



**GTFS/RAS/198/ITA**  
**Support to the Regional Programme for Food Security in the Pacific Island Countries**

**FAO/ITA/KIR/01**  
**Development of Home Gardens and Root Crops**

**TERMINAL REPORT**

**By**

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## Executive Summary

The Kiribati Development Plan (KDP) 2008-2011 with the theme of “*Enhancing economic growth for sustainable development*” identifies six key policy areas for development: human resource development; economic growth and poverty reduction; health; environment; governance; and infrastructure. Individual line Ministries’ strategies are aligned towards these key policy areas. The KDP also seeks to contribute to goals and agendas aspired to in three prominent conventions: the Mauritius Strategy; the Millennium Development Goals; and the Pacific Plan. Revitalizing the replanting of staple food crops on all islands, strengthening and diversifying the copra industry, and updating statistics and relevant information for planning and policy formulation are all highlighted as strategies under the key policy area: “Economic Growth and Poverty Reduction”.

The atoll environment is one of the most challenging for crop and livestock production. Poor soils, scarcity of the water resource, and vulnerability to environmental degradation and impacts of climate change limit options to increase production. Nevertheless, rapidly increasing population density in urban areas, soaring international fuel and oil prices and deteriorating diets, make it imperative that the level of self-sufficiency in food production is improved. Furthermore, opportunities exist to improve livelihoods (particularly on outer islands) through improved agriculture and fisheries productivity. Where there is sufficient local production of crops processing and value adding opportunities for income generation and import substitution may exist. Through the FSSLP and TCP resources support will be provided to strengthen traditional food production systems and services to the sector. Particular attention will be accorded to Kiribati’s vulnerability to the impacts of climate change and sea level rise.

Livestock production in the country is mainly at subsistence level, with pigs and free-range chicken being the main livestock kept. Most households at the outer islands keep a few pigs and a number of local chickens. Opportunities for import substitution through improved livestock management and production is a key strategic objective for the agriculture department. A decisive factor determining increased livestock production is the cost of animal feed since such feed has to be imported. Further experimentation with local feed materials and appropriate animal breeds is warranted.

The heavy dependence on imported staple foods (such as rice and flour), coupled with soaring global food prices is posing a serious threat to food security. RPFS main objective is to sustain and increase food production to assure food availability to I-Kiribati. To achieve these objectives, both farmers traditional agriculture skills and improved farming technology for atoll condition will be encouraged. The use of compost for crop production and other farming methods that have proven for atoll condition will be promoted due to their effective and most importantly, their little impact on the fragile environment.

## **1. Introduction**

Kiribati has limited natural resource base, especially land and freshwater for development and soils are generally thin, coralline and generally lacking in a number of plant nutrients- particularly Nitrogen, Phosphorus, Potassium and Calcium- and micro- nutrients. The narrow islands and islets are over- exposed to wind and salt sprays. There is no running water and the fresh water- lens is thin and highly susceptible to pollution.

Agriculture and fisheries are vital for food security, sustainable livelihoods and for national economic growth. Agriculture and fisheries development, particularly for the outer islands, are emphasized as priorities in the Kiribati Development Plan (KDP) 2008-2011. An overall strategic objective for the development of the agriculture sector is to maximize sustainable agricultural production to enable the Kiribati people to have: adequate food, a generally healthy diet and increased cash income. However, agricultural conditions are extremely difficult in Kiribati because of poor soil conditions and scarce fresh water on the atoll islands. A central focus of the agriculture department is to increase production and productivity of traditional staple crops and for the development of home gardens to produce nutritious vegetables and fruits. An agriculture sector plan that provides a coherent policy framework and medium term financing plan for promoting agriculture development is urgently needed to progress work in the sector.

Agriculture occupies an important part of the daily activity of the Kiribati people and involves the cultivation of a number of crops and raising a limited number of pigs and chickens. Crop production is primarily subsistent, crops comprising coconut, babai (giant swamp taro), breadfruit, pandanus, banana, pumpkin, sweet potatoes and papaw. Home gardening had been introduced but constrained by lack of tools, seeds, fertilizers and pesticides.

The traditional farming system is characterized by groves of coconut trees with various layers of crops inter-planted between the trees. A significant feature of the system is the presence of family owned pits in which giant swamp taro is cultivated. The use of the pits facilitates the plants ability to access the thin water lens. An important activity in the cultivation of taro is that of regularly adding organic matter to the base of the plants around which coconut leaves have been thatched to retain the material. The coconut tree dominates agricultural production. It provides a daily component of the diet (food and drink) as well as household cash, especially important for the outer islands. Copra exports constitute a significant proportion of the country's export earnings despite the currently very low prices.

Kiribati's traditional farming system is still widely adopted across the atolls and there exists a wealth of indigenous knowledge on viable atoll agricultural production technologies. Added to this are information generated through externally funded projects including the UNICEF home gardening project, EU PRAP Atoll Farming Systems project, SPC/FAO agro-forestry project as well as the on-going work of the FSP.

Experience gained and information gathered from these projects, have led the Agriculture Division programmes to concentrate at the present time on opportunities for increased production of: eggs, tomatoes, bananas, cabbage, cucumbers, papaya and eggplant. Emphasis is being put on encouraging wider adoption of improved techniques, applying effective environmentally friendly pest control methods and improved marketing organization and skills.

Under this project, initial supplies of planting materials will be sourced from SPC germplasm collections and vegetable seeds will be imported from reputable overseas/local seed suppliers.

Likewise, exotic fruit and leafy trees that have proved to survive well under atoll conditions will be propagated, multiplied and distributed.

## **2. Main Official Arrangement**

The Project title “**Strengthening the Development of Food Crop Production**” was officially launched in 2003 and implemented in 2004 to 2007 and extended to 2008

## **3. Objectives**

This project will focus on increasing domestic food production through the upgrading of the nurseries in Tarawa and outer the outer islands, production of planting materials and distribution to farmers and marketing of the produce. Initial supplies of planting materials (sweet potato, banana, and taro) will be sourced from the SPC germplasm collections and vegetable seeds will be imported from reputable overseas/local seed suppliers. These materials will be propagated and multiplied in the nurseries and distributed to farmers. Likewise, exotic fruit and leafy trees e.g. bele, spinach, and drumstick that have proved to survive well under atoll conditions will be propagated, multiplied and distributed.

### **Programme of Work**

During the first country visit of the RPFS RC, a draft programme of work was developed with the details of the targeted communities (see attachment). However, during the course of the implementation, there were changes accommodated in light of the nature and the urgent need of the the communities during the consultation. Home garden tools was the most needed materials, and the community nurseries were foreseen as a problem due to the fact that land lease is an issue, hence the project target the existing nurseries managed by the Agriculture Divisions on all outer islands to do upgrade only. That is to provide set of tools including water tanks. A log-frame was developed very late (toward the end of 2007) and went through a number of changes due to continuous delaying in implementing the approved activities due to funding transfer problem (see attachment).

## **2. Project Organization and Budget Arrangements**

The Agriculture Division of MELAD was the executing organization for RPFS. The national steering committee (NSC) of the RPFS was shared with DSAP NSC as the two project address the same issue and both are managed by the Agriculture Division. Hence, the NC for DSAP was endorsed to be the same NC for RPFS, however, toward the end of the project life, The Director of Agriculture Mrs Kinaai Kairo was nominated as the National Project Coordinator and Mr Tianeti Ioane the Principal Agricultural Officer and the National Co-operator for DSAP was nominated as the Project Manager for RPFS. The Project Assistants were selected from the pool of Agriculture Staff based on their experience with the community and their involvement with the project. Mr Maio Tebania, Mr Tiua Ieremia, Mrs Tekataake Taere and Mrs Tanana Taretti have been actively involved in the implementation of the project activities on outer islands.

Ninety nine percent of the project sites located on outer islands and have to be visited by either the plane or boat. One of the sites, in particular Kiritimati island was quite distance and has to be visited by plane via Fiji or Honolulu.

The budget of the project was prepared by the Project Regional Coordinator Mr Bismarck Crowley and the Project Manager Mr Tianeti I Beenna (see appendix 1.a)

The home garden requirements were purchased through a local supplier and were delivered directly to the project sites.

#### **4. Project Outputs**

The project logical framework was developed toward the end of the project life (end of 2007 and finalised at the beginning of 2008). However, the work was implemented based on the set objectives and as need arises from the communities during the cause of community consultation and execution of the activities. For example during the community consultation most communities could not resolve the issue of land dispute (land lease) where the community nursery has established as originally planed. Hence the Project manager proposed to the Regional Coordinator through the NPC, that the current nurseries operated by the Agriculture Division on all the islands be improved and upgraded with the materials from the RPFs. The nursery on all the islands will cater for the needs of planting materials (See attached)

#### **5. Major Issues and Concerns in Project Implementation**

As usual an always the case, time frame is always the problem. It is very difficult to implement the approved activities as set the time frame due to a number of reasons. FAO policy does not fit to all member countries and should be specific, however flexibility is the solution. For example when sending cost of items purchased locally FAO policy requires at least three quotations from different suppliers, sometime in small countries where there is only one provider of that service FAO policy need to be flexible. When this has been resolved after seeking clarification from FAO, time has lapsed and this may take a month or more.

Funding transfer is always a problem, when acquittals and approved proposed activities have been submitted to FAO, it takes ages (more than three months) to organised or transfer funds for the next activities. Thus has resolved in missing our booking to travel to outer islands and also put our bad picture with the air-lines. One instances, it took almost 7 months for the fund to be transferred. This system need to be improved.

Missing acquittals, as FAO required scanned copies of acquittals and reports to be sent by emails, this is again a problem as the internet cannot send such large size files, and when sending acquittals through DHL or Safe hand carry to FAO office, the documents went missing, thus penalized the country for that mistake, therefore future activities are suspended until documents are recovered.

Communication problem is one of the major issues or constraints faced during the cause of implementation. This is not something the project can do something about it. However, there should be other options laid or put in placed to avoid complications,

this include project internet and telephone line disconnection. The project fund for Admin work (internet, fax and telephone) should be transferred on time.

Transportation problem is our internal and national problem which has a greater influence on the cause of implementation. There were times when transferring of funding does have a impact on project workplan. A number of times, the project manager has confirmed bookings to outer islands and make arrangement with the Clerk (Officer in Charge of the islands (Government Representative stationed on the islands) to the island council for logistic arrangement, but this turned out to be great disappointment and embarrassment as the arrangement had to be cancelled without contacting the Clerk due to short notice. Cancellation of flight due to fuel shortage and technical problem did also affect the timing in accomplishing our target in time.

## **6. Conclusions**

In conclusion, the project does achieve 100 % in terms of delivery. All the proposed trainings and workshops for the target communities have been implemented. In terms of timing of delivery, the project does fall behind schedule. As it always the case, the belated in transferring training fund is one of the common problems repeatedly committed throughout the life span of the project. In terms of project support and collaboration with the Government and other existing partners (DSAP), this is a excellent approach in terms of maximizing and have a greater benefits from both human and financial resources.

## **7. Recommendations**

FAO Regional Project Unit should put in place a system that is robust and flexible to accommodate the differences within the member countries. The Logical Framework for the project should be well developed and assess prior to implementation. The financial regulation for FAO in terms of tools and items purchased locally, should be revisited and take into consideration the reality of the beneficially country.

## **8. Acknowledgements**

I wish to acknowledge the invaluable support and commitment of those who have make the initial design and implementation of the project for Kiribati. I wish to thank in particular the Late Manate Tenang the former Chief Agricultural Officer for his great contribution. A very big thank you to Dr Vili Fuavao the FAO Representative for the Pacific Island Countries, Mr Bismarck Crowley the Regional Project Coordinator and his management and technical staff for their involvement in the paper and implementation of the project.

## **Annex 1**

## PROJECT BUDGET

### Equipment

#### Main Nursery (Tarawa)

Item	Quantity	Price/unit (Aus\$)	T/price (Aus)	US(\$)
Wire fence (Roll)	10	\$175.00	\$1,750.00	
Tie wire (Roll)	2	\$150.00	\$300.00	
Spades	7	\$35.00	\$245.00	
Shovel	14	\$32.00	\$448.00	
Shade clothe (Metre)	60	\$20.00	\$1,200.00	
Bricks	120	\$2.00	\$240.00	
Water tank (5,000 litres)	1	\$1,500.00	\$1,500.00	
Water tank (500 litres)	1	\$500.00	\$500.00	
Watering can	5	\$65.00	\$325.00	
Iron post	24	\$45.00	\$1,080.00	
Plastic roofing	20	\$35.00	\$700.00	
Cement	20	\$16.50	\$330.00	
Irrigation fittings (set)	6	\$350.00	\$2,100.00	
Water Pump	1	\$750.00	\$750.00	
Water hose (Metre)	50	\$5.75	\$287.50	
Grass cutter	1	\$2,075.00	\$2,075.00	
<b>Total</b>			<b>\$13,830.50</b>	<b>9,863.55</b>

#### Secondary Nursery

##### (Tarawa) Tissue Culture

Item	Quantity	Price/unit (Aus\$)	T/price (Aus)	US(\$)
Wire fence	4	\$175.00	\$700.00	
Tie wire (Roll)	1	\$150.00	\$150.00	
Spades	2	\$35.00	\$70.00	
Shovel	4	\$32.00	\$128.00	
Shade colthe (Metre)	30	\$20.00	\$600.00	
Bricks	76	\$2.00	\$152.00	
Water tank (5,000 litres)	1	\$1,500.00	\$1,500.00	
Water tank (400 litres)	1	\$500.00	\$500.00	
Watering can	4	\$65.00	\$260.00	
Cement	15	\$16.50	\$247.50	
Iron post	12	\$45.00	\$540.00	
Plastic roofing	10	\$35.00	\$350.00	
Water hose (Metre)	30	\$5.75	\$172.50	
Shred-machine	1	\$2,075.00	\$2,075.00	
Pot Plant (Large size)	50	\$15.75	\$787.50	
Pot pant (Medium)	100	\$10.25	\$1,025.00	
Pot plant (small)	100	\$8.15	\$815.00	
Water pump	1	\$750.00	\$750.00	
Irrigation fittings (set)	3	\$350	\$1,050.00	
<b>Total</b>			<b>\$11,872.50</b>	<b>8,467.11</b>

## Outer island plots

### Single Plot

Item	Quantity	U/Price (Aus\$)	T/price (Aus\$)	US\$
Tie wire	1	\$150.00	\$150.00	
Wire fence	4	\$175.00	\$700.00	
Spade	2	\$35.00	\$70.00	
Shovel	4	\$32.00	\$128.00	
Wheel barrow	1	\$175.00	\$175.00	
Knives	2	\$12.25	\$24.50	
Shade clothe (metre)	10	\$20.00	\$200.00	
Watering can	2	\$65.00	\$130.00	
			<b>\$1,577.50</b>	

**Total Cost for 42 Plots** **66,225.00** **47,253.00**

## Outer island Nursery

### Arorae Nursery

Item	Quantity	Unit Price (Aus\$)	T/price (Aus\$)	US\$
Water tank (400 litre)	1	\$500.00	\$500.00	
Local hand water pump set	1	\$350	\$350.00	
Watering can	3	\$65.00	\$195.00	
Water hose (metre)	30	\$5.75	\$172.50	
Shovel	4	\$32.00	\$128.00	
Spade	2	\$35.00	\$70.00	
Wire fence	4	\$175.00	\$700.00	
Wheel barrow	2	\$175.00	\$350.00	
Shade clothe	20	\$20.00	\$400.00	
			<b>\$2,865.50</b>	
<b>Total Cost for 13 Nurseries</b>			<b>37,251.5</b>	<b>26567.77</b>

## Summary Budget

<b>Item</b>	<b>Cost USD</b>
Equipment	92,151.32
Operating Cost	5,000
Miscellaneous	3,000
Supplies (300 bags for each of the 5 vegetables) 1.50 per bag	2,250
<b>Total</b>	<b>102,401.00</b>

Annex 3

Figure 1: Work Plan

(a) Upgrading of Nurseries in Tarawa and Outer Islands

ID	Task Name	Start	Finish	Duration	Sep 2004		Oct 2004				Nov 2004				Dec 2004				
					19/9	26/9	3/10	10/10	17/10	24/10	31/10	7/11	14/11	21/11	28/11	5/12	12/12	19/12	
1	Consultation with communities on nursery upgrade	9/14/2004	9/28/2004	2.2w	[Gantt bar from 9/14/2004 to 9/28/2004]														
2	Procurement of equipments	9/14/2004	10/14/2004	4.6w	[Gantt bar from 9/14/2004 to 10/14/2004]														
3	Transport of Equipments and Constuction	10/18/2004	12/17/2004	9w	[Gantt bar from 10/18/2004 to 12/17/2004]														
4	Procurement of seeds and Propogation	11/18/2004	1/18/2005	8.8w	[Gantt bar from 11/18/2004 to 1/18/2005]														
5	Distribution and monitoring	1/18/2005	2/28/2005	6w	[Gantt bar from 1/18/2005 to 2/28/2005]														

Annex 4

(b) Plots

ID	Task Name	Start	Finish	Duration	Sep 2004		Oct 2004				Nov 2004				Dec 2004				Jan 2005			Feb 2005			Mar 2005							
					19/9	26/9	3/10	10/10	17/10	24/10	31/10	7/11	14/11	21/11	28/11	5/12	12/12	19/12	26/12	2/1	9/1	16/1	23/1	30/1	6/2	13/2	20/2	27/2	6/3			
1	Preparation of plots	9/14/2004	11/12/2004	8.8w	[Gantt bar from 9/14/2004 to 11/12/2004]																											
2	Planting and watering	12/13/2004	2/11/2005	9w	[Gantt bar from 12/13/2004 to 2/11/2005]																											
3	Monitoring	2/11/2005	4/11/2005	8.4w	[Gantt bar from 2/11/2005 to 4/11/2005]																											
4	Harvesting and replanting	4/11/2005	5/11/2005	4.6w	[Gantt bar from 4/11/2005 to 5/11/2005]																											

**Annex 5****Plot allocation based on island population.  
(Proposed islands)**

<b>Island</b>	<b>Plot</b>
Banaba	1
Makin	2
Butaritari	2
Marakei*	
Abaiang	3
N.Tarawa	2
Maiana	2
Abemama	2
Kuria	2
Aranuka	2
Nonouti	3
N.Tabiteuea	3
S.Tabiteuea	2
Beru	2
Nikunau*	
Onotoa	2
Tamana	2
Arorae	2
Teeraina	2
Tabuaeran	2
Kiritimati	3
Kanton	1

Annex 6

Activities	List activities here	Means or Inputs:	Costs:
	<ol style="list-style-type: none"> <li>1. Awareness Campaign <ul style="list-style-type: none"> <li>• Radio broadcasting (15 mins. every 2 weeks)</li> <li>• Writing an article on the local newspaper</li> <li>• Demonstrations in schools</li> </ul> </li>   <li>2. Staff attachment</li>   <li>3. Farmers training <ul style="list-style-type: none"> <li>• Outer island</li> <li>• South Tarawa</li> </ul> </li> <li>4. Import and distribution of planting materials <ul style="list-style-type: none"> <li>• Imported vegetable seeds</li> <li>• Locally supplied</li> </ul> </li> <li>5. Procurement of equipments/tools???</li> <ul style="list-style-type: none"> <li>• Purchased overseas</li> <li>• Purchase locally</li> </ul> <li>6. Collection and delivery of planting materials to nurseries on outer islands <ul style="list-style-type: none"> <li>• Delivery planting materials requirements to all nurseries on outer islands</li> </ul> </li> <li>7. Communicating progress</li> </ol>	<p><b>Means or Inputs:</b></p> <p><b>Human resources:</b></p> <p><b>Research and Extension &amp; Information staff, including the Project manager and NPJA</b></p> <p><b>The NSC</b></p> <p><b>Other projects operated under the Agriculture Division such as DSAP, FAO Banana project and FAO-SSC under RPFS contribution</b></p> <p><b>The Government of Kiribati support in terms of providing project staff and co-funding of the activities.</b></p> <p><b>NGOs participation in the project NSC</b></p> <p><b>Material resources:</b></p> <p><b>Home garden tools (W/barrow, shovel, spade, knives and watering cans)</b></p> <p><b>Training materials pamphlets on compost making and basic home gardening management and as well as Livestock basic management ( from land preparation, seed sowing, hardening, transplanting, field management and post harvesting. Seed collection and conservation were also included)</b></p> <p><b>Field demonstration</b></p>	

	reports 8. RPFNS NSC meeting <ul style="list-style-type: none"> <li>• 4 NSC quarterly meetings</li> </ul>		
	8. Quarterly report <ul style="list-style-type: none"> <li>• Prepare and send 5 quarterly reports</li> </ul>		

Annex 7

**Work Plan and Budget Requirements  
August to December 2008**

Activities	Resources	Budget Required AUD	
<b>1. Awareness Campaign</b> 1.1 Broadcast project activities on local radio 1.2 Publish articles on local newspaper 1.3 Conduct techno demo in schools in Tarawa 1.4 Conduct techno demo in schools in outer islands	Radio and school visit	750 (500)	
<b>2. Training</b> 2.1 Conduct farmers training in: Nonouti Onotoa South Tarawa Maiana	Travel DSA Planting Materials Refreshments Transport Venue Hire	10860	
<b>3. Procuring and distributing planting materials</b> 3.1 Procure planting materials from overseas 3.2 Procure planting materials locally 3.3 Distribute planting materials to farmers	Breadfruit cuttings, dwarf coconut seednuts, giant swamp taro	2450 – (1500)	
<b>4. Procuring and distributing equipment/tools</b> 4.1 Procurement of equipment and tools	Office Equipment Pruning Saw,	3,050 –(1000)	
<b>5. Visiting nurseries on outer islands</b> 5.1 Follow up visits Abemama Aranuka North Tarawa		4855 - (1,730)	
<b>6. Monitoring and evaluation of the project</b> 6.1 Submitting reports 6.2 Organizing NSC meetings	GOE (Internet, Computer repair, transport and tea during NSC meeting)	2,750 (1500)	
<b>Total</b>		<b>24,715</b>	



Annex 9



Piglets and 1 week old chickens loaded on the boat to deliver to islands, Project Assistant and staff delivered the items.



World Food Day (MELAD Day) promoted consumption of local food (pandanus)



Agriculture staff participated in community homegardening Agriculture staff mass produce planting materials



Church youth group invited RPFS Project manager and RPFS NPC, Church groups learnt from Project Assistant



School children learnt compost making

Project assistant demonstrate compost making



Mass production of planting materials

Kids involved in home gardening



Small household farmer

Breadfruit cuttings ready to be planted



Hon Minister for MELAD lead a team to promote food security    A household homegardening on the outer islands



This is one of the local Seedless Breadfruit varieties that the RPFS is promoting it for household



Sweet potato and seedless breadfruit mass produce for planting materials for outer islands.



Marcotting (air-layering) of seedless breadfruit ready to be planted, coconut seed nuts packed for outer islands



Project Assistants prepare pumpkin seeds for outer islands



Household vegetable garden

Household toddy tree with giant swamp taro pit



Household giant swamp taro pit maintained on one of the project sites (Butaritari)



Home gardening continue with vegetables and sold surplus to earn money



Childrens in the homes enjoy working in the garden