

Government of Fiji Country Report on Pacific Adaptation to Climate Change (PACC) Inception Meeting Samoa, from 29th June – 3rd July 2009.

1.0 The Fiji Islands

The Republic of the Fiji Islands lies in the Southwest Pacific Ocean, between longitudes 175° East and 178° West and latitudes 15° and 22° South. The Fiji Islands is made up of two major islands – Viti Levu and Vanua Levu, with land areas of 10,429 and 5,556 square km² respectively (Fig. 1).



Figure 1: **The Fiji Islands** (Fiji Visitors Bureau, 2000).

Other main islands are Taveuni (470 km²), Kadavu (411 km²), Gau (140 km²) and Koro (104 km²). The total land area of the Fiji Islands is 18, 272 km². The Republic includes the island of Rotuma (43 km²), located 650 kilometres north-northwest of Suva. Fiji's Exclusive Economic Zone (EEZ) covers about 1.3 million km² and contains approximately 332 islands, of which one-third are inhabited.

The larger islands of Fiji are largely of volcanic origin, such as Viti Levu and Vanua Levu (which take up 87% of the total land area), and have a diverse range of terrestrial ecosystems, including extensive areas of indigenous forest. The high islands also have distinct wet and dry sides due to prevailing wind patterns. Fiji Islands also contain numerous small volcanic islands, low-lying atolls and elevated reefs. Coastal ecosystems include mangroves, algae and sea-grass beds in shallow reef and lagoon areas, and various reef types such as barrier, fringing platform and atoll or patch reefs.

The climate of Fiji is generally categorized as an oceanic tropical climate which is largely influenced by the South Pacific Convergence Zone (SPCZ), associated with high rainfall which fluctuates northeast and southwest of Fiji. The El Niño-Southern Oscillation (ENSO) phenomenon influences the positioning of the SPCZ relative to Fiji. During the dry season (May to October) the SPCZ tends to be positioned more to the northeast of Fiji. In the rainy season (November to April) the SPCZ tends to be located over Fiji. In addition to these seasonal variations, there is also a high degree of inter-annual variability in rainfall, which is strongly influenced by ENSO and SPCZ fluctuations.

Another important influence on rainfall is the southeasterly trade wind, which carries moist air onto the islands. On Viti Levu and Vanua Levu, the southeastern regions experience high and intense rainfall. The mountains of these high islands have a strong influence on the distribution of rainfall, with the regions on the leeward (western) side of the mountains being much drier on average. The annual rainfall in the east of Viti Levu, where Suva is located, ranges from 3,000 mm to 5,000 mm, while in the west of Viti Levu, where Ba, Lautoka, Nadi and Sigatoka are located, annual rainfall ranges from 2,000 mm to 3,000 mm.

Fiji is also affected, often severely, by tropical cyclones and depressions which tend to track from the north and west. Fiji lies in an area normally traversed by tropical cyclones mostly during the November-April wet/cyclone season. Cyclones bring about flooding and multiple landslips which have major impacts on the economy and infrastructure, and many adverse effects for the people of Fiji. Although the west of Viti Levu is drier on average it can experience very heavy rainfall events and associated flooding during storm events over short periods of time.

2.0 Linking PACC with National Sustainable Development Policies

Since 1992 Fiji has signed and ratified 19 International and Regional Conventions that emanated from the Earth Summit; and formulated 17 international and regional plans of actions, 25 national policies and plans and 17 national implementation programmes addressing sustainable development.

Fiji ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 02 February 1993, and has submitted its Initial National Communication (INC) to the UNFCCC on 18 May 2005. Following the preparation of its INC (under the Pacific Islands Climate Change Assistance Project (PICCAP) and Phase II enabling activities, the country has initiated efforts to create an institutional set-up that seeks to mainstream climate change issues into the national planning and legal frameworks. Moreover, its INC provides compelling evidence that, by global standards, Fiji is one of the nations most vulnerable to climate change and sea-level rise.

Ratification of the UNFCCC is one step forward in terms of commitment to addressing climate change and related issues. Fiji is also a Party to many other UN conventions, such as those, among others: biological diversity, biosafety, persistent organic pollutants, and combating desertification. The country has also ratified the Kyoto Protocol on 17 September 1998.

- 2.1 Fiji's sustainable-development policies are entrenched in Government's "Strategic Development Plan 2007-2011 (SDP), a rolling development plan, which is updated every three years with emerging needs and priorities of government. The policies embedded in the SDP are consistent with the Millennium Development Goals adopted in September 2000 and emphasizes that sustainable development is achieved through policies that are economically sound, socially balanced and environmentally friendly.
- 2.2 The Ministry of Land Planning and Development undertakes planning, development and management of land resources. It has the Crowns Lands Act.
- 2.3 The Ministry of Fisheries has polices on sustainable use of fisheries and marine resources which target promoting production and export of value added fisheries and products; providing appropriate institutional and infrastructure to support development. The Ministry has the Fisheries Act.
- 2.4 There are also polices for sustainable forest management which addresses management and development of forestry resources; community owned and management forestry processing; production and export of value added timber products; and institutional support and development.
- 2.5 Government through the Water and Sewerage Section of the Public Works Department of the Ministry of Works and Energy, is responsible for the construction, operation and maintenance of water supplies and sewerage services.
- 2.6 The Department of Energy has policies on development of renewable energy resources, energy conservation and coordination of the rural electrification scheme.
- 2.7 The polices within the ministry of health comprises of provision of efficient and adequate primary and preventative health services; curative health services; infrastructure and facilities; and institutional strengthening.
- 2.8 Reduction of the vulnerability of communities to disaster such as cyclones, floods. This is undertaken through the Disaster Management Office under the National Disaster Management Act. Comprehensive Hazard and Risk Management (CHARM) approach to disaster mitigation and management.
- 2.9 The Department of Environment is responsible for the better coordination and effective formulation and implementation of national environmental policies through the National Biodiversity Action Plan; Climate Change Policy; Public Awareness and Education.

Climate change and sea-level rise is considered as one of the main environmental problems as well as the expansion of agricultural lands causing land degradation Fiji. The main policy objective is to minimize degradation of natural resources and protection of biodiversity. Towards this end a Sustainable Development Bill has been developed which includes a requirement for all development projects to have environmental impact assessments.

- a) Climate change policy framework which aims to promote understanding of, and to formulate appropriate responses to climate change by mainstreaming climate change concerns/issues in all environmental, social, and economic processes including enactment and amending of current legislations. The policy also focuses on adaptation to and mitigation of climate change.
- b) National Environment Act 2005 which established the National Environment Council with multi-stakeholder representation and includes provisions for mandatory environmental impacts assessments for development projects.

- c) The National Capacity Self Assessment (NCSA) is aimed at determining national capacity requirements and defining national capacity needs and priorities under the United Nations Convention for Biological Diversity (UN CBD), the United Nations Framework Convention on Climate Change (UN FCCC), and the United Nations Convention to Combat Desertification (UN CCD). The main output of the NCSA is a National Strategy and Action Plan (NSAP) to meet prioritized needs and a mechanism for monitoring and evaluating progress made in meeting those needs.
- d) NCSA Program addresses Environmental & Sustainable Natural Resources Management and there were 7 projects identified under this; and Program 4 specifically addresses Desertification and Land Degradation Mitigation.

3.0 General Brief on Adaptation Projects

Guidelines for design of drains and drainage networks to adapt to future rainfall regimes.

Demonstrating integration of climate change risk reduction in drains and drainage networks in Tailevu/Rewa and Serua Namosi Province (with co-financing support). The above outputs will assist the Land and Water Resources Division of the Ministry of Agriculture in Fiji to develop their technical capacity for the design and implementation of drainage and drainage networks. Most of the 50 drainage networks around Fiji today are over 20 years old. Their present designs, will sufficient to accommodate historically stable flooding and rainfall, no longer copes with the emerging trends in flash floods and intense rainfall regimes. The consequence is that low-lying areas are frequently flooded, and water outflow limited, causing substantial damage to valuable crops that the Fijian economy, including farmers' livelihoods, is dependent on. The Government of Fiji over the years has used considerable amount of funding to try and dredge the water-ways and rejuvenate existing drainage schemes to alleviate the flooding problems the country is facing. In most cases, this is an exercise in futility, as the drainage networks are not designed for two-tothreefold increases in precipitation. As recent as February 2007, the Fiji government was requested to relocate a whole village due to extreme rainfall and consequent flooding. The Government has allocated a budget of about US \$8.6 million over the next 5 years to improving drainage schemes throughout the country. The PACC project activities will focus on reviewing and revising existing drainage design criteria in the context of emerging climate change risks and demonstrating their use in a pilot situation to increase resilience of current drainage infrastructure to current and projected changes in extreme events. Review of drainage design will also include the review of drainage design discharge in relation to ability of different crops to withstand expected water-logging as a result of climate change induced pressures. Two pilot sites in Tailevu/Rewa and Serua/Namosi provinces have been identified for demonstration measures through this project. The population of the two pilot provinces are 149,763 and 21,203 respectively with a total land area of 121,701ha and 139,201ha respectively of which 10,122ha and 3,643ha are considered arable land. Specific activities include:

- Undertaking an assessment of the impacts of climate change on the drainage network;
- Developing Guidelines that include drainage specifications that take into account current and future rainfall regimes;
- Training technical staff in the Land and Water Resources Division and other relevant institutions to apply the guidelines in a pilot situation; and
- Demonstrating use of a Guideline through drainage design measures that take into account current and future rainfall regimes and other expected climate change pressures.

In past two to three decade, Climate patterns have significantly changed in Fiji like other SICs. Especially, it occurred with high intensity rainfall, long duration, erratic season time , sea level rise etc. Similarly, it had experienced with long dry spell and drought. Both effects contribute the threats on the Agricultural sector, such as crop damage, declining of agricultural production as majority of the agricultural commodities are grown in the flood plains and the deltaic areas. It becomes uncertainty of national food security and the unhealthy economic growth as well.

Fiji raised its concerns in this particular area in relation to CC, while the preliminary project fact finding team of UNDP and SPREP visited in early 2006.

In the mean time, Fiji Government had developed and maintained infrastructure to support agricultural development over the years. The Government allocated the Capital funds for infrastructure development in Agricultural sector every year as a short term and intermediate term programs to ensure economic growth and food security sustainability.

However, these agricultural development activities are now significantly affected due to the Climate Change sea level rise.

As for a typical example, Fiji had reclaimed lands for agriculture in low lying and the flat lands since early 1970s, by constructing of drainage facilities/ network, salt water protection infrastructure such as sea-water protection dike, tidal gates, culverts, road access and etc. By doing so, previous tiri lands were converted into arable lands for sugarcane, root-crops, vegetable and fruit crops. It is also giving the advantage to the live stock farmer as well.

When it was developed, these agriculture infrastructures were designed and built with appropriate criteria. The criteria were applied for determination of size and interval of drains, outfall structure (to drain out floodwater), tidal gate, and height and size of seawater protection dike (seawall), etc. Those design criteria used in past three decade ago, were based on the *past* Climate factors and rainfall data of before 1970's.

The existing structures, which were designed by using of those old criteria, are now in question on their capacity and adequacy due to the effects of CC in past two to three decades. As a result, it has also been observed that frequent flooding and high intensity flooding, prolong flood duration are experienced in the developed low lying drainage schemes in Fiji.

In other words, we would have to say that the capacities of existing infrastructures are not be able to cope the present rainfalls and effects sea level rise due to the of CC. As such, there is a need for enhancement or upgrading works to the existing agricultural infrastructure which have become essential for the sustainability of agricultural growth.

It, therefore, shows that the existing design criteria for the drainage/ irrigation infrastructures are now required to be reviewed and revised to reduce vulnerability of the agricultural sector to climate change and sea level rise. For this technical input is firstly needed to set the revised design criteria (i.e., ***guide line of further implementation***) being linked up with the CC factors. This exercise will be time consuming, thus will need more concentrating on the technical/ engineering analysis. In the present circumstance of the LWRM Division, with shortage of professional engineers, this review exercise

could not be engaged in house. We need out source this by means of technical assistance program. [*Output 2.51.a of PACC project paper PIMS 2162*]

However, we cannot wait until some assistance comes in. If we cannot address this issue starting from now, it will be too late and more costly to rectify in future and will definitely face with more damages to soil conditions leading to decline in the agricultural production, then induced to severe adverse impacts on the nation's social economic sector and food security.

In the interim, the Land & Water Resource Management Division, Ministry of Primary Industries of Fiji has been constructing some additional enhancing structures (*like flood relieving structure – flap gate*) in addition to previous existing tidal gate outfall structures, in the flood prone and more vulnerable areas of agricultural land by sharing of **some fund** of Government's **annual** capital project for drainage rehabilitation programs. However, those enhancement or adaptation activities are not able to fulfill the adequate level, due to the limitation of fund.

These situational issues were raised to the PACC project facts finding team of SPREP & UNDP during their visit to Fiji, in 2006.

The PACC project team recognized the present LWRM's activities (*as national ongoing programs in related to CC adaptation*) which are in line with the PACC's project policy. The PACC encourages and gave some indication to assists such kind of project in which involving of the countries' contribution (*co-financing*) and ongoing activities, in related to the CC adaptation.

Moreover, the Land & Water Resource Management Division's ongoing programs have been recognized as a demonstration pilot activity in this regional project.

After the inception workshop for the PACC project preparatory process with 13PICs in Nadi, Fiji in 2006, it had been defined that Food Security Category is one of three key selected areas to be addressed in related to the adaptation of Climate Change. It was determined to put Fiji under this category of PACC project

4.0 Institutional Arrangements.

PACC Focal Point is the Director for the Department of Environment and the Implementing/Executing Agency is the Land and Water Resources Management Division of the Ministry of Agriculture. The Executing agency has this project already inbuilt in their Divisions corporate plan.

These are some other Ministries and organizations that play some part in this project.

- Ministry of Local Government, Urban Development, Housing and Environment,
- Ministry of Primary Industries – Land Resources Development and Planning (Fisheries & Forest)
- Ministry of Foreign Affairs
- Ministry of Finance and Planning
- Ministry of Tourism
- Ministry of Works, Transport, Energy and Public Utilities
- Ministry of Commerce and Industry
- Ministry of Health

- Ministry of Education
- Fiji Meteorological Services
- Ministry of Fijian Affairs
- Disaster Management Unit
- The University of the South Pacific and other relevant regional organizations
- Relevant national and international non-government organizations
- Local Community (Villagers)

5.0 Co Financing Confirmation

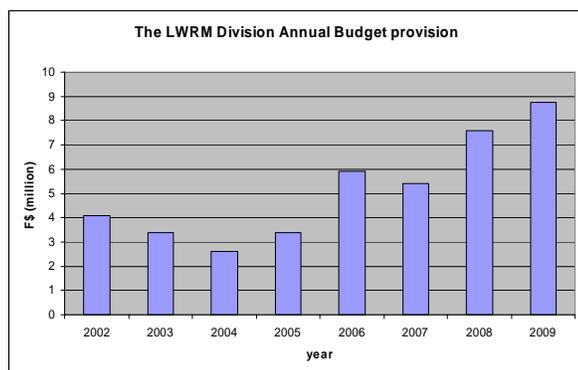
1. Government of Fiji Expenditures based on 2007 estimates Drainage and Irrigation \$4,800,000.00
2. Government of Fiji Expenditures based on 2008 estimates land Drainage and Flood Protection \$4,800,000.00
3. Government of Fiji Expenditures based on 2009 estimates Drainage and Irrigation \$4,800,000.00

6.0 Pilot Demonstration areas and Projects

Low lying areas in Tailevu province, Rewa and Serua (Navua) province were selected as pilot demonstration areas of the PACC project. All those areas are in the flat terrain and deltaic areas, normally threatened by the frequent flood and the salt water intrusion due to the Climate Change effect. As areas are fertile and arable lands provided with drainage facilities, it is an important national asset for food security through the agriculture development. [Output 2.51.b of PACC project paper PIMS 2162]

Selected pilot area [see attached map]

The LWRM Division has being yearly implemented land drainage and flood protection activities for the agricultural lands using of Government Capital funds. [ref.: *annual budget provision of the LWRM Division*]



Challenges

- Financial: Limited annual budget. Just sufficient for the normal maintenance and normal maintenance program. Not enough to implement for the requirement of CC adaptation. Need funds

for review, research and development of technical inputs for future implementation. Need additional funds for introducing of infrastructures, to meet the requirements for present and future CC effect.

- Submission of request for **financial assistance** (e.g.,co-financing support from PACC project) from out sources, which are interested on the adaptation of CC (eg. GEF or other funding agencies)
- Submission of request for additional fund in the Government annual budgets
- Technical: the implementing agency has limited skill technical and professional staffs. Hard to share of manpower to man on the proper review, analysis on the design criteria, adequacy & serviceability of existing infrastructures and revise of engineering design criteria, norm/standard, specification, practice, technology & etc., to meet to the requirement in adaptation of CC for now and future
 - Request for technical support/ assistance through consultancy service.
 - Request for the training (TOT) in related with updated technology/engineering, appropriate design/technique, construction practice & etc.
 - To seek an assistance for the research and development facilities (human/financial resource and equipment) for the engineering sections in order to monitor, up keeping of engineering practices to facilitate the agriculture sector development aiming to the food and income security of the nation as a whole.
- Training and Awareness : the implementing agency lacks proper development an operational manual to educate technical staffs and farmers, thus the project need
 - Develop updated guidelines for engineering infrastructure development, incorporated with CC aspect
 - Awareness manual for farmers
- Community empowerment and support
- Institutional Strengthening
- Research Capabilities
- Enabling Environment
- Technology

8.0 Conclusion

The Fiji Government would like to thank the GEF, UNDP and SPREP for this invitation in allowing the Mr. Kyaw Win of the Ministry of Primary Industries and Mr. Jope Davetanivalu of the Department Environment to be part of the PACC Inception Workshop.

The content of this paper reveals the status of the PACC project planned to be undertaken in Fiji and it must indicate that the Government is committed to this project through its current funding mechanism as showed by its yearly budget from 2007.

There are challenges stated and the Fiji Government is looking forward to the project consideration in assisting Fiji in this regard. The inception workshop will be a window of opportunity to review what currently exist and then where we want to be in the coming years.

By doing this PACC project, the outcome will be used by Government to implement similar policies and practice in other areas in Fiji while taking into consideration that Climate Change is considered as a local issue from its Global effects.