



Republic of Kiribati

Climate Change Adaptation (CCA) Strategy

1. *Aim and Content of the Strategy*

1.1. The CCA Strategy aims to implement the Government's policy on adaptation to climate change, which states that:

- A. Kiribati should be mentally, physically and financially well prepared to deal with whatever climatic trends and events the future may hold;
- B. this should be achieved through a nationally co-ordinated, participation-based adaptation programme carried out by official and private agencies; and
- C. external financial assistance should be obtained to meet the costs of the national adaptation programme.

1.2 Adaptation to climate change is in the first place an intellectual process. It involves people and organisations providing, receiving, interpreting and understanding information about climate variability and change and the resulting impacts and adjusting their behaviour in the light of this information so as to be better able to deal with climatic trends and events.

1.3. Flows of information and adjustment of behaviour occur at individual, household, community, government and non-government institutional and national levels. The information comes from various sources through formal or informal channels. Behavioural changes may relate to the way existing resources and assets are used, or involve their relocation or modification, or require the acquisition of new and different resources and assets. The way people and communities behave towards each other may also change according to how they expect their resources and assets to be affected by climate change

1.4. The climate has a direct and far-reaching impact on personal and institutional life in Kiribati. Droughts and storms have shortened lives and damaged or destroyed resources and assets as long as the atolls have been inhabited. Over hundreds of years communities and households in Kiribati developed great resilience in the face of climate-related hardships, while keeping their investment in physical assets to a level they could sustain and renew.

1.5. In modern times the growth of population, monetisation and access to assistance from Government and aid donors have weakened traditional self-reliance based upon the environment and its natural resources, while driving huge increases in the monetary value of public and private assets. Climate change is now increasing the risks of loss and damage to these assets. Long-term trends are likely to intensify short-term events—storms and droughts—and make them more frequent. If such changes occur no aspect of life in Kiribati will escape their impact.

1.6 To enable actions in response to climate change to be planned, assumptions must be made about the nature and extent of the change. As events in Kiribati and globally provide new data, trends will be monitored, initial assumptions modified and plans adjusted. Based on recent work by the Government’s Climate Change Study Team (CCST) the initial planning assumptions made now for Tarawa are as follows¹:

<i>Climate change indicator.</i> <i>Year</i>	2025	2050	2100
Mean sea level rise (centimetres) relative to the level in year 2000	+6 cm (+3 to +10)	+14 cm (+6 to +26)	+39 cm (+12 to +83)
Change in annual mean air temperature (degrees Centigrade) relative to year 2000	+0.4 °C (+0.3 to+0.5)	+1.0 °C (+0.8 to+1.4)	+2.3 °C (+1.3 to +3.5)
Change in annual mean rainfall relative to year 2000	+3% (+1% to+7%)	+7% (+2% to+17%)	+15% (+4% to +46%)

1.7. As the risks are far-reaching, so adaptation-awareness also needs to reach into all areas of development policy and operations. Adaptation requires greater capacity at all levels to provide, get and use relevant information and to take action to improve environmental, social, and economic sustainability. Money, people and other assets for such action need to be mobilised and managed efficiently. Climate change will also affect the ENSO cycle which in turn may affect the variability of temperature, rainfall, and sea level even further. Such changes in variability could have large effects, for instance on the occurrence and intensity of droughts. While the current climate models cannot precisely project these risks, Kiribati can prepare for them by improving its resilience to the current projected variability and change.

1.8. The CCA strategy therefore aims to strengthen Kiribati’s ability to handle climate change by action under eight headings:

- i. *integration of CCA into national planning and institutional capacity*
- ii. *use of external financial and technical assistance*
- iii. *population and resettlement*
- iv. *governance and services*

¹ Projections based upon four emission scenarios (IPCC SRES A1F1, A2, B1), and three climate models (CSIRO2, MadCM3, CCCma1/2). The ranges reflect the uncertainty in climate projections, partly inherent in the climate models, and partly due to uncertainties about future greenhouse gas emissions.

- v. *freshwater resources and supply systems*
- vi. *coastal structures, land uses and agricultural practices*
- vii. *marine resources*
- viii. *survivability and self-reliance.*

The content of the strategy is described in the following sections of the statement.

2. *Integration of CCA into national planning and institutional capacity*

2.1. The national planning and budgeting process comprises five main parts:

National Development Strategies (NDS): a four-yearly statement of national development issues, priorities and strategies—the broad picture of Government thinking and intentions for near term implementation.

Long-range policy and strategy statements: policies and strategies developed by responsible ministries and approved by Cabinet for specific aspects of national development in a longer (ten years or more) time frame: for example, education policy, population policy, transport policy, policy on information technology, policy on adaptation to climate change.

Annual GoK Budget approved by Parliament towards the end of each financial year, estimating revenue and authorising expenditure for the following year on current operations and development projects.

Multi-year Budget Framework: a rolling seven-year framework presenting the Annual Budget as the mid-year, with three past years (actual out-turns) and three forward years, to show recent fiscal performance and the fiscal implications of the Government's current NDS and policy statements.

Ministry Operational Plans (MOPs) and Public Enterprise Business Plans (PEBPs): annual statements of the condition and capabilities of the ministry or public enterprise and its operational or business plans for the current year and one or two years ahead. MOPs explain how ministries will spend the funds allocated to them in the Annual Budget in pursuit of NDS strategies and their statutory and policy responsibilities.

2.2. Integration of CCA into this process is apparent at each level. NDS 2004-7 identifies climate change as a serious risk to economic growth and calls for development of ways of minimising and managing the risk of loss. The Government's recent policy statement on adaptation to climate change sets out three main policy aims, which in turn shape the present statement of CCA strategy. This explains how the Government intends to improve the security of public assets in the face of increasing climate-based risks, and how it proposes to assist individuals, households, communities and non-state agencies to do likewise with their own assets. In the MOPs of ministries with specific responsibilities for parts of the strategy², under the relevant programmes of each ministry, appear activities related to improving asset protection, minimising risk to persons and property and conserving resources for subsistence and economic

² And in the Annual Business Plan of the Public Utilities Board, the state-owned enterprise responsible to the Government for water, sewerage and electricity supply in South Tarawa.

use. In the Annual Budget, within the authorised expenditures of the relevant ministries, appear allocations to the appropriate programmes of a recurrent or developmental nature, with attribution to aid sources in the case of externally funded activities.

2.3. Planning and implementing CCA involves many ministries and agencies with different technical specialisations. Effective coordination of planning and monitoring of implementation is of particular importance in such a diffuse programme. Central oversight and coordination will therefore be provided by the Office of Te Beretitenti through the division of National Strategic Risk Management (NSRM).

2.4 A technical working group designated the Climate Change Study Team (CCST) is currently based in MELAD and chaired by a senior MELAD official. This group is made up of national climate change specialists and officials from the most concerned ministries. CCST monitors climate change nationally and globally, and assesses the vulnerability of islands and investments or activities to climate-related risks. CCST reports to the National Adaptation Steering Committee (NASC) currently based in MFED.³

2.5. NASC is chaired by the Secretary to OB and includes senior officials from concerned ministries and representatives of churches, the private sector and non-government organisations. It is serviced by the KAP secretariat. NASC has been concerned with inter-Ministry co-ordination and the inclusion in MOPs of CCA-related activities. NASC reports to and advises OB, and through OB in collaboration with relevant line ministries it advises the Cabinet on CCA matters. Cabinet decisions are advised to NASC and implemented by responsible ministries.

2.6. With the implementation of this strategy, OB will assume responsibility for oversight, coordination and monitoring of progress in all aspects of CCA. OB will monitor the explicit links between this overall CCA strategy and specific activities in MOPs, and will draw together relevant MOP progress reports into a regular report to Cabinet on progress with implementation of this strategy. These tasks will be carried out by OB's new NSRM division, assisted by NASC. The KAP secretariat will be incorporated into NSRM (see also paragraph 5.1 and footnote thereto). Continuing non-government participation in overseeing CCA is provided through non-official membership of NASC.

³ . Official members of both CCST and NASC are expected to convey their ministry's technical and policy advice on issues being discussed in these forums, and to relay CCST and NASC decisions and advice back to their ministries for action or further study.

3. Use of external financial and technical assistance.

3.1. The regular operations of several ministries (principally MPWU, MELAD, MISA, MFMRD and MCTTD) include activities that provide the planning and design basis for CCA and underpin the feasibility of specific CCA investment projects. These regular activities are integrated into ministry planning and work programmes. They constitute a national commitment to CCA that forms a counterpart to any external funding of specific CCA projects and programmes.

3.2. In 2003-4 Kiribati pursued a two-track process of developing CCA strategy and identifying CCA-related activities suitable for external assistance. With assistance from UNDP funded by the Global Environmental Facility (GEF) the Government undertook preparation of a National Adaptation Programme of Action (NAPA). This would have a strong base of participatory consultation to identify impacts of climate change already occurring, and the coping strategies already employed by households and communities to deal with those impacts. Assessments of vulnerability to climate change and ability to adapt successfully would be prepared for each island. From this would be developed a national programme of action with prioritised project profiles for government and non-government agencies and island communities. This programme, periodically revised and extended as required by new information and circumstances, would attract further external assistance as the international community implements the United Nations Framework Convention on Climate Change.

3.3. At about the same time and with assistance from the World Bank (WB) the Government embarked on preparation of a project intended for submission to GEF with substantially similar objectives to NAPA. The Kiribati Adaptation Programme (KAP) would also be based on participatory consultation and would identify adaptation mechanisms suitable for adoption at national, community and household level. The approach of KAP differed from that of NAPA in being more explicitly project-oriented in accordance with WB practice, and making greater provision for use of external assistance in project design.

3.4. The similarities between NAPA and KAP in general concept and demands for scarce national staff resources were such that duplication of effort at national level was unavoidable. Useful collaboration was achieved in 2003 when NAPA and KAP combined to hold participatory consultations on impacts of climate change and coping strategies as perceived by community representatives. But after that the separate and parallel existence of the two programmes was clearly problematic.

3.5. Accordingly in 2004 GoK decided to consolidate the direction of NAPA and KAP under the direction of OB to ensure the development of unified outcomes. These would form a comprehensive and broad-based national strategy for adaptation to climate change, incorporating the initial stages of an implementation programme whose activities would attract external funding. The present statement of CCA strategy constitutes the first output of this process. With periodic updating revisions and appropriate technical annexes on specific

topics this CCA Strategy will in due course fulfil the requirements envisaged for a Kiribati NAPA and implementation of decisions of the Conference of the Parties to the UNFCCC.

3.6. In collaboration with WB an outline KAP project proposal was lodged with GEF in late 2004 and is now under more detailed preparation. Elements of that project are described in relevant sections of this strategy statement. Proposals for grant aid for CCA-related investments are also being prepared for submission to the EU, and it is expected that ADB and bilateral donors will be approached for assistance in due course. As implementation of the strategy advances, progress with securing external funding for CCA will be reflected in GoK's annual budgets.

4. Population and resettlement.

4.1 Population policy has important linkages to CCA policy and strategies. The number of persons living on an atoll and engaging in subsistence or money-earning activities directly affects the nature and extent of the risks they face from climate change, the demands they place on the environment and natural resources, and their ability to plan and undertake adaptation measures. The expected size and location of the population are thus critical factors in analysing climate-related risks and planning CCA measures. In turn, those measures may include the relocation of people within islands, to other islands, or outside Kiribati.

4.2 NDS2004-7 identifies population growth as a major constraint on growth of income per head and requires development of a policy and strategies to stabilise total population by 2025. The Government accordingly adopted a comprehensive population policy in August 2004 and is starting to implement it in 2005. Like CCA policy, population policy is also to be supervised by the newly established Strategic Risk Management Division of OB, in collaboration with relevant line ministries.

4.3 The Government's current population policy aims at a stable population of about 125,000 persons by 2025. Of these, about 50,000 would be in North and South Tarawa, 45,000 in the other Gilbert Islands, and 30,000 in the Line and Phoenix Islands (of whom 25,000 would be on Kiritimati). This distribution would be sustainable on the basis of known and estimated land and water resources, provided that effective CCA measures are put in place to handle the risks to those resources that are expected to arise from climate change between now and 2050.

4.4 To achieve overall stability the population policy requires both a rapid transition to smaller family size through parental self-management of fertility, and active promotion of permanent emigration to Pacific Rim countries. Activities in adult education, school curriculum development, family planning and mother and child health services aimed at lowering fertility will be appropriate for direct external assistance in association with this CCA strategy. The need to reduce the vulnerability of Kiribati to increasing physical risks caused by climate change forms an important part of the case for host country agreement to government-

sponsored and self-sponsored emigration to resettle about 10,000 I-Kiribati overseas in the next twenty years.

4.5 To provide the envisaged population with acceptable living standards will require continued investment in infrastructure and services in Tarawa and Kiritimati, and development of one or two smaller growth centres in the Gilberts group (to help stabilise population in the Gilbert outer islands as a whole). These public investments, most of them to be funded by external assistance, are to be designed and built with full CCA awareness, and are to incorporate economically efficient solutions⁴ to the need to withstand climatic trends and events foreseeable over the next fifty years.

5. *Governance and services*

5.1 *Portfolio responsibility for CCA.* The responsibility of OB for strategic planning and policy coordination is described above in section 2. Responsibility for operational planning and the carrying out of activities to implement CCA strategy will lie with the relevant technical ministries and public enterprises. These are MPWU (water, infrastructure and public buildings), MELAD (external liaison on climate change, environmental management and regulation, agricultural extension, land use planning and regulation), MFMRD (inshore and ocean fisheries)⁵ and MISA (support to local government in urban areas and outer islands), MCTTD (telecommunications, weather and climate monitoring and weather forecasting). Each Ministry's operational commitments will be found in the relevant programmes in its MOP, while the appropriation of local funds and allocation of external aid to these purposes will be found in the Annual GoK Budget.

5.2. *Coordination of planning, administrative and regulatory activity.* At practical level coordinating committees will be established as required by the appropriate ministries. The Foreshore Management Committee of MELAD, with inter-ministry membership, is expected to assist MELAD to discharge its environmental regulatory and permitting functions relating to seawalls and foreshore structures. Generally the regulatory functions of MELAD and other agencies concerned with land use and structure design appear to be frequently bypassed by developers. This strategy will require the overhaul of arrangements for co-operation among regulatory agencies, so as to close loopholes through which unexamined

⁴ The location of the CC technical liaison and NAPA management functions in MELAD will be reviewed when the NSRM division of OB is operational. It may be logical then to co-locate these functions with the KAP secretariat in NSRM/OB

⁵ MFMRD is also responsible for minerals policy, which includes taking forward proposals for regulated commercial mining of sand and gravel in the Tarawa lagoon, replacing the present haphazard and damaging beach mining operations. These materials will be needed in large quantities for coastal protection works around South Tarawa. Accelerated action is required to implement the commercial-scale lagoon mining project. See also at Section 7.3, below.

developments can slip, and to avoid unnecessary processing delays or variations in standards.

5.3. *Climate monitoring, consultation and awareness.* Kiribati will maintain close contact with regional and international agencies engaged in monitoring and assessing climate variability and longer-term change. The role of the Intergovernmental Panel on Climate Change is important in that regard. As more and better data becomes available on the rate and nature of climate change, the conclusions will be taken into account in the regular revision of national development strategies and the design of CCA-driven activities and investments.

5.4. GoK will maintain periodic national and island-level consultations with communities to keep them informed of what appears from domestic and external information to be happening to the local climate. This will enable them to develop their own responses and to contribute to national and island planning on the basis of their own observations of trends and impacts of climate variability and change.

5.5. *Identifying and responding to community concerns.* A process of continuing consultation implies a commitment by the authorities to listen to the insights and concerns of people and communities and to make a credible and relevant response. The first national CCA consultations in 2003, conducted as a joint KAP-NAPA exercise, were necessarily broad-based. With the backing of this strategy statement, future consultations can focus on a few priority concerns, and can aim at identifying activities and investments and allocating responsibility for taking action. Funds for the continuing consultative process will be provided in the GoK Annual Budget, using both local and external funding. Agreed action by GoK on concerns identified in this way will appear in the appropriate MOPs.

5.6. *Local government administration and development.* Improving the capacity and effectiveness of local government is crucial to implementing this CCA strategy. Many of the services that most directly affect people's ability to handle climate variability and change fall naturally to be delivered at local government level, both in urban areas (South Tarawa) and the outer islands. Building standards and densities, waste disposal, land planning and permitting, land reclamation and community coastal defences are all within the remit of local government. Kiritimati, where national government has until now been responsible for everything, is now moving towards provision of services by local government.

5.7. GoK is thus taking steps (not for the first time, but with an increased sense of urgency) to strengthen capacity at local level and to equip local governments with more and better information on CCA and related issues. UNDP and bilateral assistance will be used in this programme. The CCA project under design for submission to GEF includes a small grants scheme to assist island-level CCA-driven investments, and the possibility of aid to construct community storm refuges in certain islands is raised later in this strategy statement.

5.8. *Weather recording, forecasting and storm/drought warning.* CCA is a long-term response to slowly emerging climatic changes. The weather is a complex daily manifestation of the present state of the climate. The immense short to medium-term variability of the weather obscures climate change signals, but the maintenance of good records of the weather is a necessary condition for effective tracking of climatic patterns and events. Among other things, good-quality island rainfall records are essential for climate monitoring, and provide the basis for interpretation of any global or regional rainfall predictions at island level.

5.9. GoK's weather and climate recording services have fallen into disrepair, and most islands no longer maintain records. This strategy requires the system to be put back into good order. Accordingly the MOP of MCTTD needs to express the GoK commitment to restore effective weather monitoring (meteorological) services throughout the country, using both domestic and external funding. This will in time provide a much stronger base for interpreting global and regional climate change data into the Kiribati setting. Among other things related to early warning of extreme weather events, it will be easier to judge when the onset of dry weather may indicate emerging drought conditions. With suitable measuring equipment the revitalised weather and climate monitoring system could also undertake monitoring of sea levels on selected islands.

5.10. At the same time the improvement of outer island telecommunications will enable weather forecasting on a regional basis to be interpreted and relayed from Tarawa several times a day. Warnings of expected storm conditions likely to bring strong winds and heavy rain can then be reliably sent out in time to be useful. If Pacific regional tsunami warning systems are upgraded the severe weather warning system may be adapted to carry such urgent messages too.

Freshwater resources and water supply

6.1. *Priority.* An assured supply of uncontaminated freshwater is crucially important to the welfare of atoll communities, and ways of achieving it consistently rank highest among the coping strategies identified in national consultations. With little industrial activity in Kiribati so far ⁶, the main use of freshwater is domestic consumption for drinking, washing and sanitation. Freshwater resources comprise the groundwater lenses found in almost all atolls ⁷ and rainwater collected and stored in public or private storage tanks.

6.2 *Nature of problem.* Security of access to these resources is vulnerable to

- i. *lack of maintenance* causing water loss in reticulation, collection and storage systems;
- ii. *damage to reticulation systems by legitimate consumers or others*

⁶ A tuna processing plant is currently under feasibility study. This would significantly increase freshwater consumption in South Tarawa, and might require special supply arrangements

⁷ Banaba is a raised reef island with groundwater in its limestone core. Teraina (Washington Island) has an inland freshwater lake.

- iii. *pollution* caused by human activity in water reserves or rubbish accumulating in catchment and storage systems;
- iv. *drought* interrupting the replenishment of groundwater reserves and stored rainwater by rainfall; and
- v. *damage* from violent storms through saltwater inundation of the groundwater water lenses and wind damage to catchments and tanks.

The prospect of increasing climate variability and long-term climate change requires strengthening of the ability of freshwater resources to serve atoll communities under more extreme conditions.

6.3. Kiribati lacks a comprehensive inventory of groundwater resources and rainwater collection and storage assets. Improvements to groundwater supply systems in outer islands are commonly made without an assessment of supply potential, while large areas of potential roof catchment in public and private ownership in Tarawa and outer islands lack effective gutters, piping and storage tanks.

6.4. Small desalination plants in public and private ownership have been used in times of drought to supplement groundwater and rainwater resources, but operating costs and vulnerability to breakdown at present militate against wider use of such plant. As desalination technology advances, operating costs (especially energy requirements) come down and reliability/support systems improve, desalination may become a cost-effective component of regular supply systems, particularly in urban environments where consumers are able and accustomed to pay for water.

6.5 *Responses*. Against that background this strategy requires action in the following areas:

- i. make more efficient use of existing resources by improved demand management, particularly in South Tarawa and Kiritimati, through leakage control consumer education
- ii. metered consumption and pricing policy
- iii. water-conserving plumbing systems
- iv. maximise use of existing resources and develop new resources, by expansion and repair of rainwater collection and storage (with centralmanagement and
- v. distribution system for public rainwater resources)
- vi. protection of known groundwater by enforcement of land reserves and use of non-polluting sanitation systems identification, measurement,
- vii. development and protection of unused groundwater resources
- viii. land reclamation to create new groundwater resources
- ix. monitoring and periodic feasibility updates of desalination plant
- x. strengthen capacity to monitor weather and climatic conditions (MCTTD, MELAD) and the extent and condition of groundwater resources (MPWU, PUB), and to plan and manage water supply systems that can withstand increased climate variability and long-term climate change (MPWU, PUB).

6.6. Existing activities address some of these areas. The ADB-funded SAPHE water and sanitation project in South Tarawa is attempting to reduce water losses through leakage, improve household water management by new metering arrangements, and construct new water supply galleries to make greater use of the known groundwater resources in Bonriki, Abatao and Tabiteuea islets. A loan scheme to assist home-builders in South Tarawa to invest in domestic rainwater collection and storage has operated successfully for several years and there are plans to extend the scheme to outer islands. MPWU is undertaking limited outer island resource investigations in preparation for upgrading existing supplies in line with a Government election commitment. These activities need to be extended and reinforced as part of a broader strategic initiative, led by MPWU and funded as far as possible by external sources, to make groundwater and rainwater resources and supply systems robust against climate-driven loss and damage.

Coastal structures, land use and agricultural practices

7.1. *Nature of the threat.* Threats to physical assets and infrastructure from climate change take the form of

an increase in the extent and severity of *coastal erosion*, causing loss of usable land and existing investments, and
a rise in the incidence and severity of flooding by *inundation from the sea*, damaging or destroying structures and water lenses.

GoK has a dual CCA responsibility in relation to assets and infrastructure:

- i. to take preventive and remedial action ('climate-proofing') to minimise the risks to publicly-owned assets and infrastructure, and
- ii. to keep the public informed about climate change and the ensuing risks, and to assist (and where appropriate to require) members of the public to take timely action to minimise such risks for their own assets.

7.2. *Tools for Adaptation.* There is no single solution for all coastal impacts. A range of tools provides a choice of possible solutions to be evaluated for each identified site at risk and the nature of the risk. The tools include

- i. 'hard' engineering solutions involving structures (eg, seawalls, breakwaters, modifications to causeways);
- ii. solutions that enhance the ability of natural landforms to withstand erosion and flooding (eg, use of aggregate to nourish island margins, re-vegetation to assist beach stability);
- iii. planning solutions that restrict the use of land exposed to flooding or erosion, and control the extraction of aggregate that destabilises the coastline.

Island topography varies in detail: in some islands the construction of a 'community storm refuge' on a relatively elevated part of the island may be a cost-effective component of CCA, in others the cost may be prohibitive. The uncertainty inherent in CCA also means that flexibility as to further responses should be built into solution designs. There may be circumstances when it is best to do nothing immediately, until the direction and nature of the threat and the cost of countering it can be better assessed.

7.3. Safe Sourcing of Aggregate. It is critically important for CCA that adequate supplies of sand and gravel are available for engineering works from sites chosen so as not to undermine coastal stability. The current practice of beach mining carried on by individuals, households, communities and building contractors demonstrably does destabilise beaches and contributes to erosion and eventually to flooding and loss of land. The problem is most acute in South Tarawa but potentially exists in all the islands except Banaba.

7.4. With the help of SOPAC a naturally replenished site has been identified offshore in Tarawa lagoon capable of supplying aggregate for the foreseeable engineering needs of South Tarawa without affecting beach stability. The need to develop this source is highlighted in NDS2004-7. In preparing this CCA strategy several coastal erosion sites have been identified in South Tarawa where remedial action is required as a matter of urgency, and large quantities of aggregate will be needed to restore reasonable safety and stability. It is therefore an urgent requirement of the strategy that this source be developed and supplies of aggregate from it be made available as quickly as possible

7.5. Strengthening of Coastal Zone Management. GoK's processes for considering and approving or permitting coastal protection works and use of coastal resources (almost all land in Kiribati can reasonably be classified as coastal) do not at present give explicit consideration to CCA factors. Awareness of climate change, with the likelihood of higher sea levels and more severe weather conditions, needs to permeate all decision-making processes that relate to planning and utilisation of resources exposed to climatic risk. This awareness is needed equally in public and private decision processes, but GoK has a special responsibility in public education and the enforcement of risk-minimising regulations in both government and private sector investment decisions. MELAD, MISA (through local governments) and MPWU are the ministries most concerned.

7.6. Activities identified at ministry level. A number of activities have been identified for inclusion in the appropriate MOPs and funding by external assistance. These are based in the national consultations described above and in the technical assessments of the relevant ministries. They are classified as in section 7.1, above, as relating to public or private assets (structures, infrastructure, land improvements) or 'all assets'.

All assets develop design standards to apply to all coastal structures in Kiribati, using standard design assumptions for sea-level rise and storm surge effect for various degrees of site exposure to wave activity, including supportive stabilisation activities, eg re-vegetation and beach enrichment. These standards will be applied by GoK to its own investments and will be applied by regulation to non-government investments.

Public assets

improve the 'climate-proofing' of public assets by modifying the MPWU design process, to include methodical evaluation, on case-by-case, site-by-site basis, of CCA options for dealing with flooding, storm damage and erosion; apply the national design standards developed under A above; and build in monitoring and evaluation processes to enable continued system improvement.

design, fund and execute the following anti-flooding and anti-erosion works in South Tarawa as a matter of urgency, applying the systematic methodology just described to choice of technical solution:

- i. flood control at the National Hospital, Bikenibeu
- ii. erosion control at the eastern end of Bonriki airport runway
- iii. road and causeway repair and improvement of protective works at a number of currently eroding sites east of Bairiki

(Note that for these activities the mining of aggregate from Tarawa lagoon, described earlier, will be essential.)

Private assets

raise public awareness, understanding and capacity to 'climate-proof' private investments by

i) strengthening the approvals process for development consents so as to ensure CCA aspects are fully considered

ii) revision and publication of the (draft) guidelines for seawall construction with design improvements to minimise erosion and flooding effects

iii) establishing a fund to assist households and communities to undertake 'climate-proofing' investments and activities ⁸

iv) study the technical and financial feasibility of 'climate-proofing' outer island community assets and livelihoods, including land improvements, evaluating several combinations of technical options and levels of cost against the expected reduction in the risk of loss.

⁸ See section 6.5 on a fund to assist householders in South Tarawa with rainwater catchment.

Marine resources

8.1. *Ocean fisheries.* The highly-migratory Central and Western Pacific tuna stocks found in part in the Kiribati EEZ are the focus of international efforts to subject the high seas and EEZ areas of the tuna fishery to management standards agreed by coastal states and distant-water fishing nations. There are no special CCA precautionary measures currently required of Kiribati in that setting, but GoK will monitor developments to obtain early warning of any CCA-related concerns about tuna stocks and migration patterns. The management of public income derived from the tuna fishery does however require a form of ‘climate-proofing’, which is discussed at section 9.1, below.

8.2. *Lagoon and reef fisheries.* Increasing population and climate change appear to be combining to place greater pressure on inshore and lagoon fisheries and marine animal life associated with the coral reefs that define the atolls. Coral bleaching is reported in several parts of Kiribati, raising concerns about sustenance of the natural food chain supporting fisheries on which the atoll populations depend. The establishment of marine protected areas in collaboration with island communities to conserve stocks of heavily-targeted species, and the replenishment by aquaculture of depleted stocks where over-fishing or climatic events have undermined natural replenishment, both form part of MFMRD’s programme contributing to national CCA.

Survivability and self-reliance.

9.1. *Fiscal policy and financial management.* Kiribati is especially vulnerable to climate-driven fluctuations in national income and government revenues because of the dependence of both on fees levied on foreign fishing activities in the country’s large EEZ. The level of these activities fluctuates with climatic conditions in the Central Pacific, particularly seawater temperatures, which are likely to be affected by climate change in ways that are not yet clear. Variability of this income can to some extent be reduced by income-stabilising fee structures, but these tend to involve an overall reduction in income. It is likely to be better for Kiribati to manage this variability by operating its own income stabilisation strategy by multi-year budgeting and comprehensive fiscal planning.

9.2. That might involve maximising the revenue sustainably available from selling access to the EEZ (accepting the large variations in annual receipts that result from cycles in climatic conditions), but taking into disposable public income only that part of the EEZ access revenue that the multi-year modelling shows to be sustainable, and saving the balance into the national reserve fund (RERF). Transfers from the RERF would then supplement government revenue to offset cyclical falls in EEZ access revenues. In effect this is the existing GoK policy as manifested by fiscal performance. This CCA strategy requires only that it be made explicit and become formally part of GoK’s overall strategies for sustainable development. Without such formal accountability there is a strong risk of

consuming more of any given level of EEZ access fees than long-term fiscal sustainability can support.

9.2. *Community and household self-reliance.* At the opposite end of the scale but in human terms even more important, is the ability of communities and households to look after themselves under conditions of climate change. A significant level of help appears to be needed for successful CCA at island level, but it will require strong efforts by individuals, household and communities to be effective. Interventions by GoK and aid donors will need to be carefully conceived and managed if they are not to induce increasing aid-dependence..

9.3. *Small grants scheme.* MISA has in the past operated a GoK-funded small grants scheme to assist privately sponsored development projects in outer islands. This appears to have avoided the dependency trap, mainly by being restricted to a few small projects each year. Carefully managed alongside a climate change information and awareness programme, a CCA-oriented and aid-funded version of this scheme may be feasible with positive outcomes (see section 7.6C, above).

CCA in perspective.

10.1. Much will depend on how people see climate change and the need to adapt to it over the next few years. GoK regards CCA as one of several critical strategic issues facing Kiribati, where failure to act in a timely manner will cause significant loss and damage. It is also an issue for which external assistance is particularly appropriate because of the nature of the causes of climate change.

10.2. Complex problems of population growth, income generation, equitable distribution and the impact of the globalisation of trade and investment are interwoven with CCA in the development strategies of Kiribati. This statement of CCA strategy, which will be periodically updated, places GoK's CCA policy aims in a practical and operational context , provides guidance to Ministries and other public agencies on what GoK expects of them in pursuit of its CCA policy, and signals the need for substantial and continuing external assistance with adaptation to climate change.