Kiribati Adaptation Project

Implementation Phase (KAP II)

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Report on

KAP II First national Consultation

compiled by

Temakei Tebano PhD

(National Consultant)

for

KAP II PROJECT

Office of Te Beretitenti

Bauiriki, Tarawa. Kiribati

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Executive Summary

The First National Consultation for the second phase of Kiribati Adaptation Project (KAP II) was conducted between 4th to 7th December of 2007 at the Otintaai Hotel Conference Hall. Participation comprised outer islands Tiibi Kauntira (Chief Councilors) accompanied by Island Project Officers and Island Community Workers, in some cases Island Council Clerks replaced either one of the latter two. Island Councils from Betio and South Tarawa were also invited together with registered church representatives from South Tarawa. Guest speakers came from a wide range of fields that included social science, environmental science, fisheries and agriculture, coastal processes, financial development, weather monitoring, traditional navigation, biblical interpretation of human's role in God's creation, land use and degradation. Some government sectors could not make it for reasons beyond the control of KAP II.

Island vulnerabilities and potential risks linked to climate change and sea level rise were presented by respective councils. The main issues raised were water supplies, coastal erosion, declining marine and terrestrial resources, climate-related diseases such as diarrhea, sore eyes, dry cough and stroke. Under each respective island there is great need for improvement on existing seawalls and causeways, the latter requires the making of channels along the solid structures to allow water exchange and other biological processes to function. Other issues specific to each island are listed under island vulnerabilities and risks (Appendix 3).

Participants expressed their disappointment with the Kiribati Meteorological Services (KMS) for not providing update forecasts to fishermen and for other general and daily purposes in the past months. The drawbacks resulted from old machines and equipment that malfunction and unable to cope with compiling adequate and reliable information. The only solution to the problem is the procurement of appropriate and proper equipment and the training of staff for required skills in the area. To date, the weather office reported that new equipment is being purchased for some operations on the outer islands. However, a variety of sophisticated equipment is still needed to enhance the national capacity of KMS.

Issues that came out of the consultation assessment and evaluation relating to adaptation strategies include mangrove planting and seawall construction along vulnerable coastlines coupled with planting trees and bushes that will keep the shorelines from bad weather and rising sea level. Outer island consultation is requested as a follow up exercise to firm up understanding and knowledge gained from the Consultation, at the same time is to discuss further issues of concern to each respective council.

Participants insisted that presentations are delivered in Kiribati language with more time given to guest speakers and questioning; this would require a longer time frame in future consultations. Participants would appreciate that handouts are in Kiribati language and distributed prior to a scheduled presentation.

It is highly recommended that in future consultations:

- suitable personnel are part of the delegation,
- resource personnel from relevant ministries turn up for their presentation,
- presentations are well prepared for the target audience,
- the delivery of presentations are in Kiribati mode if participants include those from outer islands.

Equally important are:

- government and its ministries provide leadership and support to projects like KAP II;
- government ministries and departments commit their services to closer cooperation in closely related projects;
- appropriate government ministries take the lead in dealing with vulnerabilities and risks most serious to individual outer islands including Tarawa;
- appropriate and affordable adaptation activities are encouraged at a village and island level while those requiring financial assistance are considered by government;
- KMS is properly equipped with appropriate equipment through the support and commitment of Kiribati Government and other external agencies, and that staff undergo proper training;
- outer island consultations are conducted more frequently to ensure a larger portion of the rural population is informed on important issues relating to global climate change and sea level rise affecting their very existence and wellbeing.

Acknowledgement

I like to acknowledge the following persons for their invaluable assistance and contributions toward the organization and implementation of the Consultation without which this would not have been possible.

Mr. Kautuna Kaitara	KAP II Coordinator
Mr. Kaiarake Taburuea	KAP II Manager
Mr. Tekoreaua Kairoro	KAP II Procurement Officer
Ms. Atu M. Moaniba	KAP II Project Accountant
Ms. Ruti Kautebiri	KAP II Office Assistant
Dr. Tim O'Meara	International Advisor
Dr. Christine Hogan	Regional Advisor

Special thanks also go to the following resource people who have diligently prepared and shared useful information on what they do at their respective ministries in relation to climate change and sea level rise, or presented talks that inspired participants to be more proactive in what they do for their islands in light of the knowledge and skills they gained from the consultation.

Mr. Timii Kaiekieki	National Economic Planning Office, MFEP
Dr. Komeri Onorio	ThEcoCare Group, Abarao
Dr. Ueantabo MacKenzie	Director, University of South Pacific Kiribati Campus
Rev. Dr. Kambati Uriam	Principal, Tangintebu Theological College
Ms.Moataake Burentoun	Outer Islands Development – MISA
Mr. Moreti Tibiriano	Kiribati Meteorological Services, Betio
Mr. Tebutonga Ereata	Commissioner of Lands, MELAD
Mr.Amon Marae	Kiribati TV, Telecom Kiribati Limited
Mr. Ioane Uhaitoi	Senior Agricultural Officer – MELAD
Ms Reenate Willie	Mineral Unit, MFMRD
Ms Tererei A. Reema	Director, Environment Conservation Division, MELAD
Ms Tooti Tekinaiti	Acting Director, Fisheries MFMRD

Many thanks to the Management and support staff of Otintaai Hotel for the catering, preparation and arrangement of the Conference Hall. And last but not least are the bus company proprietors that assisted with transporting participants to wherever they are required, in particular Tibete Tomizuka, Manu Bakatokia and Roko Timeon.

Kam bati n rabwa

Abbreviations and Acronyms

AoG	Assembly of God
AusAID	Australian Agency for International Development
BTC	Betio Town Council
CC	Chief Councilor
CCA	Climate Change Adaptation
CPPL	Central Pacific Producers Limited
CCST	Climate Change Study Team
CoG	Church of God
ECD	Environment and Conservation Division of MELAD
EIA	Environmental Impact Assessment
GEF	Global Environmental Facility
GoK	Government of (the Republic of) Kiribati
IC	Island Council
ICW	Island Community Worker
IPO	Island Project Officer
KAP I	Kiribati Adaptation Program, Phase I
KAP II	Kiribati Adaptation Program, Phase II
KAP	Kiribati Adaptation Project
KHA	Kiribati Housing Authority
KFHA	Kiribati Family Health Care Association
KMS	Kiribati Meteorological Services
KPC	Kiribati Protestant Church
KTV	Kiribati Television
LDS	Latter Day Saints (Mormon Church)
LRD	Land Resource Development
MELAD	Ministry of Environment, Lands and Agricultural Development
MoE	Ministry of Education
MFEP	Ministry of Finance and Economic Planning
MFMRD	Ministry of Fisheries and Marine Resources Development
MHMS	Ministry of Health and Medical Services
MCTTD	Ministry of Communications Transport Tourism Development
MISA	Ministry of Internal and Social Affairs
MOP	Ministry Operational Plans
MPWU	Ministry of Public Works and Utilities
NAPA	National Adaptation Program of Action
NASC	National Adaptation Steering Committee
NDS	National Development Strategies
NEPA	National Environment Policy Act
NEPO	National Economic Planning Office
NSRM, NSRMU	National Strategic Risk Management (Unit)
NZAid	New Zealand Aid

NZODA	New Zealand Overseas Development Agency
OB	Office of Te Beretitenti
OI	Outer Islands
PIP	Project Implementation Plan
PUB	Public Utilities Board
PWD	Public Works Department
RAK	Reita-n-Aine ni Kiribati (Protestant Women Group)
RC	Roman Catholic
SOPAC	South Pacific Geoscience Commission
SPC	Community of South Pacific
ST	South Tarawa
TUC	Teinainano Urban Council
USP	University of the South Pacific
VP	Vice President
WB	World Bank

1. Introduction

All islands in Kiribati, except Banaba, are barely more than 3 meters above sea level (Thaman and Tebano, 1995). Kiribati is listed as one of the most vulnerable countries in the South Pacific to the effects of climate change and sea level rise. Not only warmer climate and rising sea level that these islands are going to be affected by but there are also events of droughts and strong winds and high waves that can wash over the whole islands in a few minutes leaving everything in a mess and critical situations (Government of Kiribati (2004, 2005). The minor effects of climate change and higher tides over time will impact on coastlines, water sources, vegetation, and people at large. The king tide events of February 9, 2005 (Greenpeace, 2005) is just a reminder of similar but more intense events yet to come. It is time to think and act now rather than wait and see. Perhaps it may be useful to think of what the World Bank (2000) terms as a 'no regret' attitude that focus on doing things that will help us in times of hazards whether they show up or do not show up at all but benefit us even more in the long term.

The Kiribati Adaptation Project, also known as KAP, has now come to Stage II in its implementation. Under KAP I, the First National Consultation was held from 21st – 25th July, 2003 (KAP II team, 2003); it was preceded by a Consultation involving representatives from Banaba, Betio Town Council (BTC) and Teinainano Urban Council (TUC) that was held from 23rd -26 June, 2003 (KAP II team, 2003). The second National Consultation took place from 3rd – 6th November of the same year.

KAP II is managed by a core staff comprising the Coordinator (Mr. Kautuna Kaitara), the Manager (Mr. Kaiarake Taburuca), the Procurement Officer (Mr. Tekoreaua Kairoro), the Project Accountant (Mrs. Atu Moaniba) and the Office Assistant (Ms. Ruti Kautebiri). The First National Consultation was planned for 4th -- 7th December, 2007 the Otintaati Hotel in Bikenibeu Village. Some government ministries such as, of Environment Lands and Agricultural Development (MELAD), of Education (MoE), and of Health and Medical Services (MHMS) are located in this same village. The remaining ministries are either in Bairiki (the main center of Government business) or on the islet of Betio, the most populated islet in Kiribati. KAP II is currently housed at one of the rented living quarters of the Kiribati Housing Corporation (KHC) in central east Bairiki a few blocks from the offices of some overseas missions. The coordinating body is the Office of Te Beretitenti (OB).

The Consultation was conceived under the auspices of the World Bank (WB) in partnership with Global Environment Facility (GEF), governments of Australia and New Zealand (co-financiers) and the Government of Kiribati (GoK), the latter implemented the Project by hiring a range of consultants and advisors through KAP II (Government of Kiribati, 2004). The aims and objectives of the consultation were to identify main issues related to climate change and sea level rise from stakeholders, discuss ways and means of adapting and planning appropriate strategies to overcome or minimize them.

The Consultation was designed and facilitated by Dr. Temakei Tebano, a former Director of the Atoll Research Center of the University of the South Pacific based in Tarawa,

Kiribati. Dr. Tebano was also tasked to take on risk assessment and similar consultations on the selected outer islands in 2008 and 2009 of the Gilbert Group and a second national consultation in 2009. The latter will depend on the outcome of the consultations on the outer islands.

2. Schedule of KAP II First National Consultation.

The tentative date mentioned earlier was confirmed, preparatory plans were finalized and implemented. The dates coincided with the election of a new President under which office this Project runs. The first part of the Consultation was the official opening by the Vice President, Ms Teima Onorio; the second part was the consultation proper, and the last part was the official closing by the President himself at the State House in Bairiki. The four days were portioned into morning and afternoon sessions with government and private guest speakers, and with lunch and tea provided. Site visits were made on the afternoon of the third day while the fourth day was dedicated to reflection on guest speakers' presentations, group discussion and evaluation.

The selection of outer islands participants was made in consultation with the Ministry of Internal and Social Affairs (MISA) and respective Island Councils. Travel arrangements were made in advance prior to the dates of the consultation through KAP II Office. Most participants arrived a day or a few days before the actual start up date. Participants from North Tarawa traveled by double hulled canoe that connect their rural villages with the urban South Tarawa. The South Tarawa and Betio participants, including church representatives traveled to the workshop together with outer islands participants on arranged transports.

3. Agenda for the Consultation

The Agenda depended partly on previous consultations and workshops of which respective reports highlighted the main issues discussed, acted on, implemented and those that need to be followed up. Reports compiled by several consultants, including the 2000 World Bank Report (2000), listed all types of vulnerabilities and potential risks from the impact of climate change and sea level rise. They were also categorized and allocated to appropriate government ministries and other stakeholders.

In the Terms of Reference of the National Consultant what came out clear were the appropriate adaptation strategies to counter or minimize identified risks and vulnerabilities. One step further is to start thinking of doing things on manageable budgets or small grant projects. These have to be thought out properly in the planning process and in partnership with all stakeholders. The development and evaluation of the best possible solutions to be implemented by the communities in order to minimize, reduce or even stop the vulnerabilities identified is crucial and is one of the expected outcomes of the consultation. Assessment of the most appropriate, practical and cost-effective possible solutions to address the challenges is important at this stage. This will be continued and reinforced during the outer islands consultations that will follow in 2008 and 2009.

In the planning and design of the Consultation agendas four resource personnel categories were engaged, that included key project professionals from each ministry, academics, community representatives (including churches), and island council representatives. The design allows all stakeholders the opportunity to voice their own opinions based on their understanding and experience with key issues and vulnerabilities to be discussed. At the same time it also encouraged them to participate and get involved in the adaptation processes on their respective islands and bring back those knowledge and understanding to their respective islands. The design basically gave all participants a chance to share their knowledge and skills on any particular issue of interest to the audience. Selected resource people were properly introduced and hard copies of their presentations were distributed during or before the sessions.

4. Proceedings of the Consultation

The Consultation was conducted as planned at the Otintaai Hotel Conference Hall. Tuesday was the first day as Monday was a public holiday to honor human rights. Friday was the last day with a closing ceremony held at the State House in the later hours of the day. The order of the Consultation is presented below.

Arrival of Participants to the Consultation

Day One (Tuesday 4th December, 2007) - Participants arrived around 8.30 am. They were invited upstairs to the Conference Hall to register and be seated before the arrival of the Vice President (VP), Honorable Teima Onorio. Mr. Tekoreaua Kairoro, an official from KAP II escorted the VP. Participants were asked to fill in the registration forms. Short instructions regarding the contents of the folders which each participant was provided. The folders contained background information on the sciences related to climate change and sea level rise, extracts from KAP II Implementation Plan and other relevant information and quotes from a variety of sources. Record sheets to note important issues raised by individual guest speakers and those discussed during the consultation were provided.

Official Opening, Tuesday 4th December

The Facilitator of the Consultation, Dr. Temakei Tebano, first showed the order of the events on power point projector. The Vice President arrived at 08.55. The Manager of the Project, Mr. Kaiarake Taburuea, who co-facilitated and chaired the opening session delivered a short welcome to the VP and all participants that included island chief councilors and officials, Secretary to Cabinet, church representatives and others who witnessed the opening of the Consultation. Reverend Burangke was requested to open the occasion with a short prayer. The VP was invited to deliver an opening speech (in Kiribati language) with a summary extract translated to English below:

"I am honored indeed to be given the task of opening the consultation in the place of the Minister for Environment who is away in Indonesia to present our concerns on climate change and sea level rise. Climate change and sea level rise affect all aspects of our livelihood. They affect our water, food, health, resources and land in many ways. We must think seriously of means and ways of countering and doing activities that will help us survive the harsh conditions of climate change and sea level rise. The Government has been proactive since its election into power and there have been talks with large countries to encourage them to reduce their greenhouse gas emissions. The USA and Australia were two industrial countries that have not ratified the Kyoto Protocol; I am glad to tell you that the newly elected Prime Minister of Australia Mr. Kevin Rudd has promised to make the signing of the Kyoto Protocol a number one on his agenda. We should work hand in hand with government and stakeholders to try and define priority vulnerabilities and show to government what you can do and what assistance government can give in light of our poor economy. I thank KAP II staff and those consultants (past and present) who have and are assisting in finding solutions to the many problems Kiribati is facing in relation to climate change and sea level rise. It is my hope that you do your utmost to identify your own vulnerabilities at island level. I wish you all the best and declare the Consultation, OPEN. Te mauri, te raoi ao te tabomoa. Kam bati n rabwa."

Scope of Project

Mr. Kautuna Kaitara, the Coordinator of KAP II, delivered a short presentation outlining the roles and functions of KAP and which activities were executed between 2003 through 2005 with KAP I as a preparatory foundation for KAP II. The latter carries out the recommendations from KAP I and its functions are described as more of putting words into planning and action. KAP II is meant to be a pilot project that will trial adaptation strategies to vulnerabilities identified in this and previous consultations. Toward the end of his presentation, Mr. Kaitara challenged participants with the saying of John F. Kennedy, former President of the United States, 'what can I do for my country but not what my country can do for me' or 'what can I do for Kiribati but not what Kiribati can do for me'.

Introductions

The next session was the introduction of participants. The Co-Facilitator asked the Chief Councilors (CCs) to introduce themselves and their team members. The order proceeded from Makin Island and finished with Arorae. Banaba and the Line Group were not represented because of difficulty in travel arrangements. Most Chief Councilors were accompanied by their Island Project Officers (IPO) and Island Community Workers (ICW). Where IPOs and IWCs were not available because of other important commitments Island Council Clerks or other officials stood in.

Presentations by Guest Speakers

The sessions after tea and those delivered after lunch till 4 o'clock were co-facilitated by Mr. Kautuna Kaitara, coordinator of KAP II. The first session was taken by Dr. Ueantabo MacKenzie, Director of the University of South Pacific Kiribati Campus. "The Sun came closer to my home" was the title of his presentation, a phrase spoken by one of the old women whom he interviewed in Butaritari during his social survey in 2003 and 2004. Dr. MacKenzie outlined major issues and findings that included: water resources,

coastal erosion, decline in marine and terrestrial resources and the dying corals. He also mentioned a connection between a decline in food resources impacted by climate change and sea level rise with food security, that I-Kiribati are more vulnerable to becoming poor because of loss of natural food sources, hence are becoming more dependent on imported food items. An interesting point that he brought forward was that I-Kiribati have not thought seriously about a long term solution in a scenario of Kiribati being under water. As in the case of Tuvalu that has started the long term strategies that included relocating its people to higher grounds elsewhere, Kiribati is probably in the process of doing so. It is important that Kiribati starts planning for short, medium and long term solutions to adapt and lessen the impact of climate change and sea level rise. Participants were encouraged to ask questions for clarification with responses from both Dr. MacKenzie and Mr. Kaitara.

The second presentation 'What caused climate change?' was delivered by Ms Tererei A. Reema, Director of the Environment Conservation Division (ECD) of the Ministry of Environment, Land and Agricultural Development (MELAD). Ms Reema specifically focused on the impact of climate change and sea level rise on biodiversity and atolls in particular, as they are barely above sea level and would probably one day go under water with case scenarios showing how South Tarawa would look like in 2025, 2050 and 2100. In other words this town can support only a few people as most of it will be under water, the coastal areas will be inundated leaving a narrow strip of land above sea level. She also stressed associated problems affecting our marine and terrestrial biodiversity. MELAD has National Adaptation Program of Action (NAPA) and can help in whatever they can in relation to climate change adaptation and sea level rise.

The third presentation on 'Water Problems in Kiribati' after lunch by the Public Utilities Board (PUB) was not delivered for reasons beyond the control of KAP II. However, the Facilitator, Dr. Temakei Tebano showed videos on the ferocity of bad weather on coastal areas and island biodiversity with additional scenes on the impact of droughts on fruit trees, coral reefs and marine life. Another video on the problems of gravel and sand mining on South Tarawa and Betio, that is linked to coastal erosion, was screened.

Afternoon tea break was called up after which sessions five and six were taken by Ms Tooti Tekinaiti, Principal Fisheries Officer, Ministry of Fisheries and Marine Resources Development (MFMRD), and Mr. Ioane Ubaitoi, Plant Genetics Officer of the Agricultural Division of MELAD, respectively. Ms Tekinaiti with 'Impact of Climate change on marine resources' outlined factors affecting fisheries and marine resources in connection to climate change and sea level rise. These included over-fishing, habitat destruction, pollution, excess nutrients, invasive species and warmer water temperatures that impact the ecological, physiological and biological aspects of marine resources in various ways. Direct impacts of climate change include increasing surface water temperature, increasing sea level, increasing weather variability, more frequent droughts and storms causing flooding, changes in deep and surface water circulation, and variation in oxygen and carbon dioxide availability to living organisms. Because of increasing temperatures corals and fish are affected, invasive species may flourish, phytoplankton

and zooplankton on which other larger organisms and fish depend on are also affected resulting in reduction and decline in marine resources.

Mr. Ioane Ubaitoi opened up his presentation titled 'Impact of Climate Change and Sea Level Rise on the Terrestrial Resources and the Potential Practical Adaptation Strategies' with God's promise to Noah that 'there will be no more floods'. The floor was full of laughter and giggles as the verse seemed to contradict the theme of the consultation that focused on potential risks and vulnerabilities from climate change and sea level rise. Mr. Ubaitoi went on to say that the impact of climate change and sea level rise could wipe out plant species that are currently endangered. They may also have substantial impact on rural areas on wildlife for subsistence living. Loss of species would impact the functions and biological processes provided by wildlife through distinct roles within an ecosystem (processes like pollination, natural pest control), including recreation, cultural and religious practices of indigenous people. The lowest coastlines will be flooded and inundated; sea water will intrude into dry land causing damage to plants, animals and drinking water. Adaptation strategies include the promotion of planting resilient food crops and drought tolerant livestock for food security; promote community agro-forestry and forestry management. Those responsible will be the Agricultural divisions under MELAD. Potential development parties include GEF, SPC (Land Resource Development) and FAO. The mention of the Biblical saying in the introduction was used in the context that people should think of sustainable development in agriculture for their own benefit and wellbeing regardless of floods or no floods.

The sixth session was taken up by Mr. Moreti Tibiriano, Director of Kiribati Meteorological Services (KMS) under the Ministry of Communications Transport and Tourism Development (MCTTD) with his paper titled 'Roles of the Kiribati Meteorological Services)'. Mr. Tibiriano outlined the roles of KMS, the problems it is facing in terms of equipment and modern technology to enable them forecast accurate and update information. These are necessary for weather and marine forecasts, awareness and advance weather predictions and even issuance of a 3-month seasonal outlook and early warnings for bad weather and related events. The importance of having stations on outer islands will help KMS collect useful data that can be used to predict events such as droughts, EL Nino and La Nina effects on our weather pattern. There is a great need for new and powerful equipment to replace the old ones; staff need proper training to ensure equipment are properly operated, events are properly recorded and interpreted for public consumption. Equipment deployment on outer islands is a must and government support is critically needed. As of the compilation of this report Mr. Tibiriano reported that some equipment have been acquired and are enhancing the capability of KMS to some extent. The day ended with a wrap up of the sessions and house keeping matters.

Day Two (Wednesday, 5th December) – The second day of the consultation was opened by Mr. Tebutonga Ercata, Commissioner of Lands under MELAD with his paper titled 'Lands Adaptation Strategies'. Mr. Tekoreaua Kairoro, a Procurement Officer of KAP II co-facilitated and chaired most of the day's sessions. Issues linking land use with climate change and sea level rise include outlook of land use now and 30 to 40 years to come, problems that affect terrestrial resources, laws and regulations related to the above,

strategies related to land use to prepare us counter or reduce our vulnerabilities and risks from any disaster related to climate change and sea level rise. Problems impacting on terrestrial resources include increasing human population, lack of physical planning, dwelling located at the lagoon high tide areas prone to bad weather and rough seas. Strategies to counter or reduce vulnerabilities and risks include knowledge retention on how traditional ways of living and managing our resources, Government should strive to seek assistance from overseas donors to help in projects beyond national economic strength, law enforcement on land use and planning, enforcement of land planning in particular on coastal areas, the establishment of land care groups on the outer islands to manage and protect coastlines and foreshores.

Session Two of the second day on 'Construction Designs, Successes and Failures' with particular reference to construction activities on the outer islands were not presented; reasons could not be obtained from a respective division of the Ministry of Public Works and Utilities. The next session by MISA presented by Moataake Burentoun with her paper 'Island Council priorities' was advanced to fill the potential gap in the program. Moataake discussed and encouraged participants on the importance of well planned projects in light of EIA at an island level before they are submitted to MISA for funding consideration. Island Council priorities for the years 2004 through 2006 were shown, some have been completed while others still await funding.

The allocated 20 minute time slot for Public Works Division (PWD) was filled in by Dr. Temakei Tebano who briefly presented the results of his survey on traditional navigation. His report titled 'Are traditional navigation skills and knowledge still useful today?' revealed that traditional navigation skills and knowledge are becoming less useful due to climate change that substantially affect weather forecast at regional and national levels. The heavenly bodies such as moon, stars and sun can no longer be accurately read as used to be hence fishermen and travelers are becoming more reliant on weather forecast warnings provided by western modern equipment. The most obvious signs of weather variation are rainy and dry seasons occur at unexpected months, droughts, heavy rains and storms are becoming more frequent with higher intensities as social science findings by Dr. MacKenzie (2003, 2004) supported. There was a general agreement amongst participants supporting the claims of the respondents involved in the survey.

Mr. Kautuna Kaitara, KAP II Coordinator, utilized the Ministry of Education's time slot presenting the outline of the project, aims and objectives, expected outcomes and financial donors. Mr. Kaitara also outlined and discussed the duration of the current project to end in 2009. He also thanked co-financers such as GEF, AusAID, NZAid and Kiribati Government, the implementing agency of the World Bank, for their assistance and contributions to this project. Outer island consultation will be carried out as early as January of 2008 where island vulnerabilities and development projects, related to climate change and sea level rise, will be discussed in full at grassroots and village levels.

Dr. Temakei Tebano, a national consultant, took up a session after morning tea where he discussed linkages between all systems, the heavens, land and sea, stressing the point that whatever you do anywhere will affect any system. He also pointed out that everything

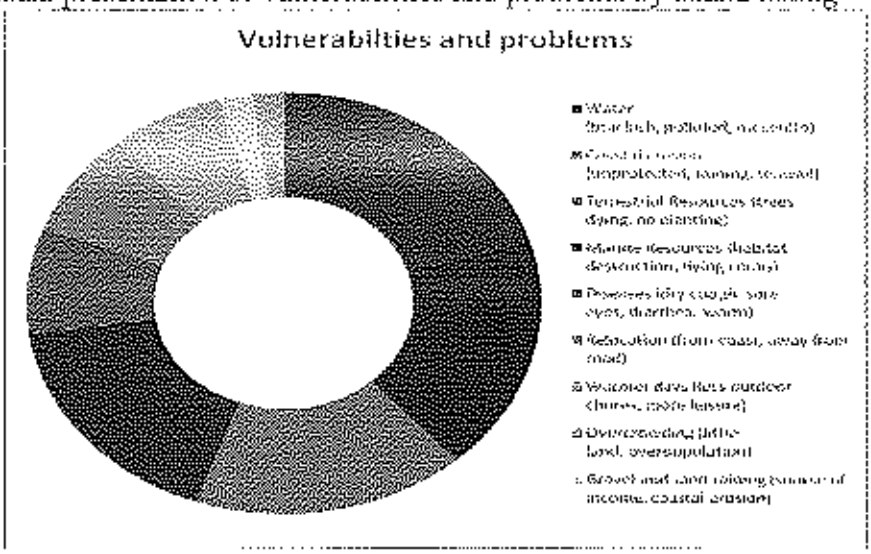
has a purpose and role to play in nature and when tampered with may cause changes within their systems and other systems. An example given was air pollution caused by industrial wastes; greenhouse gases keeping the heat in the Earth's atmosphere that in turn contributes to increasing temperatures which in turn is causing weather variables and sea level rise. No matter where the pollutant is disposed of, one day it will come to any part of the earth and even the equator via ocean deep and surface currents. Dr. Tebano emphasized the importance of Environmental Impact Assessment known as EIA as a crucial tool for any activity to be executed. Examples of human destructive activities were briefly explained and the importance of the role of all kinds of plants and animals, with local examples given, was discussed. The session was summed up as 'before you embark on any activity, remember that whatever you do here will also affect something else elsewhere near or far, and that everything has a role to play in nature.' Following Dr. Tebano's presentation were island presentations.

Island Presentations

Chief councilors or their nominees read out their list of vulnerabilities and potential risks that they are facing. Further explanations were provided in very serious cases such as water quality and quantity. An analysis on presentations showed that all islands are affected by the quality and quantity of water caused by prolonged drought with associated impacts on marine and terrestrial resources, hence food availability. Coastal erosion and declining marine and terrestrial resources followed; diseases linked to prolonged drought and water quality was next. The diseases listed included sore eyes,

diarrhea, headache and sunburn. Details on each item can be sighted in forms under each respective island (Appendix 6). The concerns can be visualized in a graph below:

Chart 1: Visual presentation of vulnerabilities and problems by island listing



Day Three (Thursday 6th December) – the day's sessions were co-facilitated by Mr. Kaiarake Taburuea, the Manager of KAP II. Mr. Timi Kaiekieki, Chief Economist in the Ministry of Finance and Economic Development (MFED) took the first session with his paper titled 'National Economic Planning in Kiribati. Mr. Kaiekieki stressed the importance of mainstreaming that considers taking on board little ideas and plans, put together and integrate them into bigger plans or development project applicable and useful to a larger or whole community. With mainstreaming process communities can be made aware of vulnerabilities and risks they are facing or will be facing as in the case of climate change and sea level rise. Ministerial Operation Plans (MOPs) of government and island councils could be developed through mainstreaming exercises that need to be enacted and not left for later. The Ministry recognizes three main vulnerabilities: declining natural resources, declining quality and supply of ground water, and coastal erosion. To help counter the impact of climate change and sea level Mr. Kaiekieki listed four strategies, 1) continued research and public awareness; 2) cooperation and support of the public and government; 3) strengthening and empowerment of government ministries and agencies that are responsible for climate change and sea level implementation; 4) improvement in monitoring and reporting systems related to climate change adaptation (CCA).

Dr. Komeri Onorio of ThEcoCare Group took up the second session of the day with his paper titled 'National Environment Policy Act - NEPA'. Dr. Onorio discussed aspects of and the importance of Environmental Impact Assessment (EIA) for any physical development activity. The points that Dr. Onorio stressed were that the EIA is a part of project management, economic assessment and market research. The goal of the EIA is to predict how a development project will effect its environment, and to make recommendations to minimize the negative effects. EIA is not a hindrance to projects but helps describe the proposal and examines alternatives; identifies and addresses the concerns of the community; identifies and assesses the potential environmental effects; mitigates adverse effects and enhances potential benefits and contains environmental monitoring and management plans. EIA is the main planning tool that addresses sustainability of development which in turn is the changing activities so we "meet the needs of the present without compromising the ability of future generations to meet their own needs". Dr. Onorio reiterated that NEPA should call for the public statement of the environmentally significant consequences of all federal actions, public input into project formulation and informed decision-making.

Reverend Dr. Kambati Uriam, Principal of Tangintebu Theological College, took up the next session with his presentation titled 'Ecolozing Our Faith: The Role of humans in God's Creation'. Rev. Uriam emphasized the importance of development for mankind but also reminded the audience that sometimes mankind is so greedy that it neglected to look after the environment as is in the case of climate change that is the result of industrialization from which material benefits were obtained by large industrial countries while the poor and small island nations are suffering as a consequence. Examining our own actions that may contribute to vulnerabilities and risks is a must. Localized destructive activities in the name of development must be realized. Looking after the

world and creation as our responsibility from God must be our guiding principle in whatever we do. He stressed 'we must all look after God's Garden.'

After tea, Ms Reenate Willie of the Mineral Unit in the Ministry of Fisheries and Marine Resources Development presented a comprehensive power-point paper titled 'Impact of climate change and sea level rise on our coastal areas'. Ms. Willie discussed in some details issues related to climate change and sea level rise and coastal processes. She first reflected on local activities that compound the effect of sea level rise, especially on Tarawa and the rest of the Gilbert group. First on the list is gravel and sand mining for construction and cash purposes. Problems associated with these activities are coastal erosion and plant dislocation from these areas, hence making our coastlines vulnerable to waves and wind actions. Second was seawalls and maintenance and land reclamation, both require material for filling and solidification, that is, gravel, sand and coral boulders are required. Local designs do not last long and are easily destroyed by strong winds and wave action. Neighbouring beaches can be affected by the construction of these structures.

Third on the list was the construction of causeways and groynes as is the case in many islands in the Gilbert Group as well as other neighboring countries such as Tuvalu, Marshall Islands and Nauru. Dredging coral boulders and reefs can cause many environmental problems like loss of habitats, marine life and coastal inundation. The removal of mangrove forests from foreshores and coastlines can also result in unprecedented environmental destruction. Some means of adapting to the discussed problems include abiding to rules and laws related to seawall construction, build seawall in areas most vulnerable to water inundation, engage EIA at all times before embarking on any physical structure development. In addition, the lagoons and oceans must be kept clean; limit coral boulder removal from coastlines, control on gravel and sand mining, setting up of gravel and sand mining company to meet the local demands and reducing mining along coastlines and foreshores; public awareness at village and school levels; encouraging the replanting of trees and plants along coastlines and where vegetation is impoverished.

Site Visits

After lunch the participants were taken for site visits, first to Betio Port where they observed a seawall protecting a wharf peer; this was constructed of Japanese-made tetra-pod concrete solid blocks. Each block weighs at least a half a ton and stacked in such a way that the arms nest and intertwined into each other thus making them steady in the face of strong waves and currents. The 2006 spring tide accompanied by bad weather tested the strength of the structure, the blocks were put there a few days before a bad weather hit the Gilbert Islands. Many damages were reported from outer islands and Tarawa, among them were some walls of the Nippon Causeway along the ocean side collapsed, there was flooding in some villages including Temaiku village, and more.

The next stop was the Roman Catholic's '*maneaba*' standing on a reclaimed land about fifty meters into the lagoon. Near to this structure is a traditionally stone made 'seawall' that extends beyond the beach's lowest mark, hence is a 'reclaimed land' by definition..

The third stop was opposite seawalls and land reclamation structures around Teaoraereke Fair Price area. A newly constructed land reclamation site in its initial stage showed vertical blocks using empty fuel drums. The design needs concrete and solid filling on the landward side to ensure it withstands harsh environmental elements related to strong winds and waves. The fourth stop was at the Parliament House standing on the reclaimed land. The seawalls surrounding the artificial island were constructed of concrete material laid at an angle of about forty five degrees, a design that most participants think is appropriate for their purposes; the cost of material was termed 'prohibitive' in Kiribati situation, one unit costs over $100.

A newly constructed concrete seawall and flourishing juvenile mangroves planted along the coastline at Bonriki Airport area were examined. These demonstrated what is termed as 'dual coastal protection' via natural and manmade means through the planting of mangroves and the erection of 'seawall' adjacent to each other in most vulnerable areas, a concept that many participants would like to support as their adaptation strategies on their islands where mangroves exist naturally. The next station was the ocean-north end of Bonriki Airport runway. Along the new road leading to and running through Anraci Village and continues toward this point of interest were sacks and heaps of gravel on the roadside apparently ready for sale. A government seawall at this location, vertically constructed with concrete, showed signs of near collapse. High waves have eroded it from both the ocean back side and land front side. Piles of gravel at the collapsed end appeared to be still operated and owned, was a clear indication of unabated gravel mining activity in this vulnerable area. The last stop was a newly settled part of Temaiku Village where a causeway, built of concrete material, stretched across the entire width of what appeared to be the remnant of a passageway that was claimed to have closed up after a causeway connecting the eastern end of Tekabutikeke and Bonriki airport was built in the early 1980s. Many dwellings are scattered in low lying areas vulnerable to water inundation during king tides, similar to that of 2005. Gravel and coral boulder mining is still active, sacks of gravel are ready for pick up, rock and stone piles are getting larger and higher, despising government efforts to build seawalls to protect the area and prevent high tides that has twice washed away homes and killing fruit trees on the way. The trip ended at the Taiwan Technical Mission where participants were taken around the gardens and husbandry compounds. A feast was hosted by Taiwan Embassy, Betio Town Council (BTC), Teinainano Urban Council (TUC) and Kiribati Family Health Care Association (KIFHA).

Day Four (Friday 7th December) – The last day of the consultation was jointly co-facilitated by Mr. Kaiarake Taburuca and the Consultation Facilitator, Dr. Temakei Tebano. The purpose of the first session was to jog everyone's memories of each presenter's talk. Dr. Tebano showed slides of names of resource people and the title of their presentations. Participants were encouraged to reflect on the main lessons and issues brought up; Dr. Tebano and others added their own comments thus summing up each

presenter's talk. The exercise took up about forty minutes after which morning tea was served.

Group Discussion and Presentation

Group Discussion was organized with six groups based on the most common vulnerabilities and problems areas listed by individual islands, the seventh group was extraordinary in that it visualized a worst scenario that just made every short and medium term adaptation worthless, that is, the islands are either partly inundated or completely drown. Group members were randomly selected by calling out numbers from 1 through 7 in a systematic manner. Each participant with a number called out on them joined others with the same group number. Staff of the Environment and Conservation Division of MELAD came just in time for the exercise, disbursed and joined groups that fall within their interest and divisional allocated tasks. KAP II staff also disbursed themselves among discussion groups. Groups and issues are as follows:

Group 1:	Water and associated problems
Group 2:	Coastal erosion
Group 3:	Declining marine and terrestrial resources
Group 4:	Vulnerabilities and problems linked to causeway and seawalls.
Group 5:	Weather related vulnerabilities linked to lack of meteorological information
Group 6:	Health problems linked to weather variability and climate change
Group 7:	If everything fails, what do we do from here???

The above groupings were derived from vulnerabilities and problems identified by island councils which also reflected the general prioritization based on the number of island listing. For example, all islands, including BTC and TUC put water as one of their main problems and potential vulnerabilities. The items are listed according to largest to lowest number of islands that listed that particular item on their island vulnerability inventory. Group 7 was a unique one but one that government and the people of Kiribati need to consider as a long term strategy for a worse case scenario when Kiribati is deemed to go under water. Individual island issues are listed under each respective island and appendixed (Appendix 6).

After lunch each group presented the results of their discussion under the given headings as:

- Vulnerability/Issue
- Origin/Cause
- Adaptation strategies
- Intensity of vulnerability (light-1/medium-2/serious-3)

The intensity numbers signal aspects of the problems that need the most urgent or least urgent responses. It was clear from the presentations that vulnerabilities are inter-related, that is, one cannot discuss one issue without mentioning others; basically all are linked to the impact of climate change and sea level rise.

The presentation of Group 7 was controversial in that they deliberated on unavoidable relocation to other countries in the event of Kiribati being partly or completely under water. The clear message was that the Meteorological Station ought to be provided with powerful and sophisticated equipment to enable it to warn Kiribati Government and its people of the imminent need to implement evacuation plans to other safer locations. There was much disagreement on who should be relocated and where to. At the end of the day some island chief councilors expressed their concern on what to tell their people when they go back home. Others are so moved by the thought of leaving their motherland and finding themselves alien to other cultures and living with no Kiribati identity. There was a misunderstanding in the area of relocation that to some the implication is that 'there is going to be flood sooner or later and that we should make plans for that now'. The Facilitator and the Manager of the Project repeatedly clarified the issue saying that we should not make our people nervous about inundation. The issue was that a long term plan as in the case of relocation would help Government start thinking of strategies that must be put in place starting from today. Short and medium term adaptation plans are necessary to apply and implement them to reduce our vulnerabilities and risks from the extreme events of climate change and sea level rise. Equally important are long term strategies that are critical components of those plans to ensure that Kiribati is not taken by surprise. Kiribati must be mentally, physically and economically fit for the challenges it may encounter in the short, medium and long terms as is the key strategy of KAP II (Government of Kiribati, 2005).

Closing

The closing of the Consultation was held at the State House *maneaba* in Bairiki. Mr. Kaiarake Taburuca (KAP II Manager) greeted all invited guests that included the participants and guest speakers of the Consultation, Members of Parliament, Government Ministers, Permanent Secretaries, foreign missions such as Australian and New Zealand High Commissioners to Kiribati, Taiwan Ambassador, and other important dignitaries. His Excellence, Te Beretitenti (President), Mr. Anote Tong, warmly welcomed all guests on behalf of his government and the people of Kiribati. He particularly praised island councils and members of Parliament (returning and new) for their continuing effort in carrying out development projects for their respective islands. He also thanked government civil servants for their support to all development initiatives of the Government including KAP II. KAP II aims to prepare Kiribati to become physically, financially and mentally fit to meet the challenges of global warming, climate change and sea level rise. Our islands are vulnerable and at risk in the face of accelerated sea level caused by the unabated activities of the industrialized nations who continue to reap financial benefits while small nations like Kiribati are suffering as a consequence. We must all join hands in doing things that can reduce or counter the impacts of climate change and sea level rise, hence sustainable adaptation is necessary. Government will try and assist wherever it can. Short, medium and long term adaptation strategies must be planned and implemented to ensure Kiribati is well prepared before the unpredictable. While relocating our people to other safer locations may seem scary to some we must bear in mind that a long term adaptation strategy like this will help Government start planning now to ensure that the people of Kiribati are safe and well today and in the future. The function finished around 10 pm.

The tables below are listed according to vulnerability listing and island numbers (most to least).

Group 1: Water Resources with associated vulnerabilities and problems

Water (aspects)	Causes	Adaptation Strategies	Level of Impact 1. little; 2. moderate; 3. serious
Brackish	Long droughts; increasing sea-water temperature; so much already used water; increasing sea level	Provision of water catchments	3
Contamination	Leaky sanitation water pipes; dirty water from pigsties; lack of proper and functional toilets; the use of beaches as toilet venues; unmanageable solid and liquid waste disposal; chemical pollutants disposal; ground disposal of waste oil and fuel	Management and proper care for water holes and wells	2
Insufficient amount	High human population; fresh water lense thin; increasing temperature; lack of water catchments; prolonged droughts	Water desalination plants	3
Untreated	Lack of chemicals for treatment; lack of knowledge on importance of clean water	Proper water treatment as for Tarawa	3
Water worm	Dirty surrounding of wells and water holes; closeness of wells to piggery areas; closeness of wells to toilets and shower facilities; lack of water cleaning chemicals;	Must be treated and cleaned	2
Mosquito larvae	Uncontrolled mosquito breeding grounds; dirty surrounding;	Appropriate location of wells and water holes identified	2
Pungent smell	Closeness to waste dumps; wells not cleaned; bathing close to wells	Proper treatment with appropriate technology	1
Waste water from various sources	Water used for washing; kitchen waste water; water from bathing and water activities; water from pigsties	Water resources and reserves identified	2
Water holes distant from settlement	Land formation and topography; well locations not properly selected; linked to village and town planning	Solar water pump	3
Wise use of water lacking	Requires strong public awareness, training and education	Secondary use of waste water and public awareness on wise use of water; adequate budget and training	3

Group 2: Coastal Erosion and Land Degradation.

Vulnerabilities related to erosion and degradation	Causes	Adaptation strategies	Level of Impact
Land degradation	People movement for need for dwelling site; development activities	Proper planning	
Coastal erosion	Sea level rise; impact of industrial development by big countries	Tree planting along coastal areas	
Gravel and sand mining	Destruction of reefs and rocks from coastal areas	Law enforcement and control of activities (EIA)	
Neighbor coastal land affected	The construction of seawalls and reclamation activities	Ban private developments and assignments	
Terrestrial and marine ecosystems disrupted	Causeway construction	Proper designs and planning; engage EIA	
Coastal damage	Natural disaster	Wind breakers (mangroves), seawalls, trees and plants).	
Land stability and resilience reduced	Sand excavation with backhoe.	Ban the activity or more control; locate other sites away from problem coastlines	

Group 3: Decline in marine and terrestrial resources.

Vulnerabilites	Causes	Adaptation strategies	Level of Impact
Marine Resources Te Bun (*Anadara holoserica*)	Heavily fished; dirty water	Law enforcement	2
Te Were (*Tridacna maxima*)	Little water exchange resulting in warmer water; change in current direction as result of human physical activities and heavy harvesting	and	1
Te Ikabuti (Spawning fish)	No restriction on harvest, just fished till vanish	creation of Law if none exists	2
Te Kereboki (sea cucumber)	Gutting sea cucumber in lagoon impacting all marine organisms and water quality	Plus	2
Te Ikanimarawa (tuna and pelagic fish)	Policing our EEZ and 12 nautical mile zone not adequate	Public awareness in schools	1
Te Uteute n taari (seaweed)	Seaweed planting not productive due to climate change and warm water	and villages.	2
Te Ane/Enga (Corals)	Corals are not healthy and unattractive to fish due to climate change and warm water	Proper screening of	2
Te On (Turtle)	Heavy harvesting and lack of law enforcement	all proposed 'development projects'	2
Terrestrial resources Te Mai (Breadfruit)	The flowing causes apply to the rest of the named and other fruit trees: warmer days, water getting brackish, felling and non-replacement of trees and plants, land littered with chemicals like used dry and car batteries, increasing sea level.	Maintain public awareness programs as in radio and local newspapers;	2
Te Nii (Coconut trees)	No proper planning for settlement schemes and replanting, damage caused by invasive species such as rats, beetles and other reported fruit problems, lack of enforcement on regulations on tree felling, bush fires and land use planning, wish to become healthier.	Agriculture training, law enforcement, formulation of law/act if non-existent, support for replanting and home gardening;	2
Te Kaina (Pandanus)	As above	proper land use especially on South Tarawa and Betio; requesting government for assistance	2
Te Bero (Figus sp.)	As above	through international, regional and national fora.	2
Other fruit trees	As above		2

Group 4: Upgrading existing seawalls and causeways

Vulnerabilities	Causes	Adaptation strategies	Level of Impact
Damage to seawall	Bad design, erosion within area, strong winds and bad weather, rise in sea level and change in current direction	Improve and redesign, parallel to beach and shoreline, located away from wave/current and wind prone areas	1
Damage to causeway	Bad weather and strong winds, rise in sea level, solid structure with no water passages through, bad design, sand and gravel mining from within location, destructive human activities	Mangrove planting along coastline adjacent to seawall, regular maintenance, financial assistance for expensive wave breakers, slanting shape instead of vertical, lots of passages in between solid structure, bridges replace causeways	3
Coastal erosion	Natural process, removal of coral pebbles and coral boulders for other construction purposes, planting of mangrove on the foreshore, seawall construction along prone coastlines	Protection and care, mangrove planting, planting trees and bushes along coastline, discourage construction of causeways and seawalls, encourage bridges than causeways, *(burying stingray on a beach to create more beach – superstition?)*	3
Declining marine and coastal resources	Coral and stone mining from the reef and lagoon; causeway construction (solid) obstructing water, nutrients, plankton, larvae and gas exchange between ocean and lagoon systems	Discourage destructive human activities; restriction on size limit, passages created along solid structured causeways to improve water exchange	3

Group 5: Weather Forecasting Problems linked to climate change vulnerabilities and risks

Problems	Causes	Adaptation strategies	Level of Impact
Lack of suitable and powerful equipment	Financial assistance minimal or non-existent	Procurement of proper equipment	3
Current equipment out of date and malfunction	As above	Replacement of current old equipment with modern and powerful models	3
Staff lacking required skills	As above	Frequent and appropriate training and upgrading of staff for required skills	3
No support from Government	As above	Government to provide support were required	3

The same group made a list of equipment needed to allow the Meteorological Unit function efficiently, as shown below:

Parameter	**Equipment**	**Purpose/Function**
Wind	Anemometer / Anemograph	Speed and direction
Pressure	Barometer / Barograph	Air pressure – high/low; strong winds location/position
Temperature	Thermometers	Identifying and recording events happening over time scales for prediction purposes
Rainfall	Automatic / Manual rain-gauges (for outer islands)	Identifying and recording rainfall events for prediction purposes
Communication	RANET (for outer islands)	Early warning system

Group 6: Health problems and vulnerabilities linked to climate change

Health Issues/ vulnerabilities	Causes	Adaptation strategies	Level of Impact
Diarrhea and vomiting	Dust; rise in sea level resulting in contaminated seawater infiltrating fresh water sources close to shoreline; poor quality of portable water	Boil drinking water; water the road and surrounding in village; plant lots of trees and plants; reduce greenhouse gases	3
Chest and dry Cough (cold and flu)	Dust; warmer and dry days; no rain or long drought	Water road running through a village; planting of trees; reduce greenhouse gases	3
Sore eye	Dust; warmer days; long drought and no rain	Use breast milk and other medications for treatment; plant trees; water road; reduce greenhouse gases; wear dark sunglasses	
Worm-diarrhea	Polluted or dirty portable water for home use; water not boiled	Home hygiene; boil drinking water	2
Fish poisoning	*Fish feeding on dead corals resulting from warmer water (misleading statement* ; waste disposal at sea and polluting water	Reduce greenhouse gases; stop polluting and disposal of waste into sea	2
Stroke	Heat stroke; not much physical activity as outdoor chores decreasing with increase in day temperatures	More exercises and outdoor activities such as planting fruit trees, etc.	1

Group 7: If nothing we can do to stop or minimize our vulnerabilities and potential risks from climate change, then what?

Vulnerability	What to do	Adaptation strategies	Potential migration locations
Islands will be completely covered with water	Hold discussions with all island and demand for a proper assessment and accurate research results; Adequate timeframe for a warning is critical; relocate all and day goodbye to Kiribati	Relocate everyone to safer locations in partnership with government, island councils and aid donors	Australia. New Zealand, Canada
Half of island inundated	Decide who to relocate in consultation with government, island councils, potential and willing migrants	Relocate teens and youths and those willing	Australia, New Zealand. Canada

5. Analysis and Synthesis based on past and current issues on climate change and sea level rise.

Rainfall – Radio New Zealand International on May 5, 2006 reported that a US climate scientist claimed that there is more rain in the Pacific due to climate change effected by a number of factors that include more moisture in the atmosphere; the wind system brings moisture collected from the Pacific Ocean from east to west where it precipitates as it rises. Hence Kiribati and Marshall Islands stand to experience more rain from the pattern.

As of the writing up of this report, Kiribati is experiencing a drought that had lasted about six months now following heavy rains in late 2006 to early 2007. The rains have not come by yet, only light showers come and go leaving dry and humid nights and days.

Rising temperature - United Nations Secretary-General Ban Ki-moon warned that some of the effects of rising levels of greenhouse gases may already be irreversible. The situation was already "so severe and so sweeping that only urgent, global action" could head off the crisis. The Kyoto Treaty reported that predictions claim a rise in global warming of around 0.2 degrees Celsius per decade (every ten years).

Sea level rise A global average of 9-81 cm is expected over the next 100 years - ice melts and expands as it heats up. Associated problems will intensify. Changes in sea level do not occur uniformly around the world. There is actually fair amount of differences in sea level rise in different parts of the globe due to ocean circulation and wind pressure patterns. The effects of storm surges and spring tides needs to also be kept in mind when evaluating sea level rise impacts.

The Intergovernmental Panel on Climate Change proposes a maximum sea level rise of 81cm (32in) this century. But in the journal Nature Geoscience, researchers say the true maximum could be about twice that: 163cm (64in). They looked at what happened more than 100,000 years ago - the last time Earth was this warm.

The results join other studies showing that current sea level projections may be very conservative. Sea level rise is a key effect of global climate change. There are two major contributory effects: expansion of sea water as the oceans warm, and the melting of ice over land.

In the latest study, researchers came up with their estimates by looking at the so-called interglacial period, some 124,000 to 119,000 years ago, when Earth's climate was warmer than it is now due to a different configuration of the planet's orbit around the Sun.

That was the last time sea levels reached up to 6m (20ft) above where they are now, fuelled by the melting of ice sheets that covered Greenland and Antarctica.

Read the article below copied from Greenpeace internet post.

King tide pummels Kiribati

09 February 2005

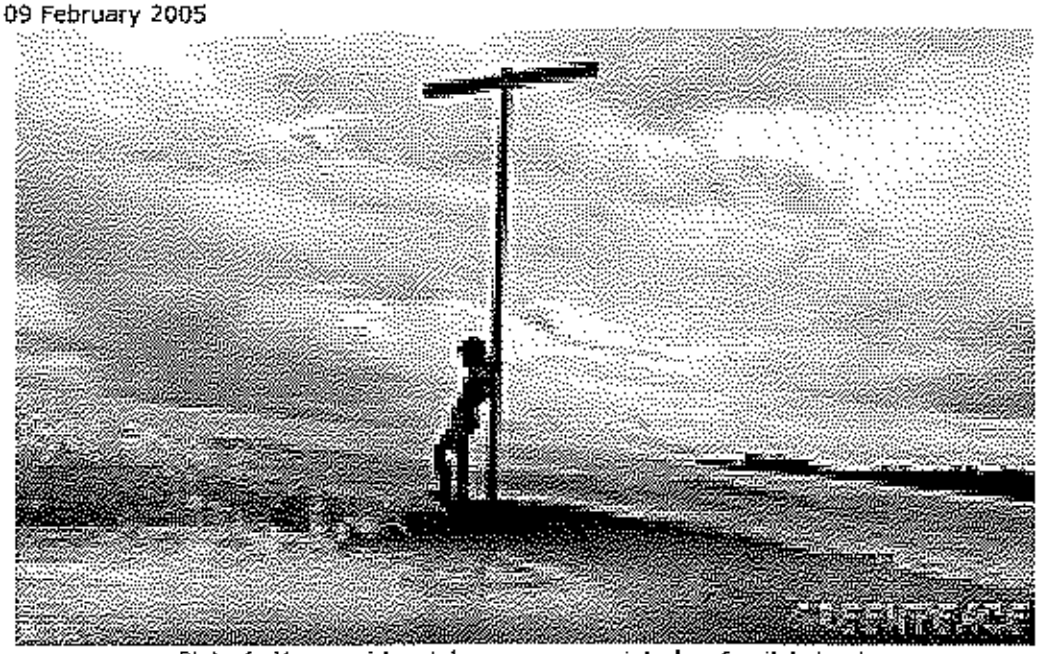


Plate 1: Young girl watches sea sweep into her family's land.

Plate 2: Teenagers testing the force of a king tide washing away seawall

"Betio, Kiribati — Less than a week before the Kyoto Protocol enters into force, the tiny island nation of Kiribati is ravished by a 'king tide' -- an example of the kind of sea-level rise we can expect to see more of as global temperatures increase.

Thousands of people living on the low-lying atoll of Kiribati in the central Pacific were hit by waves that reached 2.87 metres (9 and a half feet) today. Farmland was swept out to sea and fresh water wells contaminated. Betio Hospital in the south of the island was flooded when waves breached sea defence walls.

"Just a week before the Kyoto Protocol enters into force, this serves as a stark reminder that climate change is upon us and governments must go way beyond the emissions cuts outlined in the treaty," said our climate campaigner, Stephanie Tunmore.

The pollution which causes global warming has reached dangerous levels and scientists have warned that low-lying islands face permanent inundation from rising seas. To save coastal communities and islands like Kiribati, governments must act to penalise polluters and invest heavily in clean energy sources in order to reduce emissions."

6. Evaluation and Assessment of the Consultation

The last day of the consultation largely focused on a review of the contents of the presentations that are significant and contribute to a better understanding of the participants about climate change and adaptation (CCA) and sea level rise. It also focused on a feed back from participants about the site visits where they observed different seawall structures and land reclamation, their designs and likely impact on a coastline. A wrap up on all presentations was summed up as "Continue working on projects for the wellbeing of your communities but with no haste, examine them first with your understanding that you have gained from the consultation, involve experts from different fields as everything is linked in many ways some of which we have no idea and understanding about".

In the last few minutes toward the end of the program all participants were asked to check if they have filled in the assessment form distributed during lunch. Forty five responses were returned out of the expected sixty two. The tally of the responses is given in Table 1 below, the versions in both Kiribati and English follow, respectively. There are 9 questions in all, each question was tallied according to similarity and differences in responses given.

(1) Goal and Objectives

Out of forty five responses forty one claimed that the goals and objectives of the workshop were achieved. Four responses had reservations saying that as far as three presentations not delivered (water, construction designs and education) the consultation failed to achieve its overall goal and objectives as those issues are very critical and important components of climate change and sea level rise. Explanations given by the facilitator included staff movement within concerned ministries and communication problems to firm up engagements. However, the facilitator and KAP II staff filled in those time slots with very useful information that could not be fitted into the program because of time constraint within the four-day timeframe. As was expected, not all government ministries and NGOs could be included; some were on the draft program but were pulled out and replaced with others as seen necessary.

(2) Topic of Interest

Overall, respondents claimed that all topics are of great interest and very important for them. Among those responses some claimed that a topic on 'the role of humans in God's creation' is of paramount importance as it reminds everyone of their responsibilities to look after the world; development activities are encouraged but must be properly considered in light of all of their aspects relating to people and the environment.

The linkages between and among all systems was also perceived as very important in that it gives participants a broad view of how one system can affect other systems no matter how big or small a system is. Other topics of interest also include how climate change has been perceived and expressed as 'the sun is coming closer to my home' meaning that the world is getting warmer that there is less time to work and more time for leisure. In addition to this, the idea of women more nurturing than men, implies that gender influences feelings and decision making about adaptation strategies, hence all views must be taken on board.

Climate change and sea level rise with their associated impact on the environment and very existence of mankind is also of great interest. Discussions on the ban of destructive activities to our reefs and coastline are also regarded as very important in light of their associated impacts to marine and terrestrial resources. Coastal erosion was of great interest as is also a big concern.

(3) Topic not of interest

Responses to this question were more concerned about the delivery of the presentations. Issues raised included the language of the presentation should be Kiribati since most participants are not comfortable with English. They also perceived some presentations as very brief and not properly prepared. Included under this heading is disappointment about sharing and discussion of issues out of consultation context, these must be controlled and discouraged by a workshop mediator.

(4) Interesting activities

Site visit to location with seawalls, land reclamation, mangrove planting and other structures was considered by most respondents as very interesting. A small number said it was a waste of time. Properly prepared presentations were listed as interesting. Doing warm ups and making jokes were encouraged and suggested that more of them should be planned and encouraged. Discussion on problems associated with causeways and seawalls was viewed as very important and interesting as both positive and negative impacts were highlighted with supporting scientific and environmental facts and interesting examples.

(5) Items not interesting

Included under this heading are: island presentations are boring because of repetition, the use of English on power point presentations and explaining ideas and issues, how industrial countries benefit from polluting the atmosphere.

(6) Attending similar consultation

As expected all wanted to be invited again to a similar consultation. Reasons include, that it is very important for the understanding of how human activities affect the environment and to see that things discussed in this consultation are carried out. It was also suggested that all kinds of vulnerabilities are discussed in more detail and more time be given to such a valuable consultation.

(7) Vulnerability to support

Coastal erosion, declining marine and terrestrial resources are mostly targeted with mangrove planting with seawalls along a coastline, coral and reef protection, a ban on destructive activities, public awareness and education on vulnerabilities and adaptation strategies, laws to ban gravel and sand mining including lagoon mining, activities to counter the impact of climate change and sea level rise on marine and terrestrial resources by replanting and coral and reef protection; formulation of laws to effect destruction in all forms; proper construction designs for solid structures.

(8) Adapting strategies relevant to island and village

A variety of strategies are mentioned above. These include mangrove planting with seawalls to protect shorelines; construction of properly designed seawalls and causeways; the use of proper material for construction; the ban on destructive activities to include gravel and sand mining, mangrove and tree cutting; consultation with villages at island level; bylaws to be drawn up and enacted; replacing causeways with bridges. The making of channels along causeways to improve water exchange and improvement on existing seawalls were considered important.

(9) Things needing improvement

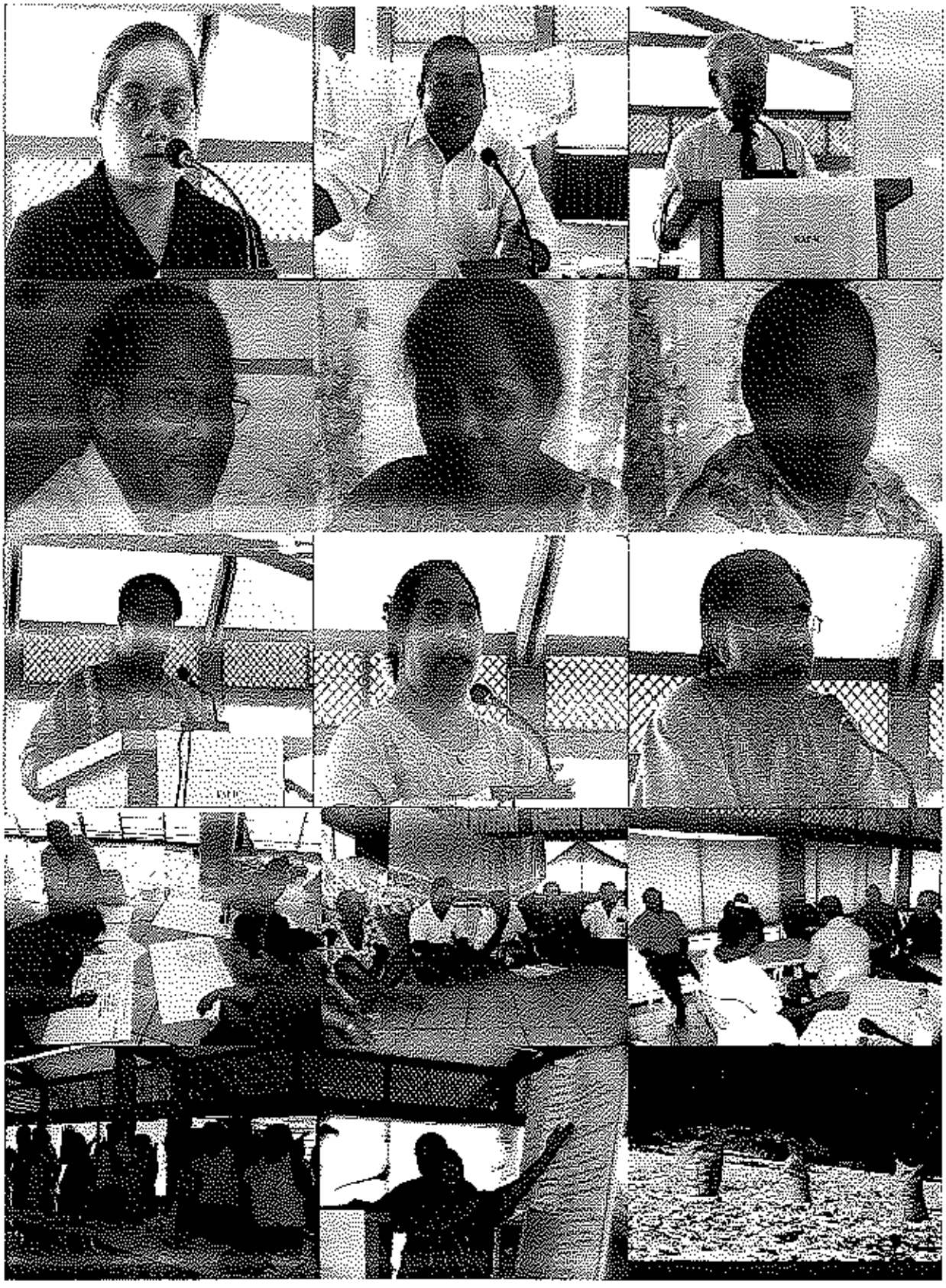
There were many issues raised under this heading. Of those concerning the welfare of the participants include properly arranged transportation on first arrival, per diem to be increased, larger lunch, accommodation and sitting allowance be considered. Also considered important are the language of the consultation ought to be in Kiribati, papers are distributed before presentations to give participants a good background on the topics presented, presentations are properly prepared and guest speakers are confirmed to ensure important topics are delivered, more warm ups and jokes to avoid boredom, discourage sharing outside of consultation context, and to give more time to presenters and questioning. Other suggestions include a longer time period (2 weeks) for such an important consultation, follow up consultations on the outer islands, laws and acts related to climate change and sea level rise and their impacts must be

discussed properly to avoid conflict of interest by Councils and people. It was also suggested that government employees and non-governmental organizations must be included. This links up with reduction on the number of outer islands participation.

7. Scenes from the Consultation – Captions (from left hand top to right and same order down)

Vice President, Honorable Teima Onorio at the Opening of the Consultation.	**Mr. Kautuna Kaitara, Coordinator of KAP II presenting KAP II**	**Mr. Kaiarake Taburuea, Manager of KAP II welcoming participants at the opening of the Consultation.**
Mr. Tekoreaua Kairoru, Procurement Officer, KAP II, co-facilitating the sessions.	**Ms Atu Moaniba, Project Accountant, giving out per diems to participants.**	**Ms. Ruti Kautebiri, Office Assistant, helping out with errands for the Consultation.**
Dr. Temakei Tebano, National Consultant, delivering his presentation.	**Ms. Tererei M. Reema, Director of ECD, MELAD, delivering her presentation.**	**Dr. Ueantabo MacKenzie, Director, USP Kiribati Campus, delivering his presentation.**
One of working groups at work. **Exercise time – Coconut action chorus.**	Another working group with lively discussion. **Group Presentation.**	Another working group still working on their presentation. **Gravel mining at Anraci Village next to Bonriki International Airport.**

Plate 3: **Scenes from the Consultation**



8. APPENDICES

Appendix 1: List of participants and islands/organizations represented.

Island/Organisation	Name	Title/Position
Makin	Taratoba Roteman	Chief Councilor
	Tongoba Reuben	Island Project Officer
	Rieta Karaiti	Island Community Worker
Butaritari	Takonimakin Atinibeia	Chief Councilor
	Matia Tarerei	Island Project Officer
	Uaraoia Teabo	Island Community Worker
Marakei	Kaaiburc Tabokai	Chief Councilor
	Raerae Taie	Island Project Officer
	Tura Tiibau	Island Community Worker
Abaiang	Teboitabu Taukoriti	Chief Councilor
	Anee Uarai	Island Project Officer
	Otimou Kabunare	Island Community Worker
Tarawa/eta	Tekarei Tabikia	Chief Councilor
	Eritai Teaiwa	Island Project Officer
	Bwereata Teautu	Island Community Worker
Maiana	Mouiu Ngaiea	Chief Councilor
	Maria Kaoma	Island Project Officer
	Tabwebwe Kokoria	Island Community Worker
Kuria	Tepa Manaia	Chief Councilor
	Kelimwa Oakeang	Island Project Officer
	Anne Matiota	Island Community Worker
Aranuka	Iobo Arakia	Chief Councilor
	Miire Keukeu	Island Project Officer
	Teera Motiua	Island Community Worker
Abemama	Tonika Burenegamga	Chief Councilor
	Mareta Teangaaba	Island Project Officer
	Teitiroa Tiaon	Island Community Worker
Nonouti	Teribaia Etekia	Chief Councilor
	Mami Mamaia	Island Project Officer
	Toota Teitikoro	Island Community Worker
Tabiteuea North	Tauia Baraniko	Chief Councilor
	Mimitong Rooba	Island Project Officer
	Tabera Bmire	Island Council Clerk
Tabiteuea South	Buare Kirata	Chief Councilor
	Maria Meeta	Island Project Officer
	Tekanebu Kaiae	Island Community Worker
Onotoa	Itamaeri Tiem	Chief Councilor
	Turiana Tebwaa	Island Project Officer
	Aitam Iakobo	Island Community Worker
Beru	Tebwa Taakai	Chief Councilor
	Terabuntaake Tetaake	Island Project Officer
	Araki Timona	Island Community Worker
Nikunau	Bitam Tinga	Chief Councilor
	Teimarawa Tikaia	Island Project Officer
	Teebo Boraing	Island Community Worker
Tamana	Tamton Tobi	Chief Councilor
	Tekinaiwa Iona	Island Project Officer
	Riati Ooka	Island Community Worker
Arorae	Erineti Ruka	Chief Councilor
	Watati Kilisi	Island Project Officer
	Ucaititi Arctania	Island Community Worker
Betio Town Council	Rurenti Muller	Chief Councilor
	Tororo Ritang	Island Project Officer
	Tirite Takaria	Island Community Worker
Teinainano Urban Council	Timau Tira	Chief Councilor
Kiribati Protestant Church	Bairenga Kirabuke	Representative
Roman Catholic Church	Kasaba Ibutima	Representative
Church of God	Rev. Burangke Tekita	Representative

Appendix 2: Consultation Program

TA – KAP II – 2007 First Kiribati National Consultation for Local CCA

Theme:
Adapt or Perish: Let us work together to survive.

Te Boto-ni-Iango
Ti na konaa n totokoi kabuanibwai ke ti na irii-nako – ti a ikarekebai bwa ti aonga n tokanikai.

(4-day workshop (4-7th December, 2007)

First National Consultation Program

(Dec. 4 – 7, 2007)

[Consultation Facilitator – Dr. Temakei Tebano – National Consultant]

Day 1:	(Tuesday) 0900 Registration	
0930	Words of Welcome, **Mr. Kaiarake Taburuea (Project Manager)**	[3 min]
	The Vice President arrives	[2 min]
0945	A few remarks from KAP Coordinator – **Mr. Kautuuna Kaitara**	[5 min]
0955	Opening prayer by Rev. Burangke Tekita	[5 min]
1000	**Opening Speech: Honorable the Vice President, Teima Onorio**	[15 min]
	Overview of KAP II	
1015	Introductions (Participants)	[30min]
1030	*Morning Tea*	[30 min]
	(Co-facilitator: **Mr. Kautuna Kaitara)**	
	Aims and Objectives of the Consultation **(Dr. Temakei Tebano)**	
1100	Session 1: **Dr. Ucantabo MacKenzie** (Social survey – adaptation strategies?)	[20 min]
	Questions	
1200	Session 2: **Ms Tererei Abete** (impact of climate change on biodiversity adaptation strategies?) – *Questions*	[20 min]
1300	***Lunch***	[30 min]
	Video Kiribati and Global Warming (N. Tabera-ni Kai)	[5 min]
1340	Session 3: Mr. Tabola Metutera (PUB – Water resources) - *Questions* [supplemented with videos]	[20 min]
1420	Session 4: More videos on gravel and sand mining on Tarawa (impact of human activities on coastlines and environment – adaptation strategies?) · *Questions*	[20 min]
1500	***Afternoon Tea***	[20 min]
1520	Session 5: Impact of climate change and sea level rise on marine and terrestrial resources (**Tooti Tekinaiti** Fisheries and **Ioane Ubaitoi** Agriculture: adaptation strategies) *Questions*	[20 min]
	Session 6: Weather Forecast – **Moreti Tibiriano** (adaptation strategies?)	[20 min]
	Wrap up for the day – House keeping matters	[5 min]
Day 2:	**(Wednesday)**	
	(Co-facilitator: Mr. Tekoreauu Kairoro)	
0900	Session 7: Land Use and Management (**Tebutonga Ereata**, Lands · · adaptation strategies?) – *Questions*	[20 min]
0940	Session 8: Construction Designs – **Toani Toatu** (outer islands developments - successes and failures – best designs?) – PWD-Works [session supplemented with Traditional navigation by Dr. Temakei Tebano] – *Questions* [20 min]	
1020	Session 9: Outer islands projects – priorities **(Moataake Burentoun)** – *Questions*)	[20 min]

1050	***Morning Tea***	[20 min]
1110	Session 10: Ministry of Education (Curriculum Development) [supplemented with KAP II overview by Mr. Kautuna Kaitara, KAP II Coordinator] *Questions*	[20 min]
1150	Session 11: **Dr Temakei Tebano** (linkages between/among all systems) *Questions*	[20 min]
1230	Session 12: Presentations from island groups: Makin, Kuria (problems related to climate change and sea level rise? – what was done, being done and to be done) *Questions*	[20 min]
	Session 13: Presentations from Butaritari and Marakei - *Questions*	[20 min]
1330	***Lunch***	[30 min]
1345	Session 14: Presentations from Abaiang and Nt Tarawa *Questions*	[20 min]
	Session 15: Presentations from Maiana and Aranuka – *Questions*	[20 min]
	Session 16: Presentations from Abemama and Nonouti	[20 min]
1445	***Afternoon Tea***	[20 min]
1500	Session 17: Presentations from Tab North and South – *Questions*	[20 min]
	Session 18: Session 12: Presentations from Onotoa and Beru *Questions*	[20 min]
	Session 19: Presentations from Nikunau and Tamana and Arorae - *Questions*	[30 min]
	Wrap up for the day – house keeping matters	
Day 3:	**(Thursday)** **(Co-facilitator: Mr. Kaiarake Taburuea)**	
0900	Session 20: Presentation: – Planning, MFED – Mr. Tinii Kaiekieki; government position in relation to continuing activities on climate change and sea level rise) – *Questions*	[20 min]
	Session 21: Importance of EIA to all kinds of physical developments **(Dr. Komeri,** TheEcoCare Group) - *Questions*	[20 min]
	Session 22: Role of humans in God's Creation **(Rev. Dr. Kambati Uriam)** *Questions*	[20 min]
1030	***Morning Tea***	[20 min]
1045	Session 23: Drama on **Climate Change [not performed]**	[30 min]
	Session 24: **Ms. Reenate Willie** 9impact of climate change and sea level rise on coastal areas/strategies and adaptation *Questions*	[15 min]
1200	***Lunch***	[30 min]
	<u>Site Visits</u>	
1300	Betio Port (Japan wavebreaker design) Catholic Headquarter land reclamation Teaoraereke seawalls (vertical and traditional) Anaanau Causeway seawall construction and mangrove planting Anraei gravel and sand mining (new village near airport)	

Bonriki International Airport ocean end – seawall collapsing with gravel mining continuing. Temwaiku settlement with causeway and seawalls, gravel and coral boulder mining next to government seawall.

Day 4:	**(Friday) (Facilitator: Mr. Kaiarake Taburuea)**	
0900	Overview of Presentations - Group critique on presentations **(Dr. Tebano)**	**[20 min]**
	Group Work (1 – 7)	[40 min]
1030	*Morning Tea*	[20 min]
1100	Group 1: Water problems Group 2: Coastal erosion Group 3: Declining marine and terrestrial resources Group 4: Vulnerabilities and problems linked to causeway and seawalls. Group 5: Weather related vulnerabilities linked to lack of meteorological information Group 6: Health problems linked to weather variability and climate change Group 7: If everything fails, what do we do from here???	
1230	***Lunch***	[30 min]
1330	Group Work	[30 min]
	Presentations	[60 min]
1600	Evaluation and Wrap Up, end of consultation	

Early finish

1900 – 2200 ***Closing: State House, Bairiki* (MC: Mr. Kaiarake Taburuea)**

2000:

1. Garlanding of guests by Tekeaginimarawa Dancing Group.
2. His Excellency the President, Anote Tong, gave the closing remarks.
3. Words of thanks by Chief Councilor from Beru Island.
4. Blessing of Food followed by feasting.

Appendix 3: Combined Table of Island Vulnerabilities (Taian kai-rootaki ni bootaki)

TE KAI-ROOTAKI	AABA AKE A ROOTAKI
-Tarikan te ran ni mooi (well water getting brackish) -Karakon te tangke ni karau (small number of water catchments) -te mautakataka (prolonged drought) -baarekan ranin te mwanibwa (contaminated well water)	Nonouti Abaiang, Maiana, TUC, Tarawaieta, Aranuka, TabSouth, BTC, Butaritari, Onotoa, Beru, Marakei, Kuria, Nikunau, Tamana, Arorae, Makin, Tabiteuea Meang, Abemama
- Te kanaki nako mataniwiin te aba (coastal erosion) - Iabutin taari (sea level rise)	Abaiang [te bono], Maiana, Tarawaieta, Aranuka, TAbSouth, Butaritari, Onotoa, Beru, Marakei, Kuria, Nikunau, Tamana, Arorae, Makin, Tabiteuea Meang, Abemama, Nonouti,
-Keerikaakin kai n amwarake (number of fruit trees decreasing) -Te manga ununiki need for replanting)	Nonouti, Abaiang,Tarawaieta, Aranuka, TabSouth, Butaritari, Onotoa, Beru, Marakei, Kuria, Nikunau, Tamana, Arorae, Makin, Tabiteuea Meang, Abemama
Keerikaakin marin taari (declining marine resources)	Maiana, Tarawaieta, Nonouti, Aranuka, BTC, Butaritari, Onotoa, Beru, Marakei, Kuria, Nikunau, Tamana, Arorae, Makin, Tabiteuea Meang, Abemama
Kai-reken ma butin te aoraki man te bubu ao te riringa ae korakora [riki ataei] (diseases related to dust, stronger light intensity, and water borne)	Aranuka, Marakei, Kuria, Niknau, Tamana, Tabiteuea Meang, Abemama
Kitanakin mwenga ake a uakaan ma te nama, rietan taari (abandonedment of settlements along coastal areas)	Nonouti, Makin, Tabiteuea Meang, Abemama
Keerikaakin mwaitin te ika (fish stock decline)	Nonouti, TUC, TabSouth, Tamana,
Rakan te kabuebue ao uarereken te tai ni mwakuri (higher temperatures reducing outdoor activities)	Maiana, Aranuka, Butaritari, Abemama
Kitanan rarikin te kawai ibukin te bareka (abandonment of roadside settlements because of dust)	Nonouti, Maiana, TUC
-Te ibetutu (overcrowding) -Tangiran taabo ni maeka (need for settlement areas)	TUC, BTC, Makin,
Te tabe atama ao tano (gravel and sand mining)	TUC, BTC
Taonakon boono ao neei n rakan te iabuti; uruakin boono ni kawai n te iabuti (existing seawalls overrun by high tides, fish ponds burst their banks)	Maiana, Marakei
Uruakin buriiti ao kootiweei (destruction of causeways and seawalls)	Tarawaieta

Aki maiu raoin ika inanon nei ni baneawa (milkfish in ponds not growing well)	Nonouti, Beru
Solar ao tianaraita, power house ibukin te Kauntira (solar, generator and powerhouse needed)	Abaiang
Karakon te uaa ni kai ibukin te amwarake (declining fruits and crops)	Maiana
Akean te nimroona ao mwamwaen marin aon te ora (dying seagrass and reduction in coral and lagoon fish)	Maiana
Te korokai ae korakora (uncontrolled/unabated tree felling)	TUC,
Te boira man te maange, tiwiita ao nakotaari (foul smell from waste disposal, dead seaweed and human waste)	BTC
Kai-taren kaako man titooa (cargo run out)	Aranuka
Barekarekan taari (water pollution)	TabSouth
Te karikirake ibukin kaawa aika bubura (village fund raising drives)	BTC
Te mwebuaka man taabo ni maange (health-related discomforts caused by living close to waste dumps)	BTC,
Te burakiako iroula roroinrikirake (youth criminal behavior)	BTC
Te bwata ni mai (breadfruit disease)	Butaritari,
Ana urubwai te kimoa (problems related with rats)	Butaritari
Te manga ununiki, karakon te kai (need for replanting)	Butaritari
Uruakin te kawai (raod damage during heavy rains)	Butaritari,
Kaukan kootiweei (opening up of causeways for marine resource recovery)	Onotoa, Beru
Te angibuaka, bwaka auti (storms and bad weather)	Marakei, Tamana,
Buakakan te tano ibukin te ununiki (soil/sand not suitable for agricultural activities)	Tamana
Invasive marine species [manin taari aika raka]	Makin
Te betinako (drifting at sea)	Tabiteuea Meang
Keerikaakin te kaubwai man te ben ao marin taari (decreasing cash from copra and sea resources)	Tabiteuea Meang

Appendix 4: KAP II CCA Consultation 2007, Assessment Results

Questions	Number respondents positive	Number respondents negative	Key words and ideas
1. Goals achieved?	41	4	Guest speakers not coming to deliver their presentation [3]; works and pub, and education; [water, seawall designs [3];
2. Interesting topic			Linkage between/among systems; importance of corals and reefs; discourage destructive activities; all interesting; climate change and vulnerabilities associated with it; role of humans in God's creation; Dr. MacKenzie 'The sun is coming closer to my home'; sea level rise and what to do then; lively presentations; questions asked for clarification; coastal erosion;
3. Not very interesting topic			EIA [5]; presentations that are written in English and concepts explained in English not Kiribati [4]; those that are not properly presented [2]; sharing outside of workshop context;
4. Interesting activities			Site visit [4]; all; clarification on causes of problems associated with causeways and seawall at island council level; properly prepared presentations [4]; jokes about EIA; warm up; jokes and warm ups should be more of them [2];
5. Items not interesting			Island presentations; clarifications on how industrial countries benefit from polluting the air while small islands suffer; use of English rather than Kiribati language; site visits and some presentations; not well prepared presentations and use of English instead of Kiribati;
6. Wish to attend similar consultation?			Very much so; all wanted to attend similar consultations to find out if our ideas and suggestions taken up in this consultation are implemented and acted on; want more information on vulnerabilities;
7. Vulnerability to be supported			Mangrove planting [8];coral and reef protection [2]; coastal protection [6]; enforcement of law and inclusion of public and experts' input into law; efforts to reduce activities affecting the environment [2]; request to industrial countries to consider small islands in their decision making; well prepared consultations with the grassroots; properly designed seawalls [ ]; continuing public awareness [2]; fishing/agriculture; no mining of sand and gravel from lagoons; replanting of trees and plants to protect shoreline and land in general; those discussed to be followed; keep sea and land clean or no polluting; ban on seawall and other constructions that affect our coastline;
8. Adaptation strategies appropriate to island/village			Mangrove planting and seawall on coastline [3]; Sea walls [8]; planting along coastal areas [10]; mangrove planting [6]; properly designed seawalls – slanting; seawalls with appropriate design as at Betio Harbor; those that deal with warming and sea level rise; ban gravel and sand mining [2]; marine and terrestrial protection of plants and animals; protection of marine environment and resources; consultations with villages at island level; training on outer islands on climate change and EIA; bylaws to be drawn up and enacted; opening up of

			causeways [3]; coastal protection [2]; strategies that tell people what to do and how to do them; causeways replaced with bridges;
9. Things needing improvement			More consultations on CCA; stop gravel and sand mining; four days not enough [ ]; presenters not coming [2]; check and firm up participation of guest speakers; government employees and ngos to be included; reduce outer islands representation; disbursement of handouts before sessions or copies presentations are in folders at beginning of consultation [4]; EIA Act need to be improved more; rules and laws must be discussed during consultation processes; the use of Kiribati language is needed when outer island people are involved [4]; handouts must be readable; food [not enough lunch], sitting allowance considered/accommodation on Tarawa/per diem to be increased; sitting positions labeled; immediate prioritizing island projects; presentation times too short; such an important consultation like this must be done over a two-week period as issues discussed touch the very existence of outer islands people; conduct of consultation should be lively, questions outside of context should be discouraged; transport arrangement for arrivals from outer islands; Acts including Environmental laws must be properly explained to people to avoid conflict of interest and confusion; time must be properly allocated to resource people and for questioning; everything good [4]; more exercises needed to avoid boredom and stress;
Total number respondents	45		

Annex 5(a): Consultation Assessment Form
[5 minutes]

1. Are the aims and objectives of the Consultation met? Yes/No.

If 'No', explain in a few words.

.....

.....

2. Which talk interests you most?.....

3. Which topic interests you least? .....

4. Which activity(ies) interest(s) you most? .....

5. Which activity interest(s) you least? .....

6. Would you be keen to attend a similar consultation if held? .....

7. Which adaptation strategy(ies) are you interested to be involved in?

.....

8. Which adaptation strategy(ies) is/are important for your island/council?

.....

9. Which part(s) of the consultation need(s) to be improved and how?

.....

Annex 5 (b) Taubwiian te Maroroo
[5 te miniti]

1. A teke nanon ana tia ma aua toko te Maroroo aei? Eng/A aki..

Ngkana a aki ao kabwaranakoa teutana.

.....

2. Tera te maroroo ae rang ni kakan-ongoraa iroum?

.....

3. Tera te maroroo ae kabotu iroum?

.....

4. Baikara kanoan ke waaki inanon te maroroo aika kaunga?

.....

5. Baikara kanoan ma waaki inanon te maroroo aika kabotu?

.....

6. Ko kan ira riki te maroroo ae aekan aei ngkana e a manga booaki?

.....

7. Tera te aeka ni waaki ni kamanomano man te kai-rootaki are ko na kan bootokaia?

.....

8. Baikara aanga ni kamanomano man te kai-rootaki ake a boongana ibukin abaru/kaawa?

.....

9. Baikara waaki inanon te maroroo ake k otaku bwa a riai ni katamaroaaki riki, ao ni kanga?

.....

.....

.....

Annex 6: Individual Island Vulnerabilities and Problem Listing

Appendix 7: Guest Speakers' Presentations (Papers)

Order of Papers presented during the Consultation.

Day 1:

1. Dr. Ueantabo MacKenzie (Director, USP Kiribati Campus)
   Paper Title: The Sun has come closer to my home. (E a kaan riki taai ma mweengau).

2. Tererei M. Reema (Director, ECD – MELAD)
   Paper Title: Climate Change. (Bibitakin kanoan te bong).

3. Tooti Tekinaiti (Principal Fisheries Officer, Fisheries – MELAD)
   Paper Title: Factors affecting fisheries and marine resources. (Rootakin te Maeu (Mari) i taari).

4. Ioane Ubaitoi (Senior Agricultural Officer - MELAD)
   Paper Title: The Impact of climate Change and Sea Level Rise on Terrestrial Resources, practical adaptation strategies. (Rootakin marine eta man bibitakin kanoan te bong ao keeraken iabutin taari, ara aanga ni kaangaraoira nakon kai-rootaki ake a irekereke).

5. Moreti Tibiriano (Director, Meteorological Office - MICTT)
   Paper Title: Roles of the Meteorological Service and needs. (Ana mwakuri Aobitin tauan kanoan boong ao kainnanona).

Day 2:

6. Tebutonga Ereata (Commissioner of Lands - MELAD)
   Paper Title: Lands Adaptation Strategies. (Kabonganaan raoi te aba ma aontano).

7. Moataake Burentoun (Outer Islands Senior Project Officer - MISA)
   Paper Title: Island Councils Priorities. (Aia Kairikirake Kaauntira).

8. Kautuna Kaitara (KAP II Coordinator)
   Paper Title: What is Kiribati Adaptation Project? (E tei ibukin tera te KAP ao riki KAP II?).

9. Dr. Temakei Tebano (KAP II National Consultant)
   Paper Title: Are traditional navigation skills and knowledge still useful today? (A bong boongana naba rabakaura ni boran ibukin buokara n taai aikai?)

10. Dr. Temakei Tebano (KAP II National Consultant)
    Paper Title: Links between systems. (A irekereke boota ni maiu ao reita ni maiu ni kabane n aanga aika mwaiti).

Day 3:

11. Timii Kaiekieki (Senior Economist, NEPO - MFEP)
    Paper Title: National Economic Planning Office – NEPO. (Kairikirakean Kaubwain Abara).

12. Dr. Komeri Onorio (Director, ThEcoCare Group - NGO)
    Paper Title: National Environment Policy Act. (Ana Tua Kiribati ibukin te Ootabwanin).

13. Dr. Kambati Uriam (Principal, Tangintebu Theological College)
    Paper Title: Ecolozing Our Faith. (Ara Onimaki ae Ootabwanin).

14. Reenate Willie (Senior Officer, Mineral Unit - MFMRD)
    Paper Title: Impact of climate change and sea level rise on our coastal areas. (Rootakin mataniwiin abara ni irekereke ma bibitakin kanoan te bong).

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APPENDIX 6: Individual Island Vulnerabilities and Problems Listing

ABWAMWAKORO (ISLAND)	KAI- ROOTAKI/KANGAANGA	(VULNERABILITIES)
Makin Island	Korakoran kanakin te aba (Makin)ni katoa ririki	Coastal erosion on Makin village
	Rietan taari (rinnakon taari inanon te namonrua)	Seawater seeping in to *bwabwai* pits
	Karakon marin tari (ika, te kereboki)	Declining resources
	Karakon kain amwarake (te ben, te mai etc)	Declining terrestrial resources
	Te mwautakataka (aoraki, ma te kai nako ai tiaki aron maiua ao riki a rota te ane i tari); Tarikan te ran	Drought affecting plants, also affecting corals; brackish water
	Te ibetutu – uarereken te tano ae e riki man te kanaki nako	Overcrowding, habitable areas getting scarce related to erosion
	Norakin te aeka ni man ae e rangi n rawata inanon te namo	Invasive organism seen at lagoon
	Korakoran te angibuaka ke te angi mainiku angiin te tai (each month) angimaeao (once in two years)	Bad weather monthly and bi-yearly
	Akean te babaire raoi ibukin te tabo ni maeka ao te mwanibwa (e a rang ni buakaka te ran ni mooi)	No planning for dwellings and well/reservoir locations.

Butaritari	Rootakin kai n amwarake man sea level rise	Declining fruit trees impacted by sea level
	Katokan aorakin te bwata-ni-mai	Breadfruit disease (rot)
	Buokan ao kauarerekean ana urubwai te kimoa (rat)	Damage caused by rats
	Tangiran riki karaoan te manga ununiki nakon te nii	Coconut tree replanting
	Kateimatoan raoiroin te kawai n taian bwai ni mwakuri aika a na kona ni karaoa re uruaki. N te tai aei ao e a manga uruaki naba ara kawai.	Road maintenance needed to be done with heavy plants. Current condition of road is bad.
	Korakoran te kabuebue man te riringa	Warm weather from sunlight
	Tarikan te ran,	Brackish water,
	Rietan taari ma kanakin te aba	Rising sea level and erosion
	Uareereken te tai ni mwakuri iaan te riringa	Less outdoor activities,
	Urgent widespread of diseases	Widespread diseases needing attention

Marakei	Tangiran katean te bono i mataniwin te aba	Sea wall along coastline,
	Katean te solar pump	Installation of solar pump,
	Keeraken te iabuti ao buan kai n amwarake i mataniwin te aba	Sea level rise and declining fruit trees along coastal areas,
	Tarikan te manibwa man korakoran te riringa	Wells getting brackish because of drought
	Te angibuaka ae e a kakaoti n tiaki taina	Unexpected searches and bad weather
	Taoraken neei ni baneawa man rangan taari nako eta	Overflow of fish ponds from high tides
	Kerikakin marin te nama man bibitakin te aira ao keraken iabutin taari	Declining marine resources caused by changes in current direction and sea level rise
	Rotakin kaai n amwarake man rietan taari	Fruit trees and plants affected by sea level rise
	Korakoran te aoraki man buakakan te ran ao te bareka man te bubu	Disease caused by contaminated water and dust
	Bonon te rawa, e riki man ana mwakuri te nao	Passage way blocked, caused by wave action,
	A na kamwaitaki nnen ran ni karau iaon aba	Water catchments provided on outer islands,
	Katean solar pump inanon kaawa ake a tarika	Installation of solar pumps in villages affected by brackish water

Abaiang	Water tank for each village	Water tank for each village
	Sea wall (Tebunginako, Koinawa, Evena)	Sea wall needed (Tebunginako, Koinawa, Evena)
	Replanting the coconut tree	Coconut tree replanting,
	Solar pump (for Government and Council staff)	Solar pump
	Generator (power house (for government and council staff and office)	Generator for lighting
Tarawaieta	Kanakin te aba	Coastal erosion
	Konaakin buriti ake i Kainaba ao Nabeina	Damage to bridges at Kainaba and Nabeina
	Tarikan te ran	Brackish water
	Rotakin maeun kai n amwarake	Declining fruit trees
	Rotakin maeun taari	Declining
	Rotakin taian kotiweei	Damages to causeways
	Akean kanoan te tangke ni karau	Lack of water catchments
Tarawateinainano (TUC)	Kanakin mataniwin te aba	Coastal erosion
	Te ibetutu	Overcrowding
	Korakoran te koro-kai	Tree cutting
	Uarereken te ran/tarika/barekareka	Water shortage/brackish water/contamination
	Kerikakin maarin taari	Declining marine resources,
	Korakoran te bubu man te kaa ao te kawaii	Dust from exhaust and road
	Te riko atama, tano ao atibu	Aggregate mining

Betio (BTC)	Urban dilapidation (ruin) / planning	slackness and ineffective proper town planning
	Squatters issue	Squatters
	Landfill problem	Landfill problem
	Water lens contamination	Water lens contamination
	Overcrowding	Overcrowding
	Youth delinquency – unlawful behavior	Youth delinquency
	Lagoon contamination	Water contamination
	Fish stock fluctuation	Declining fish stocks
	Rotten sea-weed on beach, reef and mudflat	Seaweed washed to beach
Maiana	Kanakinakon mataniwin te aba man te angibuaka	Erosion of coastline from bad weather
	Taonakon te bono/ ke neei n rakan iabutin taari	Fish ponds flooded with high tides
	Uruakin boono ni keeraken te uabuti /angibuaka	Sea walls damaged by high tide and bad weather
	Keeraken tarikan te ran	Brackish water
	Rakan namakinan te kabuebue	Increasing temperature felt
	Karakon uaan kai n amwarake	Fruit trees declining
	Korakoran te bubu man te mwau teretere	Dust caused by drought
Akean	arina on te ora taari n aron te bun, nouo, karakon iika	Declining and reduction in marine resources
	Akean te nimroona	No seagrass and seaweed
	Mwamwaen marin aonteora (eg. Nouo)	Shifting locations of marine benthic grow-out areas

Kuria	Tarikan te ran	Brackish water
	Kanakinakon mataniwin te aba	Coastal erosion
	Karakon aekakin iika	Reduction in fish variety
	Rotakin maeun kaai n amwarake	Affected fruit trees
	Rietan iabutin taari	Sea level rise
	E korakora te mwautaketaka	Drought
	Korakoran te bubu ae e a karika te aoraki	Dust causing disease
Aranuka	E moanna n tarika te ran ni mooi	Water beginning to become brackish
	Karakon te ika ni buti, koumwara, koikoi	Fish getting fewer
	Rotakin kai n amwarake (te mai, te bwaabwaiaa, te nii)	Fruit tress affected
	Kabuebuen aontano, te bubu ke korakoran te bubu (karekea te aoraki)	Ground getting hotter, lot of dust causing disease
	Kanakin te aba	Coastal erosion
	Aki bwabwakan te karau (taan nangkona a moi man te mwanibwa)	Drought, no rain
	Kai reken te aoraki n aron te maraki n eta / waimata / bekobeko	Head ache and sore eyes more frequent
	Tangiran te mooi – dehydration ibukin te kabuebue	Dehydration from warmer days and nights

Abemama	Tarikan te ran	Brackish water
	Rotakin ao maten kai n amwarake n aron te nii	Plants and trees like coconut are dying
	Ikeikenakin te bubu / mwaiti te bubu man aki babakan te karau	Inhaling of dust caused by drought
	Keerikaakin mwaitin te ika, marin taari nako, eg. ikabuti	Marine fish and resources declining
	Korakora kanakin mataniwin te aba, tanrake ma tanrio	Coastal erosion on lagoon and ocean sides
	Buan, bwakan nii tao 5-6 te rinan mai tanrake/tanrio	Erosion causing loss of 5- rows of coconut trees
	Korakora te kabuebue	Warmer days and nights
	Mweebuaka irouia taan maeka, riki irakin taari maeao kerake riki (move riki aia auti nako nuukaneaba)	Dwellings close to coastline need to move further inland
	Aoraki aika okioki, flue, waimata	Frequent diseases such as flue and sore eyes
Nonouti	E rang ni buakaka ao ni barekareka/tarika te ran	Drinking water dirty and contaminated
	E a rang ni kanaki te aba, a rotaki kain amwarake/auti ni maeka	Serious coastal erosion, fruit trees affected, dwellings affected
	Keerikaakin kai n amwarake	Fruit trees declining
	Kiitanan rarikin te kawai ibukin ikeikenakin te bubu	Dwellings moved away from road side to avoid dust
	Uarereken mwaitin te ika, were, ibo, etc.marin tari eg ibo, were etc	Decline in marine resource, worm, tridacna, and more
	Aki maeuraoin ika inanon nei ni baneawa	Pond fish not healthy

Tabiteuea Meang	Kain amwarake n aron (i) te nii (ii) te mai (iii) te bero	Fruit tress like coconut, breadfruit and fig dying
	Mwanibwa ni mooi; Mataniwiin te aba	Wells becoming brackish, coastal erosion
	Ataei aika uarereke (aoraki ni korakoran kabuebuen taai)	Children are sick from warmer days and nights
	Auti ni maeka ake n uakaan ma mataniwiin taari	Dwellings along coastal areas affected
	Taan akawa (a kona ni betinako ni korakoran te aira)	Fishermen drift at sea due to strong current
	Maunan kaubwai ake iai ngkoa ao akea ngkai (te ibo, were)	Declining or loss of marine resources such as worm and tridacna
	Uareereken te kaubwai man te ben	Revenue from copra diminishing

Tabiteuea Maiaki	Karako kai n amwarake man kabuebuen taai (lack of food); Taabo aika a kanaki/taabo aika riki (bibitaki)	Fruit trees declining in numbers due to increasing temperature; lots of eroded and accreted areas – physical changes
	Kanaki nako te aba (land erosion) a mwaemwae nako ke mwaingiing man butin te aira	Land erosion due to changing current direction
	Marin taari ke ika (not enough marine resources)	Declining and diminishing marine resources
	Te ran e a riki rake n tarika (water salinity)	Brackish water
	(otan tai) kanganga man tai	Sunlight too bright for eyes
	Te bubu (bad air) mautakataka cause te aoraki	Lots of dust and dryness causing lots of diseases
	Sea pollution from kereboki, bwaia, poisoning fish	Water pollution and poisoning from sea cucumber gutting
	Te ran, e riki rake n tarika	Water getting saltier
	Kanaki nako te aba	Coastal erosion
	Marin taari – e keerikaaki	Declining marine resources
	mautakataka	Drought
	Mate kai-n-amwarake	Dying fruit trees
	Barekarekan taari	Polluted sea water

Onotoa	Kaukan te tunga (Temao, Otoae)	Opening up of causeways at Temao-Otoae
	Uruakin taabo n akawa	Destruction of fishing grounds
	Kanakin te aba	Land erosion
	Rotakin maeun kai n amwarake (global warming)	Plants and trees affected by warming
	Tarikan te ran ni mooi	Brackish water
Beru	Rootakin te ran ni moi, eg. E rang n raroa te mam, Taboiaki Meang, Teteirio, Nuka, Aoniman ao Tabiang.	Drinking water affected, too far from village
	Rotakin kai n amwarake, mai, nii, kaina, bwabwaia, etc.ibukn korakoran te kabuebue ao rietan taari,	Fruit trees affected by warmer temperature
	Marin taari ea rotaki, maten ika nte nama a beibeti ao ni koro n te bike	Declining marine resources, fish dying and floating
	Kainnanoan kaukan kotiweei i Kariraia	Need for opening up of causeway
	Rootaki nei ni baneawa, taoro nte iabuti	Fish ponds flooded and becoming more saltier
	Kanakin aaba tabeua aertang korakora n tabo aika Antaai ao Venete	Erosion at Antaai and Venete

Nikunau	Kanakin mataniwin te aba	Coastal erosion
	Rootaki mwanibwa (tarikan te ran)	Wells affected, water becoming brackish
	Kai butin ao eweewen ma okiokin aoraki n aekaia nako man te korakoran te bubu	Widespread of diseases caused by dust
	Buan ao maten kaai n amwarake ao aroka tabeua	Declining and dying trees and plants
	Rikiraken karakon mwaitin iika ao buan iika tabeua	Diminishing fish stocks
	Rikiraken uarereken ao aki taun te karekemwane ai taari ao aonteaba	Diminishing revenue from marine and terrestrial resources
	Rikiraken uarereken te tai ni mwakuri i tinanikun te auti eg. N te rua, buakonikai, etc.	Shortage of time for outdoor activities eg. Working in bwabwai pits
	Rikiraken iabutin taari	Increasing sea level
Tamana	Te ang buaka – ana urubwai nakon Auti ni maeka	Bad weather causing damage to dwellings
	Te kanakinako (mataniwin te aba) man ana urubwai te nao	Coastal and land erosion and wave action
	Te tarika (climate change) te ran	Saline water
	Uarereken marin tari	Declining marine resources
	Bubun nanon te kawai – e a karika te aoraki ae moan te bati aekakina	Road dust causing lots of diseases
	Aki maeureirein te tano ibukin unikakin kai n amwarake ao kaai riki tabeua especially te nii	Poor soil quality for planting purposes

Arorae	Kanakin mataniwin te aba Rotakin kai n amwarake man kabuebuen taari	Coastal erosion Higher temperatures affecting fruit trees