Secretariat of the Pacific Community
Government of Tuvalu
GLOBAL CLIMATE CHANGE ALLIANCE: PACIFIC SMALL ISLAND STATES
PROJECT DESIGN DOCUMENT

IMPROVING AGRO-FORESTRY SYSTEMS TO ENHANCE FOOD SECURITY AND BUILD RESILIENCE TO CLIMATE CHANGE IN TUVALU

Project Summary

The overall objective of the EUR 0.5 million project is to 'Increase resilience to climate change impacts in Tuvalu'. The purpose is to 'Enhance food security in Tuvalu'. The implementation period for this project will begin immediately after the required parties have signed the agreement and ends on 30th June, 2015. The project will benefit the 6,194 people living in the urban capital Funafuti (55% of the population) as well as one outer island yet to be selected. The key result areas are as follows: (i) Enhanced understanding of agro-forestry among community members, land owners, and *Kaupule* through awareness raising, capacity building and training; (ii) Improved agro-forestry system implemented in demonstration sites in Funafuti and one outer island; (iii) Marketing potential and access evaluated; and (iv) Enhanced coordination and capacity of the Department of Agriculture.

This project attempts to lessen the negative impacts of climate change and urbanization in Funafuti and outer islands through reviving traditional integrated farming practices combined with innovative 'climate ready' crops and trees. The project will demonstrate intensive agricultural production on under-utilized land, while diversifying crop varieties available nationally. Such outputs will help to stabilize local food supplies, thereby enhancing food security and building resilience to economic shocks, extreme events, and the predicted effects of climate change. Specifically the project will establish integrated agro-forestry demonstration sites on two islands, where unproductive trees will be thinned, the soil will be enhanced, and the sites replanted with trees and crops sourced from within Tuvalu, as well as imported from the Secretariat of the Pacific Community's (SPC) climate ready plant collections developed by the Centre for Pacific Crops and Trees (CePaCT). An extension team from the Department of Agriculture will train the land owners and communities in the cultivation and usage of the crops in this integrated agro-forestry farming system. Training and awareness raising will be a key component of the project, and will target farmers, women's groups, and school children.

The capacity of the Department of Agriculture will be enhanced by providing technical staff for the duration of the project, by offering overseas attachments to selected technical officers, by strengthening the department to gather data on successful crop and tree varieties, and by re-equipping their Agricultural Research Station for the purpose of holding national stock of plant varieties. Potential economic benefits of the agricultural yields will be determined by an Agricultural Marketing Plan, and may include producing coconut products and pandanus juice, as well as selling the fruits and vegetables in the Funafuti market and stores. Strengthening local farmers' cooperatives and associations will complement this process.

The project will ensure close coordination with other actions, e.g. the UNDP- NAPA projects, Australia - SPC CePaCT Nursery Project, Taiwan ICDF Horticulture project, and SPC- GIZ CCCPIR climate change coordination project. The project is consistent with the Te Kakeega II: National Strategy for Sustainable Development (NSSD) 2005–2015 four key policy objectives related to agriculture: (i) reverse the decline in subsistence agriculture production; (ii) increase the availability of land for agriculture; (iii) increase the production and consumption of local produce; and (iv) mitigate climate change related agricultural impacts. The project aims to specifically address these key policy objectives and the corresponding priorities stated in the Te Kakeega II: NSSD through an integrated agro-forestry approach.

Fakatomuaga kite ata saukatoa ote polotieki

Te fakamoemoega saukatoa ote polotieki tenei kote mea ke mafai o "atili avaka ki lug ate mafai o agai ne Tuvalu a pokotiaga mai luga i fakalavelave ki mafulifuliga tau o aso." Kote autuu tonu kote mea ke mafai o fakamaumea kae fakalei tulaga o mea tau meakai i luga i Tuvalu. Te fakatelega ote polotieki tenei ka kamata mafai ko palele ne saina a feitu katoa e la mai te feitu ote maalo o Tuvalu mote SPC kae fakatautau ke fakaotioti te polotieki ite po 30 June 2015. Te polotieki tenei ka lausa tena manuia ki tino e 6, 194 (55% ote aofaki tino Tuvalu saukatoa) pela foki mo niisi fenua mai tua atu o Tuvalu kola kooti ne filifiligina ke aofia i loto ite polotieki tenei.Te polotieki ka fesoasoani malosi loa ki feitu konei(Atili avaka ki luga tulaga ote mainaga mote atamai o tino e ola ite fakai, tino fai manafa, Kaupule mo sui mai matagaluega kesekese ote maalo i feitu tau toki lakau e auala i (i) akoakoga fakamasani mo talatalaga ote mataupu (ii) Fakalei tulaga o feitu tau toki lakau e auala i polotieki fakaataata kola ka fakatuu i luga i Funafuti kae tasi i fenua i tua (iii) Iloiloga ote maketiga ki tua o fuaga lakau kaina kola e fua mai luga i polotieki fakaataata mote (iv) fakaleiga mote atili avakaaga ki luga te iloa mote atamai ote matagaluega ote toki lakau mote fagai manu.

Te faiteega ote ata saukatoa ote polotieki ne faitegina ite kiloga tela ke mafai o fakafoliki a pokotiaga kola e mafai o m'afua mai m'afulifuliga tau o aso mo m'afuliga ki luga ite olaga e auala ite toe fakafoki mai io me fakaola a iloa mo atamai faka-Tuvalu ki feitu tau te toki lakau mote fagai manu fakatasi iei mote fakaolaga o lakau kaina valevale kola kooti ne tofotofogina ke mafai o ola i tau masei i luga i fenua foliki penei mo Tuvalu. Te polotieki tenei ka taumafai o fakatuu se ata tela e fakaasi iei te fakaolaga o lakau kaina valevale mo lakau kola e aoga ki t'uu mo faifaiga faka-Tuvalu i luga i laukele foliki kola e matemategina me se ola lei iei ne lakau kaina. A fuataga mai luga i ata konei ka fakatuu, ka lasi kii tena fesoasoani kite fakal'eiga tulaga o mea tau meakai i luga i fenua foliki tela ka lasi foki iei tena fesoasoani kite atili avakaga ki luga tulaga ote agai atu'uga o fakalavelave ki m'afulifuliga tau o aso mo fakalavelave fakamataku mai luga i galuega ote natula. Kae faka-silisili ite poloieki tenei kote taumafaiga ke mafai o fakatuu se fatoaga tela ka mafai o fakaola i loto a lakau kaina valevale i luga i fenua e lua mote aga'aga maluga ke vele katoa ki lalo a lakau pela mo niu kola ko mao kae ko se fai fu'ataga foki, ka fakal'ei ate tulaga ote laukele, mote tau l'asiga o lakau ka auami loa i loto i lakau kola e ola i Tuvalu. Ka fesoasoani atu kiei kote fakapotopotoga ote SPC i tena maga tela e fakaolaola ne ia a lakau kaina kola e toka o fakaola i kog'akoga kola e pokotia mai mafulifuliga tau o aso.

A ofisa galue ote toki lakau mote fagai manu kola e t'uu i tua atu o Funafuti ka faka-a'konga kae akoako ne tino atamai mai tua atu o Funafuti, ke oko foki ki tagata fai manafa kite fakaolaga mote tausiga fakalei o lakau kaina kola ka fakaolagina ne te polotieki. Akoakoga mote atili avaka'aga ote atamai mote iloa ko vaega taaua loa ote polotieki tenei kae ka taketi loa ki tagata toki lakau i uta i fenua, fakapotopotoga fafine mo tamaliki akonga foliki. Te atamai mote iloa o ofisa galue ite toki lakau mote fagai manu ka atili fanake ki luga e auala ite galue tasi mote fakatau fesoasoani o ofisa mai te polotieki ote SPC GCCA:PSIS pena foki mo galuega fakamasani ki tua atu o Tuvalu kola ka ave ki ofisa kola e galue i mea tau te toki lakau, fakamalosi ate iloa mote atamai mai luga ite tauloto ne ofisa konei ka olo o galue fakamasani a vaega lakau kaina kesekese kola ko fakaola i loto ite polotieki tenei. Ko mafai foki o maua se avanoaga ke toe atili fai fakalei a kope mo mea faigaluega ate toki lakau mote fagai manu i luga i Tuvalu mote fakamoemoega maluga ke mafai o toe fakalei tulaga o kope ote ofisa ote toki lakau kote mea ke mafai o fakatumau te lei on akote agaaga maluga ko lakau kaina i luga i Tuvalu ke tumau te ola ka eke gasolo o soloki atu tena lei katoatoa. Te penefiti tela e mafai o maua ne te toki lakau ka fakavae loa mai luga ite lei ote fakatokaaga ote Palani tela e fakatau atu ei ki tua a fuataga mai te toki lakau kaina, se gata iei kote fakatau at'uuga o fuataga mai luga i niu mo mea inu kola e mafai o faite mi fuataga o fala, ke oko ki fuaga lakau kaina valevale i lua i Fuafutii maga o store mo supamaketi. . Te avakaaga ki luga o atamai mo iloa o tagata galue i luga i fatoaga i uta i fenua ka atili fesoasoani ki taumafaiga konei e taumafai atu kiei ate polotieki tenei.

Te polotieki tenei ka taumafai malosi kote mea ke galue fakatasi mo niisi polotieki kola e fakatele olotou polotieki i luga i Funafuti pela mote fakapotopotoga maalo kau fakatasi i tena polotieki tela e fakaigoa kite NAPA (UNDP-NAPA), polotieki a fesoasoani a Ausitalia kite fakaolaga o lakau kaina I tena maga ite SPC, te polotieki Taugasoa Fiafia a Taiwan mo Tuvalu (Taiwan ICDF Horitculture) mote polotieki ate maalo o Siamani i feitu tau te mafulifuliga tau o aso (SPC-GIZ CCCPIR). Te polotieki tenei e talafegai loa mo manakoga ote palani atiake a Tuvalu tela e fakaigoa kite Kakeega II 2005-2015 tela e onoono ki tapula e faa (i) ke toe atili fai fakalei tulga tulaga o lakau kaina i loto I Tuvalu, (ii) ke toe atili fakalei a tulaga o laukele kola ko se lasi te fakaoga; (iii) ke toe atili avaka ki luga tulaga o fuataga o lakau kaina.

Map of Tuvalu

Table of Contents

1. INTRODUCTION

The Global Climate Change Alliance: Pacific Small Island States Project (GCCA: PSIS) is a three-year project funded by the European Union and executed by the Secretariat of the Pacific Community (SPC). The overall objective of the GCCA: PSIS project is to support the governments of nine smaller Pacific Island states, namely Cook Islands, Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Niue, Palau, Tonga and Tuvalu, in their efforts to tackle the adverse effects of climate change. The purpose of the project is to promote long-term strategies and approaches to adaptation planning and pave the way for more effective and coordinated aid delivery to address climate change at the national and regional level.

The GCCA: PSIS project is implemented by SPC as part of its 'whole of organization approach' and is one of the activities contributing to the SPC Climate Change Engagement Strategy. The four key result areas (KRA) of the GCCA: PSIS project are:

National Level Key Result Areas

- KRA 1: Supporting national efforts to successfully mainstream climate change into national and sector response strategies.
- KRA 2: Identifying, designing and supporting the implementation of adaptation activities.

Regional Level Key Result Areas

- KRA 3: Enhancing the contribution of regional organisations to national adaptation responses.
- KRA 4: Building regional capacity to coordinate the delivery of streamlined adaptation finance and targeted technical assistance to countries.

Tuvalu, as one of the countries participating in this project, has been involved in a number of climate change projects during the last decade which have helped shape how climate change adaptation is dealt with in-country. Tuvalu's approach to climate change adaptation is based on a no-regrets approach and it will pursue a strategy for precautionary adaptation since it is difficult to predict far in advance how climate change will affect a particular site, sector or island community. The strategy ensures that implementing adaptation measures now would be justified even in the absence of climate change, as it would lead to better management of natural resources and sustainable development.

Tuvalu has highlighted its adaptation needs at various regional and international fora and in official documents, in particular in Tuvalu's national development strategy, Te Kakeega II: National Strategy for Sustainable Development (NSSD) 2005–2015. This strategy prioritizes key strategic areas and was developed through extensive consultation and participatory processes. The expected outcomes are: increased employment opportunities, higher economic growth, better health care, better basic infrastructure, and continued social stability. Within agriculture, the key policy objectives are to: (1) reverse the decline in subsistence agriculture production; (2) increase the availability of land for agriculture; (3)

increase the production and consumption of local produce; and (4) mitigate climate change related agricultural impacts.

Given the above, Tuvalu has identified "Improving agro-forestry systems to enhance food security and build resilience to climate change in Tuvalu" as its focus for a national climate change adaptation project to be implemented under the GCCA: PSIS project.

This project design document (PDD) outlines the overall objective, purpose, key result areas and activities that comprise the project. The project design follows the logical framework approach. This first section of the PDD outlines the background of the project, its rationale and related projects. Section two describes how the project was identified. The third section describes the project's overall objectives, purpose, key result areas and activities using a logical framework approach, while the fourth and fifth sections of the document provide a schedule and budget for the project activities. Institutional arrangements and risk management and exit strategies are the content of sections six and seven respectively.

Background

Tuvalu is situated in the western South Pacific Ocean between 176^{o}E–180^{o}E and 5^{o}S–11^{o}S. It consists of five true atolls and four raised limestone reef islands, with a total land area of approximately 26 km^{2}. Land levels are very low, with maximum heights above mean sea level typically ranging from 3 to 4 m and the highest elevation being 4.6 m.

Tuvalu is now known as one of the world's smallest independent nations, gaining independence from Britain in 1978. It is a constitutional monarchy with Queen Elizabeth II as head of state with a 15-member parliament elected every four years.

Members of parliament generally have close links with their island constituencies and an effort is made to balance island representation in the cabinet, which comprises the prime minister and several ministers. Each inhabited island also has its own high chief *(ulu-aliki)* and several sub-chiefs *(alikis)* and elders *(te sina o fenua)* and together they form an island council or *falekaupule*.

Tuvalu is characterised as having a small, open economy and as such it is highly vulnerable to external shocks and natural hazards. Therefore, its economic performance tends to be highly volatile. The main focus of economic activity is fishing and subsistence farming and there are nascent tourism and retail industries. However, the majority of the country's income stems from external flows such as grants from donors, receipts from the Tuvalu Trust Fund and overseas remittances. The Trust Fund and donor flows act as an important buffer against financial uncertainty.

With the majority of the population engaged in subsistence farming and fishing, a private sector-led economy has not emerged. Thus the monetary economy is dominated by government activity, with fishing licences and marketing of its internet domain name '.tv' contributing to government revenue.

One of the key development challenges for Tuvalu is providing residents of the outer islands with greater access to services and opportunities for paid employment. Residents of the

outer islands depend on remittances from relatives working and living overseas and those who are working for the government in Funafuti. Another key development challenge is the lack of transport infrastructure, which severely constrains service delivery to the small populations dispersed across nine remote atolls.

Climate and Climate Change Projections for Tuvalu

The climate of Tuvalu is tropical marine. The mean air temperature is 28^{o}C, with a mean maximum of 31^{o}C and a mean minimum of 25^{o}C. The mean rainfall ranges from 2,300 mm to 3,700 mm annually. High year-to-year variability in rainfall is mostly due to the El Niño-Southern Oscillation; tropical cyclones are the main extreme event with an average of 8 cyclones per decade.

Future projections for climate change in Tuvalu show the following changes over the next 40 years: (i) average air temperatures will increase by +1.0 to +1.7^{o}C; (ii) projections for future trends in rainfall are not clear but indicate a general increase in both dry season and wet season rainfall with an increase in extreme rainfall events; (iii) less frequent droughts; (iv) increase in sea surface temperatures by +0.9 to +1.7^{o}C; (v) increase in ocean acidification; and (vi) sea level will continue to rise from +12 to +50 cm[1]. Projections about the future behaviour of extremes, including cyclones, and the future behaviour of ENSO show a range of uncertainties at the moment.

Rationale

Approximately 75% of the population of Tuvalu (total population in 2011 was 11,206 with 6,194 in Funafuti) is involved in subsistence farming, which is the main source of both food and income for many Tuvaluans. Commonly farmed crops and trees include coconuts, breadfruit, pandanus, bananas, ground taro, and pulaka (swamp taro). However, domestic subsistence agricultural production has been significantly declining in recent years with less people cultivating local produce and more reliance on imported foods. This is due to many fundamental issues and challenges. Recent pressures include: (i) saltwater intrusion affecting low lying areas; (ii) flooding and drought events; (iii) limited arable land availability; (iv) urbanization and lifestyle changes; (v) declining outer island populations; and (vi) poor local and export market access. These causes for the decline of subsistence agriculture are predicted to worsen with the adverse impacts of climate change and climate variability, as increasing air temperatures will put stress on crops and trees, and saltwater intrusion and flooding will further decrease the area of land available for farming. Urbanization is already limiting the land available for subsistence agriculture in a nation with a total land area of only 26 square kilometres.

The recent decline in subsistence agriculture has resulted in increasing dependence on imported foods such as rice and flour, which is having a negative impact on the population of Tuvalu. Cases of non-communicable diseases are increasing (for example mortality rates

[1] Australian Bureau of Meteorology and CSIRO, 2011; *Climate change in the Pacific: Scientific Assessment and New Research* Volume 1: Regional Overview. Volume 2: Country Reports.

from diabetes have increased by 29% since 2000[2]) and food shortages due to unreliable transportation of imports are common, especially in the urban center of Funafuti. This unreliability in food supply causes the nation to be highly vulnerable to economic shocks and extreme events.

The porous and acidic soils of Tuvalu have limited fertility and support a narrow range of crops, making agriculture production difficult. It is a national challenge to increase the fertility of the soil for subsistence agriculture, in order to increase household income for farmers and gardeners. Most agricultural crops are produced in farms that are small in size (less than an acre) and communally owned. There is little local livestock production, although many families raise pigs and chickens for local consumption. Copra is the only agricultural export, and is limited in its production.

In Tuvalu's national development strategy, the Te Kakeega II: National Strategy for Sustainable Development (NSSD) 2005–2015 extensive consultation informed the identification of the four key policy objectives related to agriculture: (i) reverse the decline in subsistence agriculture production; (ii) increase the availability of land for agriculture; (iii) increase the production and consumption of local produce; and (iv) mitigate climate change related agricultural impacts. The key agricultural priorities stated in the Te Kakeega II: NSSD to address these policy objectives are to:

1. Improve and expand agricultural extension services.
2. Create more opportunities to educate and train agriculturalists.
3. Expand availability of basic agricultural tools and equipment.
4. Assist private entrepreneurs to produce and market local produce.
5. Assist with access to land and credit.
6. Incorporate more agricultural subjects into school curricula.

This project aims to specifically address the policy objectives and numbers 1-4 of the key priorities stated in the Te Kakeega II: NSSD through an integrated agro-forestry approach. This project will be driven by the Tuvalu Department of Agriculture and will demonstrate integrated agro-forestry farming methods in urban Funafuti (with a population of 6,194 or 55% of the total population) and one nearby outer island (to be selected).

Integrated agro-forestry practices have already been successfully trialled in Tuvalu by the Department of Agriculture. The approach is based upon traditional agricultural practices, where complementary crops and trees are planted adjacent to each other (see Figure 1).

This approach has been well documented in the Pacific, and has been shown to provide the following benefits for farmers: (i) increased total productivity, (ii) increased efficiency of land, labour and resources, (iii) early returns from crops, and (iv) increased diversity of crop

[2] World Health Organization- Health Profiles Tuvalu. WPRO, 2013. http://hiip.wpro.who.int/hiip/CountryProfiles/Tuvalu/HealthProfiles/TabId/203/ArtMID/1060/ArticleID/117/Default.aspx

yields.[3] However, recent farming approaches in Tuvalu have shifted to mono-cropping, thus decreasing productivity and depleting the soil.

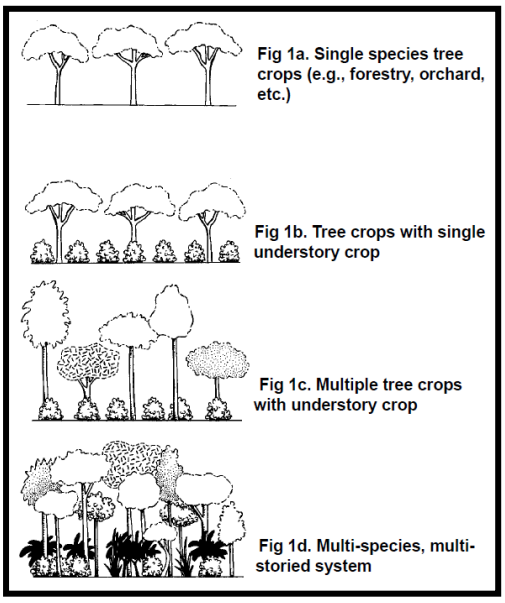

Figure 1: Diagram showing the transition from mono-cropping to a multi-species integrated agro-forestry approach.

Implementing integrated agro-forestry practices in Tuvalu consists of:

1. Clearing the land of any unproductive crops and trees such as senile or closely packed coconut trees (coconut trees that are planted too close together will not bear fruit regularly) (see Photo 1). An estimated 65-70% of the coconut trees in Tuvalu are senile and no longer bear fruit.

2. Preparing the underlying land for planting by breaking up any rocks, creating compost from the removed plants and trees, and tilling the soil (see Photos 2 & 3).

3. Sourcing a variety of crops and trees from various islands in Tuvalu and from SPC's climate ready plant collections developed by the Centre for Pacific Crops and Trees (CePaCT). Climate ready crops have a higher resistance to salinity and high temperatures. These varieties will be initially grown in nurseries until the seedlings have reached an appropriate size for planting. Duplicates of each variety will be given to the Agricultural Research Station in Vaitupu in order to increase the nation's stock of plant varieties.

4. Planting the crops and trees agreed upon by the land owners. These will be planted in a three-tiered approach in order to maximize the productivity of the land. First tall trees such as coconuts, breadfruit and wild figs will be planted equidistant from each other and at least 5 meters apart. Then smaller trees, such as pandanus, banana and papaya will be distributed between them. Finally, low lying ground crops such as cassava, sweet potato, ground taro, cucumber, pumpkin, and watermelon will be planted in the underlying space (see Photo 4).

5. Evaluating the success of the crop and tree seedlings in terms of growth, productivity, and adaptively to climate stresses. Data will be collected and compiled by the Department of Agriculture over the project timeline, and will be shared nationally and with other Pacific island nations. Also, the project will put in place the processes and procedures with the Department of Agriculture for longer term monitoring.

[3] Wilkinson, K.M. and C.R. Elvitch, 2000. Integrating Understory Crops with Tree Crops: An Introductory Guide for Pacific Islands. Agroforestry Guides for Pacific Islanders #4. Permanent Agriculture Resources, Hawaii USA. www.agroforestry.net

Photo 1 (Upper Left): Closely-packed coconut trees that have not achieved maximum productivity.
Photo 2 (Upper Right): Rocky soils will require heavy equipment to prepare the ground for planting.
Photo 3 (Lower Left): A banana tree planted in composted soil.
Photo 4 (Lower Right): Examples of banana and ground taro growing together.

Project stakeholders have been involved in every step of the project. A project planning workshop was held on 19 August, 2013, where 24 participants from government agencies, non-government organizations, island councils, and other regional organizations met to design the overall objective and purpose, key results, and activities of the project. The project outlined in this design document is a result of the outcomes of the workshop and of additional in-depth consultations with government and the Tuvalu National Women's Council.

Cognizant of the issues associated with land tenure in Tuvalu, the Director of the Department of Agriculture has been holding initial meetings with land owners to identify demonstration sites in Funafuti. Positive feedback has been received for the proposed activities and several options for project sites on Funafuti have been identified. The two sites

on Funafuti will be finalized in a consultative meeting with the land owners after the project design document is signed and agreements will be prepared between the land owners and the Department of Agriculture.

The land owners will be involved during the project implementation and after the project comes to a close. They will be able to select which crops and trees are planted and will be involved in a number of educational and training activities. The project demonstration sites will continue to be maintained by the land owners after the project's duration. The land owners will have the benefit of consuming and selling the produce from the demonstration sites in the future. They will continue to have the support of the Department of Agriculture, in particular the agriculture extension agents, who will have gained new knowledge and skill and increased their capacity as a result of this project. A Letter of Agreement will be signed outlining the roles of the farmers and Department of Agriculture in maintaining the demonstration sites.

Training and awareness raising will be a key component of the project, and will target the land owners and farmers, as well as women's and school groups. An extension team from the Department of Agriculture will train the land owners and communities in the cultivation and usage of the crops from this integrated farming system, through hands-on technical trainings at the demonstration sites. Separate trainings will educate women in integrated gardening techniques.

An equipment technician will train the farmers and communities in proper equipment handling and maintenance strategies. Funds for maintenance have been set aside in the project budget. Ownership of the heavy equipment will be transferred to the *Kaupule* on each island at the close of the project. A maintenance plan between the Department of Agriculture and *Kaupule* will be developed at the close of the project including future funding arrangements.

An Agricultural Marketing Plan will be prepared as part of the project and will identify potential economic benefits of the project such as producing coconut products and pandanus juice, as well as selling the fruits and vegetables in the Funafuti market and stores. The project will also strengthen local farmers' cooperatives and associations, with the outputs including technical support, training, and implementation plans for the farming initiatives as determined by the Agricultural Marketing Plan. This will contribute to a comprehensive integrated approach to food security and agriculture.

The capacity of the Department of Agriculture will be strengthened by: providing technical staff for the duration of the project to enhance their agricultural extension team, providing support for overseas technical attachments, improving their ability to gather data on successful plant varieties, and re-equipping their Agricultural Research Station. The agricultural outputs will continue to be monitored beyond the project lifetime. Lessons learnt/best practices from the project will be gathered and compiled with other lessons at a national workshop with all related agriculture/ food security projects (especially Taiwan ICDF Horticulture Project, UNDP- National Adaptation Programme of Action (NAPA), UNFAO country programme, and SPC CePaCT- AusAID Nursery Project, described in detail in the next section) and other stakeholders. These lessons will be circulated widely, both nationally

and internationally, and the Department of Agriculture will integrate the outcomes into their future work plans.

Lessons learnt from other programs in Tuvalu that will be addressed by the project include:

1) **Having an in-country presence**- as Tuvalu has an extremely limited number of skilled and experienced officials. The project will address this by having a full time project officer and financial officer based in the department of Agriculture, which will also help build capacity

2) **Strengthen Data collection capacity-** as up-to-date and regular data are lacking for many sectors. This project will strengthen the capacity of the Department of Agriculture to collect data and maintain a database.

3) Urbanization- there is a need for more attention to population and development issues on Funafuti. This project will help to alleviate land pressures and increase local food security, thus addressing aspects of urbanization.

4) **Gender-** there is a need to be pro-active in assuring that the planned beneficiaries do in fact benefit. This project will work directly with local women's groups in one of the planned activities in order to ensure they benefit directly from the project.

Collaboration with related projects will be central to the output of this project to avoid any duplication and maximize the impact. As the NAPA, AusAid, and Taiwanese projects are all focusing on household scale home gardens for root crops and vegetables, little duplication has been identified thus far. Possible areas for collaboration include working together with CePaCT and NAPA to identify climate ready crops that are appropriate for Tuvalu, procuring equipment together in order to decrease transportation costs, collaborating on the development of a national agricultural marketing plan, and partnering on trainings (such as composting and home gardening) to maximize the benefits.

Related Projects

Tuvalu has implemented a number of climate change adaptation projects over the past decade and produced its First National Communication under the UNFCCC in 1999. Tuvalu is in the process of finalizing its Second National Communication and its Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management (JNAP). The projects outlined below focus on adaptation related to food security and the agriculture sector, and provide opportunities for building synergies and for collaboration.

1. *National Adaptation Programme of Action Projects (UNDP: 2007- 2014):* Through its status as a Least Developed Country, Tuvalu submitted a National Adaptation Programme of Action (NAPA) to the United Nations Framework Convention on Climate Change (UNFCCC) in May 2007. The objective of the document is to identify and promote activities that address the urgent need of Tuvalu to adapt to the adverse impacts of climate change. The priority sectors described under the NAPA are agriculture, water, fisheries, land, disaster, and human health services.

These priorities from the NAPA are currently being implemented through UNDP in three project rounds: NAPA I (3.3 million), NAPA I+ (1 million), and the NAPA II project (4.2 million, commencing in December 2013). Within agriculture, the NAPA has prioritized enhancing the traditional subsistence economy through increasing crop yields by introducing salt-tolerant root crops as well as other agricultural initiatives focused on improving pulaka pits and home gardening. These agriculture initiatives are in the process of being implemented through the NAPA 1+ project.

2. *Horticultural Crop Development Project (Taiwan International Cooperation and Development Fund -ICDF: 1.4 million; 2011 - 2014):* This Funafuti based project is designed to assist with vegetable and fruit cultivation and production as part of a wider promotion of the consumption of fruits and vegetables. The aims of the project are to improve production, reduce imports, expand home gardening and promote the consumption of nutritious lunches through the operation of school vegetable farms. The main project outputs are: 1. Transferring the demonstration farm to government personnel so that they perform operations independently, 2. Promoting home gardening and school vegetable farms by supplying seeds and improving awareness, 3. Building a composting facility and producing a handbook on compost production, and 4. Promoting home gardening by establishing crop rotation systems and promoting the use of compost.

3. *UN Food and Agriculture Organization Country Program:* The UN FAO country program has two ongoing projects related to agriculture in Tuvalu:
   -- Development of Community-based Aquaculture System and Management of Inshore Fisheries for Food Security in Tuvalu (2011-2013; $290,000): This project will demonstrate the use of aquaponics for raising freshwater fish on Funafuti.
   -- Home Gardening for the outer islands of Tuvalu (2013-2014; $80,000): This project will provide awareness and distribute hand garden tools (i.e. spades, shovels, chicken wire, etc.) to home gardeners in the outer islands, for the cultivation of root crops and vegetables.

4. *Establishing nurseries in Tuvalu to support conservation and distribution of staple food crops and climate ready diversity (AusAID: $60,000; 2012-2014)*: This project will establish two nurseries for the cultivation of pulaka and other root crops on Vaitupu and Nukulaelae Islands. SPC's CePaCT is providing 'climate ready' root crops and aiding in implementation of this project. The planting material will then be distributed to farmers on Vaitupu and Nukulaelae Islands, and the success of the new crops will be evaluated.

2. PROJECT SELECTION PROCESS

The project selection process involved a number of activities which are listed below in chronological order.

February–May 2012: Review of background information

A literature review was conducted of the projects, programmes and activities relating to climate change that were ongoing or recently implemented in the country. Information from the review was compiled into the first version of the Tuvalu Climate Change Profile and was published online at http://www.spc.int/en/our-work/climate-change/gcca.html. The document provided a useful background for identification of a possible focus area for the adaptation project in Tuvalu.

May 2012: Initial discussions at the GCCA:PSIS Project Steering Committee Meeting

Tuvalu's adaptation needs and priorities were discussed at the first GCCA: PSIS Project Steering Committee Regional Meeting held from 28-29 May 2012 in Suva, Fiji. At this meeting a specific session was focused on identification of possible focus areas for adaptation and other areas including mainstreaming, national coordination activities, working arrangements and training and/or capacity building needs.

July–October 2012: In-country consultations relating to the on-the-ground adaptation project and other activities

A mission was conducted to Tuvalu in July 2012. The objectives of the mission were to (i) introduce GCCA: PSIS Project in Tuvalu; (ii) meet with the Tuvalu Climate Change Country Team; and (iii) discuss possible sectors for the adaptation project to focus on. Subsequent to this mission, four possible sectors for the adaptation project were selected by the government in October 2012: water resources, coastal protection, disaster risk management, and agriculture/food security.

January–March 2013: In-country consultations to advance the identification of a sector and signing of the project Letter of Agreement

A mission was conducted to Tuvalu in January 2013 to advance identification of the sector. During this mission, the Letter of Agreement confirming implementation arrangements was signed by the government, and in February 2013, agriculture was selected as the focus sector. Upon confirmation of the adaptation focus area, work started on the preparation of the project concept note.

July 2013: Project concept development, approval, and circulation

A project concept note entitled "Enhancing food security in Tuvalu through the introduction of fast-growing and climate resilient crops" was developed in consultation with the Ministry of Foreign Affairs, Trades, Tourism, Environment & Labour; Department of Environment; and Department of Agriculture. The project concept outlined the key implementing agencies and partners, estimated costs, objectives, justification/rationale and how the project fits with key criteria including feasibility, scientific validity, urgency, equity, replication, measurability, and scope, and supporting policy documentation. The concept note was approved by the EU and

was shared through meetings with SPC-GIZ, UNDP-NAPA, and SPC CePaCT- AusAID to avoid any duplication and identify areas for potential collaboration.

July–August 2013: Updated version of the Tuvalu Climate Change Profile and Project Coordinators in place

The Tuvalu Climate Change Profile was updated to include recent activities and developments, and this second version was reviewed by the national government and finalized. This exercise provided useful information for the design of the project activities, especially in avoiding duplication with other food security related projects. Also, two GCCA: PSIS staff: a project coordinator and capacity building officer were recruited and started work in the Department of the Environment in August 2013.

August 2013: In-country consultations and project planning workshop

A mission was conducted to Tuvalu in August 2013 and in consultation with partners on the ground the project concept was revised to "Improving agro-forestry systems to enhance food security and build resilience to climate change in Tuvalu". A project planning workshop was held on 19 August 2013, with 24 participants from government agencies, non-government organizations, island councils, and other regional organizations to discuss the overall objective and purpose, key results, and activities of the project. The meeting's participants developed a draft Project Logical Framework (Logframe) outlining the key elements. Separate consultations were held with the Office of the Prime Minister, Ministry of Foreign Affairs, Trades, Tourism, Environment & Labour (MFATTEL), Ministry of Finance and Economic Planning (MFEP), Ministry of Natural Resources (MNR), Department of Environment, Department of Agriculture, and the Tuvalu National Council of Women (TNCW). In addition, the Tuvalu CC Adaptation Video documentary was launched, which gave national recognition to the GCCA: PSIS project.

September 2013: Further discussions at the Third GCCA: PSIS Project Steering Committee Meeting (SCM) and land owner consultations

A bilateral meeting was held at the third SCM to discuss the current status of the project. The Tuvalu adaptation project concept was presented by the Tuvalu National Coordinator. Land tenure was among the issues that arose in the following discussion. The Director of the Department of Agriculture has been holding initial meetings with land owners with positive results. The sites will be finalized in a meeting with the land owners after the project design document is signed.

3. PROJECT DESCRIPTION

This section outlines the overall objective, purpose and key results as outlined in the project logical framework. It also describes how the key results will be implemented, monitored and evaluated over the project life and beyond.

Overall Objective

The overall objective of the project is **"To increase resilience to climate change impacts in Tuvalu."** The objective is consistent with Tuvalu's First National Communication (FNC) under the UNFCCC (1999), which identified major vulnerabilities within the agriculture sector: increasing population; land loss due to the adverse impacts of climate change; and increasing reliance on imported foods. The FNC stressed the need to lessen such vulnerabilities in order to prepare the nation for the negative impacts of climate change.

The project will implement and evaluate the success of integrated agro-forestry farming practices in Tuvalu, which use a minimum amount of land to produce a high yield from a variety of crops. It will benefit the 4,492 people living in Funafuti, as well as one outer island community that has yet to be selected. Crops and trees will be sourced from within Tuvalu and from SPC CePaCT's 'climate ready' plant collections, which have a higher saline and temperature resistivity. The project will compile and circulate lesson learnt and/or best practices, in collaboration with related projects and key stakeholders, for integrated farming practices in an atoll environment facing the impacts of climate change in Tuvalu and the wider Pacific region.

Project Purpose

The project purpose is **"To enhance food security in Tuvalu."** The project aims to improve food security through a number of activities including: (i) demonstrating intensive agricultural production from under-utilized land; (ii) diversifying crop availability; (iii) introducing 'climate ready' crops; (iv) developing an agricultural marketing plan; (v) strengthening farmers' cooperatives and associations; and (vi) educating farmers and land owners. The crops produced will serve as reliable and healthy local food sources for both the urban and rural areas, and will help revitalize interest in traditional agriculture practices. Such activities will help to stabilize local food supplies, thereby enhancing food security and building resilience to economic shocks and extreme events.

The project will establish agro-forestry demonstration sites where a variety of complementary crops and trees will be planted in a tiered approach so that the maximum overall yield can be produced. An extension team from the Department of Agriculture will train the land owners and communities in the cultivation and usage of this integrated farming system. Training and awareness raising on intercropping with coconut trees will be a key component of the project, and will target the land owners (who are also the farmers), as well as women and communities. The capacity of the Department of Agriculture will also be enhanced by providing technical staff for the duration of the project, by providing for overseas technical attachments, by strengthening the department to gather data on successful plant varieties, and by re-equipping their Agricultural Research Station.

An agricultural marketing plan will be produced in collaboration with related projects, with potential economic benefits including producing coconut products and pandanus juice, as well as selling the fruits and vegetables in the Funafuti market and stores. Strengthening local farmers' cooperatives and associations will help supplement this process.

Key Result Areas and Activities

The key result areas (KRA) identified through a consultative and participatory process for this project are as follows:

Key Result Area 1: Enhanced understanding of agro-forestry among community members, land owners, and *Kaupule* through awareness raising, capacity building and training.

This component will involve the following activities:
1.1 Hold a training workshop in agro-forestry farming practices in Funafuti for key stakeholders from all islands - to support the implementation of the project, a nationwide training workshop will be held for farmers and land owners from each of Tuvalu's nine islands. The training topics will include utilizing integrated agro-forestry practices, creating compost and cultivating the land, and utilizing a variety of crops to enhance food security. The participants will be expected to present the knowledge they gained to their local farming cooperatives/ associations upon return to their communities.

1.2 Hold two onsite training workshops in agro-forestry farming practices in Funafuti and one outer island for land owners and others - this activity will include hands-on-training for land owners and farmers in the communities adjacent to each demonstration site. This will include a series of workshops run by an extension team from the Department of Agriculture. The trainings will focus on a variety of techniques to cultivate the land and plant the selected crops and tree varieties in an integrated agro-forestry approach. This will enhance understanding of the crops and trees and of their linkages to each other, and will build ownership over the demonstration sites described in KRA 2.

1.3 Hold a training workshop in integrated gardening practices in Funafuti for women's group representatives from all islands - this activity arose from a request by the Tuvalu National Council of Women. This training of trainers' workshop will involve women's group representatives from all islands and will focus on integrated home gardening practices. The women involved will then return to their communities and hold a training for the other women's group members. Seedlings from this project will be available for the women to take back to their island and cultivate. Since this activity has already been accommodated under a separate technical assistance request, no further amount is included for this activity in the project budget.

1.4 Implement at least six different awareness and education activities related to improved agro-forestry systems and climate change adaptation, e.g. brochures, billboards, videos, radio programmes - Awareness and education activities will focus on target groups including farmers, communities, local government, women, and schools. The awareness and education materials will include preparation of information brochures and pamphlets, school

programmes that include hands-on demonstrations, radio/television broadcasts, and community billboards in Funafuti. These materials will be developed with government in collaboration with the NAPA, Taiwan, and AusAid projects, as well as with SPC- CePaCT.

Key Result Area 2: Improved agro-forestry system implemented in demonstration sites in Funafuti and one outer island.

This component will involve the following activities:

2.1 Establish a Steering Committee and meet quarterly- Project oversight will be provided by a Project Steering Committee whose membership will be comprised of representatives from the Ministry of Natural Resources (MNR), Ministry of Foreign Affairs, Trades, Tourism, Environment and Labour (MFATTEL) and the Ministry of Finance and Economic Planning (MFEP), and the Tuvalu National Authorising Officer for the EDF, among others. Selection of the Project Steering Committee will be decided by the Permanent Secretary of MFATTEL (SPC focal point) and the other key members described above. Preference to use existing committees will be taken into consideration. The SPC GCCA: PSIS National Climate Change Coordinator based in the Department of Environment, and the Project Technical Officer to be based in the Department of Agriculture, will also be part of the Project Steering Committee and will provide secretarial support. This committee will be responsible for providing technical and policy advice on the implementation of the project.

2.2 Select at least two sites for demonstration projects in Funafuti, and two further sites in one outer island in consultation with Kaupule, communities and land owners- Initial consultations with land owners have already begun in Funafuti, in order to identify a list of possible project sites. Consultative meetings will then be held with *Kaupule*, communities and land owners in Funafuti and the outer islands to confirm possible project sites.

2.3 Procure and purchase equipment for four demonstration sites (2 sites will be located on each island so they can share equipment) - The project will procure heavy equipment (tractors, trailers, chippers, small jack hammers with generators, diggers/backhoes, chain saws), and small farming equipment (shovels, bush knives, wheelbarrows, fencing, gasoline, etc.) for the purpose of thinning unproductive trees, enhancing the soil through tilling and compost, and replanting the demonstration sites with trees and crops. A storage shed will be built at each location to protect the equipment and a water tank will be provided to water the crops (with a water pump in the outer island). Funds are set aside in the project for maintenance, and a plan will be prepared for the continuation of maintenance beyond project life.

2.4 Recruit an equipment technician for 12 months, based in Department of Agriculture, to train *Kaupule* and local farmers in operations and maintenance of the equipment - The equipment technician will be knowledgeable in operations and maintenance of the equipment. The role will involve training of MNR staff, agricultural extension agents, demonstration site land owners, and farmers in the proper usage and maintenance techniques for the project farming equipment.

2.5 Prepare and maintain demonstration sites including tree thinning, selection of climate ready crops to be planted, compost making, weeding, etc. - Agricultural extension agents, the project technical officer, and the equipment technician will oversee the land owners and farmers in preparing and maintaining the project sites. Selection of crops to be planted will be decided in collaboration with the land owners, and the agricultural staff will hand over the maintenance of the site after a series of technical trainings (activity 1.2).

2.6 Source local planting materials for the demonstration sites and the Agricultural Research Station - Crops for the demonstration sites will be sourced from within Tuvalu by agricultural extension agents and the project technical officer. The following trees and crops will be sourced: coconuts (including dwarf varieties), breadfruit, pandanus, banana, wild figs, papaya, taro, pumpkin, and cucumber. The planting material will then be propagated in the Agricultural Research Station, and the varieties supplied to the on-site nurseries.

2.7 Strengthen capacity of CePaCT to produce sufficient climate resilient plant materials for Tuvalu - Crops and trees will also be supplied from SPC's climate ready plant collections, developed by CePaCT. These crops are bred to have a higher resistivity to salinity and temperature extremes, so that they are able to withstand the projected impacts from climate change. A bioreactor, which is used to mimic an ideal biologically active environment for growing plants, will be used to grow the climate ready plants for Tuvalu. A laboratory technician (ideally from Tuvalu) will be employed to produce the planting material for Tuvalu, in particular cassava, sweet potatoes, and breadfruit trees.

2.8 Establish a nursery/ nursery extensions for the two islands where the demonstration sites are located - A nursery will be established at each demonstration site to supply the planting material to farmers during the project. The nurseries will continue to be used after the project lifetime to propagate the seedlings for use by community farmers.

2.9 Evaluate the initial performance of the crop and tree varieties and compile the results in a lessons learnt workshop with input from other projects and stakeholders.- This activity will be led by the Department of Agriculture, and will involve farmers in collecting data and evaluating the crops and trees planted in the demonstration sites. This activity will encourage collation and analysis of information, and will strengthen the Department of Agriculture's database. The lessons learnt will then be gathered and compiled with other lessons at a national workshop with the Department of Agriculture, the National Adaptation Programme of Action (NAPA) Project, the Taiwan ICDF Horticulture Project, UNFAO, SPC-CePaCT and other stakeholders. These lessons will be circulated widely both nationally and internationally, and the Department of Agriculture will integrate the outcomes into their future work plans.

Key Result Area 3: Marketing potential and access evaluated.

This component will involve the following activities:

3.1 Develop an agricultural marketing plan for Tuvalu which will address transportation, food preservation, packaging and incentives such as buy local campaigns, annual competitions (*Nafa*) – A consultant will be recruited to analyse the economic viability of agriculture produce in Tuvalu. Potential economic benefits of Tuvalu's crops and trees will be determined, and may include producing coconut products and pandanus juice, as well as selling the fruits and vegetables in the Funafuti market and stores. Incentives for buying local will also be proposed in the plan.

3.2 Strengthen farmers' associations and initiatives to participate in commercial farming - The results from the consultancy identified in 3.1 will be shared with farmer's associations and cooperatives. The outputs will be determined by the Agricultural Marketing Plan, but may include technical support, training, and implementation plans for the farming initiatives.

Key Result Area 4: Enhanced coordination and capacity of the Department of Agriculture.

This component will involve the following activities:

4.1 Recruit a technical officer and a finance officer for 18 months, to be based in Department of Agriculture to drive the project - Two staff for the project will be employed by MNR Department of Agriculture to drive the project. The project technical officer will oversee the training activities and implementation of the demonstration sites, and the financial officer will manage the project finances and help procure equipment. The two staff will carry out day-to-day operations relating to project implementation.

4.2 Support international training attachments to share good farming practices - this activity arose from a desire by the Department of Agriculture to understand best farming practices in other Pacific island atoll countries with similar geography and soil conditions. Extension agents and other technical staff will be selected and will have the opportunity to be involved in plant propagation at CePaCT and to view another successful atoll farms. On their return they will share the knowledge with other staff and farmers. These attachments have already been accommodated under a separate technical assistance request, so no further amount is included for this activity in the project budget.

4.3 Re-equip the Agricultural Research Station in Vaitupu for stocking planting materials and provide duplicates of the project planting materials to the station for future use - The project will provide the additional equipment necessary to keep stock of all the planting materials provided for the demonstration sites, so that they are available to farmers over and beyond the lifetime of the project.

Project Log Frame

Project title: Improving agro-forestry systems to enhance food security and build resilience to climate change in Tuvalu.			
Description	**Verifiable Indicators**	**Verification Sources**	**Assumptions**
Overall Objective: Increase resilience to climate change impacts in Tuvalu.	• Lessons learnt from food security initiatives compiled, analysed and shared with other atoll countries by 06/2015	• Lessons Learnt workshop report • Lessons Learnt publication	
Purpose: Enhance food security in Tuvalu.	• At least two demonstration sites operational in 2 different islands by 06/2015 • Operation and maintenance of demonstration sites are incorporated into the 2015/2016 work plan for the Department of Agriculture by 06/2015	• Project progress reports • Department of Agriculture annual work plans and budget	• Communities, farmers, and land owners receptive to agro-forestry practices and willing to adopt them • Equipment and plant materials available within project timeframe • Delivery and installation not affected by an extreme weather event or natural hazard e.g. cyclone, tsunami
Key Result Area 1: Enhanced understanding of agro-forestry among community members, land owners and *Kaupule* through awareness raising, capacity building and training.	• At least 20 farmers effectively applying agro-forestry practices by 06/2015 • At least 6 education/awareness activities implemented by 03/2015	• Surveys of farming practices pre and post project implementation • Surveys of awareness of general population about agro-forestry pre and post project implementation	• Suitable staff available for timely recruitment • Communities receptive to agro-forestry farming practices
Key Result Area 2: Improved agro-forestry system implemented in demonstration sites in Funafuti and one outer island.	• 4 sites for demonstration selected in 2 islands in a participatory manner by 06/2014 • 20 farmers across 2 islands have access to and are using equipment needed for agro-forestry by 12/2014 • 2 nurseries established or enhanced in 2 islands to supply planting material to farmers by 03/2015	• Agreements with land owners • Project progress and financial reports • Project workshop reports • Department of Agriculture annual work plans and budget	• Communities and land owners willing to adopt agro-forestry practices • Sufficient agricultural labour available • Transport to outer islands available within project timeframe

Key Result Area 3: Marketing potential and access evaluated.	• Agricultural production marketing plan for Tuvalu prepared by 06/2015	• Agricultural production marketing plan	• Consultant available to undertake the plan preparation • Buy-in from communities and government for agricultural marketing
Key Result Area 4: Enhanced coordination and capacity of the Department of Agriculture.	• Agricultural Research Station equipped to supply planting material for two new crops to farmers by 06/2015 • Minimum 2 extension officers trained in propagating climate ready crops	• Agricultural Research Station report • Sectoral plan • Attachment reports • Department of Agriculture annual work plans and budget	• Suitable staff available for timely recruitment • Transport to outer islands available within project timeframe
1.1 Hold a training workshop in agro-forestry farming practices in Funafuti for key stakeholders from all islands. 1.2 Hold two onsite training workshops in agro-forestry farming practices in Funafuti and one outer island for land owners and others. 1.3 Hold a training workshop in integrated gardening practices in Funafuti for women's group representatives from all islands --To be paid for through a separate TA for training and attachments, requested by the Tuvalu National Council of Women. 1.4 Implement at least six different awareness and education activities related to improved agro-forestry systems and climate change adaptation, e.g. brochures, billboards, videos, radio programmes. 2.1 Establish a Steering Committee and meet quarterly. 2.2 Select at least two sites for demonstration projects in Funafuti, and two further sites in one outer island in consultation with Kaupule, communities and land owners. 2.3 Procure and purchase equipment for four demonstration sites (2 sites will be located on each island so they can share equipment). 2.4 Recruit an equipment technician for 12 months, based in Department of Agriculture, to train *Kaupule* and local farmers in operations and maintenance of the equipment.	**Means** Technical assistance Missions to countries Information sharing systems Purchase of equipment Training activities Attachments Meetings and workshops Media involvement Reporting and evaluation	**Indicative Budget** € 0.5 million	

2.5 Prepare and maintain demonstration sites including tree thinning, selection of climate ready crops to be planted, compost making, weeding, etc. 2.6 Source local planting materials for the demonstration sites and the Agricultural Research Station. 2.7 Strengthen capacity of CePaCT to produce sufficient climate resilient plant materials for Tuvalu. 2.8 Establish a nursery/ nursery extensions for the two islands where the demonstration sites are located. 2.9 Evaluate the initial performance of the crop and tree varieties and compile the results in a lessons learnt workshop with input from other projects and stakeholders. 3.1 Develop an agricultural marketing plan for Tuvalu which will address transportation, food preservation, packaging and incentives such as buy local campaigns, annual competitions (Nafa). 3.2 Strengthen farmers' associations and initiatives to participate in commercial farming. 4.1 Recruit a technical officer and a finance officer for 18 months, to be based in Department of Agriculture to drive the project. 4.2 Support overseas technical training attachments to share good farming practices --To be paid for through a separate TA for training and attachments. 4.3 Re-equip the Agricultural Research Station in Vaitupu for stocking planting materials and provide duplicates of the project planting materials to the station for future use.			

4 PROJECT BUDGET

Activity	Activity Budget	KRA Total
	AUD	AUD
Key Result Area 1: Enhanced understanding of agro-forestry among community members, land owners and Kaupule through awareness raising, capacity building and training.		***100,000***
Key Result Area 2: Improved agro-forestry system implemented in demonstration sites in Funafuti and one outer island.		***415,000***
Key Result Area 3: Marketing potential and access evaluated.		***40,000***
Key Result Area 4: Enhanced coordination and capacity of the Department of Agriculture.		***80,000***
Sub-Total	***635,000***	***635,000***
Contingency (7.9%)	***50,000***	***50,000***
Overall Cost	***685,000***	***685,000***

The sum allocated to Tuvalu for this project is the Australian equivalent of €500,000. The detailed budget has been displayed above in Australian dollars, however, there may be some slight adjustments required due to currency fluctuations.

The first payment of AUD 426,000 will be paid once this Project Design Document is signed by all parties. Payments shall be made into the Government's account. All payments will be made in AUD, the currency of the Government of Tuvalu. The second payment can be requested once 80% of the first payment has been fully acquitted. Acquittals must be supported by receipts. Annual government audits will be sufficient unless any accounting or financial problems emerge. Any interest accruing from the advances paid by SPC shall be considered as income for the purpose of operating this project. It may be used to cover eligible costs of the operation.

Quarterly financial reporting is required and a specific template for Tuvalu will be developed once the Project Design Document is signed.

The Government shall oversee accurate and regular records and accounts of the implementation of the operation.

- Financial transactions and financial statements shall be subject to the internal and external-auditing procedures laid down in the financial regulations, rules and directives of SPC.
- Copies of substantiating documents relating to each financial transaction shall form part of the quarterly acquittal (originals to be held by government of Tuvalu).
- Reimbursements of funds shall only be made on receipt of the proper acquittal of the funds already advanced.
- Fixed assets (equipment): All fixed assets (equipment) will remain the property of SPC until the closure of the project. On closure of the project the assets will be officially handed over by SPC to the respective stakeholders in the country. An asset register of all assets purchased should be kept in the office of the Government.

5. PROJECT SCHEDULE

Key Result Areas/Activities	2013	2014				2015	
	Q4 Oct	1Q Jan	2Q April	3Q July	4Q Oct	1Q Jan	Q2 April
Key Result Area 1: Enhanced understanding of agro-forestry among community members, land owners, and Kaupule through awareness raising, capacity building and training.							
1.1 Hold a training workshop in agro-forestry farming practices in Funafuti for key stakeholders from all islands.							
1.2 Hold two onsite training workshops in agro-forestry farming practices in Funafuti and one outer island for land owners and others.							
1.3 Hold a training workshop in integrated gardening practices in Funafuti for women's group representatives from all islands							
1.4 Implement at least six different awareness and education activities related to improved agro-forestry systems and climate change adaptation, e.g. brochures, billboards, videos, radio programmes.							
Key Result Area 2: Improved agro-forestry system implemented in demonstration sites in Funafuti and one outer island.							
2.1 Establish a Steering Committee and meet quarterly.							
2.2 Select at least two sites for demonstration projects in Funafuti, and two further sites in one outer island in consultation with *Kaupule,* communities and land owners.							
2.3 Procure and purchase equipment for four demonstration sites.							
2.4 Recruit an equipment technician for 12 months, based in Department of Agriculture, to train *Kaupule* and local farmers in operations and maintenance of the equipment.							
2.5 Prepare and maintain demonstration sites including tree thinning, selection of climate ready crops to be planted, compost making, weeding, etc.							
2.6 Source local planting materials for the demonstration sites and the Agricultural Research Station.							
2.7 Strengthen capacity of CePaCT to produce sufficient climate resilient plant materials for Tuvalu.							
2.8 Establish a nursery/ nursery extensions for the two islands where the demonstration sites are located.							
2.9 Evaluate the initial performance of the crop and tree varieties and compile the results in a lessons learnt workshop with input from other projects and stakeholders.							

Key Result Areas/Activities	2013	2014				2015	
	Q4 Oct	1Q Jan	2Q April	3Q July	4Q Oct	1Q Jan	Q2 April
Key Result Area 3: Marketing potential and access evaluated.							
3.1 Develop an agricultural marketing plan for Tuvalu which will address transportation, food preservation, packaging and incentives such as buy local campaigns, annual competitions (*Nafa*).							
3.2 Strengthen farmers' associations and initiatives to participate in commercial farming							
Key Result Area 4: Enhanced coordination and capacity of the Department of Agriculture.							
4.1 Recruit a technical officer and a finance officer for 18 months, to be based in Department of Agriculture to drive the project.							
4.2 Support overseas technical training attachments to share good farming practices							
4.3 Re-equip the Agricultural Research Station in Vaitupu for stocking planting materials and provide duplicates of the project planting materials to the station for future use.							

6. INSTITUTIONAL ARRANGEMENTS

The project will be managed and implemented by the Ministry of Natural Resources (MNR): Department of Agriculture in collaboration with the Ministry of Foreign Affairs, Trade, Tourism, Environment and Labour (MFATTEL) and the Department of Environment. The GCCA: PSIS project is being implemented under the ambit of the Letter of Agreement signed on 14th November, 2012 by SPC and the Government of Tuvalu. The Tuvaluan signatories to the Letter of Agreement are the Permanent Secretary, MFATTEL and the Permanent Secretary, Ministry of Finance and Economic Planning.

Project Oversight Committee

Project oversight will be provided by a Project Steering Committee (name still to be confirmed) whose membership will be comprised of representatives from the MFATTEL, MNR and the Ministry of Finance and Economic Planning. The SPC GCCA: PSIS National Climate Change Coordinator based in the Department of Environment, and the Project Technical Officer to be based in the Department of Agriculture will also be part of the Project Oversight Committee and will provide secretarial support. The Project Steering Committee will be responsible for providing technical and policy advice on the implementation of the project.

Reporting

The Department of Environment based SPC GCCA: PSIS National Climate Change Coordinator and the Department of Agriculture based Project Technical Officer will be responsible for overseeing the implementation of project activities and providing quarterly progress reports to the Steering Committee and the SPC GCCA: PSIS Climate Change Advisor based in Suva. A template for the quarterly report is presented as Annex 1.

Day to Day Implementation of the project

Two project staff members, the Project Technical Officer and the Financial Officer will be based in the Department of Agriculture to implement and manage the project activities. They will report directly to the Director of the Department of Agriculture and will work closely with the SPC GCCA: PSIS National Climate Change Coordinator.

7 RISK MANAGEMENT AND EXIT STRATEGY

Risk Management

The project risks and ways to manage them are listed in the table below.

Risk and consequence	Likelihood	Seriousness (Impact)	Mitigation actions	Responsible Organization
1. Natural hazards				
Natural hazards such as tropical cyclones, extreme rainfall events, drought and tsunamis could dramatically damage the crops/ shift project focus away from implementation to other emergency response activities.	Medium	Medium	Grow plants in protected nurseries until they are large enough to survive extreme rainfall events Schedule planting the crops and trees outside of the cyclone period Sound early warning system	MNR MNR Tuvalu Meteorological Service
2. Availability of materials				
Unavailability of planting materials for the demonstration sites	Low	Medium	Source planting materials from both SPC CePaCT and locally through the Agriculture Department extension officers	CePaCT, MNR
Unavailability of planting materials for farmers to continue using the integrated approach	Low	Medium	Keep seedlings in nurseries near each demonstration site and have them available for farmers Duplicate the planting materials in the Agricultural Research Station run by the Department of Agriculture, serving as a national seed bank	MNR
3. **Funding for maintenance**				
Inadequate maintenance of equipment will lead to failure	Medium	Medium	Maintenance plan between the department of Agriculture and *Kaupule* Funds set aside for maintenance in the project budget	MNR, land owners GCCA: PSIS

Risk and consequence	Likelihood	Seriousness (Impact)	Mitigation actions	Responsible Organization
			Monitoring of agricultural outputs continued beyond project life Marketing plan for crops to help pay for individual farming costs	MNR GCCA: PSIS, MNR
4. Lack of stakeholder involvement				
Unclear division of roles between government agencies and land owners	Low	Low	Ensure project committees take on oversight role Letters of Agreement between the Department of Agriculture and the land owners outlining specific roles	MNR, MFATTEL MNR
Insufficient involvement of local communities and land owners	Low	Medium	Local community members involved in project planning and design Local communities and land owners to be included in site selection, nursery development, demonstration planting, trainings, and maintenance plan	MNR MNR
5. Overlap with other climate change activities				
Inefficient use of resources resulting in duplication of effort	Low	Medium	Continuous collaboration with partners and sound project design Ensure project activities and results are shared widely with climate change funding partners	All Donors, SPC

Exit Strategy

The overall design of this project has attempted to lessen the negative impacts of climate change and urbanization, through reviving traditional integrated farming practices combined with innovative 'climate ready' crops and trees. Increased capacity in integrated agro-forestry for farmers and land owners, through attachments, trainings, awareness and education activities, pave the way for continuation and sustainability of this agricultural approach in Tuvalu. This will have been enhanced by collaboration between land owners and the Department of Agriculture technical officer and extension agents, as well as with related projects, e.g. the UNDP- NAPA projects, AusAID- SPC CePaCT Nursery Project, Taiwan ICDF Horticulture project, and SPC- GIZ CCCPIR climate change coordination project.

Maintenance of the agricultural equipment provided to implement the demonstration sites has been included in the planning, as farming associations will be trained in proper equipment handling and maintenance strategies by an equipment technician. Funds for maintenance have been set aside for this in the project budget. Ownership of the heavy equipment will be transferred to the *Kaupule* on each island at the close of the project. A maintenance and financial plan between the Department of Agriculture and the *Kaupule* will be developed at the close of the project.

It is envisaged that MNR Department of Agriculture will enhance the crop varieties available to farmers through their National Research Station located in Vaitupu, which will continue to supply the crop and tree varieties to the communities involved in the demonstration sites after the close of the project. These plants can be propagated in the nurseries provided by the project. This will ensure the plants trialled through this project will be available into the future. In addition, this project will help refurbish the National Research Station, so that it can continue to supply local farmers with proven varieties of the crops and trees they require.

As a depository of information, the Department of Agriculture will be responsible for documenting, archiving and storing relevant information, data and lessons learned. Lessons learnt will be developed in collaboration with other projects and stakeholders. MNR will be supported to circulating this information on best practices and proven varieties of crops and trees for atoll environments. This information will be made available to the farmers and land owners in Tuvalu, as well as to other Pacific Island atoll countries that are facing similar issues related to urbanization, saltwater inundation, and arable land shortages. This should lead the way to replace the short-term reactive approach to food security with a longer-term, planned and proactive approach.

The sustainability of the activities will be further enhanced by the Tuvalu Agricultural Marketing Plan, which will provide clear guidance for farmers and communities to raise funds from their surplus crops. Farming associations will be strengthened to complement the recommendations of the plan. This plan will provide good examples of ways the MNR can impact local economies, and such a model can continue to be relied upon into the future.

Annex 1 Quarterly Reporting Template

Activities	Progress in Quarter X	Planned Activities in Quarter X+1
Key Result Area 1: Enhanced understanding of agro-forestry among community members, land owners, and Kaupule through awareness raising, capacity building and training.		
1.1 Hold a training workshop in agro-forestry farming practices in Funafuti for key stakeholders from all islands.	•	•
1.2 Hold two onsite training workshops in agro-forestry farming practices in Funafuti and one outer island for land owners and others.	•	•
1.3 Hold a training workshop in integrated gardening practices in Funafuti for women's group representatives from all islands.	•	•
1.4 Implement at least six different awareness and education activities related to improved agro-forestry systems and climate change adaptation, e.g. brochures, billboards, videos, radio programmes.	•	•
Key Result Area 2: Improved agro-forestry system implemented in demonstration sites in Funafuti and one outer island.		
2.1 Establish a Steering Committee and meet quarterly.	•	•
2.2 Select at least two sites for demonstration projects in Funafuti, and two further sites in one outer island in consultation with *Kaupule*, communities and land owners.	•	•
2.3 Procure and purchase equipment for four demonstration sites.	•	•
2.4 Recruit an equipment technician for 12 months, based in Department of Agriculture, to train *Kaupule* and local farmers in operations and maintenance of the equipment.	•	•
2.5 Prepare and maintain demonstration sites including tree thinning, selection of climate ready crops to be planted, compost making, weeding, etc.	•	•
2.6 Source local planting materials for the demonstration sites and the Agricultural Research Station.	•	•

Activities	Progress in Quarter X	Planned Activities in Quarter X+1
2.7 Strengthen capacity of CePaCT to produce sufficient climate resilient plant materials for Tuvalu.	•	•
2.8 Establish a nursery/ nursery extensions for the two islands where the demonstration sites are located.	•	•
2.9 Evaluate the initial performance of the crop and tree varieties and compile the results in a lessons learnt workshop with input from other projects and stakeholders.	•	•
Key Result Area 3: Marketing potential and access evaluated.		
3.1 Develop an agricultural marketing plan for Tuvalu which will address transportation, food preservation, packaging and incentives such as buy local campaigns, annual competitions (*Nafa*).	•	•
3.2 Strengthen farmers' associations and initiatives to participate in commercial farming.	•	•
Key Result Area 4: Enhanced coordination and capacity of the Department of Agriculture.		
4.1 Recruit a technical officer and a finance officer for 18 months, to be based in Department of Agriculture to drive the project.	•	•
4.2 Support overseas technical training attachments to share good farming practices.	•	•
4.3 Re-equip the Agricultural Research Station in Vaitupu for stocking planting materials and provide duplicates of the project planting materials to the station for future use.	•	•