans, drought is intimately connected with the viability of ground water supply (White *et al*, 1999).

Drought periods are of significant concern in urban areas where the population depend largely on imported food and other supplies whereas in the rural, people are well prepared to live under these conditions. The traditional food preservation practices enable the island communities to survive long drought periods on preserved food and brackish water.

Droughts play a significant part in degradation of land resources. The effects of drought can be severe at times creating undesirable environmental and health conditions. Assessing the effects of drought needs a national effort so that all areas affected are taken into consideration.

A disaster preparedness task force was established for the purpose of managing the activities that are appropriate during disaster. This taskforce can assist with the drought aftermath assessment and devise actions to be performed at a national level.

On Tarawa, the nation's capital, there were periods of drought in 1998 and early part of 1999 resulting in dry rainwater tanks, and a dramatic increase in salinity of underground water, the loss of food trees and the increase in skin diseases. The occurrence of drought will raise the need for provision of potable or wholesome water especially for domestic purposes. As recommended (Gibbs 1975), dry conditions which lead to a sufficient lack of water to meet normal requirements, should be regarded as drought. This cannot be readily accepted in the context of drought according to an I-Kiribati. Drought will mean more severe conditions. Rainfall data is always available from the Meteorological Division. The rainfall for Tarawa is shown in Appendix 2. .

(The effect of drought on vegetation)

13. Financial Allocations from National Budgets in Support of Implementation as well as Financial Assistance and Technical Cooperation Received and Needs Identifying and Prioritizing Requirements.

The national government has committed funding provision to partly support project which are externally aid funded. In addition technical cooperation is afforded in order to facilitate the implementation of projects. Funds are utilized in accordance to the priority needs of the nation.

Prioritizing needs is under the jurisdiction of the Economic Planning Division of the Ministry of Finance and Economic Planning.

14. A Review of the Benchmarks and Indicators Utilized to Measure Progress and an Assessment Thereof.

As projects are implemented, assessment of their progress from time to time is made in order to detect obstacles and difficulties that are encountered. As a means of carrying out the realistic assessment or monitoring it is the indicators that will assist in making conclusions whether the project is progressing as planned or not. The indicators are continually reviewed to determine their suitability under varying circumstances.

The evaluation of programmes requires information therefore mechanisms for furnishing information are essential. Through monitoring and evaluation of programmes progress, the status of the programme can be assessed over a certain period. Evaluation and monitoring systems should be incorporated in the planning schedule. Of necessity is the assessment of programme's outcome as evaluated against strategies, goals, and objectives. For all nationally implemented projects, evaluation should be the norm. Reports on this particular aspect of the project's implementation is usually demanded by the national government in order to assess the validity and usefulness of the project.

Provision of services and resources such as finance, land, human and other appropriate resources needed or necessary for the effective implementation of project should be facilitated by government through the action of ministries' employees. Benchmarks and indicators of progress will be determined as in other current projects.

Pandanus tree – a threatened natural resource.

Causeways reduce seawater flushing of lagoon.

Sand mining for construction purposes inundation of foreshore

Clearing vegetation for development creates land degradation

Benchmarks for future projects will be established so that certain portions or segments of the project's implementation are completed within planned periods. In this way control over implementation schedule is made more effective and the completion can be better assessed and determined.

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Appendix 1

Abbreviations or Acronyms.

A.D.B	Asian Development Bank
CASO	Conservation Area Support Officer.
E.E. Z.	Exclusive Economic Zone
E.I.A	Environmental Impact Assessment
E.S.C.A.P	Economic and Social Commission for Asia and the Pacific
F.S.P.	Foundation for the Peoples of the South Pacific
G.D.P	Gross Domestic Product
G.I.S	Geographical Information System
N.E.M.S	National Environment Management Strategy
N.G.O	Non-governmental Organization
N.I.S	National Implementation Strategy
P.I.C.C.A.P	Pacific Islands Climate Change Assessment Programme
P.O.Ps	Persistent Organic Pollutants
S.A.P.H.E	Sanitation. Public Health and Environment
S.O.E	State of the Environment
SPBCP	South Pacific Biodiversity and Conservation Programme
S.P.C.	Secretariat for the Pacific Community
S.P.R.E.P.	South Pacific Regional Environment Programme
U.N.C.C.D	United Nations Convention to Combat Desertification
U.N.C.E.D	United Nations Conference on Environment and Development
U.N.E.P.	United Nations Environment Programme
U.S.P	University of the South Pacific
W.H.O	World Health Organization

Appendix 2.

Monthly Rainfall -Tarawa. 2001&2002

(Data source: Meteorological Division)
The chart is produced by the Environment & Conservation Division