



**REGIONAL FISHERIES LIVELIHOODS PROGRAMME
FOR SOUTH AND SOUTHEAST ASIA (RFLP)**

**PHASE II. ICE PRODUCTION AND
DISTRIBUTION SYSTEM FOR THE SMALL
SCALE FISHERIES SECTOR IN TIMOR-LESTE**

**Proposal prepared by the Regional Fisheries Livelihoods Programme for South and
Southeast Asia**

2011

The present document is a project proposal for the establishment of a nationwide hygienic ice production and distribution system specifically designed for the small scale fisheries sector of Timor-Leste.

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Executive Summary

Timor-Leste suffers food insecurity, significant levels of malnutrition, dietary deficiencies, and stunting, with 33 percent and 58 percent of children under five years of age being either severely stunted or stunted respectively; and one third of children and women are anaemic.

A national survey conducted in 2011 estimated annual per capita animal protein and fish protein consumption to be only 5.4 and 6.1 kg respectively, both of which are extremely low compared to the average figures for Asia. This is due in large part because there is no large-scale production of ice in Timor-Leste which results in rapid spoilage of highly perishable agricultural and aquatic products and means aquatic products from coastal communities seldom reach the interior of the country and agricultural products produced in the interior districts seldom reach markets in coastal districts and the capital city Dili.

This project proposes an ice production and distribution system for Timor-Leste, costing a total of US\$ 1,350,327 which if funded would provide the following benefits:

- Improved market access through the establishment of a cold chain system, using hygienic and food safe ice, to distribute marine aquatic products and human and animal vaccines, from the coast towns and the capital Dili to inland districts and the transportation back of perishable agricultural products from inland districts to coastal districts and the capital Dili;
- Reduction of aquatic product and agricultural post-harvest losses leading to increased human consumption;
- Improved price for fish and agriculture products, income and contribution to local and national economies;
- Greater availability (quantity and geographic coverage) of animal protein (including aquatic product), at affordable prices, leading to improved animal protein consumption;
- Improved food hygiene, food safety and nutrition; and,
- Improved food security, reduced conflict and enhanced political stability.

Background

The Regional Fisheries Livelihoods Programme for South and Southeast Asia is a regional programme covering six countries of the Asia Pacific Region (Cambodia, Viet Nam, the Philippines, Indonesia, Timor-Leste and Sri Lanka). The RFLP's main goal is *Strengthened capacity among participating small-scale fisher communities and their supporting institutions towards improved livelihoods and sustainable fisheries resources management*. RFLP started activities in 2009 and is solely funded by the Kingdom of Spain, this four year programme, which is being executed by FAO in collaboration with the national line agencies for fisheries is working on the achievement of the following six outputs:

1. *Co-management mechanisms for sustainable utilization of fishery resources*
2. *Measures to improve safety at sea and reduce vulnerability for fishers and other community members*
3. *Measures for improved quality of fishery products and market chains to reduce health hazards and add value*
4. *Strengthened and diversified income opportunities for fisher communities*
5. *Facilitated access to micro-finance services for fishers, processors and vendors*
6. *Regional sharing of information.*

In Timor-Leste, RFLP the implementing partner is the Ministry of Agriculture and Fisheries, National Directorate of Fisheries and Aquaculture. Under RFLP Timor-Leste output 3 a feasibility study for the introduction of ice was conducted in 2010 and constitutes Phase I in a road map for the introduction

of a cold chain mechanism for the small scale fisheries sector in the country. This project proposal is based on the results of the aforementioned technical study.

The fish production and consumption in Timor-Leste

Timor-Leste faces a national, general shortage of affordable fish and marine protein. The Ministry of Agriculture and Fisheries (MAF) estimates that 5,265 fishers operate along the 730 km of coastline, taking their catch mainly from the intertidal areas (budu tasi) and fishing with small canoes in mainly inshore coastal fishing areas using inefficient fishing techniques. One consequence of the country's underdeveloped fishing and aquaculture sector, is the low availability of aquatic products, the relatively high price of aquatic products in local markets, and the subsequent low consumption of fish protein.

In a recent *Fish and Animal Consumption and Availability Survey* conducted by RFLP Timor-Leste in five districts of Timor-Leste¹, it was estimated that per capita fish consumption remains low, with a national average of 6.1 kg per person per year². Furthermore, the lack of basic facilities to preserve aquatic products means that fresh fish spoils quickly and can pose health risks, as well as a loss of income and value from the fishery and spoilage of animal protein which could otherwise be consumed.

The sector is stuck in a vicious circle³ of low investment, unstable prices for producers and high market prices for final consumers, with the market chain largely controlled by very few middle-traders. Without ice, fishers are dependent on powerful middle-traders, who directly use their access to the limited amount of ice that is available to maintain their advantageous position. Fish is an extremely perishable product, and when large catches are taken fishers receive significantly lower prices. All this is a disincentive for fishers and as a direct consequence fishers are reluctant to invest in the sector. Although RFLP Timor-Leste is providing specific training on alternative processing techniques (e.g. drying and smoking of fish, etc.), there is a vital need to:

- Stimulate trading of aquatic products, and to create a more open market;
- To give fishers a better price for their aquatic products
- To make marketing of aquatic products more competitive by reducing the control of middle-traders over the market price of aquatic products;
- To create an incentive to increase investment in the sector by fishers;
- To increase the supply and quality of aquatic products available in all markets;
- To improve fish quality and reduce food poisoning occurrence;
- To make fish affordable to poorer Timorese people; and
- To increase the consumption of fish protein and thereby reduce malnutrition of particularly women and children.

The 2010 Demographic Health Survey shows that women and children are the most affected by malnutrition, and “The most common forms of malnutrition in the country are protein energy

¹ **AMSAT Int.** *Fish and Animal Protein Consumption and Availability Survey in Timor-Leste*, Regional Fisheries Livelihoods Programme for South and Southeast Asia (GCP/RAS/237/SPA) Field Project Document 2011/TIM/3 (Preliminary results-Draft version).

² As it was expected, the consumption in the coastal areas (16 kg/capita year) and in Dili (with an average of 5.6 kg) was higher than the fish consumption in the mainland where the average was less than 4 kg/capita year.

³ **Hartmann, W. D.** (2010). *Consultancy to Verify National RFLP Work Plan Activities, Collaborators and Indicators*. Food and Agriculture Organization of the United Nations

malnutrition (PEM) and micro-nutrient deficiencies.”⁴ Some of these problems could be addressed by an increase in the supply and better distribution of aquatic products, since, as the RFLP *Fish Consumption Survey* reveals, the majority of respondents don’t eat fish because *there is no fish in the markets*.

In addition, the small-scale fisheries sector has significant potential to expand and become more efficient, which linked to an ice production and distribution system would increase both the aquatic product supply and the quality of aquatic product on the domestic market, while in the future it could also stimulate the export of fish from Timor-Leste. The sector however needs additional organization and support, to overcome a variety of challenges. Research has shown that a significant proportion of the current marine catch goes to waste largely due to insufficient availability of hygienically produced ice. The aforementioned study and pilot ice production was initiated through FAO-AECID, under the RFLP program in collaboration with the Ministry of Agriculture and Fisheries (MAF), National Directorate of Fisheries and Aquaculture (NDFA). In addition the RFLP and the NDFA are formalizing groups of small-scale fishers and the merging of the private fish processing sector⁵.

There exist a number of important issues to be addressed in this context. Some of them are described in detail later in this proposal, but it must be clearly stated that the described vicious circle cannot be broken until there is a regular national supply of hygienically produced ice through the establishment of a cold chain for aquatic fishery products. The most important issue is to ensure that the catch, which is landed today, can be preserved hygienically and is fit for safe human consumption, until it is distributed and sold to the end consumer at local markets. To address this issue properly, it is proposed that the current on-going pilot hygienic ice production and distribution project, launched by the Ministry of Fisheries, National Directorate of Aquaculture and Fisheries together with FAO – AECID under the RFLP program during October-November 2010 is expanded.

The pilot project proved that utilizing small scale ice making and storage equipment already available in the Ministry of Agriculture and Fisheries, with the purchase of a few additional small equipment items, that small quantities of hygienic ice can be produced and distributed to two districts of Timor-Leste in a cost effective manner. A second phase of the pilot ice production and distribution pilot, would, with only a modest investment compared to the potential benefits, produce a rapid change in the fisheries sector⁶ in Timor-Leste, by addressing several of the key production, market chain and consumer market constraints. Phase 2 requires additional donor support for its development. This project proposal contains a set of steps and budget estimate for the proposed second phase.

Phase II for the Introduction of Ice. Project concept

RFLP Timor-Leste is seeking to implement a Phase II of the Project on the Introduction of Ice. Phase I consisted of:

- Feasibility study on the introduction of ice

⁴ **National Directorate of Statistics** (2010). *Demographic Health Survey*. Dili: Ministry of Finance, Government of Timor Leste.

⁵ As an example, RFLP is assisting in the creation of a Federation of Cooperatives to help the fisheries cooperatives to overcome a number of shared market constraints.

⁶ The benefits of this proposal potentially extend beyond the fisheries sector since agricultural production including meat, fruit and vegetables, and human vaccines could all be distributed nationwide, if an effective ice production and distribution system were in operation.

- Training of trainers in:
 - Basic hygienic principles
 - Post-harvest and handling of fishery products
 - Use of ice and its application
 - Introduction of a cold chain in the small-scale fisheries sector
 - Installation of basic equipment for small-scale ice production
- Cost effective demonstration of pilot-scale ice production and distribution to two districts of Timor-Leste.

Phase II will consist of performing the following actions in a timely and sequential manner:

- Purchase, installation of equipment and assessment of supporting actions.
- Conduct specific training for key staff in:
 - Setting up the equipment
 - Maintenance of ice factories and storage equipment
 - Operation of the system and division of tasks and responsibilities
- Establishment of the ice production and distribution system
 - Establishment of responsibilities and functions
 - Establishment of a legal basis for the operation of the system, production costs and other specifications including inclusion of the project in the current draft law of *Ports and Auction Centers* to ensure sustainability.

The current project proposal requires the agreement and support of the National Directorate of Fisheries and Aquaculture and the Ministry of Agriculture and Fisheries, and their commitment to provide some equipment and facilities already available (at 9 Lotas de Pescas/auction centers, space at Tai Besi Market, Vemasse, a refrigerator container, scales, ice machine, etc.) as well as human resources for the sustainability of the system. Once the project is finished, it is envisaged that the complete system will be managed and operated directly by the NDFA-MAF.

Step 1. Equipment purchase

The first step of this Phase II project will be to purchase and ship the machinery identified during the first phase, that is needed to set up the ice production and distribution system⁷. The machinery includes equipment for ice production, equipment for storage in depot facilities and equipment for distribution.

The main tasks for this will be:

- Assessment of the technical condition of the equipment and machinery currently available for the project and the technical/operational condition of the same.
- Activation and preparation of the facilities and infrastructure at Tai Besi fish market for the installation of a minimum 02 and a maximum of 04 ice machines, with a capacity to produce 3,892 kg of ice daily, as well as associated equipment and utilization of the existing storage space.
- Procurement of 04 new ice distribution vehicles.

⁷ Specified in **Christensen, M.** (2010). *Feasibility study on hygienic production of ice for the small scale fisheries sector in Timor-Leste*. Regional Fisheries Livelihoods Programme for South and Southeast Asia (GCP/RAS/237/SPA) Field Project Document 2010/TIM/2.

- Procurement and availability of heavy duty isolated fish boxes with lids, balances, gutting knives, etc.
- Identification and allocation through a separate field study of suitable sites for the installation of ice storage facilities at Oecussi, Atauro and Baucau sites, with location criteria to include that the facilities serve the most fishers in the area and are conveniently close to the national road network and public transport.
- Availability of staff and training facilities for training at the ice production facility, distribution level, depot level and official level.
- Activation of hygienic market facilities nationwide for fish distribution and sale at existing markets.
- Study mechanism for introducing a fish auction system to facilitate the establishment of a private sector processing industry.

The key elements and steps in accomplishing the project are as follows:

Ice production machinery and associated equipment

It is critical to first ascertain the current status and condition of purchased available equipment and machinery in country. It is important to ensure that the current machinery is in a good technical condition and operational. This initial task would include procurement of a first stock of ice and fish storage boxes, tables etc., as previously listed in the feasibility report elaborated by the RFLP international consultant (IC) in order to have sufficient capacity to handle and correctly ice in order to establish the product cold chain.

Distribution system equipment and data gathering

This requires the purchase of refrigeration vehicles. The approach proposes using the trucks as mobile storage and distribution of both ice and catch and possibly other agricultural products. In this manner information from fisher centers on catch volume can be recorded simultaneously by District Fisheries Officers as ice is distributed and catch collected, thereby generating a reliable catch database for further analysis⁸. The availability of regular transport will facilitate the local work of the DFO's in the districts, will also improve communications between the district and the national headquarters and as such has the potential to bring the fishers and the public sector closer together. Furthermore, RFLP TIM, under the Output 1, Co-management mechanisms, is setting up a data gathering and analysis system using the Lotas de Pesca/auction centers constructed by the NDFA around the country. It is envisaged that this data gathering system will work in parallel with and will be complementary to the ice distribution system. Currently no catch data is collected in the country and this information is desperately needed in order to properly manage the fish stocks of the nation, to establish control systems and to issue quotas.

To design an effective, efficient ice distribution system, it is essential to know where fishers are concentrated, their location and operational bases in relation to the public road system, the catch volumes and species in order to have the depot located at the most central and favored location as well as to have an idea of the current health state of aquatic stocks and marine bio-diversity in different areas of the country.

This proposed initiative and the suggested use of the distribution vehicles would provide immediate feed-back on the logical location of the existing and planned depots through possible research by the

⁸ Currently no data is collected on fish production in Timor-Leste. RFLP has done first estimations throughout two surveys, but they are not specific in terms of species and volumes of fish catch.

newly appointed RFLP field managers who are working in conjunction with the NDFA, the RFLP consultants and fishers. An early survey found that the Lotas de Pesca are not all located in the vicinity of the most favored landing sites from a logistical point of view. Despite this, some are well located⁹ and it is envisaged that some of the selected existing auction centers will be used in Phase II of the ice distribution system. Others will also be used as training centers for fishers.

Project depots for storage of hygienic ice and catch

Under this proposal ice storage depots will be installed at the district level. To date field work in the districts have always been constrained by poor information availability, but the electrical grid distribution has been and is being improved, so there may be opportunities to improve data collection and sharing.

There is currently one mobile ice storage container available belonging to the Ministry of Agriculture and Fisheries. This container requires a technical overhaul and topping up of its refrigerant, before it can be brought into long term operation. It is proposed to locate this unit at Baucau LdP site (in Vemasse), once the electrical power and water supply has been established. This is a priority task, but it can be carried out relatively easy and without inordinate cost.

Further, it is proposed to utilize and modify the existing installations at Tai Besi Fish market to serve as an interim buffer store and to use the ice machines as far as possible for loading the ice directly from the ice making machines into distribution trucks to minimize handling operations and to streamline the entire production from the start of the project.

Step 2. Staff training

The best form of training of staff will be to have assigned people available during all phases of project equipment installation, thus transferring a certain level of co-ownership and broader understanding of the steps in the installation process and knowledge of the machinery. It also allows for a certain degree of performance monitoring of the individual staff by the trainer, enabling the project to start up with the best suited staff assigned to and working in, the most suitable areas. Training material has already been partially elaborated as part of the pilot project, but it is envisaged that job descriptions will require further amendments, adjustments and elaboration before they are finalized.

Currently, one of the main constraints is that the National Directorate of Fisheries and Aquaculture has weak staff capacity and only very few government staff have had specialized tertiary training. Moreover staff have no clear ToRs or job descriptions to identify their operational functions. The RFLP TIM has initiated a Human Resources Development (HRD) Plan¹⁰ to address these problems. The NDFA currently has 115 employees, including some at district level, with non-clear jobs functions. This proposed project will help the NDFA to set up a self sustainable ice distribution system, and also help to establish concrete functions for many of the current staff, as well as developing the capacity of the current human resources to sustainably continue ice distribution in the

⁹ As per the preliminary evaluation conducted in 2010 by RFLP: **Alonso, E.** (2010) *Fish landing centers and market chains in Timor-Leste. A preliminary evaluation and a reviewed plan of action.* Regional Fisheries Livelihoods Programme for South and Southeast Asia (GCP/RAS/237/SPA) Field Project Document 2010/TIM/1; and the further complete technical analysis: **Christensen, M.** (2010). *Feasibility study on hygienic production of ice for the small scale fisheries sector in Timor-Leste.* Regional Fisheries Livelihoods Programme for South and Southeast Asia (GCP/RAS/237/SPA) Field Project Document 2010/TIM/2.

¹⁰ **Arenas, C., & Pintos, J.** (2011). Phase I Report for the development of a Human Resources Development Plan (HRDP) in the National Directorate of Fisheries and Aquaculture. Timor-Leste. Regional Fisheries Livelihoods Programme for South and Southeast Asia (GCP/RAS/237/SPA) Field Project Document 2011/TIM/1

future. The establishment of the ice production system will run parallel and will complement the HRD Plan for the National Directorate of Fisheries and Aquaculture. Specifically, training under this proposed project is planned for three different levels:

- Set up equipment for technicians currently working as officials
- Installation and maintenance of the equipment (ice factories) for the technicians in charge of the maintenance
- Operation of the system and division of tasks for the managers, technicians and drivers, responsible for the ice delivering system.

In doing this, the project will address one of the main concerns of the Ministry of Agriculture and Fisheries, namely the need to build the capacity of its staff and to improve the efficiency of services provided by the government.

The training package mentioned already exists from Phase I, *including the draft job descriptions which have been already formulated for the pilot project*, but the new operators will need to be trained specifically on the safe operation and maintenance of the *larger ice making machines*. In this context the assigned staff will be subject to ad hoc training during installation and commissioning of the ice producing machinery as this will be very valuable in generating their insight into the installation of the ice machinery, its components, and will thus eliminate any doubts and questions and will additionally give the staff improved confidence at a crucial stage.

The drivers will be responsible for the timely distribution of the ice to the destinations and as such must be trained in how to safely lift and handle the filled ice storage containers and must also be trained in how to load and handle storage containers of fish coming back from the districts with catch for distribution. The drivers will also be trained on basic vehicle and refrigeration system maintenance and trouble shooting, thus making the project less vulnerable to set-backs caused by minor problems, which will inevitably occur.

The commercial function of the project will have to be addressed at a relatively early stage and the cash generated from ice sales¹¹ will be handled in a transparent manner. The NDFA and RFLP TIM will start to address this issue at the earliest possible convenient opportunity.

Step 3. Functional fisheries inspection service

The overall objective is to ensure that marine catch landed from the small scale fisheries sector is safe for human consumption. The competent authority in this case is divided between the Ministry of Health and the Ministry of Agriculture and Fisheries. This will require that the entire framework for fisheries inspection services becomes activated and functional to ensure that basic hygiene, handling and cold chain facilities and documentation is in place at both the district and central level. This is a high priority task, but a relatively simple one to implement, due to the dedication of the staff and the institutional support. Also, in setting up the system, it can easily be adopted to the conditions already in place to meet for example the requirements of the EU model.

The Ministry of Agriculture and Fisheries must decide on, which sales model to adapt and how funds from sales of ice and rent of storage boxes will be disbursed.

¹¹ The calculations for the production of ice were done in the phase I of the present project. The first pilot for the production and distribution of ice served also as an exercise to calculate the system's expenditures. It is expected and agreed with the NDFA that the ice will be sold based on the calculation plus the taxes established in the current draft of the Law of Ports and Auction Centers.

It is proposed to utilize the mass media to raise greater awareness of the planned activities before and prior to the commencement of full operation of ice production and nationwide distribution and to inform the public that from a certain date ice will be available from specific dedicated locations and at a particular price, followed by contact phone numbers of the staff in the event that larger volumes are required¹².

A second and parallel objective will be to record marine catches and to create fisheries databases. They will be constructed in total synergy, as both are basic pillars of the same construction. Furthermore, in order to ensure the sustainability of the project, the operation of the system must be sustained by being set up with a legal basis whereby the way the ice is sold, as well as the price of the ice is legally established in a transparent manner. RFLP has started the recruitment of a national legal assistant. One of the duties of him/her will be to include in the current draft law of auctions and ports, the conditions that make possible the operation of the ice production and distribution system.

Project management

Output 3 of the RFLP Timor-Leste activity work plan and budget will include activities which compliment the proposed project and to provide some technical back-stopping. However as external funds will be needed to implement this project, an *ad hoc* structure for management and accountability will have to be agreed and established in order to provide the project manager with enough autonomy and at the same time, account for the implementation to the donor(s) and the implementing partner (NDFA-MAF).

Project Manager

The project manager must have authority to carry out the tasks defined and required for timely ice production plant installation, central and district level staff training and that of staff working with marketing and ice sales structure. As such, the project should be executed by an experienced individual with a fisheries sector background and on hands experience with ice machines, refrigeration systems, electrical distribution systems and basic commercialization.

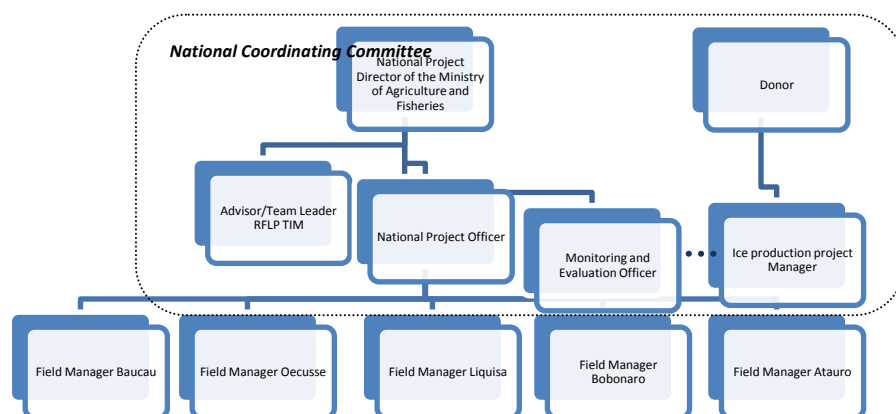
The project manager will issue regular project progress reports in line with the internal reporting system of the RFLP TIM, regular progress reports of RFLP and in line with the requirements of the donor. The Project Manager will issue ad hoc progress reports prior to Quarterly Coordination Meetings and national coordination committee meetings. Information from the project will be included in regular progress reports of the RFLP TIM to the RFLP regional office and to the Spanish donor AECID.

Project Steering Committee

A Project Steering Committee will be set up in parallel to the regular six-month RFLP national coordinating committee meeting at which the *Project Manager* will present progress and account for the actions taken, justify any deviations from the project activity schedule and proposed solutions for the decision of national coordinating committee and consequent issuance of instructions. Furthermore, the Project Manager will participate and present project progress during the regular Quarterly Coordination Meetings held between RFLP Project Management Unit together with the National Project Director-Director General of the Ministry of Agriculture and Fisheries and the National Director of Fisheries and Aquaculture.

¹² Some visibility has been already done by RFLP TIM and larger awareness campaigns are planned for 2011.

As part of the RFLP, the Project Manager will participate and contribute in regular meetings held with the National Director of Fisheries and Aquaculture, senior staff of the NDFA and chiefs of Department to get feedback. Regular meetings will be set up following the requirements of the donor. The ice production and distribution project will be accomplished with the assistance of the current RFLP district field staff (Field Managers) and collaboration of the human resources of the RFLP and in close coordination with the RFLP Project Management Unit. The duty station of the Project Manager will be located within the RFLP office, in the Ministry of Agriculture and Fisheries. Despite this, the Project Manager will have autonomy on technical decisions and implementation of the activities and will account for such to the donor.



Project activities schedule

The proposed main activities are shown below for informative purposes.

PROJECT ACTIVITY		PROJECT ACTIVITY PERIOD	RESPONSIBLE ACTIVITY STAKE HOLDERS
01	Purchase of main equipment planned during Phase I of the Project for the introduction of ice	Month 1	Ministry of Agriculture and Fisheries
02	Fielding of Project manager	Month 2	RFLP RAP
03	Equipment test, repairs. Elaboration of lists of additional project equipment for procurement	Month 2-3	RFLP TIM, Project manager and Ministry of Agriculture and Fisheries
04	Staff interviews and allocation	Month 2-3	Ministry of Agriculture and Fisheries, FAO TIM, Project Manager
05	Installation of ice making equipment at Tai Besi Fish market and infrastructure modifications	Month 4	Ministry of Agriculture and Fisheries, RFLP TIM, Project Manager
06	Commissioning of ice making machinery	Month 4	Contractor, Project manager
07	Installation and commissioning of Oecussi depot	Month 4	Contractor, Project manager
08	Installation and commissioning of Atauro depot	Month 4	Contractor, Project manager
09	Installation and commissioning of Baucau depot	Month 4	Contractor, Project manager
10	Installation and commissioning of Liquisa depot	Month 4	Contractor, Project manager
11	Receipt and delivery of procured additional equipment and installation on sites	Month 5	FAO TIM, and RFLP (regional and TIM)
12	Training of ice factory and depot	Month 5	Project Manager

PROJECT ACTIVITY		PROJECT ACTIVITY PERIOD	RESPONSIBLE ACTIVITY STAKE HOLDERS
	staff		
13	Training of driver staff	Month 5-6	Project Manager
14	Distribution starts to depots for tests and training of staff	Month 6	Ministry of Agriculture and Fisheries, RFLP TIM, Project Manager
15	Trial period commences. Ministries site inspection visits.	Month 6 to 8	Ministry of Agriculture and Fisheries, RFLP TIM, Project Manager
16	Review of project activities and ice needs at district level. Mid- term report elaboration.	Month 8	RFLP TIM Monitoring and Evaluation Officer, Project manager
17	Planning for Phase 3, eventual depot expansion plan. Elaboration and confirmation of budget and proposal for 11 sites for donor support.	Month 11	RFLP TIM , Project Manager
18	Donor visit to sites. Donor response for support.	Month 11-12	FAO RAP, RFLP TIM
19	End of trial period. Final report for Phase 2.	Month 12	RFLP Monitoring and Evaluation Officer, Project Manager

As per the above plan, this Phase II project will first start by installing the storage facilities at the locations listed below:

- Oecussi, ferry landing site,
- Atauro, Beloi ferry landing site,
- Vemasse, LdP site.
- Liquiça, LdP site.

The ice production factories will be installed in the Tai Besi Market and the distribution system will be set up.

Once the most suitable and acceptable locations for the ice and catch depots have been identified, a full feasibility study will be performed. A Phase III project work plan will also be developed to incorporate two more ice factories located in Baucau-Vemasse to cover the distribution of ice to the eastern part of the country and expand the distribution system for ice nationwide. With that aim, storage facilities will be located in:

- Vemasse
- Manututo,
- Com,
- Viqueque,
- Same,
- Suai,
- Atabae,
- Liquiça

The complete ice production and distribution system is delineated in the picture below.

Project budget

The budget below covers only the cost not covered by RFLP. It is expected that RFLP will cover at least two months of the International project manager as well as two months of the driver and other additional operational costs. RFLP will also cover the follow up of the project as well as staff for coordination, administration and monitoring and evaluation for the project. RFLP will also cover administration costs and operating costs related with office equipment, including generator, fuel and other related expenditures necessary for the correct operation of the project. As such it is proposed the project will be located in the Ministry of Agriculture and Fisheries within the RFLP office.

Items	Unit	Quantity	Unit Cost (US\$)	Sub-total
Staff and operational costs				
International Project manager (IC)	Months	8	7,000.0	56,000.0
Driver	Months	8	350.0	2,800.0
Car	Lump sum	1	24,000.0	24,000.0
Shared operational costs	Month	8	1,000.0	8,000.0
Equipment				
Ice factories	Unit	2	45,000.0	90,000.0
Ice machines	Unit	2	7,500.0	15,000.0
Installation costs	Lump sum	1	12,000.0	12,000.0
Storage containers	Unit	2	25,000.0	50,000.0
Local ice depots	Unit	4	25,000.0	100,000.0
Depot installation	Lump sum	4	20,000.0	80,000.0
Food grade HDPE pallets	Lump sum	4	4,000.0	16,000.0
Refrigeration equipment	Lump sum	1	14,000.0	14,000.0
Cool boxes	Unit	100	60.0	6,000.0
Hygienic equipment	Lump sum	1	5,500.0	5,500.0
Water treatment equipment	Unit	4	4,000.0	16,000.0
LdP office supporting facilities	Lump sum	4	7,000.0	28,000.0
Emergency generators	Unit	4	25,000.0	100,000.0
Regrigerated vans	Unit	4	45,000.0	180,000.0
Construction works at markets	Unit	2	115,000.0	230,000.0

Items	Unit	Quantity	Unit Cost (US\$)	Sub-total
Construction works at LdPs	Unit	2	30,000.0	60,000.0
Supporting equipment and works	Lump sum	4	25,000.0	100,000.0
Contingencies 10%	Lump sum	1	40,906.0	40,906.0
General operating expenses (5%)	Lump sum	1	24,115.8	61,710.3
Support costs (13%)	Lump sum	1	62,701.1	54,410.3
Total			409,060.0	1,350,326.6