

REPUBLIC OF KIRIBATI

MINISTRY OF PUBLIC WORKS AND UTILITIES KIRIBATI ROAD REHABILITATION PROJECT

ENVIRONMENTAL MANAGEMENT PLAN



August 18, 2010

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KIRIBATI ROAD REHABILITATION PROJECT

I. EXECUTIVE SUMMARY

1. The country's statutory framework requiring compliance to the Environmental Impact Assessment (EIA) System for all projects is embodied in the ***Environment Act 1999 (No. 9 of 1999), "Act to Provide for the Protection Improvement and Conservation of the Environment of the Republic of Kiribati and for Connected Purposes***.
2. Environmental impact assessment of all public or private development projects is a legal requirement under Part III of the Act. Prescribed development projects listed in Schedule in Section 14 have to prepare an Environmental Assessment Report (Initial Environment Evaluation or Environmental Impact Statement) and submit a Development Application for processing and review by the Environment and Conservation Department (ECD).
3. The proposed Kiribati Road Rehabilitation Project involves rehabilitation of an estimated 27.5 kilometers of main road and approximately 6 kilometers of principal feeder and access roads on South Tarawa. Extensive damage, primarily because of unusually prolonged periods of wet weather over the past year and increase in traffic volume plying the roadways, has made the existing roads difficult to traverse.
4. The Republic of Kiribati which became an independent republic in 1979, is composed of 33 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. Only 18 of the 33 islands are inhabited. 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.
5. The population of Kiribati, as enumerated on 7 November 2005, was 92,533 people: 45,612 males and 46,921 females. This is an increase of 8,039 persons in 5 years compared to the 2000 census (84,494) with an annual rate of growth of 1.8 per cent. Kiribati's population has steadily increased since the 1930s when the first census was conducted. With a population of just under 30,000 people in 1931, 56,000 people in 1978, and over 90,000 in the year 2005, the Kiribati population more than tripled in size during the last 74 years. The country's economy is predominantly subsistence, with copra, seaweed and fisheries being the main source of foreign exchange earnings. Revenue from the licensing of foreign vessels in the Kiribati Exclusive Economic Zone (EEZ) contributes some \$2-3 million per annum. Tourism plays a fairly modest role in the Gilbert but In the Northern Line Islands especially Christmas Island, tourism is high.
6. The infrastructure of Kiribati is generally rudimentary. Wherever practicable, roads are built on all atolls, and connecting causeways between islets are also being built as funds and labor permit. A program to construct causeways between North and South Tarawa was completed in the mid-1990s. Kiribati has about 640

kilometers of roads that are suitable for motor vehicles. All-weather roads exist in Tarawa and Kiritimati.

7. Excavation works and the clearing of vegetation will result in erosion. However with well designed drainage and good planning during design stage, erosion can be minimized and adverse environmental impacts can be minor and temporary. Road accidents have substantial impact on the pedestrian and community safety and can be reduced by good design and selection of appropriate design alternatives.
8. Displacement of people is not envisaged during the implementation of the proposed project. The proposed rehabilitation works are expected to be carried out within the Right of Way (ROW) of the existing road and limited acquisition will be required for the project for bus stops, sidewalks and drainage. The projected disturbances during construction are expected to be minor and temporary and can be readily mitigated.
9. The objective of erosion prevention is to minimize the amount of sediment lost from the site. Proper application of mitigation measures will ensure that the residual impacts are minor and temporary during the construction phase. Storm water runoff from the road will be diverted to the nearby drainage ditches for discharge to the ocean or to, where appropriate, freshwater collection ponds for secondary uses.
10. Air quality problems created by road traffic are not a critical issue along the road.. However, to minimize dust nuisance during road rehabilitation, the Contractor will regularly spray water on exposed surfaces during dry periods and minimize on site storage. Noise is one of the most obvious impacts of construction activities and daily road use. In Tarawa, it will mainly affects rural centers and villages near the road and where the traffic is heavy.
11. To minimize ongoing impacts of disturbed areas after the construction is completed, the Contractor will be responsible for the proper decommissioning of the used sites. Recommended measures will include: (a) raking or loosening of compacted ground surfaces and (b) establishing site re-vegetation. Where possible involve local communities / women's groups will be contracted to implement re-vegetation.
12. With the implementation of the project, economic development of the area (South Tarawa) will be induced. Travel time between Bairiki and Tanaea will be reduced as a result of better road conditions and connectivity. Vehicle operation costs such as fuel and maintenance will also be reduced as better road conditions would result in more efficient vehicle operation and reduced damage to vehicles.
13. Without the implementation of the project, road conditions will remain very bad and continue to deteriorate. Transport operators, specially taxis, will further reduce service or refuse to operate in the area. Travel to and from Bairiki and Tanaea will be very difficult owing to the bad road conditions. Vehicle operation costs will remain high as damage to vehicles will continue. Economic development of the area will remain stagnant or decline as transport of goods and services will remain costly. Health concerns, as is being experienced now will remain as it is, with dust being generated during the dry season by the unpaved areas. Ponding/stagnant water will continue to serve as breeding grounds for mosquitoes during the rainy season.

14. The project assessment concludes that with appropriate mitigation strategies described in the EMP, and the positive social / economic and environmental benefits which will flow from the Project, the construction related environmental impacts can be managed within acceptable levels. There are no significant environmental impacts needing in-depth assessment. All potential and associated impacts can be addressed through proper implementation of the mitigation measures as proposed in the EMP. Provisions will be made in the Project Budget to cover the environmental mitigation and monitoring costs.

II. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

15. The country's statutory framework requiring compliance to the Environmental Impact Assessment (EIA) System for all projects is embodied in the ***Environment Act 1999 (No. 9 of 1999), "Act to Provide for the Protection Improvement and Conservation of the Environment of the Republic of Kiribati and for Connected Purposes***.
16. Environmental impact assessment of all public or private development projects is a legal requirement under Part III of the Act, Development Control, Environmental Impact Assessment, Review and Monitoring, of the Kiribati Environment Act of 1999. Prescribed development projects as listed in the Schedule in Section 14 require an Environmental Assessment Report (Initial Environment Evaluation or Environmental Impact Statement) and submission of a Development Application which is processed and reviewed by the Environment and Conservation Department (ECD). Annex A presents excerpts of the relevant sections on Environmental Impact Assessment System and the Schedule of the Prescribed Developments covered under the Act.

III. DESCRIPTION OF THE PROJECT

A. The Executing Agency

17. The Executing Agency for the Project will be the Ministry of Finance and Economic Development. The Implementing Agency will be the Ministry of Public Works and Utilities (MPWU). During project implementation, engineers and technicians of the Civil Engineering Division of the MPWU will work with the design and supervision consultants on day to day technical management.

B. Project Rationale

18. The existing road is in poor condition as evident with excessive pot holes, gaps and cracks, surface rain puddles, etc. and is need of urgent repairs. Every time it rains, expensive repair work is needed. While parts of the South Tarawa road network were rehabilitated in 2008¹, no major maintenance works have been done on the remaining paved roads for more than 20 years. These roads have already reached the end of their economic life. The damage to the roads have greatly affected travel in South Tarawa with the average travel speed reduced to 20 km/h and vehicles traversing large and deep depressions filled with water during rainy seasons. During dry seasons, dust from the unpaved sections of the

¹ Town roads in Betio and Biriki, as well as a section of the main road at Bikenibeu were upgraded under an A\$12 million project financed by the Government of Japan as part of the Fisheries Project.

road has become a nuisance and health hazard to the adjacent communities. An increase in upper respiratory diseases has been noted among the residents of the adjacent communities from excessive dust generation.

19. Most of the South Tarawa road traverses a ribbon development area composed of residential dwelling units, small commercial and business concerns, churches, schools, etc. These are all situated within the confines of the atoll which is generally no more than 100 meters wide. Virtually the entire population lives in close proximity to the road and is greatly affected by the existing conditions of the road.
20. In accordance with the basic issue "improve the standard of roads" in the Kiribati development plan, currently the road standard is not satisfied. Since life of the people of Kiribati, especially on South Tarawa, is heavily dependent on road transportation the reconstruction or improvement of South Tarawa road is an urgent matter.

C. The Proposed Project

21. The purpose of this project is to replace the existing surface with a thicker and stronger pavement structure. This will reduce future road deterioration and to solve the problem of the continuous road repairs. The rehabilitated road will also minimize breakdown of vehicles, accommodate the increase traffic density, and cater for pedestrians and other non-motorized traffic.
22. The South Tarawa road upgrading. will consist of 7 m wide sealed road with 1.5 m easement on each side for drainage and service lines (electricity, water supply, telephone line, and other services). The road rehabilitation and upgrading will cover the road from St.Anne Pre School (Bairiki) to Tanaea including Tekawai ae Boou and Temaiku road – about 27.5km. It will also include repairs to the surface of the Betio Causeway.



Figure 1: Satellite Photograph Showing Proposed Main Investments

23. The road upgrading will include scrapping of top layer of the road and plowing the existing road base; laying, mixing, spreading and compacting up to 30cm of new imported crushed gravel base, and a new bitumen surface. The road will have concrete edging to prevent the propagation of edge breakdown of the new road. The finished road level be slightly higher than the surrounding area to ensure proper drainage. The project will also include the construction of speed humps at suitable locations, and construction of some 50 bus stops at locations to be identified. Wherever possible, the drainage will be connected to to soak pits for groundwater recharge or discharged directly to the ocean.

24. The Project will also include sealing of unsealed urban feeder roads with high traffic volumes. Currently, these roads consist of earth road with many depressions creating stagnant water after rain causing severe difficulties to cars in navigating the road. The feeder road will be sealed and provided with improved drainage.
25. Under an associated technical assistance program, the Project will support improved institutional arrangements, including drafting of the requisite legislation for managing the Kiribati Road Assets to ensure a systematic and adequately financed regular and periodic maintenance programs. Specifically, the Project will support the creation of the Road Maintenance Fund to be financed by user charges and build the capacity of the MPWU for management of the road assets as well as creation and training of micro enterprise units for outsourced road maintenance.

IV. DESCRIPTION OF THE ENVIRONMENT

A. Physical Environment

1. Location and Geography

26. 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. See Figures 2 and 3 for the general location of the proposed Project and map of Kiribati. The three groups of islands namely the Gilberts, the Line and the Phoenix is either coral atolls or coral islands with the exception of Banaba which is a raised or an elevated limestone island. Of the 33 islands comprising the Republic of Kiribati only 18 are inhabited. Kiribati became an independent republic in 1979.

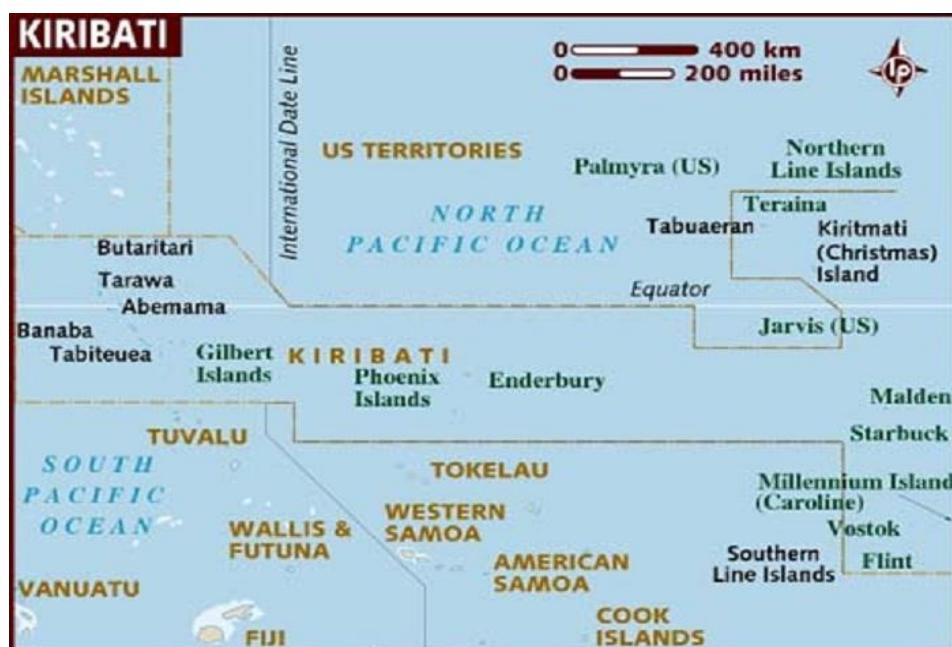


Figure 2: Map of Kiribati

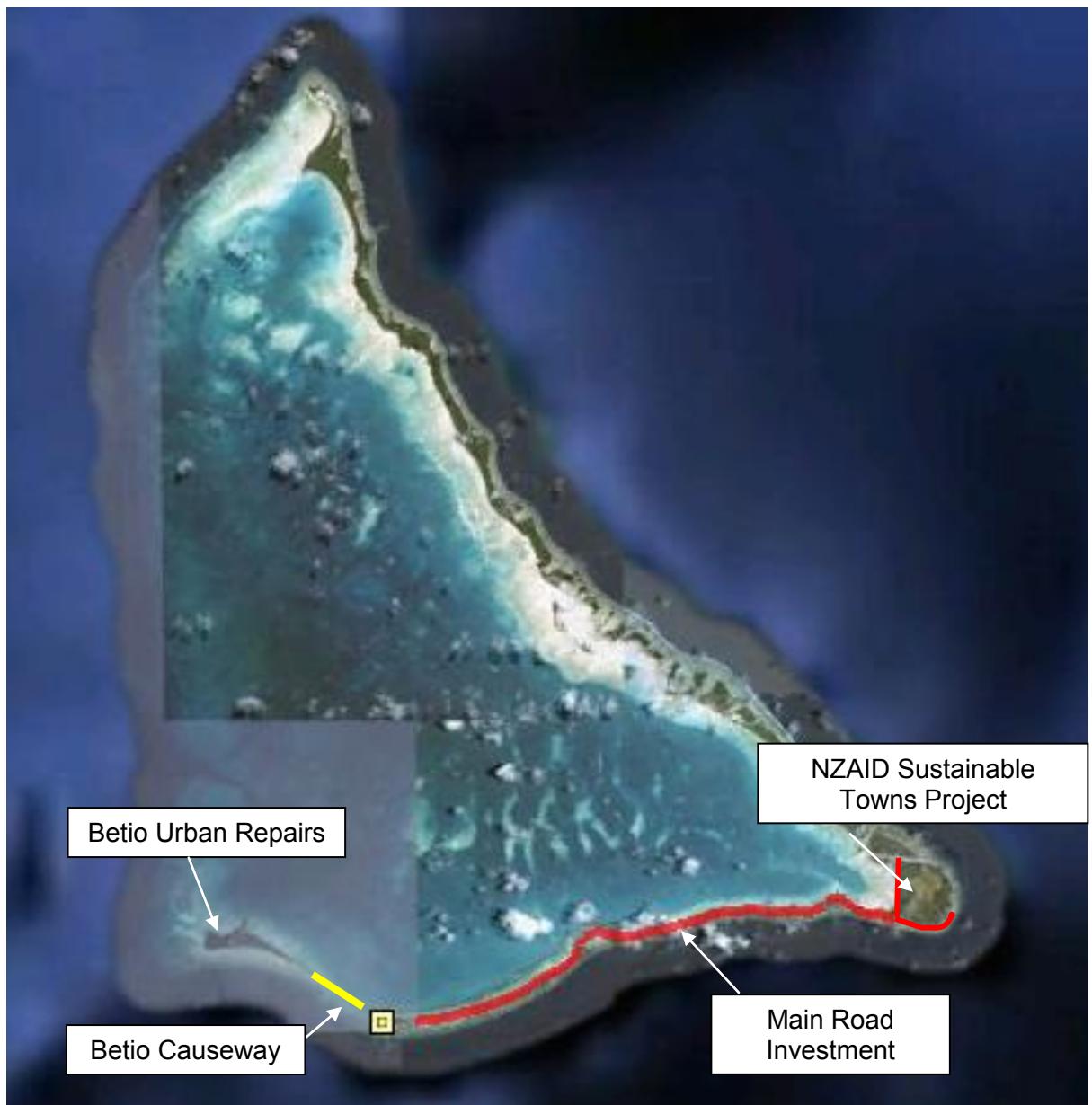


Figure 3: Project Investments

27. The Gilbert Group which is comprised of 17 islands has a total land area of 286 square kilometers. Tarawa, an atoll in this group, is home of the Kiribati government, the port of entry, and the international airport. Eight islands and atolls constitute the Phoenix Group. The Line Islands consists of a total of 8 islands and atolls covering an area of 497 square kilometers, including Kiritimati with a land area of 384.5 square kilometers, which is the largest atoll in the world. Whilst Banaba (Ocean Island) rises some 78 meters above sea level, the rest of the islands are no more than 3 meters above sea level. The national capital Bairiki is located on the Tarawa atoll. Betio is the port of entry while Bonriki is the international airport.

2. Climate

28. Due to its geographical location, Kiribati has a predominantly hot dry equatorial climatic conditions with prevailing South Easterly winds most of the year. Temperature varies between 25°C and 33°C with maximum possible annual sunshine of 4134 hours. The wet season extends from December to May and rainfall variation is high on most of the islands. A gentle breeze from the easterly quarter is predominant. Tables 1 below displays average monthly climate indicators in Tarawa, based on 8 years of historical weather readings.

**Table 1. Average Monthly Temperature (degrees C), Tarawa Island
1o 35"S, 172o 93"E, 4m asl**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Avg. Temperature	27	26	27	27	27	27	27	27	28	27	27	27
Avg. Max Temperature	27	27	27	27	27	28	28	28	29	28	28	28
Avg. Min Temperature	26	26	26	26	26	26	26	26	26	26	26	26

29. 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 3,000 mm. Low temperatures are experienced during heavy downpours accompanied by strong winds over long periods. Prolonged drought periods were encountered in 1988 to early 1989 followed by another in 1998 extending into mid 1999 and resulting in the loss of many valuable food crops including coconuts (*Cocos nucifera*) and breadfruits (*Artocarpus* sp.).

3. Soils

30. 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. There is no andesitic rock formation in South Tarawa that can be used as quarry sources for road construction. The soil is alkaline and therefore it does not support the growth of certain plants and trees. The poor and infertile nature of the soil is due to its alkalinity, porosity and lack of essential elements which makes it unable to support plant life. Consequently, it is incapable of supporting intensive agricultural activities.
31. 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 with plant cover and other areas covered with wild bushes. Due to their ability to withstand the harsh atoll conditions the predominant plants species that survives are coconuts (*Cocos nucifera*), pandanus or screw pine (*Pandanus tectorius*), salt bush (*Scaevola sericea*), and other tolerant indigenous plants and trees.

4. Water Resources

32. Freshwater resources exist underground as water lenses floating on seawater. These are 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. The lens is formed where the width of the island is sufficiently wide so as to reduce the outward flow of the accumulated underground lens. The freshwater lenses in low coral atoll and islands are extremely vulnerable to occasional environmental influences. Groundwater is the principal source of fresh water in Kiribati. Urban or South Tarawa water supply originates from water wells located in water reserve areas with restricted use and access in the villages of Bonriki and Buota. Well water is pumped from wells and conveyed through a system of pipes to consumers. Chlorination without preliminary treatment of urban water supply is carried out at the source. The proposed road rehabilitation project will, where appropriate, include provision to allow for soak pits that will facilitate recharge of the groundwater. Thus the project will have a positive impact in improving groundwater situation.

B. Biological Environment

1. Coastal Resources

- 33. 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, numerous eco systems and marine organisms. The coastal areas support fishing, recreation, trade and communication. With constant mining of beach sand, gravel and other aggregates for construction purposes the coastal areas are greatly threatened. The European Union (EU) is currently funding a project on Environmentally Safe Aggregates for Tarawa (ESAT) Project, implemented by SOPAC. The ESAT project aims to protect the vulnerable beaches of South Tarawa from damage caused by aggregate mining and provide an alternative supply of material through environmentally safe lagoon dredging. However the earliest implementation of the ESAT Project is expected to be December 2011.
- 34. Ministry of Fisheries and Marine Resources is responsible for the management of marine resources including production of aggregates and sand from the coastal areas. Preventing the destruction of marine resources including coral reefs is necessary. Therefore, the Project will ensure that material to be used for road rehabilitation and upgrading will not cause significant adverse environmental impact on the coastal and marine environment. The proposed Road Rehabilitation Project will not use the reef mud from the EU funded project, but instead will import material from Banaba, Nauru, Fiji or elsewhere. The project will also take necessary precautions and measures to ensure that the construction activities will not pollute lagoon environment.

2. Forest Resources

- 35. Except for a few uninhabited islands in the Northern Line Islands and the Phoenix Group, where “te buka” (*Pisonia grandis*) and other wild trees grow, there are no natural forest of major significance in terms of size, age and biological diversity. Forests in the Lines and Phoenix are resting and nesting places for long distance flying migratory birds all the year round. Mangrove forests also exist on muddy shores and coastal beaches where

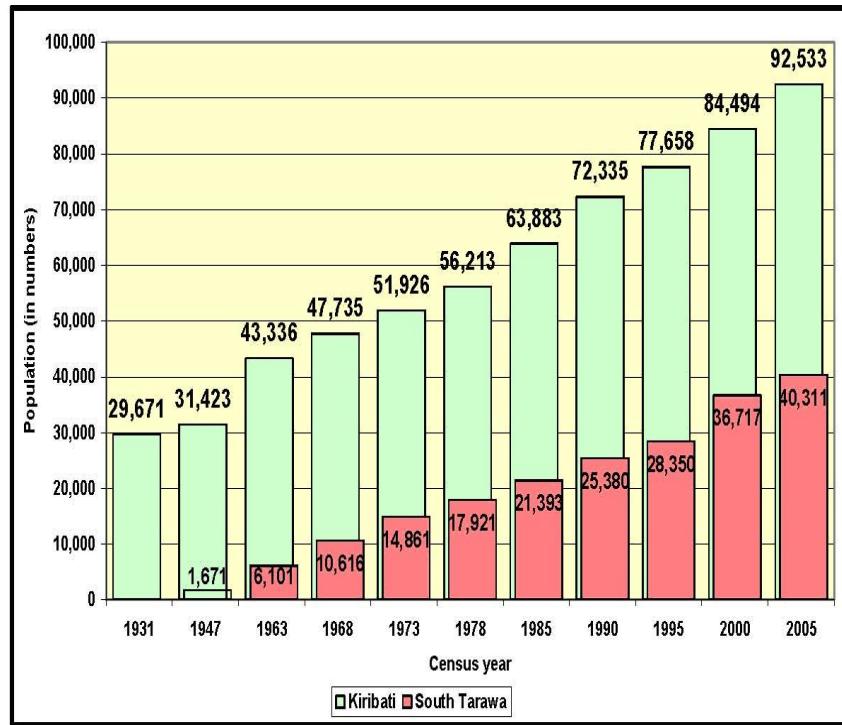
water is calm and in areas that are protected from waves and strong currents. Mangrove rehabilitation is undertaken by the Government under the World Bank funded project, Kiribati Adaptation Project (KAP). It includes planting of mangrove in selected areas prone to coastal erosion and in areas to protect causeways. Several types of the mangroves are found in Kiribati namely the white mangroves (*Sonneratio alba*), the tongo buangui (*Bruguiera gymnorhiza*), te aitoa (*Lumnitzera littorea*), and the red mangrove (*Rhizophora stylosa*).

36. The road to be rehabilitated under the Project runs through built up areas with no natural vegetation. There is no forest areas located along or close to the road and no mangrove will be adversely affected by the proposed Project.

C. Socio-Economic Environment

1. Population

37. The original inhabitants of Kiribati are Gilbertese, a Micronesian people. Approximately 90% of the population of Kiribati lives on the atolls of the Gilbert Islands. Although the Line Islands are about 2,000 miles east of the Gilbert Islands, most inhabitants of the Line Islands are also Gilbertese. Owing to overcrowding in the capital on South Tarawa, in the 1990s, a program of directed migration moved nearly 5,000 inhabitants to outlying atolls, mainly in the Line Islands.
38. The population of Kiribati, as enumerated on 7 November 2005 consisted of 45,612 males and 46,921 females or a total of 92,533 people. This is an increase of 8,039 persons in 5 years compared to the 2000 census (84,494) with an annual rate of growth of 1.8%. Kiribati's population has steadily increased since the 1930s when the first census was conducted (Figure 4). With a population of just under 30,000 people in 1931, 56,000 people in 1978, and over 90,000 in the year 2005, the Kiribati population more than tripled in size during the last 74 years.
39. Population growth varied extensively by Island and Island Groups. While the overall growth rate of Kiribati was 1.8% per annum, the Gilbert Group of Islands grew only at a rate of 1.4% while the Line and Phoenix Group of Islands grew at a very rapid rate of 6.7% per annum. Islands that experienced significant population increase include: South Tarawa (3,594); Kiritimati (1,684); Tabuaeran (782); Makin (694); Abemama (262); and North Tarawa (235).
40. Almost 44% of the population of Kiribati lived in South Tarawa in 2005. Its population increased from 25,380 in 1990 to 36,717 in 2000, to 40,311 in 2005. The census counted 13,999 private households with 88,644 household members, which is 6.3 persons per household on average. In South Tarawa 7.5 persons share a household on the average. Almost a third (26,798) of all persons that live in private households live in households with 10 persons or more, and 7,191 persons live in households with 15 persons or more. The long term trend of rural to urban (South Tarawa) migration has eased. The 2005 census data show a net flow of people from the Gilbert Group Islands towards the Line Islands during the inter-census period 2000-2005.



Note: Data for South Tarawa for year 1931 is not available

Figure 4: Population Size Kiribati and South Tarawa 1931-2005

2. Economy

41. The country's economy is predominantly subsistence, with copra, seaweed and fisheries as the main source of foreign exchange earnings. Kiribati's per capita GDP of US\$ 700, is one of the lowest in the world. Only 16% of the workforce participates in the formal wage economy and over 60% of all formal jobs are in South Tarawa. The monetary economy of Kiribati is dominated by the services sector, representing a GDP share of over 73%, and the public sector which provides 80% of monetary remuneration. Tourism is one of the largest domestic activities. Between 3,000 and 4,000 visitors per year provide \$5-\$10 million in revenue. Attractions include World War II battle sites, game fishing, ecotourism, and the Millennium Islands, situated just inside the International Date Line and the first place on earth to celebrate every New Year.
42. Most islanders engage in subsistence activities ranging from fishing to the growing of food crops like bananas, breadfruit, and papaya. The leading export is copra, which accounts for about two-thirds of export revenue. Other exports include pet fish, shark fins, and seaweed.

3. Infrastructure, Public Services and Utilities

43. The infrastructure of Kiribati is generally rudimentary. Whenever practicable, roads are built on all atolls, and connecting causeways between islets are also being built as funds and labor permit. A program to construct causeways between North and South Tarawa was completed in the mid-1990s. In 2008 the roads in Betio and Bairiki were improved

with Japanese aid. Kiribati has about 640 kilometers (398 miles) of roads that are suitable for motor vehicles. All-weather roads exist in Tarawa and Kiritimati. In 1998, there were some 2,000 motor vehicles registered in the islands, of which some 75% were motorcycles. In 2009 6,000 vehicles per day were counted over a 24 hour period at the New Zealand High Commission in Bairiki. A 2010 traffic count found 40% of the traffic were passenger vans, 32% were light 4 t trucks, and 28% were passenger cars.

44. In early 1998, work began on a major project to rehabilitate the port terminal and facilities at Betio. Financing for the project was provided by a grant from Japan of US\$22 million. There is a small network of canals, totaling 5 kilometers (3.1 miles), in Line Islands as well as ports and harbors such as Banaba, Betio, English Harbor, and Kanton. There are 21 airports, 4 of them with paved runways. Only Tarawa and Christmas Island are served by international flights.

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

45. Safeguard measures have been incorporated in the Project as follows: (i) **Design-Preconstruction Phase**, the period before the actual construction starts and designs are being prepared (Section A). This allows the designers to incorporate the environmental management plan (EMP) in the project design, technical specifications and contract documentations; (ii) **Construction Phase**, the period from the time that the "Notice to Proceed" is given to the Contractor until the issuing of the "Certificate of Completion" (Section B). The Contractor would construct the Project as per the design and technical specifications and implement the EMP; and (iii) **Operation and Maintenance Phase**, the period starting with the issuing of the "Certificate of Completion" issued by the DOW until the end of the 20 year lifetime of the project (Section C).

A. Design/Pre-Construction Phase

1. Protection of Sensitive and Ecologically Important Areas

46. The proposed development will not traverse any environmentally sensitive areas, and no adverse impacts caused by the rehabilitation of the road are anticipated. However, during the preparation of the detailed design for the road rehabilitation project, attention will be given to protect potential environmental sensitive areas and to minimize negative impacts on sensitive ecosystems, or the natural environment. Suggested measures to achieve this objective are:

- Identify environmentally sensitive or ecologically fragile areas (if any);
- Ensure construction personnel are aware of locations and importance of the sensitive areas and avoid disturbing them;
- If the proposed construction is located close to these areas, take necessary measures to avoid/minimize disturbance.

2. Environmentally Sound Design and Road Maintenance

47. Excavation works may induce soil erosion, but this can be minimized and avoided through proper design. This include:

- Sufficient road camber (5-8% cross fall) to drain the rainwater flows away from the road.
- Installation of suitable drainage structures (side-drains, culverts and sufficient turnouts) areas along the entire road.
- Proper handling and discharge of cross water flows from causeways, bridges, and culverts.

3. Road Safety

48. Road accidents have a substantial impact on the community and this can be reduced through proper attention and incorporation of safety in the design. The MPWU will ensure that all safety aspects of the road are integrated into the project design and implemented during the construction phase. During project preparation a road safety audit was done to identify the engineering issues to be addressed on the project. This information will be used by the design engineers to ensure the design is as safe as practicable. The design will incorporate:

- Proper signs and signals along the entire highway.
- New footpaths and pull-off bays in selected areas of the roads; e.g. through villages; and near markets, schools, and other community facilities.
- Safety instructions for the construction activities in the contract documents.
- Sufficient visibility along the road section according to standard specifications.
- Speed humps near schools, hospitals, and markets.
- Safe bus stops with sufficient turn out area.

During the project additional road safety activities will be addressed through the road safety Technical Assistance activities.

4. Cultural Heritage

49. Historical sites from the World War II consisting large canons and bunkers are located along the beach in Betio area. However, these sites are located outside the project area. No specific cultural / archeological sites have been identified along the road section from St. Anne to Tanaea. However, in case a cultural/historical heritage site is identified during the construction, the Contractor will be asked to stop work immediately and notify the MPWU supervision consultant who in turn will notify the relevant Government agencies.

5. Social or Community Concerns (Pre-Construction)

50. Because the project is concentrating on rehabilitation of the existing road only, there is limited concern regarding the negative effects of the road construction. Road improvements are generally aimed at bringing benefits to surrounding communities through lower transport costs and better access to market places, jobs, and services such as health and education. The rehabilitated road would also have a safer design, e.g. by providing better pedestrian facilities. It will also reduce costly breakdowns and damages to private and commercial motor vehicles. Road reconstruction and rehabilitation projects can lead to changes in the community or social

environment around the road, influencing various aspects of lifestyles, travel patterns, social and economic activities.

51. No displacement of people will be required for the proposed Project. The proposed rehabilitation works will be carried out along the existing road alignment and within the right of way. The only potential impacts are from (i) provision of approximately 50 bus stops; (ii) minor widening in some urban areas for footpaths; and (iii) temporary easements for drainage. Measures to minimize the social impact of any necessary land acquisition and compensation of loss of crops include:

- Identification of land acquisition needed, and trees and plants or other items which may be affected by road reconstruction and rehabilitation, and compensation requirements;
- Prior discussion of project impacts and proposed measures with the affected community; local government officers and non-governmental organizations.
- Conduct surveys before activities commence to identify all members of the affected population.
- Identification of other land-based natural resources, infrastructure, and services that will be lost to the affected community.
- Preparation of resettlement plan to address the land acquisition, trees/plants losses, and other social impacts.

B. Construction Phase

1. Social or Community Concerns (construction)

52. The objective is to minimize social disturbance and maximize community benefits from the Project. Measures to achieve this objective are:
- Advise the local community of project plans in advance of the construction, and seek their views.
 - Avoid or minimize disturbances near living areas.
 - Control run-off and manage sediments near farms / garden areas.
 - Arrange employment and training for local people.
 - Include women and other community groups in project activities.

53. The projected disturbances in the communities are minor and temporary, and the Contractor will make appropriate arrangements during the construction period. The general practice is that Contractors employ workers from the communities. The clan leaders will be consulted when recruiting workers for the Contractors.

2. Soil Erosion

54. Proper application of mitigation measures will ensure that impacts of surface erosion are temporary and minimized to acceptable levels. Measures to achieve these objectives are:

- Minimize work areas.
- Keep vegetation clearing to a minimum.
- Keep vehicles on defined tracks.
- Construct the necessary temporary/permanent control structures.

- Encourage re-vegetation as soon as the construction activities finish, or plan to immediately rehabilitate the disturbed sites after use.

3. Controlling Sediment

55. Implementation of proper mitigation measures will ensure that the impacts are temporary and minimized to acceptable levels. The proposed mitigation measures are:

- Installing silt traps or other control structures at the outset of the construction.
- Preparing all disturbed areas for re-vegetation or for natural re-vegetation.
- Phasing and limiting ground disturbance to areas of a workable size.
- Scheduling construction to limit disturbance of large areas of soil during wet seasons.
- Avoid discharging of contaminated water to the lagoon.

4. Controlling Storm Water

56. The objective to control storm water is to minimize the impact of contaminated run-off water. Implementation of proper mitigation measures will accordingly ensure that impacts can be minimized to acceptable levels. Measures to achieve the objective are:

- Pass stormwater run-off from construction areas through rocks or hay traps to remove soil and petroleum-based organic pollutants before disposal.
- Store oil and bituminous products at a contained location away from drainage ditches.

5. Management of Stockpiles and Spoil-heaps

57. To minimize dust and sediment run-off, material stockpiles and spoil heaps (if any) require proper management. Suggested measures are:

- Discuss dumping locations with the government officials and local landowners including plans for future use of the spoil materials.
- Include all drainage provisions suggested for construction sites in the site plans.
- Choose the locations of waste spoil piles to avoid blocking surface run-off or drainage ditches.
- Cover all spoil heaps or stockpiles during rainy season to prevent erosion and sediment run-off.

6. Air Quality and Dust Control

58. Dust problems created by road traffic are a nuisance but not a very critical issue along the proposed road section, mainly because the traffic volumes are relatively small. However, to control unnecessary dust from the road section under construction, the Contractor will:

- Spray water on exposed surfaces during dry periods especially near schools, hospitals, rural communities, etc.
- Cover all dust generating loads carried in open trucks

7. Noise Control

59. Noise mainly affects urban areas, villages, hospitals, schools, etc. along the roads. To control noise during construction the suggested measures are:

- Use modern and well-maintained equipment (with mufflers where appropriate)
- Use noise screens or mounds near residential areas, when appropriate.
- Carry out noise construction activities during normal working hours.
- Advise schools, hospitals, churches, etc. when there will be unusual or unavoidable noise.

8. Aggregate Management

60. Aggregates for the road construction will be imported from Banaba, Nauro or Fiji with aggregate size 5 to 20 mm. The aggregate will likely be stored in Betio port area, currently an empty field, located next to the port, and about 250 m from the closest settlements, or a similar isolated area towards Temalku. Measures to address potential environmental impacts are:

- Avoid overloading trucks and cover trucks to minimize dust and loss of load from trucks during transportation;
- Use water sprays or covered chutes to reduce dust emission during loading and unloading of materials from barges;
- Maintain crushing and mixing plants in good working condition so as to reduce emission from the plant.
- As far as possible, plan truck trips between the processing plant in Betio to the sites during low traffic hours;
- Implement safety procedures to reduce the potential for road accidents in village or urban areas;

61. The Contractor will have to obtain the requisite permits and clearances from the Environment and Conservation Division (ECD) of the Ministry of Environment, Land and Agricultural Development (MELAD). The Environmental permit will be one of the conditions required prior to starting the construction work.

9. Offsite and Waste Management

62. To manage waste the objective is to avoid contamination from solid wastes and sewage. Suggested measures to achieve this objective are:

- Contain all stored wastes within construction sites.
- Properly dispose of all used fuel and lubricant oils in environmentally sound manner, either by recycling or for other use such as fuel for hot mix plant, etc.

- Crush, burn, and bury all inorganic solid waste in an approved solid waste disposal area.
- Remove all disabled machinery from the project area.
- Use above-water table pit latrines or composting toilets at construction sites.
- Compost all green or organic wastes or use as animal food.

10. Safety and Health

63. Occupational health and safety risks of road works can be limited by clearly defining procedures for handling construction materials, conducting tests, paving, operating heavy equipment, etc. Specific equipment and training may be needed to:

- Ensure all occupational health and safety requirements are in place on construction sites and in work camps;
- Understand the use of personal protection equipment (PPE) and processes for obtaining relevant PPE.
- Install lights and cautionary signs in hazardous areas;
- Establish footpaths, zebra crossing, and bus stop bays along roads through villages, near markets, schools and other community facilities;
- Ensure safety and inspection procedures;
- Safe handling of toxic materials and other hazardous substances; and
- Penalties for violation of rules and regulations

64. General Health and Safety Awareness for construction workers will include:

- Introduction to health and safety issues in construction sites;
- Education on basic hygienic practices to minimize spread of tropical diseases;
- HIV/AIDS and STD awareness, including information on methods of transmission and protection measures;
- Prohibition of drugs and alcohol on construction sites; and
- Availability of medical assistance in emergency or non-emergency situations and availability of other health-related assistance.

11. Site De-commissioning

65. To minimize ongoing impacts after construction is completed, the Contractor will be responsible for the proper decommissioning of the temporary construction sites. Suggested measures to achieve this objective are:

- Rake or loosen all compacted ground surfaces.
- Implement revegetation / rehabilitation of the sites involving, where possible, local women's / community groups.

C. Operation Phase

1. Road Safety

66. Road safety features will be included as an essential element in the design for road upgrading projects, particularly along sections of roads where there is pedestrian traffic within and between settlements, or between settlements and gardens, and set down points or bus stop turn out bay.
67. Community requirements for road safety measures will be discussed with the affected communities during the initial awareness program, and their inputs will be integrated into the design phase. Issues which will be incorporated into detailed design for specific projects in more densely settled areas include:
- Measures to slow traffic; e.g. install speed bump at selected places (e.g. settlements, schools, markets, etc).
 - Off-road set down stops.
 - Improvements in road signage and pavement markings.
 - Attention to road accident black spots.

2. Rehabilitation and Maintenance of Practices

68. Routine maintenance refers to activities such as grading, grass cutting, drain clearing, pothole patching and shoulder repairs, which are performed at regular intervals. Periodic maintenance activities are typically scheduled over periods of several years and include resurfacing and repairs. Other maintenance activities considered to be periodic include seasonal maintenance, such flood repairs, emergency maintenance to reinstate roads after major failures, and the regular upkeep of safety features and road signs. The government will ensure that there is sufficient funding available to carry out routine and periodic maintenance of the road. This will be addressed by a Technical Assistance activity to be done under the project.

VI. ANALYSIS OF ALTERNATIVES

69. This is the only east-west corridor through South Tarawa so there is no alternative to ensuring that it meets the basic access needs to the community and remains passable.
70. With the implementation of the project, economic development of South Tarawa will be induced. Travel time between Bairiki and Tanaea will be reduced substantially as a result of better road conditions and connectivity. Vehicle operation cost such as fuel and maintenance will also be reduced as better road conditions would reduce damage to vehicles and promote more efficient vehicle operation. Transport of goods and services within the area and within Tarawa Atoll will be enhanced and would in turn, spur economic development as cheaper goods and services will be made available as a result of better transport conditions.
71. Health risks such as the occurrence of upper respiratory diseases and mosquito vectored illnesses will be reduced since there will be fewer large depressions that will pond with stagnant water that will serve as breeding

grounds for mosquitoes. The generation of dust from unpaved busy roads will be eliminated.

72. Without the implementation of the project, the road conditions will remain bad, and travel to and from between Bairiki and Tanaea will continue to deteriorate owing to the bad road conditions. Vehicle operation costs will remain high due to damage to vehicles and fuel consumption will remain high. The economic development of the area will stagnate as transport of goods and services will remain costly. Health concerns will remain as is with the dust being generated from unpaved roads during dry seasons and ponding/stagnant water will continue to serve as breeding grounds for mosquitoes during the rainy season. Also because of the narrowness of the atoll, there are no other road alignment alternatives. Hence, the implementation of the Road Upgrading and Rehabilitation Project on the current alignment is a necessity.
73. The main alternatives considered were with regard to road design options and, importantly, material selection. Cement concrete pavements were considered but rejected due to their high capital costs and also the high volumes of water required for their construction—fresh water is a scarce commodity in South Tarawa. The normal practice for materials supply is the use of coral. While the government is considering implementing a dredge for deep-water dredging of coral from within the atoll, it was instead decided for the project to import high quality material from sustainably sourced suppliers in Banaba, Nauru and/or Fiji. This will minimize the negative environmental impact of the project.

VII. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

74. As required by the World Bank and Asian Development Bank Safeguards Policies, public consultations were undertaken during the preparation of EMP. Preliminary consultations were undertaken on 10 and 11 July, 2010 during the field visit to Tarawa. Additional public consultations and information disclosure will be carried out in August/September 2010. The EMP will be disclosed to the Public and will be available locally to the communities at the MPWU office and Community centers.
75. The July 10-11, 2010 site visit consultations with twelve individuals and small groups of people most likely to be affected by the project revealed that:
 - Most respondents were not aware of the proposed project.
 - All the respondents considered the project very important and would be happy if it was implemented as soon as possible.
 - Most would like the road to be widened to prevent accidents especially near the end of the causeway.
 - All would like to reduce the height of the speed humps because there is tendency for the trucks, buses, cars, motorbikes, bicycles to evade the hump and pass on the side jeopardizing the pedestrians.
76. Dust was not perceived as an issue since most are already used to it. However they universally welcomed the improvement to the road.
77. Beneficiary consultations will be conducted during the preparation and construction phases, and records of environmental and social issues

raised and complaints received during consultations, field visits, informal discussions, formal letters, etc. will be followed up and the records will be kept in the project office at MPWU.

VIII. GRIEVANCE REDRESS MECHANISM

78. The MPWU project office will receive and document issues and concerns that the local populace and stakeholders will have relative to the project and its implementation. Resolution of these issues and concerns will be undertaken expeditiously so as to minimize any impacts that may affect the project implementation.
79. The following process will be followed to address the issues and concerns that stakeholders and Affected People may have on the proposed development:
 - The first step towards resolution of issues and concerns relevant to project is the filing of a formal notice/complaint by the Affected Person/People (AP) with the MPWU. For minor complaints such as excessive dust, noise, safety violation, the person assigned to supervise environment and social aspects by the Supervising Engineer will respond within 24 hours of lodging the complaint and a resolution will be conveyed to the AP within 48 hours. For more substantial complaints about land occupation, damage by contractor's equipment, drainage issues, etc. the Supervision Engineer will respond within 24 hours and set up further discussion / meetings with the complainant to reach a satisfactory resolution acceptable to all parties within seven days. For land issues, the timeframe may be longer.
 - The MPWU will maintain a register where all complaints are logged by: date, name and contact address and details of the complaint. A duplicate copy of the register entry will be given to the AP for their record. The AP may, if so desired, discuss the complaint directly with MPWU or its representative at a mutually convenient time and location. If the complaint of the AP is dismissed the AP will be informed of his/her rights in taking the complaint to the next step. However, every effort will be made to resolve the issue to the mutual satisfaction of both the parties.
 - Should the AP be not satisfied with the decision of the MPWU, the AP may file a written complaint with the Environment and Conservation Division (ECD) of the Ministry of Environment, Land and Agricultural Development (MELAD). The time horizon for the investigation and resolution of the complaint will vary and is dependent on the investigating officer of the ECD.
 - Should the AP still be not satisfied with the decision of the ECD-MELAD, the AP may then take the grievance to the Kiribati Judicial System. This will be at the AP's cost but if the court shows that MPWU have been negligent in making their determination the AP may seek costs.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Overview

- 80. The proposed road traverses a flat terrain, and no specific risks are foreseen with the upgrading of the road section aside from possible land acquisition, disruption of traffic, and disturbance to the adjoining areas. Possible impacts are detailed above and will be mitigated during the design/pre-construction, construction, and operation Phases, as summarized in the Environmental Management Plan.
- 81. According to the Kiribati Government's *Environmental Act, 2007, An Act to Amend the Environment Act 1999*, the Project will require to prepare Basic Environmental Impact Assessment, which is equivalent to the World Bank's Environmental Management Plan (EMP). According to the Act, MPWU will need to comply with environmental requirements as detailed in the EMP and secure Environment License from the Ministry of Environment, Lands, and Agricultural Development (MELAD).
- 82. An environmental assessment of the proposed South Tarawa road reconstruction and rehabilitation project concluded that the construction impacts will be minor, reversible and manageable if the mitigation measures as given in the EMP are properly implemented. The EMP (Table 2) is based on the type, extent and duration of the identified environmental impacts. The EMP has been prepared by close reference to best practices and in line with the *World Bank's Safeguard Policies*. The effective implementation of the EMP will be audited as part of the Grant conditions. In this regard, the MPWU (the Implementing Agency) will guide the design and supervision engineers and contractors on the implementation of the EMP.
- 83. Prior to implementation of the Project, and upon completion of the detailed design, the EMP will be reviewed by the MPWU to ensure that it complies with the proposed design and any additional changes made at the design stage (e.g. location, scale, source of materials, safety, etc.) and which have impacts on the environment are reflected in the EMP

B. Environmental Management Plan

- 84. The findings and proposed mitigation measures have been compiled into an Environmental Management Plan (EMP). It summarizes all the anticipated environmental impacts and its associated mitigation measures during the design, construction and operational phases. It makes reference to the relevant law and contract documents, approximate location, timeframe, mitigation costs (in US Dollars), and the responsibility for its implementation and supervision.
- 85. The recommendations and proposed mitigation measures will be attached to the Project Bidding Documents and subsequently the Contractors' contracts. The total costs for environmental mitigation is estimated at US\$22,500. This amount is only a rough initial estimate and will be refined and adjusted during the detailed design stage. However, many of the mitigation measures will be incorporated as part of the standard design and construction practices and as such their costs will be included in the construction cost.

1. Design/Pre-Construction Phase

86. Experience shows that inadequate application of the EMP by the contractor may occur due to weak linkages of the EMP with the contract documents. The EMP is a part of the work program and as such it must be addressed by the contractor and carried out as required.
87. In the Bid and Contract section “Special Conditions of Contract”, the Project Supervision Consultant (PSC) of the MPWU will, prior to the tender being called, will revise and update the EMP and the EMP as forming part of the Bid and Contract document. The contractor will use this document to cost his compliance with the EMP.
88. Bid evaluation and selection of contractor: The contractor will be required to provide a short statement that confirms that:
- the EMP conditions have been costed into the bid price,
 - the contractor has experience of working with an EMP,
 - the contractor has a qualified and experienced person on the contractor's team who will be responsible for the environmental compliance requirements of the EMP.
89. Land acquisition and compensation will be discussed with the affected communities, including identification of the land to be acquired, trees and plant or other affected by road reconstruction and rehabilitation, and compensation requirements. MPWU will discuss measures with the affected community and work with the local government officers to implement land acquisition and provide compensation as described in the Resettlement Plan.

2. Construction Phase

90. During the construction the contractor will work according to the requirements of the Contractor's Environmental Plan (CEP) (based on the EMP) which has been prepared by the contractor. Supervision and monitoring of the CEP activities will be undertaken as follows;
- (i) The contractor has the initial responsibility for preparing and implementing the CEP as per the works contract.
 - (ii) The Project Supervising Engineer (PE) will direct the contractor with regard to compliance with the CEP.
 - (iii) The MPWU will carry out independent monitoring of the work and can issue Defect Notices to the PE who will transmit these to the contractor.
 - (iv) The contractor will have his own representative on site – the Site Engineer (SE) who will be responsible for implementing the contract and complying with the CEP.
91. Contractor prepares CEP: following the award of the contract and before commencing the work the contractor will prepare a Contractor's Environmental Plan (CEP) that addresses the conditions of the construction in the EMP that has been attached to the Bid and Contract Documents. The CEP will amplify how the contractor will address the activities in the construction section of the EMP. The contractor will submit the CEP to the MPWU for approval.

92. Induction of contractor to site: Following the selection of the contractor and the approval of the CEP, the contractor together with the person on the contractor's staff who will be responsible for supervising the CEP will meet the PSC (Environment) on-site. If the plan is appropriate and implementable, the PSC will advise the PE that the contractor can now commence work.
93. Preparation of site and establishment of contractor's facilities: This applies to all of the contractor's facilities, storage areas, workshops, labour camps (when needed), concrete batching areas, asphalt plant, etc. The location and development of the contractors' facilities will be approved by the PE. The sites will be selected so that:
- they do not interfere with the environment and social well being of the surrounding communities re noise, dust, vibration, etc.,
 - The size of contractor's facilities are limited to absolute minimum to reduce unnecessary clearing of vegetation, sanitary waste and grey waters are treated before release into surface water systems,
 - the sites are properly drained. Paved areas, including vehicle parking areas, workshops and fuel storage areas are to drain to an oil and water separator, and
 - fuel storage areas are not located within 20m of a water course. The contractor's facilities are to be contained within an adequate security fence.
94. Clearing of sites and removal and disposal of vegetation:
- Wherever possible limit area to be cleared and avoid excessive machine disturbance of the topsoil.
 - Wherever practical 10 m wide buffer zones are to be established at sites abutting to the lagoon.
 - Cleared material is to be piled into manageable sized heaps according to disposal or re-use requirements.
95. Prevention of soil erosion on construction site: The contractor will be responsible for ensuring that the erosion is contained by appropriate soil conservation protection methods. This is particularly important since the work location are close to the lagoon. The contractor will:
- Limit the extent of excavation to reduce soil erosion potential.
 - Apply soil conservation protection methodology to susceptible areas to prevent / minimize storm water runoff carrying eroded materials off-site.
 - Avoid excavation and operating machinery in wet ground conditions.
 - Upon completion of works, the contractor will ensure that all excavated areas are properly stabilized. This includes the rehabilitation of all disturbed areas by the most appropriate and effective method.
96. Storage and handling of construction materials, fuel and lubricants: Construction materials will include aggregates, gravel and cement for concrete manufacture, reinforcing rods and steel mesh, wood and other construction materials, fuel and lubricants, etc. Fuel and oil will be stored

in dedicated areas at least 20 m away from the lagoon areas. Where fuel in excess of 5000 litres is stored on site, it will be stored in sealed tanks on a concrete base that is bunded to hold 110% of the tank capacity. All workshops would be provided with oil and water separators. Vehicles and machinery will not be refuelled within 20 m of the lagoon. The contractor must have trained personnel who are competent in fuel handling procedures and for cleaning up accidental spills. Any major spill in the vicinity of the lagoon will be reported to MELAD. All waste oil, oil and fuel filters will be collected and disposed of in secure landfill areas. At the closure of the site, all contaminated soil will be excavated, removed and replaced with fresh topsoil.

97. Noise and Vibration: this applies to all machinery, vehicles and construction sites where noise and vibration may affect susceptible receptors. The contractor will be responsible for ensuring that noise and vibration does not affect the adjacent communities. While it is unlikely that noise and vibration will be an issue due to the large distances between the activities and the communities the contractor will confine all work to daylight hours (0700hrs - 1900hrs) should the community find that any night time operations become a nuisance.
98. Dust management: this applies to all of the construction sites and haul roads. During construction when dust may be generated the contractor will monitor the worksite conditions and apply dust control measures which includes reducing construction traffic movements and spraying water on exposed areas.
99. Community safety from increased vehicle movements: this applies to all vehicles and particularly to haul trucks that pass through villages. The contractor will ensure that all vehicles which pass through villages are operated safely without endangering these communities. The contractor is to ensure that:
 - all trucks and equipment is maintained in a safe operating condition,
 - all drivers and machinery operators are properly trained and act responsibly,
 - all loads are secured and all loads with potential dust generating materials (e.g. excavated soil and sand) will be covered with tarpaulins,
 - the contractor will immediately remove any drivers that ignore any of the community safety requirements.
100. Safety and Hazard: Before commencing work, the contractor will be required to identify potential hazards and if necessary, prepare an emergency response plan to address serious accidents and nominate a person who will be immediately contacted should an accident occur. The emergency response plan will be submitted to the PSC for approval one week prior to starting work.
101. The contractor will be required to keep the site free of drugs and alcohol.
102. The contractor will be required to provide a safe work environment and provide safety measures and protective equipment to all workers including; hand, head, eye and ear protection and safety footwear.

103. The contractor will provide first aid facilities on-site and employ a trained first aid person.
104. The contractor will provide supplies of potable water, toilets and wash water to the workers.
105. Disposal of waste materials: All construction waste materials including drums, lumber, sand and gravel, cement bags etc are to be suitably disposed of. If these cannot be recovered for scrap value these materials should be taken to an approved landfill sites for safe disposal.
106. Clearance and rehabilitation of construction sites and removal of contractor's facilities: It is the contractor's responsibility to address site cleanup. This includes the removal all waste materials, machinery and any contaminated soil. All construction sites and work areas will be rehabilitated so that these can be returned as close as possible to their previous uses. This includes the stabilization and landscaping of all of the construction sites. No waste will be left on site after the work is completed. Should the contractor fail to remove the waste, the MPWU is entitled to withhold payment and arrange the clean up and deduct the cost of the clean up and appropriate administrative charges from the final payment.

3. Operational Phase

107. People Safety: During operation, road safety features will include (i) measures to slow the traffic; e.g. installation of speed hump at selected places (e.g. settlements, schools, markets, etc), (ii) bus stop turn out bay that allow the passengers to get in and out of the bus safely, (iii) dust suppression sealing, (iv) improvements in road signage and pavement markings, and (v) attention to road accident black spots.
108. Road Maintenance: Routine maintenance (grading, grass cutting, drain clearing, pothole patching and shoulder repairs) will be undertaken on regular basis. Seasonal maintenance such as flood repairs, emergency maintenance to reinstate roads after major failures, and the regular upkeep of safety features and road signs will be undertaken as necessary. Major maintenance that include resurfacing and repairs are typically scheduled over periods of several years.
109. Noise control: Considering the low traffic volume, noise is not considered a major concern in the area. For occasional houses, dust fence barriers (using traditional material such as coconut leaves mat) commonly used in Tarawa might be considered.

C. Environmental Monitoring Plan

110. A monitoring plan for the proposed Project (Table 4) has been prepared. The main components of the monitoring plans include:
 - Environmental issue to be monitored and the means of verification;
 - Specific areas, locations and parameters to be monitored;
 - Applicable standards and criteria;
 - Duration and frequency and estimated monitoring costs; and
 - Institutional responsibilities for monitoring and supervision.

111. The cost of implementing the monitoring plan during the construction phase is \$22,500.
112. A field monitoring checklist has been prepared based on the EMP and monitoring plan (Annex B). The field monitoring checklist will be used by the supervising field engineers. The signed checklists will be provided to the MPWU who will be responsible for the appropriate follow-up and compliance reporting.
113. The MPWU will maintain a Complaints Database, which will contain all the information on complaints received from the communities or other stakeholders. This would preferably include: the type of complaint, location, time, actions to address these complaints, and final outcome.

D. Institutional Implementation and Reporting Arrangements

1. Project Implementation

114. MPWU is the Implementing Agency for the Project and will be responsible for the implementation and compliance with the EMP and Monitoring Plan. Day-to-day implementation and compliance will be the task of PSC.

2. Reporting Arrangements

115. The findings of the regular monitoring activities, as specified in the Monitoring Plan (Table 4) will be included in the quarterly PSC progress reports. The person assigned for environmental and social affairs of the MPWU will be responsible for the reviewing of Environmental Safeguard sections of the quarterly progress reports. The report will include an overview of the status of the implementation of the EMP's and compliance to the national environmental regulations. The progress reports will be submitted for information to the EDC-MELAD, the World Bank and Asian Development Bank.

TABLE 2. ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL ISSUE AND OBJECTIVE:	MITIGATION MEASURES	LOCATIONS	TIMEFRAME	ESTIMATED MITIGATION COSTS ²	IMPLEMENTATION	SUPERVISION
DESIGN/PRE-CONSTRUCTION PHASE						
Protection of (sensitive) Natural areas To minimize negative impacts on sensitive ecosystems, or the natural environment:	<ul style="list-style-type: none"> Identify potential environmentally sensitive / natural areas Locate optional construction sites/activities away from them. Ensure construction personnel are aware of locations of sensitive areas and avoid them If the proposed construction pass close to these areas, include temporary fences to restrict machines and activities from encroaching the area. 	Some sections of the proposed road and causeways.	During project preparation and design.	Minimal (part of standard design practices).	MPWU/DC/CSC	ECD and World Bank
Environmentally Sound design To avoid erosion and damage to the road:	<ul style="list-style-type: none"> Roads should have sufficient camber (5-8% cross fall) so that the rainwater flows away from the road. Road structures should have effective drainage systems (side-drains, culverts, etc.). Cross drainage flows are properly taken care of at causeways, bridges, culverts, etc.. 	Entire road section, culverts, and crossing with rivers/creeks.	During project preparation and design.	Minimal (part of standard design practices).	MPWU/DC/CSC	ECD and World Bank
Road Safety To avoid accidents during and after construction of the road:	<ul style="list-style-type: none"> Include occupational health and safety requirements are in place on construction sites in work camps.. Include install of lights and cautionary signs in hazardous areas. Ensure that footpaths and pull-off bays along roads; through villages; and near markets, schools, and other community facilities are included in the design. Include safety instructions for the construction activities in the contract documents. Ensure that speed bumps near schools, hospitals, and markets are included in the road design. Ensure sufficient visibility along the road section according to standard specifications. 	Entire road section and construction sites	During project preparation and design.	Minimal (part of standard design practices).	MPWU/DC/CSC	ECD and World Bank

² Costs are estimates only and will be calculated during the detailed engineering design.

ENVIRONMENTAL ISSUE AND OBJECTIVE:	MITIGATION MEASURES	LOCATIONS	TIMEFRAME	ESTIMATED MITIGATION COSTS ²	IMPLEMENTATION	SUPERVISION
Cultural Heritage To avoid any serious damage to cultural heritage site (i.e. ceremonial sites and burial grounds):	<ul style="list-style-type: none"> In case a cultural heritage site is identified during the construction, the Contractor will cease all work immediately and notify the PSC 	All potential cultural heritage sites.	During project preparation and design.	Minimal (part of standard design practices).	MPWU/DC/CSC	ECD and ADB/World Bank
Social or Community Concerns To minimize social impact of an relocation or resettlement of people:	<ul style="list-style-type: none"> Plan activities to avoid/minimize displacement of residents Discuss the projected impacts and negotiate proposed measures in advance with the affected community; work with local government officers and NGOs Conduct surveys before activities commence to identify all members of affected populations Identify other land based natural resources, infrastructure and services which may be lost to the affected community Identify suitable land (if possible, land having the same clan ownership) for resettlement. 	Along the road alignment .	During project preparation and design.	To be determined	MPWU/DC/CSC	ECD and World Bank
To minimize damage to personal and community property:	<ul style="list-style-type: none"> Ensure works will be restricted to the 'right-of-way' of the existing road; Ensure projected impacts and proposed measures have been discussed in advance with the affected community; work with local government officers and non-governmental organizations. Conduct surveys before activities commence to identify all members of affected populations. 	All properties close to the road sides	During project preparation and design	To be determined	MPWU/DC/CSC	ECD and World Bank
CONSTRUCTION PHASE						
Social or Community Concerns To minimize social disturbance and maximize community benefits from the subproject:	<ul style="list-style-type: none"> Advise the local community of project plans in advance of construction, and involve them in planning, as necessary Avoid or minimize disturbances near living areas, schools, hospitals, etc. Control runoff and manage sediments near cultivated areas Arrange employment and training for local people Include women's and other community groups in project activities 	Along road alignment	During mobilization and commencement of construction activities in the communities	Minimal (part of standard design practices).	Contractor	MPWU/CSC

ENVIRONMENTAL ISSUE AND OBJECTIVE:	MITIGATION MEASURES	LOCATIONS	TIMEFRAME	ESTIMATED MITIGATION COSTS ²	IMPLEMENTATION	SUPERVISION
Soil Instability and Erosion To minimize the amount of sediment lost from the site:	<ul style="list-style-type: none"> Reduce the time surfaces remain bare Keep vegetation clearing to a minimum Keep vehicles on defined tracks Construct necessary temporary/permanent control structures Encourage re-vegetation immediately after construction activity finishes 	All areas where clearing is required	Continuous	Minimal (part of standard construction practices)	Contractor	MPWU/CSC
Controlling Sediment To minimize impact of storm water containing sediment on streams and coasts:	<ul style="list-style-type: none"> Install control structures at the outset of construction phase These may need to include silt traps in drainage ditches Revegetate all disturbed areas which are not to be paved after final land shaping Limit ground disturbance to areas of a workable size Schedule construction minimize areas of soil disturbance during wet seasons Contain or isolate construction areas using a bund or trench, rom other surface runoff. Clean and rehabilitate when construction is complete 	All areas where clearing is required.	Continuous	Minimal (part of standard construction practices).	Contractor	MPWU/CSC
Controlling Storm water To minimize the impact of contaminated runoff water:	<ul style="list-style-type: none"> Divert run-off from non-construction areas away from the construction areas to segregate non contaminated drainage from construction run-off. Pass storm water run-off from construction areas through a silt traps before discharge into culverts or drainage systems. Design drains and culverts to remove all run-off water without scour.. Store oil and bituminous products in a contained location away from drainage ditches . 	All areas where clearing is required.	Continuous	Minimal (part of standard construction practices)	Contractor	MPWU/CSC
Management of Stockpiles and Spoil-heaps Tominimize dust and runoff	<ul style="list-style-type: none"> Discuss dumping locations with local landowners Ensure proper drainage to isolate the sites. Ensure stockpile or spoil-heap locations do not block surface runoff or drainage lines Cover or revegetate spoil-heap or stockpiles if prolonged exposure is envisaged. to minimize erosion and sediment runoff In rainy areas, avoid high, unstable spoil-heaps and stockpiles to safeguard against slips Discussions reuse of spoil materials with local landowners or community groups. Where possible spoil should be used to level low lying areas or waste disposal pits before revegetation. 	Dumping areas.	Continuous	Minimal (part of standard construction practices)	Contractor	MPWU/CSC

ENVIRONMENTAL ISSUE AND OBJECTIVE:	MITIGATION MEASURES	LOCATIONS	TIMEFRAME	ESTIMATED MITIGATION COSTS ²	IMPLEMENTATION	SUPERVISION
Dust Control To minimize health risk or inconvenience due to dust production:	<ul style="list-style-type: none"> • Spray water on exposed surfaces during dry periods, specially near schools, hospitals and community areas. • Ensure trucks are not overloaded and are covered when transporting friable materials 	Cleared areas, material transport	During dry periods	Minimal (part of standard design practices).	Contractor	MPWU/CSC
Noise control To minimize nuisance from noise:	<ul style="list-style-type: none"> • Use modern and well maintained equipment with mufflers • Use noise screens or mounds near residential areas • Carry out noisy construction activities during normal working hours • Advise local people, schools, hospitals, etc. when there will be unavoidable noise activities. 	All construction areas, access routes	Continuous	Minimal (part of standard design practices).	Contractor	MPWU/CSC
Material Management To minimize impacts of materials delivery and waste disposal	<ul style="list-style-type: none"> • Develop materials delivery and waste disposal handling plan; • Develop site sediment control plan • Develop safety measures to avoid loss of load from trucks • Implement methods to reduce dust emission from the loads • Number and timing of truck trips to and from the unloading site • Put into practice safety methods to reduce potential road accidents in village or urban areas. Restrict peak traffic delivery. • Develop safety measures which to ensure stability of exposed faces or waste material stockpiles 	All materials management areas	Continuous	Minimal (already part of standard design practices)	Contractor	MPWU/CSC
Offsite and Waste Management To prevent / minimize contamination from solid wastes and sewerage:	<ul style="list-style-type: none"> • Contain all solid waste within construction sites • During site clean-up collect all spilled fuel oils • Crush, and bury all inorganic solid waste in an approved disposal area. • Remove all disabled machinery from the project area • Use above-water table pit latrines or composting toilets at construction sites • Compost or use as animal food all green or organic wastes 	All offsites storage and disposal sites	Continuous	Minimal (part of standard design practices).	Contractor	MPWU/CSC

ENVIRONMENTAL ISSUE AND OBJECTIVE:	MITIGATION MEASURES	LOCATIONS	TIMEFRAME	ESTIMATED MITIGATION COSTS ²	IMPLEMENTATION	SUPERVISION
Safety and Health To ensure maximum safety of construction personnel and local residents:	<ul style="list-style-type: none"> • Ensure all occupational health and safety requirements are in place on construction sites and in work camps • Install lights and cautionary signs in hazardous areas • Establish footpaths and pull-off bays along roads through villages, near markets, schools and other community facilities • Limit construction activities from 0700 hr to 1900 hr to limit exposure to dust, noise etc. ; • Enhance safety and inspection procedures; and • Use Personal Protection Equipment (PPE) 	All construction sites.	Continuous	USD\$???	Contractor	MPWU/CSC
	•					
General Health and Safety Awareness for construction workers:	<ul style="list-style-type: none"> • Train and familiarize workers about health and safety issues on construction sites including main areas of risk to workers and others • Education on basic hygiene practices to minimize spread of tropical diseases • Increase workers' HIV/AIDS and STD awareness, including information on methods of transmission and protection measures • Prohibit usage of drugs and alcohol on construction sites • Post notices about seeking medical assistance in emergency or non-emergency situations and procedures for seeking other health-related assistance. • Provide first aid and trained nurse-aid at camp site. 	Construction camps	Continuous	Minimal (part of standard design practices).	Contractor	MPWU/CSC
Site de-commissioning To minimize ongoing impacts after construction is completed:	<ul style="list-style-type: none"> • Rake or loosen all compacted ground surfaces • Establish a site re-vegetation plan. Where possible involve local women's groups and community groups and provide materials to implement re-vegetation 	All construction and camp sites	After completion of construction	Minimal (part of standard design practices).	Contractor	MPWU/CSC

ENVIRONMENTAL ISSUE AND OBJECTIVE:	MITIGATION MEASURES	LOCATIONS	TIMEFRAME	ESTIMATED MITIGATION COSTS ²	IMPLEMENTATION	SUPERVISION
OPERATION PHASE						
Peoples Safety To enhance safety following increased vehicle speed :	<ul style="list-style-type: none"> Install speed bump at selected places (e.g. settlements, schools, markets, etc) to slow down traffic at critical locations. Promote off-road let down stops for PMVs. Enhance improvements in road signage and pavement markings. Pay increased attention to road accident black spots. 	Sensitive areas (settlements, schools, markets)	As required	part of standard design practices	MPWU	MPWU HQ, Provincial Government, ADB/World Bank
Rehabilitation and Maintenance of Practices To avoid drainage / erosion problems,	<ul style="list-style-type: none"> Conduct regular monitoring and inventory of risks for erosion and drainage problems Conduct routine maintenance like grading, grass cutting, drain clearing, pothole patching and shoulder repairs 	Entire road section	As required	part of standard design practices	MPWU	MPWU HQ, Provincial Government, ADB/World Bank

TABLE 4. ENVIRONMENTAL MONITORING PLAN

ENVIRONMENTAL ISSUE AND OBJECTIVE:	WAYS FOR VERIFICATION	LOCATION	STANDARDS/CRITERIA	DURATION/FREQUENCY AND ESTIMATED COSTS	IMPLEMENTATION	SUPERVISION
CONSTRUCTION PHASE						
Social or Community Concerns Minimization of social disturbance and maximize community benefits.	Verbal or formal complaints. Project progress reports.	Along the entire road alignment	Resettlement Guidelines and international ' <i>Best Practices</i> ' (see WB Handbook on Roads), as necessary.	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
Soil Instability and Erosion Minimization of the amount of sediment lost from the site.	Visual check for sediment load and waste management procedures. Verbal or formal complaints.	All areas where clearing is required.	Construction and waste materials should be controlled. Waste can only be disposed of at approved sites.	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
Controlling Sediment Minimizing storm water containing sediment from discharging into streams.	Visual and field Inspection. Verbal or formal complaints.	All areas where clearing is required.	Erosion should be controlled.	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
Controlling Storm water Minimizing contaminated runoff water.	Visual check for water and drainage management. Verbal or formal complaints.	All areas where clearing is required and construction sites.	No increase of drainage problems or water logged areas. Waste can only be disposed of at approved sites.	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
Management of Stockpiles and Spoil-heaps Manage to minimize dust and runoff.	Visual field checks. Verbal or formal complaints.	Dumping areas.	Construction and waste materials should be controlled. Waste can only be disposed of at approved sites	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
Air Quality and Dust Control Ensure there is no health risk or inconvenience due to dust production:	Visual field checks. Verbal or formal complaints.	Cleared areas,	International ' <i>Best Practices</i> ' (see WB Handbook on Roads and the Environment and WHO Guidelines), as necessary.	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
Noise control Ensure nuisance from noise is minimized.	Visual field checks. Verbal or formal complaints	All construction areas, access routes	International ' <i>Best Practices</i> ' (see WB Handbook on Roads and the Environment and WHO Guidelines), as necessary.	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU

ENVIRONMENTAL ISSUE AND OBJECTIVE:	WAYS FOR VERIFICATION	LOCATION	STANDARDS/CRITERIA	DURATION/FREQUENCY AND ESTIMATED COSTS	IMPLEMENTATION	SUPERVISION
Safety and Health Ensure maximum safety of construction personnel and local residents.	Visual field inspections Verbal complaints by workers	All construction sites.	International 'Best Practices' (see WB Handbook on Roads and the Environment and WHO Guidelines), as necessary.	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
Avoid disturbance by the constructions workers.	Verbal and formal complaints by communities.	Construction camps	As listed in the EMP.	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
Health and Safety Awareness for construction workers.	Verbal and formal complaints by communities and workers.	Construction camps	As listed in the EMP.	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
Site de-commissioning Minimize ongoing impacts after construction is completed	Counting of replanting. Agreement with Communities	All construction and camp sites	No increase of soil erosion	After completion of construction (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
OPERATION PHASE						
Peoples Safety Mitigate increased vehicle speed .	Visual checks. Verbal and formal complaints by communities.	Sensitive areas (settlements, schools, markets)	Routine and Periodic Maintenance of traffic signs, road hump maintenance, etc	Annually after construction (USD 2,000 per year)	MPWU Engineer	MPWU HQ, Provincial Government, World Bank
Rehabilitation and Road Maintenance Practices Avoid drainage problems, aggravation of erosion, and reduced visibility.	Verbal and formal complaints.	Entire road section	.Routine and Periodic Maintenance	Annually after construction (USD\$ 2,000 per year)	MPWU Engineer	MPWU HQ, Provincial Government, ADB/World Bank

X. CONCLUSION AND RECOMMENDATION

116. The project will introduce short-term negative environmental disturbances associated with the construction activities. This will be mitigated by operational procedures during construction, within the framework of a contractor's approved Environmental Management Plan to be supervised by the PSC and monitoring by the MPWU.
117. Positive impacts to the local economy will accrue through better travel conditions on the roadways, new income earning opportunities generated by demand for labor during construction, enhanced transport and access of goods and services and through the creation of new business opportunities in the surrounding areas.
118. The EMP concludes that in the context of appropriate mitigating strategies described above, and the positive environmental benefits to flow from the Project, environmental impacts can be managed within acceptable levels. There are no significant environmental impacts needing further detailed study or EIA. All potential and associated impacts can be addressed through implementation of the mitigation measures as proposed in the EMP. Provisions will be made in the Project Budget to cover the environmental mitigation and monitoring costs.

**ANNEX A: EXCERPTS OF THE RELEVANT SECTIONS ON
ENVIRONMENTAL IMPACT ASSESSMENT SYSTEM OF THE
ENVIRONMENT ACT OF (AS AMENDED) 1999**
ENVIRONMENT ACT 1999
(No. 9 of 1999)

**AN ACT TO PROVIDE FOR THE PROTECTION IMPROVEMENT AND
CONSERVATION OF THE ENVIRONMENT OF THE REPUBLIC OF KIRIBATI AND
FOR CONNECTED PURPOSES**

PART III
**DEVELOPMENT CONTROL, ENVIRONMENTAL IMPACT ASSESSMENT,
REVIEW AND MONITORING**

General duty to consider environmental impact

In considering the grant of approval for any existing or proposed development or further expansion in any existing development, the Minister, acting in accordance with the advice of Cabinet after consultation with the Division and the relevant public authority and all other relevant and concerned shareholders shall have regard as far as practicable to the effect such development or expansion would have on the environment.

Declaration of prescribed development
Schedule

- (1) The development specified in the Schedule shall for purposes of this Act be classified as prescribed development.
- (2) The Minister acting in accordance with the advice of Cabinet may by order from time to time as the Minister sees fit, include in or delete from the said Schedule any development or proposed development except for individual proposals.

Applications for approval

- (1) Any developer who proposes to carry out any prescribed development in Kiribati shall make application to the Minister in the prescribed form.
- (2) On receipt of a development application referred to in subsection (1), the Minister shall instruct the Secretary within fifteen working days of such receipt to advise the developer to submit either -
 - (a) A development application accompanied by an Initial environment evaluation report, together with any additional requirements as notified by the Secretary; or
 - (b) A development application accompanied by an environmental impact statement, together with any additional requirements as notified by the Secretary.

(3) Where the developer is a foreign investor, a certified copy of the Foreign Investment Commission's certificate of approval shall be attached with the application.

(4) Where the Minister acting in accordance with the advice of the Cabinet decides to dispense with the requirements of subsection (2), the Secretary shall advise the developer accordingly within the time stipulated in that subsection

(5) In determining as to whether the developer is required to submit a report referred to in paragraph (a) or (b) of subsection (2), the Minister acting in accordance with the advice of the Cabinet shall take into consideration the significant impact the development is likely to have on the environment and other factors that may be prescribed by regulations made under section 52.

Requirement for information concerning existing prescribed development

Any developer carrying on an existing prescribed development, who has not submitted a development application to the Minister as required under section 14 shall, if required to do so in writing by the Minister provide -

- (a) Information of the nature of the activity carried on; and
- (b) Unless exempted by the Minister, acting in accordance with the advice of the Cabinet -
 - (i) A development application; or
 - (ii) Initial environment evaluation report or environmental impact statement, as the case may require, in accordance with this Part.

Consent required for prescribed development

(1) No developer shall commence or continue to carry out any prescribed development unless-

- (a) A development application has been submitted to the Minister, together with either a initial environmental evaluation report or an environmental impact statement, as specified by the Minister in section 14; and
- (b) The developer has been issued with a development consent by the Minister, acting in accordance with the advice of the Cabinet under this Part; or
- (c) The Minister acting in accordance with the advice of the Cabinet has exempted the development from the requirements of this Part.

(2) Any person who carries on any prescribed development in breach of subsection (1) commits an offence and shall be liable on conviction of a fine not exceeding ten thousand dollars or imprisonment for a term not exceeding twelve months or to both such fine and imprisonment.

Contents of initial environmental report

Any initial environmental evaluation report in respect of proposed and existing prescribed development shall -

- (a) Describe the prescribed development in summary form, including its objectives and any reasonable alternatives to it;
- (b) Describe any aspects of the prescribed development having or likely to have a substantial or important impact on the environment;
- (c) Describe the environment likely to be affected by the prescribed development and any reasonable alternatives to it;
- (d) Indicate the potential or actual impact of the prescribed development on the environment and of any reasonable alternatives to the prescribed development, including any enhancement of the environment;
- (e) Outline the reasons for choice of the prescribed development;
- (f) Describe and assess the effectiveness of any safeguards or standards intended to be adopted or applied for the protection of the environment;
- (g) State any intended investigations or studies of the possible impact on the environment before the prescribed developments implemented;
- (h) State any intended monitoring and reporting of the impact of the prescribed development; and
- (i) Address any further matters that the Minister, acting in accordance with the advice of the Cabinet may specify.

Requirements for further information

The Minister acting in accordance with the advice of the Cabinet may, where the Minister, deems it necessary require the developer to submit further information within a specified period.

Publication of initial environmental evaluation report and procedure in respect of objections and appeal

- (1) The Minister acting in accordance with the advice of Cabinet on being satisfied that a public environmental report meets the requirements of this Act shall cause the public environmental report to be published in such manner as he considers adequate or most effective for the purpose of bringing it to the attention of all public authorities and other persons, whose interests are likely to be affected by the proposed development.
- (2) Any public authority or person whose interests are likely to be affected by the proposed development may within thirty days from the date of publication of the notice referred to in subsection (1) make written objections to the Minister in respect of the proposed development.
- (3) On receipt of the written objections referred to in subsection (2), the Minister shall examine the grounds of objections and where the Minister deems it necessary after examining the objections of the affected parties either -

- (a) Acting in accordance with the advice of the Cabinet consent to the development, or the continuation of that development, with or without conditions;
 - (b) Acting in accordance with the advice of the Cabinet require the developer to produce an environmental impact statement and to conform with the provisions concerning environmental impact statements under this Part; or
 - (c) Acting in accordance with the advice of the Cabinet refuse consent to the prescribed development.
- (4) In making the decision the Minister, acting in accordance with the advice of the Cabinet shall take into account -
- (a) The information contained in the development application in the initial environmental evaluation report;
 - (b) Any objections received under subsection (2) and any information provided in support of the objections; and
 - (c) The objects of this Act.

Contents of environmental impact statement

An environmental impact statement in respect of proposed and existing prescribed development shall -

- (a) Contain a full description of the objectives of the prescribed development;
- (b) Analyze the need for the prescribed development;
- (c) Indicate the consequences of not implementing or carrying out the prescribed development;
- (d) Include adequate information and technical data adequate to allow assessment of the impact of the prescribed development on the environment;
- (e) Examine any reasonable alternatives to the prescribed development, including alternative sites for it;
- (f) Describe the environment that is or is likely to be affected by the prescribed development and by any reasonable alternatives to it;
- (g) Assess the actual or potential impact on the environment of the prescribed development and of any reasonable alternatives to it, including the primary, secondary, short term, long term, adverse and beneficial impacts on the environment;
- (h) Outline the reasons for the choice of the prescribed development;
- (i) Estimate the time period of any expected impacts;
- (j) Describe the geographic boundaries of the impacts;

- (k) State the methods of predicting and assessing each impact from the construction, operational and where relevant, the de-commissioning phase of an implemented development and for each alternative presented;
- (l) Justify the prescribed development in terms of environmental, economic, culture and social considerations;
- (m) Identify and analyse all likely impacts or consequences of implementing the prescribed development, including implications for the use and conservation of energy;
- (n) Describe measures to prevent or reduce significant adverse impacts and enhance beneficial effects and an account of their likely success with estimated costs as appropriate;
- (o) Describe residual impacts which cannot be mitigated or can only be mitigated partially;
- (p) Describe proposed monitoring and reporting schemes with estimated costs as appropriate;
- (q) Describe and assess the estimated cost-effectiveness of any safeguards or standards for the protection of the environment to be adopted or applied including its implementation, monitoring and reporting;
- (r) Give an account of the impact on the environment of any of a series or programme of similar development (whether implemented or not) over a period of time;
- (s) Give sources and references to information relied on and outline any consultations with any person's made during the preparation of the report;
- (t) Include a site survey report concerning National Heritage items or traditional artefacts as specified by the Minister acting in accordance with the advice of the Cabinet;
- (u) Address any further matters as the Minister acting in accordance with the advice of the Cabinet specifies; and
- (v) Give a clear and concise summary printed on a separate page.

Publication of environment impact statement and procedures in respect of objections and appeal

- (1) The Minister, acting in accordance with the advice of the Cabinet on being satisfied that an environmental impact statement meets the requirements of this Act, shall cause such statement to be published in such manner as he considers adequate or most effective for the purpose of bringing it to the attention of all public authorities, and other persons whose interests are likely to be affected by the proposed development.
- (2) Any public authority or person whose interests are likely to be affected by the proposed development may within thirty days from the date of publication of the notice referred to subsection (1) make written objections to the Minister in respect of the proposed development.

(3) On receipt of the written objections referred to in subsection (2), the Minister acting in accordance with the advice of the Cabinet shall examine the grounds of objections, and where he deems it necessary, after examining the objections of the affected parties either-

- (a) Acting in accordance with the advice of the Cabinet issue consent to the development with or without conditions; or
- (b) Acting in accordance with the advice of the Cabinet refuse consent.

Development to be carried out in accordance with development consent

(1) A developer shall not carry on any development except in accordance with the development consent.

(2) An Inspector may at any time if he has reason to believe that any person is responsible for, or substantially involved in any development, request such person to produce within a reasonable time evidence of the development consent.

(3) If any Inspector is not satisfied that a development consent authorising the particular development exists, or where the person requested under this section fails within a reasonable period to produce such evidence, the Inspector may issue a notice in writing requiring all persons involved in the development to immediately discontinue such development.

(4) Any person who contravenes subsections (2) or (3) commits an offence against this Act.

(5) Any person who is satisfied or disagree with the decision of an inspector may appeal to the Minister within 21 days of the inspector's notice issued under subsection (3).

(6) Any person who is dissatisfied or disagree with the Minister's decision under subsection (5) may within 21 days of the Minister's decision appeal to the High Court.

Offence of providing false or misleading information

A developer who knowingly or recklessly provides false or misleading information to the Minister or Secretary or to any public authority concerning any matter required to be addressed in the initial environmental evaluation report or in an environmental impact statement commits an offence against this Act.

Prescribed forms

Initial environmental evaluation report and environmental impact statement shall be in such form as prescribed by regulations.

Secretary to keep records

(1) The Secretary shall keep proper records of all development applications, environmental impact assessments, public environmental reports and development consents.

(2) The Secretary shall make the records referred to in subsection (1) available for perusal to the public during normal working hours.

Minister to issue guidelines for assessment of reports and statements

The Minister, acting in accordance with the advice of the Cabinet, may issue guideline for assisting the Division and the relevant public authority in assessing and evaluating any report, statements or other information.

Responsibility for initial environmental evaluation reports, etc.

- (1) The developer shall be responsible for all expenses incurred in the preparation of-
 - (a) An initial environmental evaluation report;
 - (b) The environmental impact statements; and
- (2) The developer shall provide the necessary information for the preparation of the initial environmental evaluation report.

Monitoring environmental aspects of development and costs

- (1) The Secretary acting in accordance with the advice of the Cabinet or the relevant public authority authorised by the Cabinet may at any time, whether before or after a development activity has been completed, monitor, or cause to be monitored, all or any of the environmental aspects of the implemented development activity.
- (2) In the performance of any functions under subsection (1), the Secretary acting in accordance with the advice of the Cabinet or any relevant public authority authorised by the Cabinet shall have regard to the effectiveness of any safeguards or standards adopted for the protection of the environment and the accuracy of any forecasts of the environmental impacts of the development activity.
- (3) The Minister, may acting in accordance with the advice of the Cabinet gives such directions to the developer to ensure that appropriate safeguards and steps are taken by the developer to mitigate any adverse environmental aspects.
- (4) The developer shall comply with the directions of the Minister issued pursuant to this section.
- (5) The developer of any prescribed development shall be responsible for the monitoring of such development and all the costs and expenses incurred for such monitoring.

Development consents non-transferable

- (1) No developer shall transfer a development consent granted under this Part.
- (2) Any transfer of shareholding in a company or other change of ownership which has the effect of substantially changing the identity of the development which has been granted development consent shall be deemed to be a transfer contrary to this section, and shall render the development consent invalid.

**ENVIRONMENT ACT 1999
(No. 9 of 1999)**

**AN ACT TO PROVIDE FOR THE PROTECTION IMPROVEMENT AND
CONSERVATION OF THE ENVIRONMENT OF THE REPUBLIC OF KIRIBATI AND
FOR CONNECTED PURPOSES**

**SCHEDULE
(Section 14)**

PRESCRIBED DEVELOPMENTS

1. FOOD INDUSTRIES including;

- (a) Fruit processing, bottling and canning
- (b) Brewing, making and distillery works
- (c) Abattoirs
- (d) Other food processing requiring packaging

2. IRON AND STEEL INDUSTRIES

3. NON-METALLIC INDUSTRIES including:

- (a) Lime production
- (b) Brick and tile manufacture
- (c) Extraction of minerals and mining
- (d) Extraction of aggregates stones or shingles, sand and reef mud, beach rock
- (e) Radioactive related industries
- (f) Manufacture of cement
- (g) Plastic manufacturing and moulding

4. LEATHER, PAPER, TEXTILE AND WOOD INDUSTRIES including:

- (a) Leather tanning and processing
- (b) Textile industry with dyeing facilities
- (c) Carpet industry with chemical dyeing
- (d) Manufacture of paper, pulp and other wood products

5. FISHING AND MARINE INDUSTRY PRODUCT

- (a) Fish processing
- (b) Seaweed farming
- (c) Land or marine foods processing or farming
- (d) Pet fishing licensing
- (e) Fishing ponds industries
- (f) Fishing activities in Kiribati waters
- (g) Introduction to Kiribati non-native (alien) species.

6. CHEMICAL INDUSTRY including:

- (a) Pesticide production and use

- (b) Pharmaceutical production
- (c) Fertiliser manufacture and use
- (d) Oil refineries

7. TOURISM INDUSTRY including:

- (a) Hotels
- (b) Golf courses
- (c) Recreational parks
- (d) Tourism resorts or estates

8. AGRICULTURE INDUSTRY including:

- (a) Livestock development
- (b) Agricultural development schemes
- (c) Irrigation and water supply schemes
- (d) Logging operations
- (e) Saw milling, all forms of timber milling and treatment, copra processing

9. PUBLIC WORKS SECTOR including:

- (a) Landfills
- (b) Infrastructure developments
- (c) Major waste disposal plants including recycling and collection systems
- (d) Soil erosion, beach erosion and siltation control
- (e) Hydropower schemes, desalination plants
- (f) Reservoir development
- (g) Airport developments
- (h) Causeways, drainage and disposal systems
- (i) Dredging
- (j) Watershed management
- (k) Ports and harbours
- (l) Seawalls/land reclamation
- (m) Boat channels
- (n) Port and harbours

10. GENETICALLY ENGINEERED ORGANISMS (GEOs)

11. OTHER

- (a) Industrial estates
- (b) Housing multiple units
- (c) Settlement and resettlement schemes
- (d) Petroleum product storage and processing works.

ANNEX B: FIELD MONITORING CHECKLIST

ENVIRONMENTAL ISSUE AND OBJECTIVE:	MITIGATION MEASURES	LOCATIONS	TIMEFRAME	ACHIEVED YES/NO	REMARKS
Social or Community Concerns To minimize social disturbance and maximize community benefits from the subproject:	<ul style="list-style-type: none"> Advise the local community of project plans in advance of construction, and where possible involve them in planning Avoid disturbances near living areas when possible Control runoff and manage sediments near garden areas Arrange for local people to be employed and trained Include women's and other community groups in project activities Negotiate with community about disposal areas, stockpiles 	Potential road alignment .	During mobilization and start of construction activities in the communities		
Soil Instability and Erosion To minimize the amount of sediment lost from the site:	<ul style="list-style-type: none"> Reduce the time surfaces remain bare Keep vegetation clearing to a minimum Avoid disturbance on steep slopes Keep vehicles on defined tracks Construct necessary temporary/permanent control structures Encourage re-vegetation after construction activity finishes 	All areas where clearing is required.	Continuous		
Controlling Sediment To minimize impact of storm water containing sediment on streams and coasts:	<ul style="list-style-type: none"> Install control structures at the outset of construction phase These may need to include silt traps along flow lines All disturbed areas which are not to be paved should be re-vegetated or prepared for natural re-vegetation after final land shaping Ground disturbance should be phased so that it is limited to areas of a workable size Construction should be scheduled so that large areas of soil are not laid bare during wet seasons Construction sites should be placed on flat ground Construction areas should be contained using a bund or trench, or isolated from other surface runoff, and cleaned and rehabilitated when construction is complete 	All areas where clearing is required.	Continuous		
Controlling Storm water To minimize the impact of contaminated runoff water:	<ul style="list-style-type: none"> Divert run-off from non-construction areas (temporarily) around the construction areas to keep the natural flow separate from construction run-off. Pass stormwater run-off from construction areas through a gross pollutant trap (to filter plastics, cans, etc.) and over a vegetated surface to remove petroleum-based organic pollutants before discharge into culverts or drainage systems. Design drains and culverts to remove all run-off water without scour. Store oil and bituminous products at a contained location away from drainage lines in an appropriate manner. 	All areas where clearing is required.	Continuous		

ENVIRONMENTAL ISSUE AND OBJECTIVE:	MITIGATION MEASURES	LOCATIONS	TIMEFRAME	ACHIEVED YES/NO	REMARKS
Management of Stockpiles and Spoil-heaps To manage features so dust and runoff are minimized.	<ul style="list-style-type: none"> Discussions about dumping be held with local landowners Site plans should include all drainage provisions suggested for construction sites The stockpile or spoil-heap location should be chosen to avoid blocking surface runoff or drainage lines If this is not a ridge-crest or flat plain site, the base should be leveled and contained If the spoil-heap or stockpile containing fine sediments is to remain bare for long in a high rainfall area, it should be covered to prevent erosion and sediment runoff Spoil-heaps and stockpiles must be subject to stability calculations to safeguard against major slips occurring After discussions with local landowners or community groups there may be plans to use spoil locally. If so a clear level site must be prepared on which the spoil can be dumped Where possible spoil should be used to backfill quarry areas or waste disposal pits before they are re-vegetated 	Dumping areas.	Continuous		
Air Quality and Dust Control To ensure there is no health risk or inconvenience due to dust production:	<ul style="list-style-type: none"> Spray water on exposed surfaces during dry periods Wet quarry loads or road fill loads being carried in open trucks 	Cleared areas	During dry periods		
Noise control To ensure nuisance from noise is minimized:	<ul style="list-style-type: none"> Use modern and well maintained equipment (with mufflers where appropriate) Use noise screens or mounds near residential areas Carry out noisy construction activities during normal working hours Advise local people when there will be blasting or unusual unavoidable noise 	All construction areas, access routes	Continuous		
Offsite and Waste Management To avoid contamination from solid wastes and sewerage:	<ul style="list-style-type: none"> Contain all stores waste within construction sites During site clean-up burn all spilled fuel oils Crush, burn, and bury all inorganic solid waste in an approved disposal area. This includes paper used in bitumen spraying Remove all disabled machinery from the project area Use above-water table pit latrines or composting toilets at residential construction sites Compost or use as animal food all green or organic wastes 	All proposed quarry sites	From quarry development to closure		

ENVIRONMENTAL ISSUE AND OBJECTIVE:	MITIGATION MEASURES	LOCATIONS	TIMEFRAME	ACHIEVED YES/NO	REMARKS
Safety and Health To ensure maximum safety of construction personnel and local residents:	<ul style="list-style-type: none"> • Ensure all occupational health and safety requirements are in place on construction sites and in work camps • Install lights and cautionary signs in hazardous areas • Establish footpaths and pull-off bays along roads through villages, near markets, schools and other community facilities • limit time of exposure to dust particles, chemical, and noise; enhance safety and inspection procedures; and • Safe handling of toxic materials, explosives, and other hazardous substances. • Use of Personal Protection Equipment (PPE) 	All construction sites.	Continuous		
To avoid disturbance by the constructions workers:	<ul style="list-style-type: none"> • Prohibitions on hunting and poaching of wildlife, purchasing wildlife meat, fishing, gathering and harvesting medicinal or valued plants and trees, and possessing firearms, snares, traps and other hunting equipment; • Access to construction camps will be controlled and access restrictions for non-construction personnel will be applied. • Housecleaning and waste management requirements • Penalties for violation of rules and regulations 	Construction camps	Continuous		
General Health and Safety Awareness for construction workers should include:	<ul style="list-style-type: none"> • Introduction to health and safety issues in construction sites and on Construction sites including main areas of risk to workers and others • Education on basic hygiene practices to minimize spread of typical tropical diseases • HIV/AIDS and STD awareness, including information on methods of transmission and protection measures • Prohibition of drugs • Prohibition of alcohol on construction sites • Procedures for seeking medical assistance in emergency or non-emergency situations and procedures for seeking other health-related assistance. 	Construction camps	Continuous		
Site de-commissioning To minimize ongoing impacts after construction is completed:	<ul style="list-style-type: none"> • Rake or loosen all compacted ground surfaces • Establish a site re-vegetation plan. Where possible involve local women's groups to provide materials and implement re-vegetation 	All construction and camp sites	After completion of construction		