ATTACHMENT 4

The Democratic Republic of Timor-Leste

MINISTRY OF AGRIGULTURE AND FISHERIES

AGRICULTURE SECTOR DEVELOPMENT

MEDIUM TERM OPERATION PLAN (2014 – 2018)

NATIONAL DIRECTORATE OF POLICY AND PLANNING (DNPP)

MINISTRY OF AGRICULTURE AND FISHERIES

FOREWORD

Since the commencement of the Vth Constitutional Government of Timor-Leste's Program, the Ministry of Agriculture and Fisheries (MAF) has made great advances in setting its priorities and developing a planning framework and budget to transform MAF into an effective and service-oriented organization which implements targeted programs and projects to improve the livelihoods of Timor-Leste's rural population.

This Medium Term Operation Plan (MTOP) and its associated Medium Term Investment Plan (MTIP) is the logical next step following on from MAF's Strategic Plan (MAFSP) which was finalized in late 2012. In essence, the MAFSP summarizes Government's strategy to: (i) focus on agricultural and rural development which supports small farmers and promotes improved markets in order to reduce poverty; (ii) ensure food and nutrition security, and sovereignty; and (iii) promote economic growth and employment in rural areas, and thus across the nation. This MTOP was developed to implement MAF's vision over the next five years (2014-2018).

Once we had identified our Strategic Objectives the Ministry moved on to identify projects and programs which address challenges and harness opportunities in our agricultural sector. As a result, this MTOP describes five Programs which each correspond to our Strategic Objectives. The five Programs are:

(i) sustainable increase in production and productivity;
(ii) improved market access and value addition;
(iii) improved enabling environment;
(iv) organizational development of the Ministry of Agriculture and Fisheries; and
(v) natural resources conservation and management

During the last six months, MAF's National and District Directorates engaged in this strategic planning process and produced a practical road map for the Ministry and its stakeholders. It is my firm belief that this plan addresses the most pressing needs in Timor-Leste's agricultural sector over the next five years, and I am speaking on behalf of my Ministry when I say that this MTOP will guide all development interventions in our agricultural sector.

In addition to achieving its targeted results, MAF is fully committed to demonstrate how the Ministry's development interventions will contribute to the achievement of Timor-Leste's overall development, as listed in the Timor-Leste Strategic Development Plan (2011-2030). An appropriate M&E mechanism will be established and sufficiently strengthened to regularly and transparently report on progress and impact.

Key concepts which my Ministry will embrace during implementation of the Medium Term Operation Plan are:

(i) pursuance of and support for innovative types of partnerships with, for example, other ministries, civil society, non-government organizations, the private sector, and existing and new development partners;
(ii) a gradual reduction in agricultural subsidies for production inputs. This can be achieved without jeopardizing the national food security objective, with the assurance that special needs and vulnerable groups are supported, and with a clear understanding of the need to increasingly stimulate private sector involvement in agricultural development;
(iii) intensification of evidence-based and results-oriented planning and programing processes to enhance accountability and service delivery; and
(iv) advancement of an integrated, participatory, decentralized, bottom-up approach to project and program planning, with an orientation towards innovation along value chains.

In line with my opening comments in MAF's Strategic Plan, I want to reiterate that the development of our agricultural rural sector cannot be undertaken by one Ministry alone. Strong support from other sectors, especially transport and roads, water and sanitation, energy, health, education, and agricultural finance is needed. Multi-sectoral and inter-ministerial coordination and collaboration are therefore a priority.

I would like to thank all who contributed to the preparation of this Medium Term Operation Plan. These include representatives from the District Administrations, MAF's staff at all levels, farmer organizations, civil society, the private sector, the World Bank, and the Food and Agriculture Organization.

On behalf of the Government of Timor-Leste and the Ministry of Agriculture and Fisheries, I pledge my full commitment and undivided attention to the implementation of this Medium Term Operation Plan.

Honorable Minister of Agriculture and Fisheries

Mariano ASSANAMI Sabino

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Abbreviations and Acronyms

AIS: Agricultural Innovation System
CGIAR: Consultative Group on International Agricultural Research
DPCM: Development Policy Coordinating Mechanism
FAO: Food and Agriculture Organizations
GAFSP: Global Agriculture Food Security Program – Trust Fund
GDP: Gross Domestic Product
GEF: Global Environmental Fund
GHI: Global Hunger Index
GIS: Geographical Information System
HDI: Human Development Index
IAA: Integrated Agriculture-Aquaculture
IADE: Business Development Centers
ICM: Integrated Crop Management
IDF: Institutional Development Fund
IFAD: International Fund for Agricultural Development
MDGs: Millennium Development Goals
MTOP: Medium Term Operational Plan
MTIP: Medium Term Investment Plan
MAF: Ministry of Agriculture and Fisheries
MAFSP: MAF Strategic Plan
M&E: Monitoring and Evaluation
MCIE: Ministry of Commerce, Industry and Environment
MSc: Master of Science
NAPA: National Adaptation Program of Action
NGOs: Non-Government Organizations
PhD: Doctor of Philosophy
R&D: Research and Development
TFSCB: Trust Fund for Statistical Capacity Building
TLSDP: Timor-Leste Strategic Development Plan (National)
SoL: Seeds of Life (Program)
SEO: Suco Extension Officer
SRI: Rice Intensification System
UNDP: United Nations Development Program

USAID: United State of America International Development
$: United States Dollar
WHO: World Health Organization

National Directorates in Portuguese

DNADCA:	Direcção Nacional de Apoio ao Desenvolvimento Comunitário Agrícola
DNAF:	Direcção Nacional de Administração e Finanças
DNAH:	Direcção Nacional da Agricultura e Horticultura
DNF:	Direcção Nacional das Florestas
DNFTA:	Direcção Nacional de Formação Agrícola
DNIGUA:	Direcção Nacional de Irrigação e Gestão da Utilização da Água
DNPA:	Direcção Nacional das Pescas e Aquicultura
DNPIAC:	Direcção Nacional das Plantas Industriais e do Agro-Comércio
DNPP:	Direcção Nacional de Políticas e Planeamento
DNQB:	Direcção Nacional de Quarentena e Biosegrança
DNPSE:	Direcção Nacional de Pesquisas e Serviços Especializados
DNPV:	Direcção Nacional de Pecuária e Veterinária

National Directorates in English

NDACD:	National Directorate of Agriculture and Community Development
NDAH:	National Directorate for Agriculture and Horticulture
NDAT:	National Directorate of Agricultural Training
NDAF:	National Directorate for Administration and Finance
NDF:	National Directorate of Forestry
NDFA:	National Directorate of Fisheries and Aquaculture
NDLA:	National Directorate of Livestock and Veterinary
NDIAWUM:	National Directorate of Irrigation and Water Management
NDPIA:	National Directorate of Plant Industry and Agri-business
NDPP:	National Directorate of Policy and Planning
NDQB:	National Directorate of Quarantine and Bio-Diversity
NDRES:	National Directorate of Research and Especial Services

Executive Summary

Enhancing agricultural production, productivity and rural livelihoods has been the main objective of all Governments in Timor-Leste. Investment in agriculture is a fundamental instrument to provide food and nutrition security, reduce poverty, create employment, generate sustainable broad-based economic growth, ensure environmental sustainability, and achieve the Millennium Development Goals. However, such investment has not yet produced the desired results, and Timor-Leste remains strongly depended on food imports, its agricultural production remains below potential and household food and nutrition security are still unsatisfactory. These issues represent major challenges for the Ministry of Agriculture and Fisheries (MAF) to fulfill its mandate of feeding the nation, increasing rural incomes and providing livelihoods for about 70% of the Timorese population.

The Vth Constitutional Government is making every effort to accelerate a much-needed agricultural transformation process. The first step in this process was the development of MAF's Strategic Plan (2014-2020) (MAFSP) as a key instrument to align MAF's activities and priorities with those in the Timor-Leste Strategic Development Plan (2011-2030) (TLSDP). The Medium Term Operation Plan (2014-1018) (MTOP) was prepared after the MAFSP. This Plan outlines how Government intends to address the challenges and harness opportunities in the agricultural sector over the next five years, and is intended to guide the implementation of MAF's development initiatives. The MTOP identifies key program areas and associated cost estimates. It is also a 'road map' to assist key stakeholders' decisions on how and where they might assist Timor-Leste's agriculture sector with the objective of reducing poverty, ensuring food and nutrition security, and promoting employment and economic growth.

At present, MAF faces macro-level challenges and constraints at the sub-sectoral and organizational levels. The Ministry is confronted with issues such as inadequate pest control; poor market orientation; little involvement of the district level in planning and decision-making; weak strategies for mitigation and adaptation to climate change; and a general capacity constraint in planning, monitoring and evaluation, and data collection. Improving MAF's service delivery is therefore an ultimate goal of the Ministry.

The MTOP recognizes MAF's commitment to gradually withdraw direct and full input subsidies. However, the MTOP investment estimates are based on the assumption that subsidies will continue in the short-term (three years). If production subsidies are withdrawn, additional resources would be freed-up to enable the testing of alternative approaches to the provision of services and input supplies. It is anticipated that during this transition period the Government will work on policies and incentive systems for private sector engagement, and at the same time establish farmer cooperatives to increase their involvement and participation in input supply, marketing outputs and other service delivery.

The process of preparing this MTOP was interactive and iterative. The Plan incorporates comments and feedback from a wide range of stakeholders who attended a number of workshops at national and district levels. As a continuation, and an important element of its transformation process, MAF will introduce an annual planning and priority setting process across all Directorates to facilitate effective planning, accountability, communication, inter-departmental collaboration, and learning from past experience.

MAF has developed five Programs to address five strategic objectives. Each Program has a number of Sub-Programs, components and projects.

Program 1: Sustainable increase in production and productivity

Agriculture in Timor-Leste is typified by low productivity. Both intensive (increased productivity) and extensive (area/number expansion) approaches are needed to increase production and create the necessary surpluses for economic take-off. Increased efficiency will largely depend on the application of improved technologies and more efficient use of water, especially on the irrigated land. Program 1 has 78 projects and six Sub-Programs: (i) agricultural research; (ii) decentralized extension services; (iii) improved pest control; (iv) water resources for agricultural production; (v) mechanization; and (vi) accelerated production of selected enterprises based on specialization and agro-zoning. The overall investment required from the public sector to support the planned activities under Program 1 for the 2014-2018 period is approximately $203 million. More than 50% of the investment has been allocated to the accelerated production of food and horticultural crops. Ten percent of the total investment has been allocated to extension services and industrial crops, and 5% to livestock production.

Program 2: Improved market access and value addition

The aim of this Program is to enhance market access and profitability through sustained competitiveness and value addition, and effective and efficient service delivery to the agricultural sector. If small producers are to be empowered to play a constructive role in the development and transformation of the agricultural sector, they require access to inputs and support services. Existing support services need urgent improvement and scaling-up to meet the needs of all. Program 2 has 21 projects and five Sub-Programs: (i) safety standards and quality control; (ii) promotion of diversification and value addition; (iii) rural market infrastructure; (iv) marketing and support to farmers' groups; and (v) promotion of private sector engagement. The overall investment required from the public sector to support the planned activities under this Program for the 2014-2018 period is around $16 million. Overall, in terms of Program 2, very little has been completed and/or is planned in form of investment to develop essential rural market infrastructure, to reduce post-harvest losses, develop collective marketing, and encourage and support private sector investment.

Program 3: Improved enabling environment

This strategic objective deals with the policies, institutions, legislation and necessary infrastructure required to facilitate the agricultural transformation process. Some of the key agricultural policy areas to be analyzed include import substitution; export promotion; irrigation and water allocation; legislation and regulations on veterinary public health; quarantine and animal diseases; land tenure support to production activities; inputs subsidies; and marketing arrangements. This Program has 11 projects and five Sub-Programs: (i) policy framework development and capacity for policy analysis; (ii) coordination of programs and partnerships; (iii) agricultural statistics; (iv) climate information and analysis; and (v) early warning systems. The overall investment required from the public sector to support the planned activities under this Program for the 2014-2018 period (excluding infrastructure) is around $11 million. In addition to establishing policy frameworks and improved coordination across the sector, Program 3 has a strong focus on building and maintaining functional agricultural statistics and climate information systems to provide data for planning and management.

Program 4: Organizational Development of MAF

The aim of this Program is to transform MAF and its related agencies into modern, efficient, client-oriented, impact-driven and accountable organizations. As a first step, the Ministry will complete its reorganization under the Vth Constitutional Government. This task includes the consolidation of certain functions such as research, extension and training; building analytical capacity within MAF to facilitate effective decision making; and creation of a Ministerial Agriculture Advisory Council to advise the Minister on thematic and cross-sectoral policy issues. This program has 17 projects and four Sub-Programs: (i) review of MAF's organizational structure and delivery modalities; (ii) MAF capacity strengthening; (iii) M&E strategy; and (iv) support to develop complementary strategies (e.g. human resources, communications, resource mobilization, and gender). The overall investment required from the public sector to support the planned activities under this Program for the 2014-2018 period is around $18 million. Developing a set of key strategies such as a capacity strengthening policy, monitoring and evaluation strategy and other complementary strategies will allow identification of the detailed investment needed to support MAF in addressing its related capacity constraints.

Program 5: Natural Resources Conservation and Management

Managing the connections between agriculture, natural resources conservation and environment sustainability is an integral part of agriculture sector development. This program has seven projects and four Sub-Programs: (i) natural resources management; (ii) bio-diversity; (iii) sustainable and environmentally-friendly agricultural practices; and (iv) maintaining national and cultural heritage. The overall investment required from the public sector to support the planned activities under this Program for the 2014-2018 period is around

$25 million. The investment areas include integrated crop-livestock-fisheries management practices; conservation and sustainable management of aquatic and marine resources; and conservation of biodiversity in forest and coastal areas. Promoting local communities as stewards of their natural environment is desirable, but it also requires a program that compensates them for refraining from unsustainable or damaging actions.

The current funding scenario (2013) related to the MTOP reveals that MAF is allocated an operations budget of about $13 million per year from the Government's national expenditure framework. The annual budget deficit was estimated by subtracting the available operational budget and Development Partners' commitment from the investment needed to implement the MTOP. The estimated budget deficit to implement the MTOP in 2014 is about $13 million, and this figure increases continuously over the period 2015-2018. For the period 2014-2018 the total budget deficit is around $147 million. Hence a major message in this MTOP is that at present MAF's funding levels are well-short of the level required to achieve the objectives and targets of the TLSDP and the MAFSP. It is intended that by preparing the MTOP, and specifically the Sub-Programs, projects, and costings, MAF will be able to catalyze and mobilize the funding required for successful implementation of the MTOP.

Translating the MTOP into action requires a series of reviews and continuous learning and adaptation towards optimizing MAF's operations. It also requires continuous dialogue between among key players to facilitate implementation processes and structures to maximize efficiency and benefits.

The MTOP aims to put in place the key ingredients needed to facilitate and accelerate MAF's development. However, it is recognized that, as a 'living document', there will be a need for a major revision of the MTOP by 2015. By demonstrating its capacity to prepare medium-term plans and to implement them effectively (including demonstrating tangible results) MAF can show its commitment to prudent budget management, thereby making a case for a larger share of the national budget. Over time this share should be closer to 10% of public sector expenditure in Timor-Leste.

1 Background and Introduction

1.1 Introduction

Timor-Leste's agriculture sector will remain the fundamental instrument to provide food and nutritional security, reduce poverty, create employment, sustain broad-based economic growth, contribute to environmental protection, and achieve the Millennium Development Goals (MDGs). Since independence, Governments of Timor-Leste have invested significantly in the sector with the objective of increasing production and productivity, and improving rural livelihoods, but with limited success. The increase in food production has not kept pace with the fast population growth. The country is still a net of importer of staple food and a small exporter of mainly unprocessed commodities. The staple food sector, despite some positive trends, continues to exhibit erratic production trends and the productivity of most commodities is well below their potential. The household food and nutrition security situation is also far from satisfactory.

The IVth Constitutional Government established a platform for essential agricultural and rural transformations. One of its main contributions was the preparation of the Timor-Leste Strategic Development Plan (2011-2030) (TLSDP). The follow-on Vth Constitutional Government is making a determined effort to accelerate this transformation process and the first step was the development of a Strategic Plan for the Ministry of Agriculture and Fisheries (2014-2020) (MAFSP). The MAFSP is the key instrument with which to align MAF's activities and priorities with those in the TLSDP. A Medium Term Operation Plan (MTOP) (the subject of this report) was then developed by MAF to facilitate implementation of the MAFSP. It is important to note that preparation of the MTOP was an internally-driven process led by the Minister of MAF and a MAF planning team, with external facilitation support.

The MTOP is divided into five main sections. In section one essential background information is provided and the linkages between the various planning processes explained. The vision, mission, development objectives, and the strategic objectives and the targets are presented in section two. Section three deals with the MTOP's key program areas and associated cost estimates. Section four deals with investment needs and budget analysis. Finally, some of the key considerations for the way forward are presented in section five.

This section describes the importance of agriculture in the national economy, the progress made by successive Governments, MAF's key constraints and challenges, the development scenario, and the MTOP development process.

1.1.1 Agriculture in the national economy

Agriculture in Timor-Leste contributes to national development in many ways: (i) as an economic activity in its own right, and as a leading sector for economic growth; (ii) as a

source of livelihoods for the majority of rural people; (iii) as a provider of environmental services, and by providing food for a growing population at affordable prices; and (iv) as a contributor to food security and political stability.

Approximately 75% of East Timorese live in rural areas, a majority of whom derive their livelihoods from agriculture. About one third of the country's non-oil GDP is generated from the agriculture sector. Industrial tree crops (mainly coffee) contribute about 23% of export earnings and account for about 80% of non-oil exports. Given its size and influence, Timor-Leste's agricultural sector is the logical platform on which to generate employment and increase incomes through sectoral development.

1.1.2 Progress to date

Since independence, Timor-Leste's Governments have invested significantly in agricultural infrastructure, including small and large machinery; irrigation systems; 100% subsidized seeds, fertilizer, drugs, pesticides, nets, and boats, etc.; land preparation and plantation rehabilitation; and revised and new policies and legislation. These achievements are documented in MAF's Annual Reports and summarized below.

- There has been a considerable increase in the area planted with staple food crops (rice, maize, mung beans, ground nuts) and cash crops (coffee and candle nuts) and in livestock numbers. The area used to grow cereals (rice and maize) increased from 77,000 ha in 1990-92 to 106,800 ha in 2008-10. According to crop cutting surveys conducted by MAF, the average yields of maize and rice in 2012 were 2.2 Mt/ha and 3.5 Mt/ha (paddy), respectively (MAF 2012).
- The quantity of maize seed supplied from domestic production increased from 32 Mt in 2011/12 to 105 Mt in 2012/13, and is expected to increase to 196 Mt in 2013/14. The total amount of rice seeds produced in-country increased from 51 Mt in 2011/12 to 81 Mt in 2012/13, and is expected to increase to 129 Mt in 2013/14. It is estimated that by 2015/16 over 90% of the demand for rice seed and around 68% of the demand for maize seed will be produced within the country (Seeds of Life, 2013).
- The mortality rate in children under five years of age declined from 83/1,000 (2003) to 55/1,000 in 2009/10[1].
- The maternal mortality rate declined to 56/1,000 in 2009/10.
- About 6% of territorial land, and 7% of territorial water, was protected in 2010.

Despite these achievements there are still a number of areas which require substantial improvement to achieve broad-based, sustainable growth and development. These are:

- The poverty rate in 2007 was nearly 50% and although there are no more recent official figures, is not expected to have changed much because of high food inflation.

[1] All figures on poverty, DHI, GHI, etc. were extracted from WHO, UNDP and World Bank reports.

- The Human Development Index (HDI) was 0.418 in 2000 (rank of 134/187) and increased to 0.576 in 2012 (rank of 134/187). The non-income HDI was 0.569 and the Inequality Adjusted HDI was 0.386 in 2012.
- The Global Hunger Index (using adjusted data) was 26.1 in 2001 and 27.3 in 2012.
- The Multi-Dimensional Poverty Index in 2009/10 showed that 68.1% of Timorese live in poverty.
- Forty five percent of children under the age of five are under-weight. The prevalence of stunting and wasting were 58% and 19% in 2009/10, and 45% of children were under-nourished.
- In terms of the Global Hunger Index, Timor-Leste is still ranked 73, and the country's index increased from 26.1 in 2011 to 27.3 in 2012.
- The forestry area has declined from 10,000 km^2 in 1990 to 7000 km^2 in 2010, and the average annual degradation rate has increased from 1.22% in 1990-2000 to 1.40% in 2000-2010. Between 2003 and 2010 the total decrease in forest area was 17.5% or 184,000 ha (JICA, 2013).

An analysis of production and productivity trends revealed that the major food crops (especially rice and maize) and cash crop (coffee) continue to exhibit erratic production patterns and the productivity of all crops is very low and far from their full potential. The production of rice and maize increased during the period 2007-2010 and then started to decline. Despite its agriculture potential, Timor-Leste remains a net importer of food (mainly rice) and an exporter of mainly unprocessed commodities.

1.1.3 Key constraint and challenges

At the macro level the agricultural sector as a whole faces a number of challenges. These include (i) its huge responsibility for food and nutrition security, rural poverty reduction, and non-oil employment generation; (ii) its requirement to address low production and productivity for all major agriculture commodities; (iii) it has to perform in an environment of high population growth pressure, and rapid rural-urban migration; (iv) it is expected to respond to the ambitious targets and objectives outlined in the TLSDP; and (v) faces poor national infrastructure, weak coordination and linkages, looming climate change, and severe natural resource depletion and degradation.

At the sub-sectoral and organizational level MAF is confronted with a number of constraints. The most important of these are:

(i) inadequate control of pests, vectors, diseases and losses in post-harvest storage and handling;

(ii) lack of incentive for the private sector to invest in agricultural development due to uncertain land rights;

(iii) predominantly subsistence farming and fishing systems, and poor market orientation;

(iv) inadequate infrastructure for value addition processes including storage, marketing and distribution;

(v) inadequate access/feeder roads to link farmers with markets;

(vi) poorly coordinated efforts and weak linkages amongst public sector implementing agencies and organizations;

(vii) poor decentralization in planning and decision making;

(viii) degradation of natural resources, and poorly developed strategies for mitigation and adaptation to climate change;

(ix) capacity constraints within MAF to address these constraints effectively and deliver services;

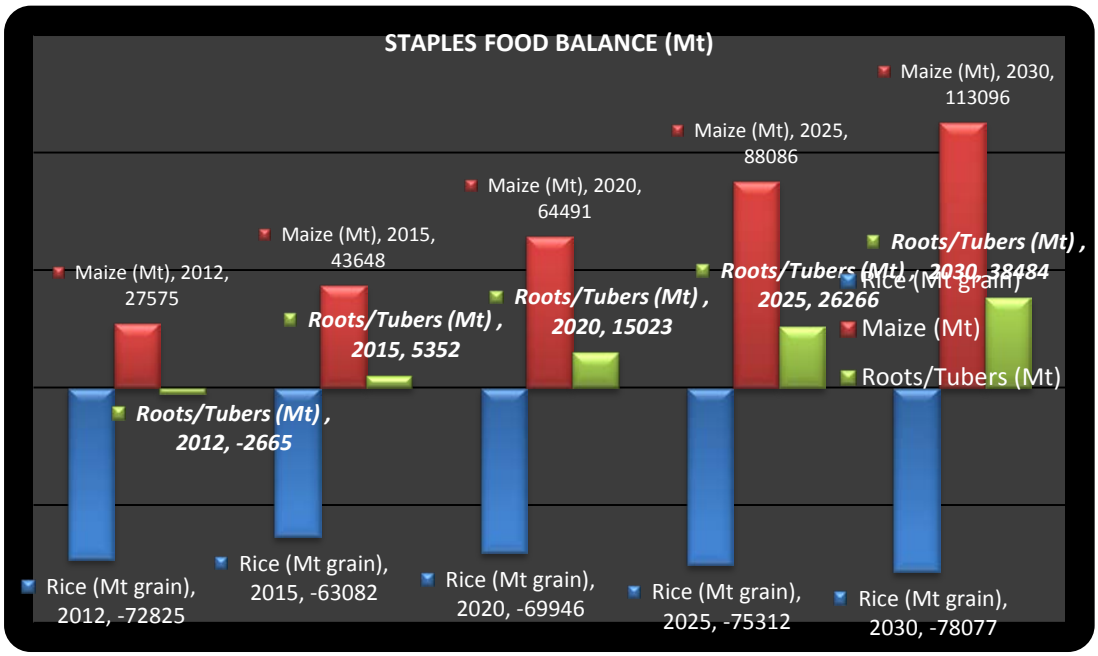
(x) poor planning, monitoring and evaluation of investments in agriculture;

(xi) unreliable data for planning and decision making; and

(xii) inadequate skills/knowledge of service delivery agents.

The major challenges confronting MAF are feeding the nation, increasing rural incomes, and providing livelihoods for about 70% of the population. The predicted food balance scenario for Timor-Leste's main staples is presented in Figure 1. This shows that in terms of staple food production the country can reach its self-sufficiency target by 2020, through increased production of maize, and root and tubers. According to these estimates, domestic rice production will not meet demand, even by 2030. Thus, there is a urgent need to intensify and expand rice production. Despite considerable potential, the current per capita consumption of fish per year is very low - estimated to be at 6.1 kg/capita/year.

Figure 1: Staple food balances



Notwithstanding these challenges and constraints, there are many opportunities in the sector and the TLSDP outlines how Government intends to release this potential. The MTOP is a 'road map' to guide stakeholders when deciding how to invest in and support Timor-Leste's agriculture sector with the objective of assisting to reduce poverty, ensure food and nutrition security, and promote employment and economic growth.

1.2 Context and development scenario

Timor-Leste is a young nation and is still recovering from deep political and social crises. It is one of the poorest nations in Asia, ranking 134 out of 187 countries (UNDP Human Development Index). Food security and malnutrition remain major challenges. Timor-Leste is the third most malnourished country in the world, just ahead of Yemen and Afghanistan, with 45% of children malnourished in 2011.

Despite the tremendous efforts that Timor-Leste has made in development (improving its Human Development Index ranking from 162nd [Least Developed Country] in 2009 to 120th (Medium Developed Country) in 2010), nearly half the population continue to live in extreme poverty and face regular periods of food insecurity. About half of all Timorese children are deprived of a nutritionally-balanced diet. Food security is a major cross-cutting issue which affects the poor and vulnerable (both rural and urban). This is a key priority for the nation as a whole and for MAF in particular. However, MAF's capacity to deliver much-needed public goods and services is weak, and current Government budget allocations do not reflect the sector's critical role in national development (receiving less than 2% of the sustainable national budget).

The TLSDP was launched by the Prime Minister in July 2011 and articulates Timor-Leste's vision for development over the next two decades. The TLSDP is an integrated package of strategies and policies which will be implemented in the short-, medium- and long-term. The Vth Constitutional Government (elected in mid-2012) emphasizes the following for the agriculture sector: (i) improved productivity; (ii) regional specialization; (iii) market-led development; (iv) crop-livestock-tree-fisheries integration; (v) improved soil, water and forest management; (vi) diversification of export crops; (vii) import substitution; and (viii) greater participation of communities and the private sector in the values chains and service delivery. Participatory agricultural and rural development, especially decentralization and beneficiary participation decision making has been prioritized.

The Vth Constitutional Government is making every effort to accelerate implementation of the TLSDP. In March 2013, the Government established a Development Policy Coordinating Mechanism (DPCM) (approved by the Council of Ministers on 15th March, 2013) to operationalize, monitor, and coordinate implementation of the TLSDP and the Vth Government's priority programs.

MAF is directly responsible for delivering production inputs (seeds, fertilizer, chemicals, nets, boats, etc.) and extension services, with little or no involvement of the private sector. Most of these inputs and services are 100% subsidized and the entire cost burden rests on the shoulders of Government. MAF recognizes that this situation is not viable or sustainable in the medium-term and therefore the Ministry is considering a plan to gradually withdraw subsidies. An alternative approach to service and input delivery is being developed, based on cooperatives, defined and supported roles for the private sector, and farmer groups and organizations. The MTOP recognizes this commitment, but associated investment estimates assume the status quo. If subsidies were to be withdrawn, additional resources would be freed-up and allow the testing of alternative approaches to services and input provision.

It is anticipated that during this transition period, Government will work on policies and incentive systems for the private sector to become engaged, whilst at the same time establishing viable farmer cooperatives and supporting their involvement and participation in input supply, marketing, and other service delivery. The other arms of the Government, development partners and NGOs have significant roles to play in this transformation process. MAF is currently in the process of signing a Memorandum of Understanding with the Ministry of Commerce, Industry and Environment (MCIE) for the establishment of cooperative shops to deliver agricultural inputs. The MTOP is guided by this development scenario.

Government will need to ensure that services are delivered efficiently to all rural stakeholders in a sustainable way. This will require a gradual move towards cost-sharing arrangements. The MTOP recognizes the private sector as an important development partner in the provision of services, especially in commercialization, job creation and value addition of agricultural, fisheries, and forest products. The role of the public sector is to (i) initiate, pilot, coordinate and monitor efforts; (ii) generate and distribute public goods; and (iii) provide the necessary conducive environment for the private sector, NGOs and farmers' association to operate. MAF will therefore be a catalyst and stimulator of growth and change.

It is important that by 2018 the necessary enabling environment has been established by the public sector so that the private sector can assume a significant responsibility for investment and service delivery in Timor-Leste's agriculture sector development. A fundamental aspect of this situation is recognition that Timor-Leste prepared a National Adaptation Program for Action on Climate Change (NAPA) in December 2010. The executive summary of this important guiding document for the MTOP is in Annex 7. In summary, Timor Leste's NAPA calls for the following priority adaptation measures:

(i) Food Security: Reduce the vulnerability of farmers and pastoralists to increased drought and flood events.

(ii) Water Resources: Promote Integrated Water Resource Management (IWRM) to guarantee water access in a climate change context.

(iii) Human Health: Enhance the capacity of the health sector and communities to anticipate and respond to changes in distribution of endemic and epidemic climate-sensitive diseases, and reduce the vulnerability to infection of populations in areas at risk from expansion of climate-related disease.

(iv) Natural Disasters: Improve institutional and community (including vulnerable groups such as women and children) capacity to prepare for and respond to climate change induced natural disasters.

(v) Forests, Biodiversity and Coastal Ecosystems: Maintain and restore mangrove and forests and promote awareness rising to protect coastal ecosystems and forests from climate change impacts.

(vi) Livestock Production: Improve planning and the legal framework for the promotion of sustainable and balanced food for livestock production.

(vii) Physical Infrastructure: Improve regulations, standards and compliance for climate-resilient infrastructure.

(viii) Supporting the ambitious national poverty reduction target in relation to the expected increased storm intensity at sea by improving the capacity to forecast and adapt offshore oil and gas infrastructure to withstand strong storms and waves.

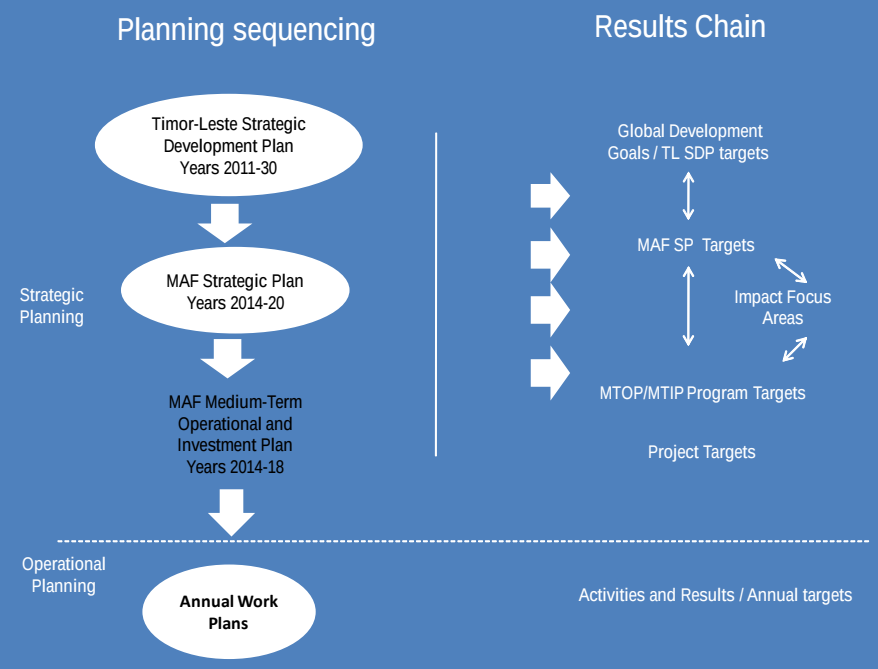
(ix) A ninth priority area, underpinning all others, focuses on developing National Institutional Capacity for Climate Change through which overarching program level coherence will be ensured.

Taken collectively, these activities provide a coherent program which, if implemented as an integrated program, would significantly reduce the vulnerability of Timor-Leste's critical development sectors to climate-related risks.

1.3 Medium Term Operation Plan (MTOP)

The MAFSP was used to develop a strategy-driven MTOP and an associated Medium Term Investment Plan (MTIP). The MTOP defines in detail: (i) specific action steps, projects and activities which are envisaged under each strategic sub-objective; (ii) responsibilities for implementation; (iii) partners needed; (iv) resources required (human and financial); (v) timing and location of activities; and (vi) performance indicators.

The MTIP was based on the MTOP and has been published separately. The objective of the MTIP is to ensure that planned activities are properly costed and that adequate funding support is provided to ensure the provision of critical agricultural public goods and services. The MTIP will guide the development of MAF's annual work plans and budgets. The linkages between the TLSDP and MAF's various planning activities leading up to the publication of the MAFSP, the MTOP and the MTIP are presented in Figure 2.



MAF's Strategic Plan

The first step in the MTOP development process was the preparation of the MAFSP. This document forms the basis of the MTOP, and therefore a brief description of how it was formulated is warranted as background information.

At the outset, the MAFSP planners realized that there are three essential steps in a planning process. These are: (i) completing a situation analysis to understand the current situation, plus constraints and issues ('where we and what are the problems'); (ii) deciding on the desired future situation ('where do we want to go'); and (iii) determining how to achieve objectives and targets ('what do we have to do to get there'). These simple guidelines indicated the need for a pragmatic approach to develop the MAFSP for the period 2014-2020, and this was the approach used. Ideally, a strategy development process should be all-inclusive, participatory, and demand-driven, and this guideline was also used during the MAFSP preparation exercise. In addition, strong local leadership was needed so that the eventual product is fully owned by MAF and its constituents.

As a considerable amount of information was already available following early planning exercises by MAF and its development partners, the following process was used to develop the MAFSP:

(i) The first step was to collect, analyze and synthesize the available information.

(ii) The second step was to validate and update this information, and to collect any missing data. Relevant primary data were collected using a targeted questionnaire addressed at specific groups of stakeholders, namely senior MAF managers, development partners, district directors, and NGOs actively engaged in the agricultural sector.

(iii) The core strategy and its components were then identified through a brain storming process within MAF.

(iv) A two-day national workshop was held with the key stakeholders in order to review the various components of the strategy and its priorities, to seek additional inputs, and to form a consensus.

(v) Finally, the draft MAFSP was presented to key stakeholders at the national and district levels to obtain consensus and seek additional inputs. The draft MAFSP was then revised and finalized based on this feedback.

(vi) The final version of the MAFSP has been published by MAF.

A number of partners and stakeholders were involved in the development of the MAFSP. These included target communities/ beneficiaries, NGOs, staff from the National and District Directorates, District Administrators, District Planning Officers, local extension staff, the agribusiness community and development partners.

The MTOP

The strategy-driven MTOP was prepared through a series of interactive and iterative processes which are shown diagrammatically in Figure 3.

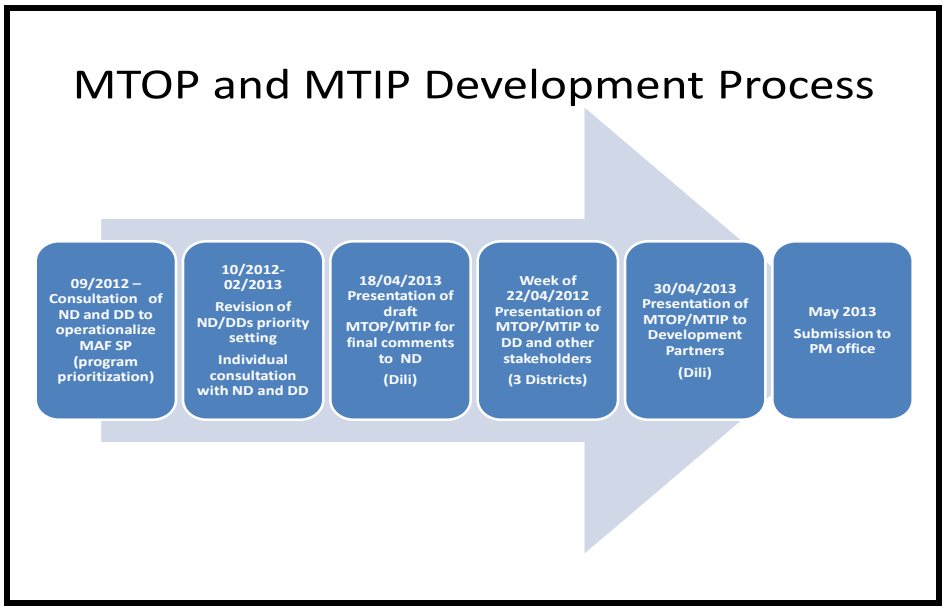
The process commenced in September 2012 when consultations and discussion were held with MAF's District and National Directors with the objective of 'operationalizing' the MAFSP. This involved working out how to move from the MAFSP (which describes strategy) to programs, sub-programs, projects and budgets (actions and funding). The National and District Directors then identified specific priority projects and budgets for their areas of responsibility. Information on the individual projects is summarized in Project Information Sheets [PISs] which are presented under separate cover because of the size of the document. The proposed projects and budgets were then compiled and reviewed against realistic and expected Government budgets, plus contributions from development partners.

This process revealed that some Directorate's plans were too large and ambitious given the likely budget ceiling. Therefore, the next step in the MTOP planning process was a revision of individual National and District Directorates' priorities, followed by one-on-one consultations between the MTOP planning team and Directors with the objective of ensuring that proposed projects and budgets were realistic and had a reasonable chance of being funded.

Once the first draft of the MTOP had been prepared (after the revisions outlined above) the next step was a formal presentation of the draft to all senior MAF staff (18th April, 2013). This process resulted is some changes to priorities and budget allocations, and the release of the next draft of the MTOP.

During the week of 22nd April, 2013, this draft was presented to the District Directors and other local stakeholders (see Annex 3 for a full list of attendees). The final consultation meeting was held on 30th April, 2013. This important workshop, attended by a wide range of MAF supporters and stakeholders including the main development partners and NGOs, was chaired by the Minister of MAF with assistance from MAF's senior management. The presentations were completed by members of the MTOP planning team, and solicited numerous comments on budget allocation across sectoral priorities and debates about MAF's subsidization strategy. The MTOP was then finalized during May and presented to the Prime Ministers' Office in late May, 2013.

Figure 3: Key sequences in the consultation process



MTOP structure

Apart from this background and introductory section (Section 1) the MTOP has five main sections, as follows:

(i) Section 2 is an overview of the MAFSF and includes: (a) brief outlines of agriculture's vision, mission and development objectives; (b) a list of MAF's strategic objectives; and (c) a table of the targets set for the MTOP.

(ii) Section 3 is a description of the five MTOP Programs which reflect the Mega Programs[2] which are the basis of the MAFSP. Each Program is broken down into Sub-Programs with: (a) specific 'pillars of action'; (b) components; and (c) tables which list specific projects and associated funding requirements.

(iii) Section 4 discusses the total funding requirements for MTOP implementation and includes an analysis of budget availability and needs – this procedure identified budget gaps which need to be filled if MAF is to implement all projects listed in the MTOP.

(iv) Section 5 summarizes the lessons learned from the MTOP planning process, and analyzes factors and constraints which are likely to impact on successful MTOP implementation.

(v) Section 6 is a series of annexes which contain additional information.

1.4 About the MTOP

At the outset it is important to keep in mind that this is the first attempt by MAF to develop an operational plan aimed at achieving two key objectives: (i) ensuring that current and planned activities and programs are in line with the TLSDP and the recently-completed MAFSP; and (ii) developing a justifiable and financially responsible plan with clearly identified projects and deliverables which focus on MAF's priorities. The underlying assumption is that if MAF can: (i) establish credible planning and monitoring mechanisms; (ii) develop its capacity to deliver public goods and services; (iii) establish strategic partnerships with the private sector and development partners; and (iv) is able to demonstrate tangible impacts and results from the investment, then the Ministry will be in a much stronger position to mobilize additional resources with the objective of reaching an annual investment target of 10% of the total public expenditure.

The MTOP will be revised within the next two years to reflect ever-changing contexts and development environments. The key drivers of change are expected to be:

- Currently the Vth Constitutional Government is in the process of revising the decree law related to MAF's organizational structure, including the number of Directorates. This proposed decree law is scheduled to be reviewed and approved by the Council of Minister by the end of May, 2013. Once this restructuring has been completed, the new Directorates and their various departments will revisit their priorities to keep in line with their respective missions and mandates. This process may lead to programmatic changes in the MTOP, but this is to be expected as the MTOP is a 'living' document.
- Many development partner-funded collaborative projects will end by the end of 2016. Against this trend, it is important to note that some development partners who are not

[2] The Mega Programs outlined in the MAFSP are referred to as Programs in the MTOP and MTIP.

currently engaged in Timor Leste's agriculture sector (The World Bank, USAID and China) intend to re-engage. In addition, a number of complementary strategies to drive MAF's transformation will be completed by 2015. It is expected that these changes may reorient some priorities and strategic partnerships, to be reflected in a revised MTOP.

- At the moment, MAF's planning process and priorities are heavily influence by the central decisions and top-down programs. However, the reorganization of MAF is expected to redefine the roles and responsibilities of the National and District Directorates and lead to more decentralized decision making processes. The soon-to-commence National Suco Development Program (PNDS) will improve the capacity of the districts, sub-districts and villages to plan and deliver services at the local level. In addition, the TLSDP calls for the definition of agricultural production zones and area-based planning for agricultural development. Once implemented, this should lead to an integrated planning process and priorities based on existing production systems.

Thus, a process to update and fine-tune MAF's programs and priorities will be pursued with the goal of institutionalizing the MTOP as part of the yearly reviews. This process, while not changing priorities in a significant way, may expand the focus areas, change the scale of operations, and increase the significance and reach of MAF's strategic partnerships. The MTOP, which focuses on key short-term development objectives, aims to put in place the important ingredients which are needed to facilitate and accelerate MAF's transformation.

1.5 Linkages between strategy and budget processes

The MTOP has been designed to be practical and operational and for these purposes needs strong links to budget processes. The budgetary information used for decision making on fund allocation has come from three sources:

- The National Government's Annual and Forward Estimate Budgets;
- The Government's Medium Term Expenditure Framework provides an indication of forward funding for agricultural development activities; and
- Funding decisions by development partners.

At the moment the public sector (Government of Timor-Leste) support for MAF is about 2% of total Government annual expenditure. At the beginning of each financial year the Ministry of Finance (MoF) provides MAF with an indicative budget called 'a budget envelop'. To a large extent this estimate is based on the previous year's allocation and increased by 10% to adjust for inflation and other factors. Budget categories are: (i) salaries and benefits; (ii) goods and services (training, demonstrations, travel and other service-related costs); (iii) minor capital (computers, furniture, vehicles, motorbikes, etc.); and (iv) and public transfers (pensions, etc.). Once MAF has this estimate the Ministry uses internally agreed priorities to allocate the budget across its Directorates.

The 'budget envelope' for 2013 is $24.176 million. Annex 5 is a detailed table which lists how this envelope has been spread across all of MAFs National and District Directorates, and Table 1 is a summary of MAF's 2013 budget. It is noteworthy that the DNAH (responsible for food crops and horticulture) has been allocated nearly 40% of the central Dili-based budget.

Table 1: Summary of MAF's 2013 budget

Office	($'000)	% a/
Office of the Minister	$136	0.9%
Legal Advisory Unit	$32	0.2%
Inspection and Auditing	$40	0.3%
Office of Community Protocol	$24	0.2%
Office of Deputy Minister	$180	1.1%
ND of Administration	$1,475	9.4%
ND of Research and Special Services	$306	1.9%
ND of Quarantine and Biosecurity	$327	2.1%
ND of Technical Agriculture Training	$864	5.5%
ND of Policy and Planning	$200	1.3%
Office of the Director General	$48	0.3%
Office of Sec of State for Forests and Nature Conservation	$101	0.6%
ND of Agriculture and Horticulture	$6,216	39.5%
ND of Plant Industry and Agri-business	$449	2.9%
ND of Forests	$718	4.6%
ND of Irrigation and Water Management	$1,025	6.5%
Office of Sec of State for Fisheries	$101	0.6%
ND of Fisheries and Aquaculture	$712	4.5%
Office of Sec of State for Animal Husbandry	$100	0.6%
ND of Animal Husbandry	$1,512	9.6%
ND of Agriculture Community Development	$1,162	7.4%
Sub-Total (Dili)	**$15,728**	65.1%
District Agricultural Services (12 district offices)	$8,448	34.9%
TOTAL	**$24,176**	100.0%

In addition, the Government of Timor-Leste operates two special funds, one covering major capital/infrastructure development (Infrastructure Fund - IF) and another for human capital development (Human Capital Development Fund - HCDF). Both Funds are administered through the Prime Minister's Office. MAF can apply for funds from the IF and the HCDF using established procedures, which officially include financial and economic feasibility.

The budget for the MTOP was considered under two different scenarios, the 'budget needs' and the 'actual available budget'. The 'budget needs' is the sum of the budgets for all projects and activities identified by MAF's Directorates for the period 2014-2018. This is in fact the budget needed by MAF to implement its entire portfolio of planned projects and activities and to achieve its targeted outputs and outcomes, which are aligned to targets indicated in the TLSDP and in the MAFSP. The actual available budget is the level of funding allocated by the Government in its normal budgetary process.

The MTOP is based on an attempt to estimate the budget needs. Simultaneously, efforts were made to obtain information on planned investments by development partners and NGOs for the same period. The difference between the budget need and the sum of the estimated available budget from Government and the commitment by the development partners is the 'gap' which has to be met, either by Government or from other sources, through fresh negotiations with Government and/or the Ministry's current and potential development partners. Therefore, Government and, in particular, MAF can effectively use its investment framework to negotiate bilateral and multilateral projects into the future.

However, realistically the MTOP should be operationalized based on the expenditure framework as well as the budget ceiling set by the Government for MAF, as this is the actual working budget for a given year. Thus, on a yearly basis further prioritization has to be undertaken within the budget need, so that the final budget fits within the total budgetary resources available for that year. This prioritization is part of the preparation of the annual work plan and budget.

It should be remembered that continuity and consistency of focus and funding over a number of years is often a prerequisite for success for many agricultural development activities – hence the importance of the Government's medium term expenditure framework and development partners' long term commitments.

2 Overview of MAF's Strategic Plan

The MTOP is guided by two key strategies: the Government's TLSDP and the MAFSP. This section of the MTOP briefly describes: (i) MAF's vision, mission and mandate; (ii) the key components of the MAFSP; and (iii) the proposed projects, budgets and targets in the MTOP.

2.1 Agriculture's vision, mission and development objectives

MAF's Goal

Based on the TLSDP MAF's goal is to '*improve national food security, reduce rural poverty, support the transition from subsistence farming to commercial farming of crops, livestock, and fisheries; and promote environmental sustainability and conservation of Timor-Leste's natural resources*'.

MAF's Mission

According to the Decree Law (18/2008), MAF's mission is to '*conceive, execute, coordinate, and assess the policy defined and approved by the Council of Ministers for the areas of agriculture, forestry, fisheries, and livestock'*.

An earlier National Development Plan (2002) developed an operational definition to facilitate the implementation of MAF's mission. As articulated in this plan, MAF's mission is '*to efficiently deliver services to agricultural, fishing and forestry communities in Timor-Leste,*

that support improved productivity, income earning potential and exports and that, therefore, support improved social welfare in the rural areas of the nation, taking into account MAF's human capital and financial resources'.

MAF's vision

MAF's vision as articulated in the MAFSP is to have a '*sustainable, competitive and prosperous agricultural sector that eliminates poverty and supports improved living standard of the Nation's people'*.

Development goals

The development goals of the Vth Constitutional Government for MAF are:

(i) improve the level of food security of the rural population, reduce hunger and malnutrition, and raise self-reliance;
(ii) increase value addition of agriculture, fisheries and forestry products by fostering output processing and marketing;
(iii) achieve sustainable production and management of natural resources;
(iv) contribute to the balance of trade by earning revenue from commodity exports both traditional and new, and by substituting imports; and
(v) increase income and employment in rural areas.

These policy objectives are articulated in the Program of the Vth Constitutional Government, 2012-2017.

2.2 Strategic Objectives (SOs)

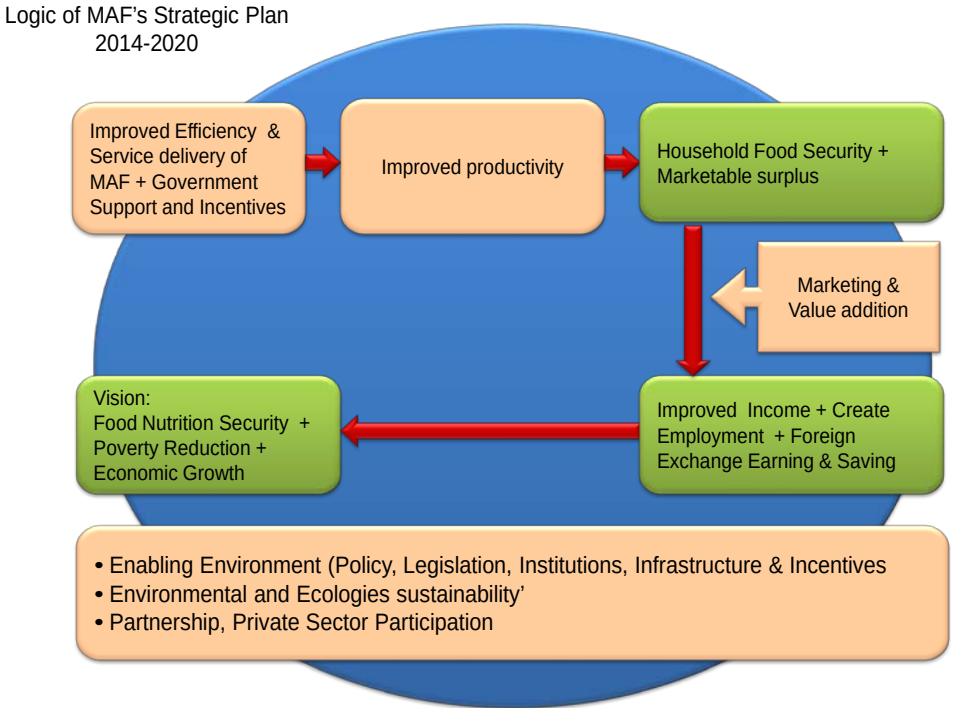
In order to achieve its stated goal, mission and vision during the 2014-2020 period, MAF will pursue five complementary and mutually reinforcing Strategic Objectives:

(i) sustainably increase the production and productivity of selected crops, livestock species, fisheries and the forestry sub-sector;
(ii) enhance and improve market (domestic and export) access and value addition;
(iii) improve the enabling environment (legislation, policies, institutions, and infrastructure);
(iv) ensure that MAF and related agencies are strengthened, appropriately configured and equipped to deliver the TLSDP and the MAFSP; and
(v) enhance sustainable natural resources conservation management and utilization.

The underlying logic of these strategies (see Figure 4) is that if the productivity of existing and emerging enterprises can be improved and/or the farmers and fishers can be helped to move up the value chain through public and private investments in marketing and value addition activities, then rural incomes will increase and livelihoods will improve. Further,

associated targeted investments related to staple food crop production and marketing will deliver improved nutrition at the household level. The agriculture sector could then move towards greater profitability and improved capacity to compete. It is expected that the enabling environment and organizational strengthening of MAF will facilitate and accelerate this transformation process. All of these changes should be accomplished without causing damage to the environment and Timor Leste's natural resources.

Figure 4: MAFSP logic



MAF has developed five Programs to address the five Strategic Objectives with a number of Sub-programs, component and projects. The Programs and associated Sub-Programs are summarized in Table 2, which has been extracted from the MAFSP.

The project proposals outlined in the MTOP aim to place Timor-Leste's agricultural sector on the path to positive transformation. The MTOP will guide public and private interventions, strategic collaboration with development partners, and investment in the sector during the 2014 to 2018 period. There are logical links between the targets set in the TLSDP, the MAFSP, Programs and Sub-programs and associated planned investments in the sector.

Table 2: Programs and Sub Programs of MAF's Strategic Plan 2014-2020

Program 1: Production and Productivity	Program 2: Markets and Value addition	Program 3: Enabling Environment (Policy, Institutions, Infrastructure)	Program 4: Organizational Strengthening	Program 5: Natural Resources Conservation and Management
Sub Program				
1.1: To enhance the contribution of agricultural research to sustainable agricultural production, food and nutrition security and poverty reduction.	2.1. To develop and implement safety standards and quality control assurance across crops, livestock, fisheries, and forestry products	3.1: To establish a functional, clear and accountable policy and legislative framework and capacity for policy analysis and implementation.	4.1: To review the organizational structure, governance mechanisms and modalities of operation to ensure that MAF and related agencies are functioning as relevant modern client-oriented organizations.	5.1: Sustainable natural resources management and utilization.
1.2: To increase farmers' access to relevant information, knowledge, and technology through effective, efficient, sustainable and decentralized extension services.	2.2: To promote access and use of high quality inputs, planting, and stocking materials, and fishing equipment.	3.2: To ensure coordination and responsibilities are undertaken in a coherent manner leading to improved implementation and management of sector policies and programs.	4.2: To develop and implement a manpower development and capacity strengthening policy strategy and program to enhance the productivity of MAF staff.	5.2: Increase the knowledge, protection and utilization of the bio-diversity within Timor-Leste.
1.3: To reduce losses through improved control of pests, vectors and disease. .	2.3: To promote diversification and value addition activities within the sub sectors along the value chain.	3.3: To establish and maintain a functional agricultural statistics system providing timely & appropriate information to sector stakeholders, and assisting with MAF planning and management.	4.3: To develop and implement a knowledge management and communication strategy to facilitate effective decision-making and accountability.	5.3: Development and dissemination of environmentally friendly agricultural industry practices.
1.4: To develop water resources for agricultural production on the basis of sustainable irrigation, water for livestock and aquaculture.	2.4: To provide the necessary rural market infrastructure including appropriate structures to improve post-harvest losses.	3.4: To develop capacity for improved decision-making in planning, and budgeting processes by providing accurate and up-to-date climate information and analysis.	4.4: To develop and implement an M&E strategy.	5.4: Promote the conservation of national and cultural heritage.
1.5: To increase the use of labor productivity enhancing technologies including appropriate mechanization and other farm management related practices.	2.5: To promote collective marketing, and support to Farmer Groups and Farmers' Associations.	3.5: To develop the necessary early warning and weather monitoring systems to help mitigate the impact of, and adapt to, climate variability.	4.5: To review the HR policy and practices to provide the necessary skills and incentives to enhance the performance of MAF's staff.	
1.6: Accelerate production of selected strategic enterprises	2.6: To promote private sector engagement in input		4.6: To develop and implement a partnership strategy	

on the basis of specialization and agro-zoning.	supply and product marketing.		for MAF	
			4.7: To develop and implement a resource mobilization strategy to ensure adequate and sustainable funding for MAF.	

2.3 MTOP and targets

The MTOP and the associated MTIP should be based on clearly identified sets of deliverables and outcomes. Quantified targets outlined in the TLSDP (2011-2030) are presented in Table 3. In addition, MAF's Directorates set time-dependent targets for their proposed projects. Program and project-related annual targets for the period 2014-2018 are summarized in Table 4 and details are listed in the project sheets. Some of these deliverables are linked to the logical framework of the MAFSP.

The targets listed in Table 4 reflect a more cautious agricultural development plan which takes into account the current agricultural environment in Timor-Leste, the low starting base-line figures (by international standards) and the fact that according to Table 43 MAF has a five-year operational budget gap of $147.3 million, and a total five-year budget gap of $237.186 million, once the demand for infrastructure budget is also considered[3]. Contrasting with what is reflected under this conservative or 'Low-Case' scenario, targets corresponding to a 'High-Case' scenario have been identified by MAF's Directorates and are reported in Annex 1. The targets corresponding to the High-Case scenario are based on the assumptions of a significant increase in MAF's support to farmers and a high elasticity of yields and area planted.

Given the underlying contrasting assumptions, a periodic review of the figures in Table 4 and Annex 1 should be carried out periodically to maintain realism and to reflect results as they accumulate. This will require the establishment of a sector data base which is supported by a national agriculture census and improved monitoring and evaluation as the MTOP is implemented.

[3] These are based on MAF's reported average figures for the period 2007-2011, and estimated annual figures for 2012 and 2013. Baseline figures were then derived from three sets of achievements – see the 2013 column in Table 4. These baseline figures, which can be justified and confirmed, were then extrapolated forward by 5% compound for the five-year MTOP.

Table 3: SDP targets for the agricultural sector (2015-2020)

2015	2020
1. Tonnage for rice grain (adjusted for losses) will have increased from 37,500 Mt to 61,262 Mt; 2. Productivity of maize will have increased from 1.25 Mt to 1.54 Mt/ ha; 3. The Timor-Leste Agricultural Advisory Council will be formulating national policies for the sector and overseeing implementation; 4. The Timor-Leste Research and Development Institute will be guiding and planning additional investment into research, development and extension for all major agricultural sub-sectors; 5. A comprehensive irrigation scheme inventory will have assembled a full inventory of existing irrigation systems to identify schemes that can be enlarged and new schemes that could be developed; 6. Dam and groundwater pilot projects will have been developed and the results used to inform further development; 7. There will have been increased capital investment in key crops such as coffee and vanilla, candlenut and palm oil; 8. Traditional fishing activities will have increased and fishing will have increased in the Exclusive Economic Zone; 9. A Forestry Management Plan, a National Bamboo Policy and Marketing Strategy will be in place; and 10. Community-based nurseries will be planting one million trees nationwide every year.	1. The food supply will have exceeded demand; 2. The area of irrigated rice will have increased by 40% from 50,000 ha to 70,000 ha; 3. Average maize yields will have increased to 2.5 Mt/ha; 4. At least 50% of fruit and vegetables will be grown locally; 5. Livestock numbers will have increased by 20%; 6. Coffee production will have doubled following the rehabilitation of 40,000 hectares of coffee plantations; 7. There will be at least three types of aquaculture activities supporting coastal communities; and 8. The fisheries sector will be export-based and have expanded to include ocean fishing.

Source: TLSDP (2011-2030)

Table 4: Agricultural targets (2014-2018)

Product			Yields (Mt/ha), Areas (ha) and Production (Mt) a/ b/							
		07-'11	2011	2012	2013	2014	2015	2016	2017	2018
Cereals - SDP figures					Base					
Maize	*Production (Mt)*	*96,453*	*30,596*	*96,471*	*87,341*	*96,293*	*106,163*	*117,045*	*129,042*	*142,269*
	Areas (ha)	63,041	21,699	44,870	54,539	57,266	60,129	63,136	66,293	69,607
	Yield (Mt/ha)	1.53	1.41	2.15	1.60	1.68	1.77	1.85	1.95	2.04
Rice (paddy)	*Production (Mt)*	*96,488*	*98,148*	*133,054*	*102,370*	*112,863*	*124,432*	*137,186*	*151,248*	*166,751*
	Areas (ha)	39,064	35,561	41,884	38,966	40,915	42,960	45,109	47,364	49,732
	Yield (Mt/ha)	2.47	2.76	3.28	2.63	2.76	2.90	3.04	3.19	3.35
Food Crops - Seeds of Life yields and more realistic area (ha) targets										
Cassava	*Production (Mt)*	*33,425*	*21,979*	*23,493*	*30,655*	*33,797*	*37,261*	*41,081*	*45,291*	*49,934*
	Areas (ha)	8,773	5,784	5152	7,829	8,220	8,631	9,063	9,516	9,992
	Yield (Mt/ha)	3.81	3.80	4.56	3.92	4.11	4.32	4.53	4.76	5.00
Sweet Potato	*Production (Mt)*	*9,756*	*9,687*	*5,620*	*9,288*	*10,240*	*11,289*	*12,446*	*13,722*	*15,129*
	Areas (ha)	3,738	3,229	1784	3,386	3,555	3,733	3,920	4,116	4,322
	Yield (Mt/ha)	2.61	3.00	3.15	2.74	2.88	3.02	3.18	3.33	3.50
Irish Potato	*Production (Mt)*	*1,868*	*918*	*209*	*1,469*	*1,620*	*1,786*	*1,969*	*2,171*	*2,394*
	Areas (ha)	907	437	120	727	764	802	842	884	928
	Yield (Mt/ha)	2.06	2.10	1.74	2.02	2.12	2.23	2.34	2.46	2.58
Soya bean	*Production (Mt)*	*1,025*	*1,539*		*1,107*	*1,220*	*1,345*	*1,483*	*1,635*	*1,802*
	Areas (ha)	899	962		910	955	1,003	1,053	1,106	1,161
	Yield (Mt/ha)	1.14	1.60		1.22	1.28	1.34	1.41	1.48	1.55
Green gram	*Production (Mt)*				*1,200*	*1,323*	*1,459*	*1,608*	*1,773*	*1,955*
	Areas (ha)				1,000	1,050	1,103	1,158	1,216	1,276
	Yield (Mt/ha)				1.20	1.26	1.32	1.39	1.46	1.53
Peanut	*Production (Mt)*	*2,779*	*4,128*		*3,060*	*3,374*	*3,719*	*4,101*	*4,521*	*4,984*
	Areas (ha)	2,074	3,753		2,354	2,472	2,595	2,725	2,861	3,004
	Yield (Mt/ha)	1.34	1.10		1.30	1.37	1.43	1.50	1.58	1.66
Mung beans	**Production (Mt)**	**1,647**	**2,562**		**1,806**	1,896	1,991	2,090	2,195	**2,941**
	Areas (ha)	1,752	2,847		1,935	2,031	2,133	2,239	2,351	2,469
	Yield (Mt/ha)	0.94	0.90		0.93	0.98	1.03	1.08	1.13	1.19
Horticulture - more realistic area (ha) targets										
Onion/garlic	*Production (Mt)*	*1,778*	*1,864*	*1,427*		*2,144*	*3,485*	*4,860*	*6,365*	*8,000*
	Areas (ha)	671	632	626	659	670	1,025	1,350	1,675	2,000
	Yield (Mt/ha)	2.65	2.95	2.28	2.64	3.20	3.40	3.60	3.80	4.00
Fruit	*Production (Mt)*	*14,128*	*14,865*	*12,409*	*13988*	*18,000*	*26,125*	*35,000*	*43,775*	*52,500*
	Areas (ha)	1,534	1,842	1,593	1,586	2,000	2,750	3,500	4,250	5,000
	Yield (Mt/ha)	9.21	8.07	7.79	8.84	9.00	9.50	10.00	10.30	10.50
Vegetables	*Production (Mt)*	*4,127*	*4,096*	*4,141*	*4124*	*4,620*	*10,370*	*16,450*	*23,178*	*30,000*
(leaf)	Areas (ha)	543	642	638	571	700	1,525	2,350	3,175	4,000
	Yield (Mt/ha)	7.60	6.38	6.49	7.27	6.60	6.80	7.00	7.30	7.50
Vegetables	*Production (Mt)*	*865*	*1,234*	*1,404*	*995*	*3,300*	*7,200*	*11,520*	*16,320*	*21,000*
(other)	Areas (ha)	211	375	390	260	600	1,200	1,800	2,400	3,000
	Yield (Mt/ha)	4.10	3.29	3.60	3.91	5.50	6.00	6.40	6.80	7.00
Industrial Crops - targets are realistic										
Coffee rehab.	ha					4,000	4,000	4,000	4,000	4,000
New plantation	ha					2,000	2,000	2,000	2,000	2,000
Coffee	*Production (Mt)*		*8,151*	*8,177*		*8,800*	*8,800*	*9,350*	*9,350*	*9,900*
	Areas (ha)		54,341	54,516		55,000	55,000	55,000	55,000	55,000
	Yield (Mt/ha)		0.15	0.15		0.16	0.16	0.17	0.17	0.18
Coconut	*Production (Mt)*		*8,894*	*9,042*		*9,300*	*9,450*	*9,600*	*9,900*	*10,200*
	Areas (ha)		14,823	14,823		15,000	15,000	15,000	15,000	15,000
	Yield (Mt/ha)		0.60	0.61		0.62	0.63	0.64	0.66	0.68
Candlenut	*Production (Mt)*		*1,837*	*1,856*		*1,848*	*1,875*	*1,904*	*1,932*	*1,923*
	Areas (ha)		3,466	3,501		3,553	3,606	3,661	3,715	3,771
	Yield (Mt/ha)		0.53	0.53		0.52	0.52	0.52	0.52	0.51
Cashew nut	*Production (Mt)*		*147*	*150*		*153*	*157*	*160*	*161*	*165*
	Areas (ha)		1,635	1,651		1,668	1,685	1,701	1,718	1,736
	Yield (Mt/ha)		0.090	0.091		0.092	0.093	0.094	0.094	0.095
Livestock - milk production targets reduced										
Buffalo	Nos			94,664		96,557	98,488	100,458	102,467	104,517
Cattle	Nos			161,650		165,691	169,834	174,079	178,431	182,892
Sheep	Nos			41,854		46,039	50,643	55,708	61,278	67,406
Goats	Nos			152,360		167,596	184,356	202,791	223,070	245,377
Pigs	Nos			330,435		396,522	436,174	479,792	527,771	580,548
Poultry	Nos			702,474		772,721	849,994	934,993	1,028,492	1,131,341
Dairy cows	Nos					100	200	300	400	500
Cow milk	('000) litres						548	548	1,000	1,500
Dairy goats	Nos					1,100	2,200	3,300	4,400	5,500
Goat milk	('000) litres					1,431	1,750	2,000	2,500	3,000
Fisheries - targets are realistic										
Aquaculture	*Production (Mt)*			*156*						*348*
Fish ponds	Fresh (ha)			78						132
Yield (Mt/ha)				2.0						2.6
Aquaculture										
Fish ponds	Brackish (ha)									511
Marine fisheries	Mt			3,877		4,459	5,127	5,896	6,781	7,798
Forestry - rehabilitation targets (ha) reduced										
Rehabilitation	ha/year					5,000	5,000	5,000	5,000	5,000
	cum. ha					5,000	10,000	15,000	20,000	25,000
Protected area	ha					4,600				15,000
Protected area	nos					5				20
Popular forest	ha					200				12,500
Watershed protect.	ha									62,000
Honey	Mt			1						2
Rattan	ha					4	4	4	4	4
Bamboo	ha			6						26

a/ Source: (i) baseline (2012), MAF report to IV Government; and (ii) predictions, supplied by National Directors adjusted to reflect more realistic targets given Directorate budgets, experiences from similar South East Asian countries, and figures reported by bilateral projects.
b/ Areas and yields increased by 5% pa to reflect adjusted SDP targets.

3 Description of Programs 1-5

Program 1: Sustainable Increase in Production and Productivity

Agriculture in Timor-Leste is typified by low productivity. Both intensive (increased productivity) and extensive (area/number expansion) approaches coupled with improved water and soil management are needed to increase production and generate the necessary surpluses for economic take-off. The key to more efficient production and improved competitiveness lies in the availability and use of more competitive inputs, efficient use of water on irrigated and rainfed lands, the application of improved production and post-harvest technologies, and reduced production and post-harvest losses. Program 1 has six Sub-Programs[4].

Sub-Program 1.1 - Agricultural research

The aim of this sub-program is to improve the contribution of agricultural research to sustainable agricultural production, improved food and nutrition security, and reduced poverty.

Publicly-funded research will continue to play a key role in enhancing productivity. Sub-Program 1.1 will focus on three key areas: (i) generating new technologies, practices and strategies for traditional/indigenous and emerging crop/enterprises, including germ-plasm collection, characterization and evaluation (given due consideration to climate change); (ii) improved uptake of new technologies and knowledge; and (iii) strengthened effectiveness of agricultural research and development. The latter includes the formulation and operation of the Timor-Leste Agriculture Research and Development Institute (TLARDI) which will be responsible for guiding and planning additional investment into research, development and extension for all major agricultural subsectors[5].

Component 1.1.1 - Generating new technologies, practices and strategies

Experience of agricultural research and technology development in many countries has shown conclusively that investment in agricultural research and development (R & D) generates high rates of return on investment[6]. MAF's current research activities are primarily the responsibility of the National Directorate for Research and Specialist Services. This component will finance production systems and target product-oriented strategic and applied research for the various sub-sectors, and will be based on intelligent borrowing and adoption of technologies and practices along the value chain using the innovation systems perspective. The research activities to be undertaken under this investment will be demand-driven,

[4] All investment numbers are expressed as $'000.

[5] See also Sub-Program 4.1, Component 2 for a more detailed description of the mandate and functions of the proposed TLARDI.

[6] See for instance World Development Report (2008), Chapter 7. The World Bank, Washington D.C.

market-oriented, and innovation-focused. Research priority setting processes will be strengthened.

The pillars of action to be funded by the proposed investments are:

- Implementing research programs which focus on: (i) improved crop seeds/varieties (food crops, plantation/industrial crops, forestry), including fertilizer response studies; (ii) crop pest and disease management and healthy crop management systems; (iii) land/forest conservation, and natural resource management; (iv) improved livestock management; (iv) post-harvest and processing technologies; (v) socio-economic studies; and (vi) developing agro-ecological/production zones and associated maps.
- Participatory field testing (adaptive trials) with extension workers and farmers which focus on improved and sustainable farming systems (research – extension – farmer linkages).

The proposed projects and estimated investments are presented in Table 7. Currently, Seeds of Life invests considerable resources in testing food crop germ-plasm, and releasing improved varieties which are adapted to Timor-Leste's variable climate. The current phase of Seeds of Life will end in 2015. However, additional resources have been provided beyond this point to continue Seeds of Life's adaptive research and on-farm testing activities. The proposed investments for research-related activities are included in Table 7.

It is envisaged that every effort will be made to give farmers the opportunity to help set research agendas, using a holistic approach to research, extension and training, and adopting a value chain approach and innovation systems perspective.

This investment plan includes three new investment areas: (i) establishing fertilizer response curves for the major food and industrial crops under different production systems; (ii) piloting and testing production system-oriented, integrated, and participatory R&D planning and implementation; and (iii) improving cropping efficiency in irrigated and dryland areas. Without basic technical information on fertilizer responses it will be difficult to determine financially feasible and site-specific fertilizer recommendations for key crops. Thus technical research on fertilizer responses has been afforded a high priority.

Currently most R&D activities are planned and implemented by individual National Directorates, based on their respective mandates. This 'silo' approach does not allow agricultural production systems to exploit potential synergies and complementarities. The TLSDP suggests a planning process based on clearly-defined production systems. Thus it will be important to plan and implement research activities which are designed to develop watershed-based production systems for small holders. This includes support for participatory planning in co-operation with other MAF Directorates, and with NGOs.

Most irrigation schemes are currently underutilized and in many cases only grow one crop per season – and at times land is left idle despite its potential. Increasing cropping intensity

will assist farmers to improve the productivity of existing irrigated areas through improved water-use efficiency, diversification away from rice, the production of high value crops, and the adoption of improved cropping systems. Therefore a program of participatory and adaptive research and extension will explore the potential for improved cropping efficiency in selected irrigation schemes. This work will be conducted on farmers' fields with community participation and NGO support.

The plan for the development of new technologies and knowledge demonstrates that there is currently gross under-investment in agricultural research in Timor-Leste. International best practice is to invest at least one percent of Agricultural Gross Domestic Product in agricultural R&D. Once TLARDI has been established, and a comprehensive R&D Master Plan developed, the Institute will enhance investment in adaptive agricultural research, with the Plan being revised and updated on a regular basis. Technology is at the heart of agricultural development, and therefore investment in this discipline will have a significant positive impact on crop and livestock productivity.

Component 1.1.2 - Improved provision of new technologies and knowledge

One of the key issues with respect to improved technologies is not their generation or availability, but their adoption and utilization by end users. This calls for more on-farm research and demonstration as well as more effective research and extension linkages, and partnerships with other service providers including NGOs and the emerging private sector.

The pillars of action for the proposed investments are:

- multiplication and distribution of seeds and planting materials;
- multiplication and distribution of seedlings using tissue culture;
- establishment and operation of community-based nurseries; and
- farmer training on improved crop/livestock production and management practices.

A considerable amount of work (especially for food crops) such as formal and informal seed systems development and seed system management (including policies and strategies) is currently undertaken by Seeds of Life, but there is an urgent need to establish similar programs and activities for commodities other than food crops.

Planned major investments are in the areas of: (i) seed multiplication and distribution of bananas, potatoes, indigenous fruits, maize, rice, peanuts, sweet potato and cassava; (ii) soils analysis; (iii) demonstration of integrated crop management techniques; and (iv) soil conservation practices. The multiplication and distribution of industrial and plantation crops, forestry, and fish fingerlings are not included in Component 1.1.2, but are incorporated in Sub-Program 1.6 (accelerated production of selected enterprises). Similarly the crop and livestock production demonstrations to be implemented by the National Directorate for Agricultural and Community Development (Extension Directorate) are included in Sub-Program 1.2. The investments in Component 1.1.2 are listed in Table 5, and in Table 7 which

is a summary of all investments for Sub-Program 1.1. Most of the research-related activities in Component 1.1.2 will be undertaken by the National Directorate of Research and Specialist Services (DNPSE).

Table 5: Investment for provision of new technologies and knowledge

SO a/	SP b/	NATIONAL DIRECTORATE	PROJECT TITLE	2014	2015	2016	2017	2018	TOTAL
1	1.1	DNPSE	Banana multiplication and distribution using tissue culture techniques	7	7	7	8	8	37
1	1.1	DNPSE	Multiplication and distribution of potato using tissue culture techniques	8	8	8	9	10	42
1	1.1	DNPSE	Multiplication and distribution of dispirus and aboranhas (indigenous fruit)	10	10	10	11	12	53
1	1.1	DNPSE	Soil analysis to establish agriculture potential at the district level	250	250	250	275	303	1,328
1	1.1	DNPSE	Demonstration and use of soya bean for human consumption (tempe)		7	7	8	8	30
1	1.1	DNPSE	Formal seed/ seedling production (maize, rice, peanut, sweet potato and cassava *			556	1,003	684	2,243
1	1.1	DNPSE	Informal seed production and distribution, plus development of seed industry *			670	1,395	1,217	3,282
			TOTAL	275	282	1,508	2,708	2,242	7,015

* Currently funded by Seeds of Life.

a/ SO = Strategic Objective; this abreviation has been used in all tables.

b/ SP = Sub-Program; this abbreviation has been used in all tables.

Component 1.1.3 – Improved agriculture research and development

This objective will be achieved through improved effectiveness of national agricultural research and development, based on the formation and operation of TLARDI. This will require the preparation of a research plan and strategies, and improved capacity of researchers to conduct research activities and link with extension staff with the objective of disseminating new and improved crop and livestock production technologies.

The Timor-Leste Strategic Development Plan (TLSDP) sets a target of having by 2015 TLARDI guiding and planning additional investment into research, development and extension for all major agricultural sub-sectors. The TLSDP also includes the establishment of three centres: (i) Livestock Production and Research; (ii) Marine Research and Development; and (iii) Forestry Training and Development. However, given the current personnel situation in MAF (mainly lack of skills and experience) the development of these centres, which are not part of TLARDI, may not be viable propositions and therefore the MTOP does not include provision for investment in these centres.

As discussed above MAF is in the process of creating a R&D Institute (TLARDI) covering all sub sectors (crops, livestock, forestry and fisheries) which will address the Ministry's research, extension and education, and training needs. A project proposal and a master plan for the formulation and operation of TLARDI will be completed by the end of 2014. Preliminary investment estimates are outlined in Table 6. Professional capacity development (recruitment of staff and long term training) will also commence in 2014 and in this regard

MAF will target foreign scholarships to create the necessary human capital. Investment in infrastructure to support agriculture R&D (over and above the cost of TLARDI) is detailed in Table 27.

The total investment costs for Sub-Program 1.1 (agriculture research), including TLARDI, are listed in Table 7.

Table 6: Preliminary estimate of investment costs in TLARDI

SO	SP	DIRECTORATE	PROJECT TITLE	2014	2015	2016	2017	2018	Total
1	1.1	DNPSE	Plan, cost and implement TLARDI	632	432	432	432	432	2,361

Sub-Program 1.2 - Decentralized extension services

The aim of this Sub-Program is to: (i) increase farmers' access to relevant information, knowledge, and technology; (ii) build the necessary skills for application through an effective, efficient, sustainable and decentralized extension service; and (iii) connect primary producers with knowledge and service providers from the private and public sectors.

Limited extension-related activities are currently implemented by almost all National Directorates, with the National Directorate for Agricultural Community Development (NDADCA) leading the way. Training of farmers in various aspects of improved production technology and management practices is included in the planned investments for most Directorates. In addition, most NGO activities are community-based and strongly extension oriented. The RDP IV project supported by GIZ and Portuguese AID is engaged in: (i) improving agricultural education systems; (ii) enhancing the skills of extension workers and subject matter specialists; (iii) agricultural extension management; and (iv) planning and implementing efficient extension campaigns. The operational costs provided by GIZ and Portugal for these purposes have been included under development partner contributions.

Table 7: Estimated investment to generate new technologies

SO	SP	NATIONAL DIRECTORATE	PROJECT TITLE	2014	2015	2016	2017	2018	TOTAL
1	1.1	DNF	Forests research	160	200	280	310	310	1,260
1	1.1	DNPSE	Social economic studies and impact assessment	25	52	68	41	41	227
1	1.1	DNPSE	Agricultural laboratory services (soil analysis, soil conservation, monitoring & bio control)	460	506	516	568	568	2,618
1	1.1	DNPSE	Research in livestock development-breed improvement, management of Bali Cattle, introduction of Indonesian goats	110	131	169	53	53	516
1	1.1	DNPSE	Livestock feed formulation and management (crop residues for pig production, local chicken, foddersfor cattle).	30	53	65	52	52	252
1	1.1	DNPSE	Food and horticulture crop improvement including cropping efficiency in irrigated areas.	215	372	867	958	958	3,370
1	1.1	DNPSE	Ongoing Component 1, Seeds of Life III			556	1,003	1,003	2,562
1	1.1	DNPSE	Investment, generate new technologies (Table 4)	275	282	1,508	2,708	2,242	7,015
1	1.1	DNPSE	Developing fertilizer responses for different crops under different production system	100	100	100	100	100	500
1	1.1	DNPSE	Basic infrastructure development for R&D						
1	1.1	DNPSE	Plan, cost and implement TLARDI	632	432	432	432	432	2,361
			TOTAL	**2,007**	**2,128**	**4,561**	**6,225**	**5,759**	**20,681**

Activities planned by NDADCA have been grouped as follows: (i) establishing and supporting farmers groups, associations, and other forms of organizations; (ii) constructing and operating extension centres in districts and sub-districts; and (iii) changing mindsets and attitudes towards agriculture as a business. More specific activities include: (i) identification of farmer groups, associations and other organizations engaged in agriculture; (ii) establishing working relationships and partnerships between farmer groups and the agricultural extension department at the district level; (iii) formation and facilitation of farmer groups and fora, and periodic assistance to these groups; (iv) sensitizing rural communities on the importance of farmer groups; and (v) training and providing technical assistance to farmer groups, promoting the implementation of good agricultural practices, and establishing and using demonstration plots.

The primary responsibility of the National Directorate of Agricultural Education (DNFA) is the provision of agricultural education. The Directorate's main activities are: (i) staff training; (ii) curriculum development for agricultural technical schools; and (iii) curriculum implementation. RDP IV provides support to this Directorate.

The pillars of action for Sub-Program 1.2 are:

- strengthening market linkages and developing the role of extension agents as facilitators and knowledge brokers, including defining roles and functions of the extension service at multiple levels (national, district, etc.);
- preparing and implementing extension programs at different levels;
- preparing training curriculum and manuals/modules for extension workers and students participating in vocational and technical training, which meet emerging needs;

- improving the capacity of extension workers, professional staff, students and farmers;
- disseminating technology through on-farm demonstrations and farmer training;
- establishing and strengthening farmer groups;
- facilitating farmers' links with markets, input suppliers, and other knowledge and service providers;
- completing baseline surveys and regular activity monitoring to assess impacts of extension; and
- extension infrastructure – vocational and training schools; extension facilities at different levels, plus transport, equipment, training materials, etc.

Given the mass migration of youth to the cities, vocational and technical education which is relevant to rural areas, and which prepares rural youth for jobs in the private sector or self-employment, is a high priority. Suitable vocational-level curricula need to be adopted and translated. These educational programs should also provide support for diversification out of agriculture into non-farm rural activities, and the creation of non-farm employment including the promotion of opportunities in the service sectors closely related to agriculture.

The planned projects and the associated investment for Sub-Program 1.2 are presented in Table 8.

Table 8: Investment in decentralized extension and agriculture education

SO	SP	DIRECTORATE	PROJECT TITLE	2014	2015	2016	2017	2018	TOTAL
1	1.2	DNADCA	Capacity building	1,200	1,500	1,500	1,500	1,500	7,200
1	1.2	DNADCA	Technology Transfer	623	612	612	612	612	3,071
1	1.2	DNF	Public awareness of forestry	250	350	340	440	440	1,820
1	1.2	DNFA	Vocational and training for students	421	508	596	694	775	2,993
1	1.2	DNFA	Curriculum development	786	100	100	100	100	1,186
1	1.2	DNADCA	Continuation of RDP IV	-	-	600	600	600	1,800
1	1.2	DNIGUA	Building staff capacity through formal training	56	56	16	-	-	128
1	1.2	DNFA	Infrastructure						
1	1.2	DNADCA	Infrastructure						
			TOTAL	3,336	3,126	3,764	3,946	4,027	18,198

It is important to note that extension staff have weak links with research and development services, and often do not have the necessary understanding and practical knowledge of more specialized topics. Theses staff also have a message-oriented, top-down working framework and have not developed strong skills as facilitators of farmers' own processes of knowledge acquisition. The process of linking district extension agents with specialized sources of knowledge is not well developed, and there are too few women extension agents. There is also a need to develop community innovation/farmer training centres, as extension bases and places to test and evaluate technologies. Ultimately, the extension system should be

accountable to farmers. The forgoing issues and constraints will be addressed when TLARDI is designed.

Sub-Program 1.3 - Improved pest control

The aim is to support the improvement of food supplies at the household level by controlling common weeds, pests, diseases, vectors, and parasites which cause production losses in the field and during storage. There are two key points when dealing with weeds, pests, vectors and disease control. These are: (i) controlling field (as well as post-harvest) pests and diseases; and (ii) issues related to quarantine. This Sub-Program focuses on post-harvest pests and diseases. Quarantine-related investments are discussed under Sub-Program 2.1.

The pillars of action for the proposed investments are:

- strengthening the diagnosis of pests, diseases, vectors and parasites, including disease mapping;
- maintenance and operation of diagnostic laboratories;
- implementing routine pest and disease control measures for crops, livestock and trees; and
- developing the necessary infrastructure – establishment of veterinary clinics and other facilities.

The investments to fund the routine control of pests and diseases of major crops (maize, soya bean, green gram, ground nut, Irish potatoes, yams, legumes, fruits and vegetable and coffee) and common livestock diseases are included in Sub-Program 1.6 and the investments in related infrastructure development are listed in Table 27.

Sub-Program 1.4 - Water resources for agricultural production

The aim of this Sub-Program is to increase agricultural production through more efficient use of available water. The key objectives are to: (i) increase the amount of land under irrigation; (ii) facilitate double cropping where water resources are reliable; (iii) reduce production weather risks; and (iv) develop appropriate local institutional mechanisms for the efficient management of irrigation schemes. This is a key aspect of MAF's approach to support the adaptation of the agricultural sector to climate change as discussed in the recently published NAPA.

The Directorate of Irrigation and Water Management (DNIGUA) is currently rehabilitating three irrigation facilities at Caraulun, Raibere and Oebaba. The rehabilitation of two additional schemes will commence in 2014 – at Tono and Larisula. An on-going feasibility study includes a preliminary study and design for dam sites on 15 rivers. These activities have already been approved and financed through the Infrastructure Fund, and are not included in MAF's budget.

Although it has traditionally been argued that the most cost-effective method of irrigation in Timor-Leste is gravity-fed, the current estimated cost per hectare of rehabilitating irrigated land (ex-transmigration schemes) using cross-river weir-based construction is about $10,000 per hectare. There is a need to test alternative irrigation systems, and over time scale up initial experience and adopt other ways to obtain maximum efficiency in irrigation water use. This will need to be accompanied by improved cropping efficiency (cropping intensity) of irrigated land and a switch to higher value crops.

The pillars of action for proposed investments are:

- increased supply of water for agriculture (crops, livestock, forest and fisheries) including construction of small tanks and reservoirs;
- operation, maintenance and rehabilitation of existing irrigation systems;
- data collection, and monitoring and management of water resources;
- preparation of a comprehensive irrigation system inventory;
- improving the efficiency of currently-operational irrigation systems;
- testing alternative irrigation systems (including the use tube wells and small pumps) for small holders; and
- developing and maintaining access roads to irrigation facilities to enable regular repairs, and access to inputs and markets.

The proposed water-related projects for the period 2014-2018 and associated investments are presented in Table 9. It is worth noting that no additional large-scale irrigation facilities are planned for this period, with the exception of those which have already been approved.

Table 9: Investment in water resources for agriculture production

SO	SP	DIRECTORATE	PROJECT TITLE	2014	2015	2016	2017	2018	TOTAL
1	1.4	DNIGUA	Supply of water for agriculture	150	165	182	200	220	917
1	1.4	DNIGUA	Feasibility study for check dam and river control to protect agricultural land	500	550	605	665	732	3,052
1	1.4	DNIGUA	Testing alternative irrigation systems for smallholders producers	350	385	423	466	512	2,136
1	1.4	DNIGUA	Rehabilitation of existing irrigation facilities (dams)	300	330	363	400	440	1,833
1	1.4	DNIGUA	Development of a comprehensive irrigation system inventory	483	508	535	-	-	1,526
1	1.4	DNIGUA	Construction of small tanks and reservoirs to provide irrigation for smallholder producers	700	770	847	931	1,024	4,272
1	1.4	DNIGUA	Operation, maintenance, and improving the efficiency of operational irrigation systems	250	275	300	333	366	1,524
1	1.4	DNIGUA	Construction of access roads to irrigation areas	52	60	65	60	60	297
1	1.4	DNIGUA	Infrastructure - approved irrigation rehabilitation *						
			TOTAL	2,785	3,043	3,320	3,055	3,354	15,557

* Oebaba, Raibere, Tono and Larisula schemes

Sub-Program 1.5 - Mechanization

The aim of this Sub-Program is increase the use of labor productivity-enhancing technologies, including appropriate mechanization and other farm management related practices. The focus will be on: (i) developing and promoting appropriate technologies including animal traction and mechanization; (ii) promoting mechanization for increased rice production; (iii) developing public-private partnerships, and establishing modalities to finance private enterprise to provide services and inputs; and (iv) supporting mechanization and extension centres.

Key activities will include: (i) supply of fuel for small and large tractors[7]; (ii) maintenance operations and tractor management; and (iii) establishment of mechanization centres. The investments required to funds these activities are embedded in the projects listed for Sub-Program 1.6. A deficiency in Sub-Program 1.5 is that no projects have been proposed for the development of public/private partnerships, or for the provision of support to finance private enterprise to provide services. These issues will be taken into consideration in view of the revision and updating the MTOP, as previously discussed.

Sub-Program 1.6 - Accelerated production of selected enterprises based on specialization and agro-zoning

MAF has a major role to play in terms of overcoming poverty and mitigating food insecurity. About half a million Timorese are vulnerable to food insecurity, with the majority living in rural areas. About two-thirds of the population experiences food deficits sometime during the year. These communities depend on a range of food crops grown in a wide variety of cropping systems, supplemented by limited supplies of animal and fish products. Rice, maize, cassava, beans, tubers, root crops and vegetables form the basis of these systems. Additional investment is needed to accelerate the production and productivity of selected agricultural enterprises, with a strong focus on staple and nutritious food. Hence one of the guiding principles for agricultural development will be the pursuance of a commodity-focused approach based on specialization and agro-zoning. This approach has produced good results in many countries and is in line with the recommendation in the TLSDP, in which specific targets are set for selected commodities.

The TLSDP identifies a number of enterprises for which special efforts need to be made by MAF to accelerate production in order to ensure food security and improved rural livelihoods. The Vth Constitutional Government's Program emphasizes three sets of enterprises: (i) food and horticultural crops which contribute to food and nutrition security; (ii) enterprises which contribute to import substitution; and (iii) traditional and new export crops/enterprises which contribute to the balance of payments. This Sub-Program focuses on these enterprises.

[7] See further comments on the use of subsidies in Component 1.6.1.

Component 1.6.1 - Food and horticulture crop production

The aim of this component is to increase productivity, overall production, and quality of important foods crops grown in Timor- Leste. The focus will be on integrating crops and livestock production, along with the adaptation and promotion of proven, profitable and sustainable farming system technologies which are characterized by efficient use of climate (rainfall), soil and irrigation water.

The priority crops listed in the TLSDP are rice, maize, cassava, sweet potato, mung beans, ground nuts, fruits, and high value vegetables, the latter with potential for import substitution. Likewise, the crops considered under this component plan are: rice, maize, soya bean, mung beans, ground nuts, cassava, sweet potato, Irish potato, legumes, vegetables (leafy, tomato, eggplants, paprika, onion and garlics) and indigenous fruits.

The proposed projects and the related investments are presented in Table 10. Activities included in this investment plan are: (i) increased rice production using SRI and ICM, hybrids and conventional techniques; (ii) intensification and area expansion of maize; (iii) cultivation of soya bean on residual moisture; and (iv) increasing the production and productivity of mung bean, ground nut, cassava, sweet potato, Irish potato, yams, legumes, fruits and vegetables. The proposed budgets include free (100% subsidized) land preparation, seeds/planting materials, pest and disease control, and fertilizer distribution. The costs associated MAF staff and farmer training are included under Strategic Objective 4. Similarly investments required for infrastructure development are detailed in Sub-Program 3.6.

These estimates assume full subsidy for all inputs provided to farmers. However once a new policy on the use and level of subsidies has been established it will be necessary to review these budgets in light of the fact that, as planned, the National Directorate of Food Crops and Horticulture (DNAH) has been allocated about 40% of MAF's planned 2014-2018 expenditure – see Table 41**.**

Table 10: Investment for accelerated food crops and horticulture

SO	SP	DIRECTORATE	PROJECT TITLE	2014	2015	2016	2017	2018	TOTAL
1	1.6.1	DNAH	Increase production of Irish potato	624	1,138	1,647	2,149	2,654	8,212
1	1.6.1	DNAH	Increase production and productivity of peanut	715	1,267	1,820	2,380	2,940	9,122
1	1.6.1	DNAH	Increase production and productivity of mung bean	525	713	962	1,180	1,400	4,780
1	1.6.1	DNAH	Increase production and productivity of soya bean	333	377	445	515	667	2,337
1	1.6.1	DNAH	Increase production and productivity of sweet potato	390	575	775	960	1,160	3,860
1	1.6.1	DNAH	Increase production and productivity of cassava	1,120	1,810	2,550	3,440	4,910	13,830
1	1.6.1	DNAH	Increase production and productivity of maize	2,284	3,293	4,375	5,500	6,166	21,618
1	1.6.1	DNAH	Increase production and productivity rice	4,079	4,621	5,101	5,691	6,294	25,786
1	1.6.1	DNAH	Increase production and productivity of onion and garlic	171	230	286	342	398	1,427
1	1.6.1	DNAH	Increase production and productivity of legumes	329	397	447	497	547	2,217
1	1.6.1	DNAH	Increase production and productivity of vegetables (tomato, eggplant, paprika)	868	616	823	978	800	4,085
1	1.6.1	DNAH	Increase production and productivity of leaf vegetables	400	609	836	1,032	1,268	4,145
1	1.6.1	DNAH	Increase production and productivity of fruit	327	365	470	550	630	2,342
1	1.6.1	DNAH	Support program for horticulture (women empowerment)	840	900	910	550	570	3,770
1	1.6.1	DNAH	Infrastructure						
1	1.6.1	DNAH	Infrastructure						
1	1.6.1	DNAH	Infrastructure						
			TOTAL	13,005	16,911	21,447	25,764	30,404	107,530

Note: this table includes investments for SPs 1.3 (pest control) and 1.5 (mechanization) - as these items are part subsidized crop production packages. At this level of detail it is not possible to separate out individual input costs.

Component 1.6.2- Industrial crop production

The aim of this Component is to enhance and develop industrial crops which will contribute to income earning opportunities and employment in rural areas, and export earnings for the nation. The Component will focus on crops which involve value adding activities and cover traditional crops such as coffee, coconut and candlenut as well as emerging crops, such as cocoa, black pepper, cashew nut, hazelnut, ginger, clove and vanilla.

The focus will be on: (i) seed/seedling multiplication; (ii) on-farm demonstration of best practices; (iii) processing of value added products; and (iii) training of farmers in nursery operations, crop management/ cultural practices, and the development of product-based co-operatives.

The pillars of action for the proposed investments are:

- rehabilitation of existing production areas and introduction of improved cultural practices;
- bringing new areas under cultivation using best practices (coffee, coconut, candlenut, cashew nut, cocoa);

- Supporting farmers, and where possible, promoting crop diversification and intercropping (especially coca cultivation under coconut);
- provision of subsidized seedlings and input supplies (fertilizer and chemicals);
- facilitating the development of master plans for industry development (coffee, coconut, cocoa, and other export crops); and
- minor infrastructure development.

The list of projects and the investments required are presented in Table 11.

Table 11: Investment for accelerated production of industrial crops

SO	SP	DIRECTORATE	PROJECT TITLE	2014	2015	2016	2017	2018	TOTAL
1	1.6.2	DNPIAC	Assistance to coconut industry development	680	680	680	680	680	3,400
1	1.6.2	DNPIAC	Development of candle nut industry	220	220	220	220	220	1,100
1	1.6.2	DNPIAC	Support to Cashew nut industry	300	300	300	300	300	1,500
1	1.6.2	DNPIAC	Crop diversification-cocoa plantation under coconut	300	300	300	300	300	1,500
1	1.6.2	DNPIAC	Assistance for coffee industry development	2,200	2,200	2,200	2,200	2,200	11,000
1	1.6.2	DNPIAC	Master plan for the development of export crops	100	-	-	-	-	100
			TOTAL	3,800	3,700	3,700	3,700	3,700	18,600

During the MTOP planning process the National Directorate of Industrial Crops and Agri-Business prepared a concept note for a large commercial coffee industry center. Implementation of this center would involve a major investment by Government and therefore investment funds cannot be sourced from MAF's regular budget. In addition, the concept note needs to be reviewed and translated into a project proposal. Once the details of this project have been finalized it may be feasible to incorporate the plans in a revision of the MTOP.

There is an overwhelming need to prepare comprehensive plans for the development of the coffee, coconut and cocoa sub-sectors. Once plans have been finalized it may be relatively straight forward to mobilize the resources required and to co-ordinate future investment. Budgetary support for the development of master plans for coffee, coconut and cocoa has been included in the MTOP.

Component 1.6.3 – Fisheries production

Despite Timor-Leste's vast fishing potential the current per capita consumption of fish is very low – estimated to be 6.1 kg/capita/year (MAF, 2012). Per capita consumption varies between districts, from 1.8 kg in Bobonaro to 8.6 kg in Oecusse. These figures are much lower than the global average (17.3 kg/capita/year), and lower than the average for least developed countries (9.8 kg/capita/year), and low-income food deficit countries (8.8 kg/capita/year). The fisheries sector has the potential to contribute significantly to the food and nutritional status of all Timorese. Immediate priority should be given to developing a commercial fishing industry as well as to promoting the consumption of fish and fish

products. Urgent investment is needed to develop marine fisheries and the aquaculture industry.

The aim of this Component is therefore to develop the nation's aquatic resources in a sustainable manner, while providing opportunities for coastal communities to benefit from such development.

The pillars of action for the proposed investments are:

- developing commercial marine and aquaculture industries;
- fish monitoring and enforcement of existing laws and decrees;
- training of and capacity building for staff, farmers and fishers;
- developing a marine fisheries development strategy, and associated programs and projects;
- rehabilitating fingerling hatcheries and operationalizing hatchery centres;
- fisheries resource identification and management, including development of aquaculture sites for increased fish production, and coastal habitat mapping;
- improving post-harvest handling, transport, storage processing, and marketing; and
- sensitization and awareness building of coastal societies, and developing co-operatives.

Component activities have been grouped under three themes: (i) fisheries and marine environmental management; (ii) fisheries industry development; and (iii) aquaculture. A two-pronged approach to fresh water aquaculture development is proposed in a National Aquaculture Development Strategy (MAF, 2012): (i) supporting the emergence of small and medium aquaculture business enterprises in suitable agro-ecological zones; and (ii) advancing Integrated Agriculture-Aquaculture (IAA) systems based on small-scale water storage systems for poor households in less favorable, resource-poor locations. Emphasis will be on the development of aquaculture based on low-cost technologies which are environmentally benign, socially acceptable and financially viable. The TLSDP targets the development of at least three types of community-based aquaculture activities for coastal communities by 2020.

To implement the recently developed Aquaculture Strategy, New Zealand Aid is supporting the NDFA with a project which will run from 2014-2018 with a total budget of approximately $5.1 million.

The proposed program for increasing marine fish production will eventually include: (i) establishing infrastructure including ports and quality control systems; (ii) supplying equipment, boats and vessels; (iii) improving fishing methods; (iv) constructing cold storage facilities and markets; (v) establishing fish receiving points; (vi) monitoring and enforcement of existing laws; (vii) establishing integrated agriculture-aquaculture systems and marine aquaculture systems; (viii) improving the knowledge and skills of aquaculturists, fisherman

and civil servants on fish production, preservation and utilization technologies; and (ix) conservation and sustainable management of aquatic and marine resources.

The fisheries investment presented in Table 12 includes: (i) implementation of improved fishing methods; (ii) direct investment in integrated agriculture- aquaculture systems; (iii) marine aquaculture; (iv) fisheries resource identification and management; (v) development of a Marine Fisheries Master Plan; (vi) and training and capacity building. Training is needed in the following topics: (i) utilization of fish products; (ii) technical training on repairs and maintenance of fishing equipment; (iii) cultivation of seaweed; (iv) cultural aspects of fresh and salt water fish species; (v) diving training; and (vi) training in other skills needed by NDFA staff.

Table 12: Investment for accelerated fisheries production

SO	SP	DIRECTORATE	PROJECT TITLE	2014	2015	2016	2017	2018	TOTAL
1	1.6.3	DNPA	Aquaculture development	278	293	238	259	285	1,353
1	1.6.3	DNPA	Fisheries resources identification and management	110	142	285	167	159	863
1	1.6.3	DNPA	Marine fisheries master plan development and feasibility for semi industrial and deep water fishing	350	350	0	175	0	875
1	1.6.3	DNPA	Marine fisheries development	180	102	277	102	127	788
1	1.6.3	DNPA	Fishing monitoring and enforcement of existing laws	185	212	183	189	17	786
1	1.6.3	DNPA	Laboratory equipment for quality control		1,000				1,000
			TOTAL	1,103	2,099	983	892	588	5,665

During the MTOP planning process the NDFA developed a concept note for a Marine Fisheries Industry Development Project. This concept will have to follow the same procedures as those outlined for Sub-Program 1.6.2 (industrial crop production).

Component 1.6.4 – Livestock production

The aim of this Component is to increase livestock-based food production, animal protein consumption, and incomes of small holder producers.

The pillars of action for the proposed investments are:

- preventing and eradicating livestock diseases through vaccination programs;
- increasing the population and improving the management of poultry, pigs, ducks, sheep and goats under traditional systems;
- increasing the cattle population and improving management practices for beef production;
- supporting small holder dairy development;
- introducing new breeds of goats and pigs;
- infrastructure development (veterinary clinics, milk collection points, artificial insemination facilities, milk processing centers, etc.);

- maintenance of diagnostic laboratories, and animal disease mapping;
- establishing and maintaining a data-base and information system for livestock development;
- building capacity of farmers and staff in the NDFA;
- supporting the processing of livestock products, including the introduction of milk processing technologies;
- establishing and providing support to farmer groups; and
- formulating livestock rations from locally-available materials.

The proposed projects and the investments required for the accelerated production of livestock production are presented in Table 13. Funding has also been allocated for a livestock sector development plan. This plan will assist in redefining priorities and the proposed operational plan can then be adjusted accordingly.

The list of projects and the investment needed are presented in Table 13.

Table 13: Investment in livestock production and veterinary services

SO	SP	DIRECTORATE	PROJECT TITLE	2014	2015	2016	2017	2018	TOTAL
1	1.6.4	DNPV	Support for development of smallholder milk production	407	459	516	582	655	2,619
1	1.6.4	DNPV	Increased duck production	63	69	76	83	92	383
1	1.6.4	DNPV	Increasing goat production using local and imported breeds	15	16	17	19	26	93
1	1.6.4	DNPV	Development of goats for milk production	28	32	36	40	45	181
1	1.6.4	DNPV	Increasing cattle population for beef production	167	183	201	221	244	1,016
1	1.6.4	DNPV	Prevention and control of animal diseases	617	667	716	765	819	3,584
1	1.6.4	DNPV	Maintenance of diagnostic laboratory	180	220	231	246	264	1,141
1	1.6.4	DNPV	Livestock sector development plan	125	-	-	-	-	125
1	1.6.4	DNPV	Infrastructure						
			TOTAL	1,602	1,646	1,793	1,956	2,145	9,142

An important activity which is missing in terms of addressing the TLSDP's targets is the establishment of and support for a Cattle Breeders' Association. This should be incorporated into operations and investment plans in due course.

Component 1.6.5 – Forestry production

The aim of this Component is to develop appropriate policies, legislation and management strategies as the basis for the formulation and implementation of forestry management plans which will facilitate the sustainable management of forest resources in Timor-Leste. Efforts will be made to encourage the participation of rural communities and other stakeholders in all aspects of forest resource management. The key focus areas will be: (i) reforestation and forest rehabilitation; (ii) forest product protection and forest resources management; and (iii) forest production and utilization. Reforestation, watershed management and establishment of protected areas are potential key development activities. Another key activity which has

potential is agro-forestry, and the intercropping of fruit trees. The overall aim is to conserve natural resources and provide alternative livelihoods for rural communities.

The pillars of action for the proposed investments are:

- expansion of forest production areas with trees of commercial value;
- development and management of potential watershed areas;
- promotion of non-timber forest products (bamboo, honey etc.);
- protection and conservation of bio-diversity in forest and coastal areas;
- introduction and promotion of community-based sustainable forestry resource management;
- conservation of wildlife parks;
- establishment of management regimes for degraded coastal areas;
- development and management of protected areas;
- strengthening forestry institutions and infrastructure development;
- strengthening government policies and regulations on forestry development;
- sensitization and consensus-building for stakeholders to support sustainable development of the forestry sector; and promoting community participation;
- rehabilitation and recovery of degraded forests;
- development of community-based forest production; and
- development of a Forestry Sector Master Plan.

Not all these projects will be implemented during the period of the MTOP. However, investment for direct support for the forestry sub-sector includes activities related to reforestation, expanding the forestry area, and developing a Forestry Sector Master Plan. The estimated investment in these three projects is presented in Table 14. Many of the remaining unfunded projects are incorporated in Strategic Objective 5 (Conservation and Management of Natural Resources). The list of all projects and investments for the forestry sub-sector are listed in Table 14.

Table 14: Investment in forestry

SO	SP	DIRECTORATE	PROJECT TITLE	2014	2015	2016	2017	2018	TOTAL
1	1.6.5	DNF	Community participatory in forestry development	235	185	185	185	185	975
1	1.6.5	DNF	Seedling production	790	800	800	800	800	3,990
1	1.6.5	DNF	Forests production	490	480	410	460	460	2,300
1	1.6.5	DNF	Forestry Master Plan	100	-	-	-	-	100
1	1.6.5	DNPSE	Forests quality improvement (breeding) and management	20	122	179	180	55	556
1	1.6.5	DNF	Facilities and infrastructure						
			TOTAL	1,635	1,587	1,574	1,625	1,500	7,921

During the MTOP planning process the NDF developed a concept note for the development of a community-based production system. This concept will have to follow the same procedures as those outlined for Sub-Program 1.6.2 (coffee development).

Total investment in Program 1

The investment required from the public sector to support the planned activities under Program 1 for the 2014-2018 period is approximately $203 million, as shown in Table 15. This does not include investment in infrastructure, or training and capacity building. The former will be funded through the Infrastructure Fund and latter is included in Sub-Program 4.2.

Table 15: Total investment in Program 1

SO	SP	Projects	2014	2015	2016	2017	2018	5 years	% budget
1	1.1 - Research	19	2,007	2,128	4,561	6,225	5,759	20,681	10%
1	1.2 - Extension	9	3,336	3,126	3,764	3,946	4,027	18,198	9%
1	1.4 - Water	9	2,785	3,043	3,320	3,055	3,354	15,557	8%
1	1.6.1 - Food crops	14	13,005	16,911	21,447	25,764	30,404	107,530	53%
1	1.6.2 - Indust. Crops	6	3,800	3,700	3,700	3,700	3,700	18,600	9%
1	1.6.3 - Fisheries	6	1,103	2,099	983	892	588	5,665	3%
1	1.6.4 - Livestock	9	1,602	1,646	1,793	1,956	2,145	9,142	4%
1	1.6.5 - Forestry	6	1,635	1,587	1,574	1,625	1,500	7,921	4%
	TOTAL	78	29,272	34,240	41,141	47,163	51,477	203,294	100%

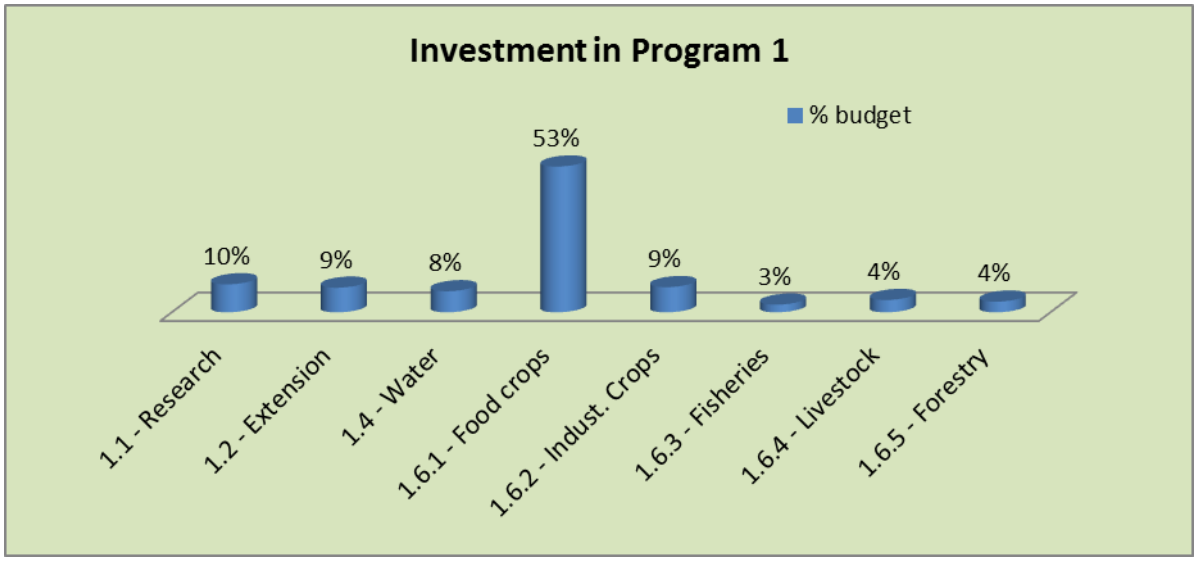
As expected, more than 50% of investment has been allocated to the accelerated production of food and horticultural crops. Nine percent has been allocated to extension services and industrial crops. Figure 5 is a graph of investment allocations for Program 1. Note that there appears to be under-investment in fisheries, livestock and forestry. However, with the development of TLARDI and the completion of sub-sector Master Plans, this scenario is likely to change. Another reason for low investment in the fisheries sub-sector is the new development partner-supported aquaculture project.

The main reason that Component 1.6.1 (food crops) has been allocated over 50% of the budget for Strategic Objective 1 is because about 80% of the total budget ($86.0 million out of $107.5 million) is for the cost of direct 100% farmer subsidies in the form of seed, chemicals, fertilizer, and fuel for tractors. The policy issue of farmer input subsidies is currently being reviewed by MAF and the Government of Timor-Leste. Therefore the MTOP

has been based on the assumption that these subsidies will continue during the period 2014-2018. However, many expect that Government will move towards a reform of farmer subsidies over the next three years and therefore overall budget allocations across all the agricultural sub-sectors will change considerably. The most probably outcome of such a decision will be a re-allocation of budget from Component 1.6.1 to other production focused sub-sectors. As demonstrated in Figure 5, the fisheries, livestock and forestry sub-sectors seem to be under-funded when compared with the budget allocated to food crops, even though it is recognized that increased food crop production is an immediate and urgent and objective for Timor-Leste's agriculture sector.

An alternative approach, possibly to be piloted through the Sustainable Agricultural Productivity Improvement Project (SAPIP), is to reconfigure on a time-bound basis the subsidies into grants to support the development of the capacity of farmers' groups and organizations in terms of improved farm productivity and commercial orientation. The progressive strengthening of farmer organizations would under this view pave the way for a subsequent reorientation of resources to support improved natural resource management, extension services, R&D, rural production infrastructure, and the strengthening of an enabling environment for private sector investment. Under the latter scenario, a revision of the MTOP and the MTIP would result in a redistribution of investment needs from Sub-Program 1.6 (component 1.6.1) to Sub-Programs 1.2, 2.3, 2.4, 2.5, and 2.6.

Figure 5: Percent allocation of investment in Program 1



Program 2: Improved market access and value addition

Access to markets – both domestic and export (including niche markets) – is crucial to realize the benefits of surplus production. In addition, every effort should be made to encourage at least partial processing of primary products to increase the value of producers' share of the consumer price for the final products, as well as substituting for some imports.

The aim of Program 2 is to: (i) enhance market access and profitability through sustained competitiveness and value addition; (ii) provide effective and efficient service delivery in agricultural sectors input supply chains; (iii) improve agro-processing and marketing; and (iv) replace imports with domestically-produced products – mainly food.

If small producers are to be empowered to play a constructive role in the development and transformation of the agricultural sector, they will require access to production inputs and support services. Thus it will be necessary to improve and expand existing support services and supply chains to meet the requirements of all types of agricultural producers. Program 2 has five Sub-Programs, namely: (i) improving quality assurance and safety standards; (ii) increasing access to and use of high quality inputs; (iii) product diversification and value addition; (iv) provision of rural market infrastructure and promotion of collective marketing; and (v) private sector engagement in agricultural marketing.

Sub Program 2.1 - Safety standards and quality control

The objective of this Sub-Program is to develop and implement safety standards and quality control assurance systems across the full range of crop, livestock, fisheries, and forestry products. This is because the quality of agricultural commodities produced in Timor-Leste is generally quite poor. This reduces farm incomes and competitiveness in domestic and international markets. Food safety is another issue of concern.

Sub-Program 2.1 will focus on grading and quality assurance, and safety standards for inputs and outputs. Quarantine and quality control will be essential in order to develop new agricultural industries, particularly those with export potential. Improving MAF's capacity to for enforce safety standards and quality assurance will be key activities in this Program.

The formulation of policies and laws, and administration of regulations related to phyto-sanitary standards, agricultural chemicals and animal and plant quarantine, are generally accepted as being important public sector functions. Attention to phyto-sanitary standards, legislation and quality assurance procedures (such as certification) for potential export commodities, will be a prudent investment with a long term view to improving access for Timorese agriculture products to international markets.

The pillars of action for the proposed investments are:

- establishment of effective quarantine services, and green house and laboratory facilities;
- establishment and enforcement of sanitary and phyto-sanitary protocols;
- establishment and management of a data base to manage standards and quality records;
- updating legislation and regulations;
- disease surveillance and identification of diseases of concern in countries which import products originating in Timor Leste;

- setting standards, and regularly monitoring and inspecting agricultural produce;
- building community awareness of the importance of safety standards and quality control; and
- carrying out training, and strengthening the capacity of quality-testing laboratories and other facilities.

The proposed projects in this Sub-Program and associated investments are presented in Table 16. As with other Sub-Programs, investments in infrastructure development and capacity building are outlined Sub-Programs 3.6 and 4.2, respectively.

Table 16: Investment for safety standards and quality control

SO	SP	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	TOTAL
2	2.1	DNQBS	Establishment of sanitary and phyto-sanitary protocols, standards and databases	100	100	100	100	100	500
2	2.1	DNQBS	Plant, animal, fisheries pests and disease surveillance, identification of pests and diseases	100	80	60	60	60	360
2	2.1	DNQBS	Inspection of agricultural products	45	45	45	45	45	225
2	2.1	DNQBS	Building community awareness on the importance and provision of quarantine information	100	80	60	60	60	360
2	2.1	DNQBS	Participation in bilateral and multilateral forums	50	50	50	50	50	250
2	2.1	DNQBS	Establishment and enforcement of legislation related to quarantine	45	45	45	45	45	225
2	2.1	DNQBS	Facilities to enforce SPS standards						
			TOTAL	440	400	360	360	360	1,920

Sub-Program 2.2 - Promotion of quality inputs

The aim of this Sub-Program is to promote access to and use of high quality inputs, seed, planting and stocking materials, and fishing equipment.

Agriculture in Timor-Leste is characterized by very limited use of modern inputs, resulting in low yields by international standards. Therefore the focus of this Sub-Program is to raise awareness amongst producers of the value of adopting high quality inputs such as fertilizers, seeds, planting materials, and small-scale equipment; and to ensure that farmers have access to these inputs. This is expected to involve: (i) strengthening the regulatory framework for input supply businesses; (ii) improving business supply investments and improving the capacity to supply; and (iii) building the capacity of public sector organizations involved in input supplies - at least until the private sector can take over this role as subsidies decline.

The pillars of action for the proposed investments are:

- seed (maize, rice, legumes, groundnuts, vegetables), seedling (coffee, coconut, trees, cocoa, fruit trees), and planting materials (cassava, sweet potato) acquisition, multiplication and distribution;
- supply of fishing equipment;
  community-based seed multiplication and seedling nurseries; and
- production and distribution of fish fingerlings.

The investments in for Sub-Program 2.2 for seed and planting materials (see above, first pillar of action) basically reflect the current commitment of Seeds of Life. This Program, which focuses on seed multiplication and seed system development for food crops, will finish at the end of 2015. Funding to continue these activities in 2016-2018 has been included in Sub-Programs 1.1 (Table 5) and 1.6.1 (Table 10). This covers most of the investment for the multiplication and distribution of seedlings (industrial crops, fruit and forest trees). Fertilizer is currently distributed mainly through MAF, and has been included in Component 1.6.1. Investments for the supply of subsidized fishing equipment and fish fingerlings has been allowed for in Component 1.6.3 – see Table 12.

There is very little involvement of the private sector in supply and distribution. This is an area to which MAF will devote more attention and support. As discussed above, one of MAF's strategic objectives is to increase investment to foster the private sector, co-operatives and farming communities in the planning, implementation and delivery of these much-needed services.

Sub Program 2.3 - Promotion of diversification and value addition

The objective of this Sub-Program is to promote product diversification (including exploitation of niche markets) and value adding activities.

Timor-Leste is an exporter of mainly unprocessed commodities – coffee, timber, live cattle, grain legumes, and candlenut. Thus, projects under this Sub-Program will: (i) study the value chains of all major commodities; (ii) identify and promote options for value addition; and (iii) exploit opportunities for specialized niche markets (mainly organic products). The outcome is expected to: (i) encourage increased public-private partnerships in agro-processing; (ii) generate and disseminate profitability information for enterprise selection; and (iii) develop capacity for business development services. It will be important to not only analyze value chains but to also identify potential participants in the innovation systems along value chains, in order to develop effective and comprehensive commodity support activities.

The pillars of action for proposed investments are:

- development and promotion of small-scale agro-industries for soya bean, banana and coconut (extractive industries);
- promoting food processing and post-harvest technologies for livestock and fish products;
- developing and promoting small-scale agribusiness for maize products;
- identification of potential markets; and collection, analysis and dissemination of market information for agricultural commodities;
- revitalizing agricultural cooperatives for inputs distribution and product marketing; and
- promoting of non-timber products including small holder honey production.

The proposed projects and the investments required to support this Sub-Program are presented in Table 17. The only product diversification projects proposed are the intercropping of cocoa under coconut plantations, and the promotion of non-timber forest products.

Table 17: Investment in agribusiness and value addition

SO	SP	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
2	2.3	DNPIAC	Development of small scale agro-industries for soya beans	37	55	68	74	89	323
2	2.3	DNPIAC	Development and promote small industries for banana	32	45	58	64	74	273
2	2.3	DNPIAC	Development and promote small scale agribusiness for maize	27	42	55	57	67	248
2	2.3	DNPIAC	Collection and analysis of market information for agricultural commodities	20	30	37	45	55	187
2	2.3	DNPIAC	Revitalizing agricultural co-operatives	32	45	57	52	65	251
2	2.3	DNPIAC	Development and promote small scale coconut extraction industries	34	50	66	67	80	297
2	2.3	DNPIAC	Development and promote small scale for fish processing industries	24	36	47	59	69	235
2	2.3	DNPIAC	Promotion of small holder meat processing (smoked beef)	24	37	37	47	59	204
2	2.3	DNPIAC	Promotion of small scale honey production	26	37	47	49	59	218
2	2.3	DNF	Promotion of non timber products	93	102	107	113	119	534
2	2.3	DNPSE	Food processing and post harvest technologies	20	42	56	35	12	165
			TOTAL	369	521	635	662	748	2,935

Sub Program 2.4 - Rural infrastructure and collective marketing

The objectives of this Sub-Program are to: (i) improve marketing strategies and associated infrastructure to help preserve the quality of marketed products and to improve product processing; (ii) reduce marketing costs; and (iii) assist producers to increase their benefits from commercialization. This Sub-Program will focus on: (i) product storage structures; (ii) post-harvest handling; (iii) promoting and/ or improving market buildings and infrastructure; (iv) developing abattoirs and butchering units; (v) establishing product collection points; and (vi) in cooperation with other ministries and projects, facilitating improved farm-to-market access roads. The approach will be to initiate pilot projects on rural market infrastructure improvement, followed by the scaling-up of best practices for rural market development.

IFAD is currently funding an on-farm, small-scale maize storage project. This project is distributing 200 litre new fuel drums to maize growers to reduce weevil damage without the use of agro-chemicals. The drums are suitable for all types of cereals and legumes and will generate a vital contribution to household food security by reducing crop losses, and increasing farm incomes by allowing farmers to sell product after harvest periods when prices are high. The IFAD-funded project will run up to 2016 and the estimated cost to continue this project is shown in Table 18.

Despite the importance of improved rural infrastructure, there are no other projects proposed for this important Sub-Program. However, improved market orientation and increased small holder commercialization will require additional investments in this area, as without this investment it will not be possible to commercialize Timor-Leste's small holder production

systems. This is a deficiency in the MTOP which will need to be addressed during annual revisions and in consultation with sector stakeholders, including development partners.

Table 18: Investment in rural infrastructure

SO	SP	DIRECTORATE	PROJECTS TITLE	2014	2015	2016	2017	2018	TOTAL
2	2.4	DNAH	Maize storage *				1,740	2,500	4,240

* investments in 2014 to 2016 funded by IFAD

Sub Program 2.5 - Marketing and support for farmer groups

The aim of this Sub-Program is to facilitate the marketing of agricultural inputs and products through farmers' groups and farmers' associations. Collective marketing is, in many respects, the most logical way to empower rural producers in Timor-Leste. By working together producers can identify members' needs, consolidate demands, aggregate economic power, and address market failures.

The pillars of action for proposed investment are:

- marketing and trading agricultural products;
- sales/acquisition of agricultural inputs (seeds, fertilizers, credit, pesticides, farm tools, veterinary drugs, nets and fishing equipment, etc.);
- transport of agricultural products from farm to market; and,
- dissemination of market information.

Agriculture cooperatives can be effective ways to support small holders. Therefore establishment of collective actions and product-focused cooperatives in Timor Leste's agriculture sector will be supported and encouraged. Support to marketing cooperatives will be part of this effort because at present MAF has very limited activities which promote collective marketing.

All projects proposed in the MTOP will be implemented through farmer groups. Supporting the formation and effective functioning of farmer groups are implicit activities for the extension services. The costs of forming farmer groups have been incorporated in various projects and Sub-Programs and proposed investment in a project to continue with this initiative is presented in Table 19. Only one NGO is implementing projects which focus on livelihood improvement through linking farming communities to markets. This important activity needs to be continued and could possibly be incorporated in the proposed Directorate of Agribusiness and Marketing. When revising this MTOP, additional resources should be committed to support this important Sub-Program.

Table 19: Investment in rural market development

SO	SP	Directorate	PROJECTS TITLE	2014	2015	2016	2017	2018	Total
2	2.5	DNPIAC	Livelihood improvement through linking farming communities to market	2,075	2,075	1,000	1,000	500	6,650

Sub-Program 2.6 - Promotion of private sector engagement

The aim of this Sub-Program is to promote private sector engagement in input supply and product marketing, including processing and value addition. This is because the TLSDP anticipates that the private sector will be the primary source of growth in income generation and employment in Timor-Leste's rural areas.

The private sector has a vital role to play in the development of agriculture – including fisheries and forestry in areas such as rural infrastructure development, transport, storage, manufacturing and processing, marketing, contract services, and the supply of inputs. Therefore the focus of this Sub-Program will be on creating an enabling environment for private sector participation, facilitating public-private partnerships, and providing necessary skills and support.

However, there are currently no clearly identified projects for this Sub-Program. This is a deficiency in the MTOP which can be rectified. A new Department will be formed to support Agribusiness and Marketing under MAF's proposed new organizational structure. Once this Department is established and priorities have been identified, it will be possible to formulate projects for this important Sub-program and the required investment can be incorporated into the MTOP.

Table 20: Investment in promotion of private sector

SO	SP	Directorate	PROJECTS TITLE	2014	2015	2016	2017	2018	Total
2	2.6	DNPIAC	No planned activities						-

Total investment in Program 2

The total investment required to support Program 2 is summarized in Table 21.

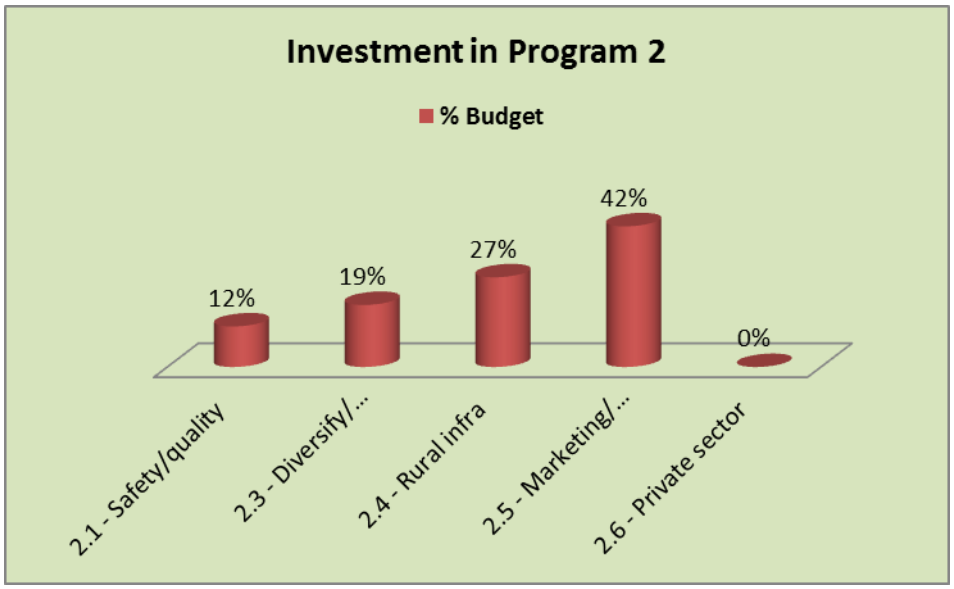
Table 21: Total investment in Program 2

SO	SP	Projects	2014	2015	2016	2017	2018	5 years	% Budget
2	2.1 - Safety/quality	7	440	400	360	360	360	1,920	12%
2	2.3 - Diversify/ value add	11	369	521	635	662	748	2,935	19%
2	2.4 - Rural infra	1	-	-	-	1,740	2,500	4,240	27%
2	2.5 - Marketing/ groups	1	2,075	2,075	1,000	1,000	500	6,650	42%
2	2.6 - Private sector	1	-	-	-	-	-	-	0%
TOTAL		21	2,884	2,996	1,995	3,762	4,108	15,745	100%
Note: excludes investments from development partners.									-

In terms of overall investment in Program 2, little is planned to: (i) build essential rural market infrastructure; (ii) reduce post-harvest losses (with the exception of maize); and (iii) support private sector investment in input supply and product marketing, including processing and value addition. Figure 6 shows the percentage allocation of investments across the six Sub-Programs in Program 2.

In the past MAF, its supporting development partners, and NGOs, have invested in the establishment and promotion of farmer groups, but mainly for the delivery of subsidized production inputs. Only a small proportion of existing farmer groups are engaged in market-related activities. This situation will need to change if Timor-Leste's rural communities are to 'enter the commercial world' and become agri-business investors in their own right.

Figure 6: Percent allocation of investment in Program 2



However, planned investments in Program 2 focus mainly on improving the role and effectiveness of the public sector, and supporting NGOs and development partners as distributors of production inputs. Diversification in terms of building and supporting other input suppliers is limited. In addition it will be important to invest in the study the value chains for important products. Some progress has been made in this area by projects and programs which have been supporting small business development, and therefore it may only be necessary to collate published information.

In terms of providing necessary rural market infrastructure, including appropriate structures to reduce post-harvest losses, some initial investment has been completed in the form of farm-level maize storage. However, other products have been ignored. This area also needs increased investment, particularly increased rice milling efficiency, and the storage of more perishable foods stuffs such as dried vegetables and fruits.

Connecting primary producers with knowledge and service providers is an essential pre-condition for the small holder agricultural transformation process. As outlined in the TLSDP, business development centers (IADE), which also focus on agribusiness needs, will be established in all districts. In summary, strong linkages and working relationships will need to be established in order to achieve this Program's objective.

Program 3: Improved enabling environment

Good policies and their effective implementation are crucial for the development of Timor-Leste's agriculture sector. Therefore the aim of this Program is to provide sound policy analysis and advice, and to contribute to the effective implementation of revised policies which focus on critical issues and constraints which are presently confronting the agricultural sector.

This Strategic Objective deals with the policies, institutions, legislation, and necessary systems and procedures which are required to facilitate the agricultural transformation process. Policy development and institutional arrangements will be extremely important as agriculture, fisheries, and forestry development relies heavily on the development and implementation of enabling and supportive policies. For example, Timor-Leste is currently importing about 50,000 Mt of rice per annum to feed the nation, whilst at the same time investing in irrigation infrastructure – in an agricultural environment in which local rice markets are not functioning and there are limited incentives for farmers to produce surpluses.

This section of the MTOP also presents a summary of the infrastructure investments required to implement the MTOP over the next five years, commencing in 2014. This information has been included because even though agriculture infrastructure will be funded through the Infrastructure Fund, it is important for the sake of completeness that this information is included in the MTOP.

Sub-Program 3.1 - Policy framework and capacity for policy analysis

The aim of this Sub-Program is to establish functional, clear and accountable policy and legislative frameworks and capacity for policy analysis. This will focus on the identification and analyses of critical policy constraints and issues which are currently affecting all agricultural sub-sectors.

Key agricultural policy topics to be analyzed include: (i) import substitution; (ii) export promotion; (iii) irrigation and water allocation; (iv) legislation and regulations on veterinary public health; (v) quarantine and animal diseases; (vi) land tenure support for production activities; (vii) productive input subsidies; and (viii) public sector marketing arrangements.

The pillars of action for the proposed investments are:

- conducting analysis of key policy issues, followed by policy advocacy;
- proposing and supporting evidenced-based revision of existing inappropriate and restrictive policies and regulations;
- drafting new laws, policies and regulations needed for agricultural transformation; and
- submission of the draft laws, policies and regulations to the council of ministers, followed by facilitation of the approval process.

Sub-Program 3.1 will have one specific project – investment to improve policy frameworks (see Table 22). Note, however, the cross-cutting connection between the role of TLAAC, which is a core project in Sub-Program 4.1, and the activity listed for Sub-Program 3.1. The descriptions of the projects to be funded through these two Sub-Programs should be read together as these projects are complementary in that they will all contribute to improved agriculture policy analysis, advocacy, policy change and implementation.

Currently there is no capacity within the DNPP to conduct meaningful policy analyses, or to advocate and support changes. There is an urgent need to revitalize this Directorate (recruit skilled and qualified staff along with the budgetary support) so that it can contribute effectively to the policy formulation process in Timor-Leste. Investments to support this process are presented and discussed under Program 4.

Table 22: Investment in improved policy frameworks

MP	STO	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
3	3.1	DNPP	Improved policy frameworks	100	100	50	50	50	350

Sub- Program 3.2 – Program coordination

The objective is to ensure coordination responsibilities are fulfilled in a coherent manner leading to improved implementation and management of sector policies and programs. This is because there is a need to follow up the implementation of new and existing policies, provide feedback to policy makers, and identify and address constraints related policy implementation. As a matter of priority there will need to be critical reviews of current policies to assess their effectiveness and to draw lessons for future planning.

The pillars of action for the proposed investments are:

- coordination of policy formulation and implementation processes;
- reviewing existing laws and policies to assess performance; and
- incorporation of the lessons learned in the future design and implementation of laws, policies and regulations.

Under this Sub-Program, the DNPP will implement a project on planning, policy analysis and review in order to improve the planning, implementation and management of sector policies and programs. The investment required is listed in Table 23, plus support for TLAAC under Sub-Program 4.1.

The activities to be completed by the DNPP will include: (i) wider dissemination and internalization of the MAFSP; (ii) leading and assisting with annual planning and budgeting to ensure that these documents are in line with the TLSDP and the MAFSP; (iii) review, consolidation and finalization of MAF's annual work plan and budget; and (iv) periodic review and updating of the MTOP. Additional resources for policy review and associated technical assistance are provided under the Program 4, and in particular, funding for TLAAC.

Table 23: Investment in Program coordination

MP	STO	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
3	3.2	DNPP	Program coordination	125	150	150	100	100	625

Sub-Program 3.3 - Agricultural statistics and data bases

The objective is to establish and maintain a functional agricultural statistics system which can provide timely and appropriate information for sector stakeholders, and assist MAF's planning and management activities. This system is urgently needed as at present reports on agricultural achievements (including targets reached) indicate major data inconsistencies and inaccuracies. There is considerable doubt about the accuracy of the data and information which MAF has at its disposal for planning and reporting purposes and this situation presents a serious constraint.

Market opportunities are not often developed due to lack of information. The quality, cost and timely availability of market information seriously affects the competitiveness of many participants in the agri-food system. In addition, market and price risks can be reduced through accurate and timely market information.

This Sub-Program will collect, manage and distribute quality data and information to all stakeholders in order to facilitate better planning and decision making. This process will also contribute to the development of a national food and agricultural statistics system which can be used to monitor food supplies and to generate national accounts.

The pillars of action for the proposed investments are:

- establishing and managing a unified, centralized data base within MAF;
- planning and implementing an agricultural census[8];
- regularly updating data sets to assist with decision making; and most importantly
- monitoring and evaluating MAF's programs and projects.

Three specific projects are planned: (i) a unified and centralized database; (ii) a national agriculture census; and (iii) the establishment of a data and information system for the livestock sub-sector. The required investments are presented in Table 24. Resources requirement to support monitoring and evaluation activities are presented in Program 4.

[8] The preparation and implementation of an agricultural census is being debated, including the required institutional arrangements. Once MAF's responsibility for implementation of the census has been determined, the figures in Table 24 will be revised.

Table 24: Investment in agricultural statistics and databases

MP	STO	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
3	3.3	DNPP	Data collection, establishment and management of a unified and centralized database	370	980	90	97	97	1,634
3	3.3	DNPP	Plan and implement an agricultural census	250	750				1,000
3	3.3	DNPV	Establishment of data and information system for livestock development	84	21	92	24	102	323
			TOTAL	704	1,751	182	121	199	2,957

Sub-Program 3.4 - Climate information and analysis

The objective is to improve decision-making for planning and budgeting by providing accurate and up-to-date climate information and trend analyses. This is because improved climate information and predicted impacts will be key inputs into the planning of future climate change adaptation strategies.

The pillars of action for the investments are:

- acquisition, management and utilization of agro-meteorological data;
- GIS analyses;
- documentation of vulnerabilities, and coping mechanisms, used by small holders;
- improved climate forecasts, and improved capacity to integrate climate change issues in planning;
- data collection on river systems, and collection of data and preparation of an inventory on irrigation potential;
- development of a national farmers' registration system; and
- maintenance of facilities and supplies, and data base management.

Proposed projects and the associated investments are presented in Table 25. Strengthening of MAF's GIS and remote sensing services to provide accurate and reliable information for informed decision making will be a key project in this Sub-Program.

Table 25: Investment in agro-meteorological and geospatial data

SO	SP	DIRECTORATE	PROJECT TITLE	2014	2015	2016	2017	2018	Total
3	3.4	DNPP	Agro meteorological data acquisition and management, and GIS Analysis	300	300	300	300	300	1,500
3	3.4	DNIGUA	Data collection on river irrigation potential (12) for agriculture; and data inventory on irrigation potential	500	550	605	660	730	3,045
3	3.4	DNPSE	Maintenance of facilities, database management and supplies	180	200	218	240	264	1,102
3	3.4	DNPP	National farmers registry systems	150	-	-	-	-	150
			TOTAL	1,130	1,050	1,123	1,200	1,294	5,797

Sub-Program 3.5 - Early warning system

The aim is to develop an early warning and weather monitoring system to help mitigate the impact of, and adaptation to, climate variability. Agriculture by definition is an industry

which is confronted by risk in the form of climate variation, attacks from pests and diseases, and price risks, as well as natural disasters such as drought, floods and cyclones.

Therefore a comprehensive risk management strategy and an early warning system which includes adequate access to and utilization of timely, accurate, relevant and free information on weather, in conjunction with recommended mitigation strategies, is critical to combat the effects of climate variability and to ensure food security.

The DNPP is currently receiving assistance from FAO for its Food and Nutrition Security Task Force (FNSTF). This unit requires support from an early warning system which has been designed but not funded. Therefore this Sub-Program includes an investment in such a system which is called the National Information – Early Warning System (NIEWS). The funding needed to support this project is outlined in Table 26. In addition there will be a project to improve the local enforcement of SPS standards.

Table 26: Investment in an early warning system

SOB	STO	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
3	3.5	DNPP	National information - early Warning System (NIEWS)	88	94	111	114	119	526
3	3.5	DNQBS	Establishment of facilities to enforce SPS standards	535	138	93	50	50	866
			TOTAL	623	232	204	164	169	1,392

Sub-Program 3.6 – Summary of infrastructure requirements

Various types of infrastructure will be required to support project implementation. These have not been included in the Sub-Program investment plans because funds to cover MAF's infrastructure development program will be sourced from the Infrastructure Fund, and therefore will be subject to standard appraisal and feasibility analysis. However in the interest of completeness, Sub-Program 3.6 which is a summary of MAF's infrastructure requirements over the next five years has been included in the MTOP.

As detailed in Table 27, the DNAH (food crops and horticulture) and DNIGUA (water and irrigation) will require the largest infrastructure investments – 36% and 29% respectively. Large investments in irrigation rehabilitation are understandable, but it is not immediately apparent why the DNAH intends to invest nearly $50 million in plant protection laboratories. This will be reviewed and revised when the MTOP is first updated in about a year's time.

Table 27: Investment in infrastructure to implement MAF's mandate

Item	SO	SP	Directorate	PRPJECT TITLE	2014	2015	2016	2017	2018	Total	%
1	3.6	1.6.5	DNF	Facilities and infrastructure	3,800	800	675	400	400	6,075	4%
2	3.6	1.2	DNFA	Construction and maintenance of agricultural technical schools and laboratories	8,600	5,481	363	399	438	15,281	11%
3	3.6	1.1	DNPSE	Basic infrastructure development for R&D	-	250	500	550	500	1,800	1%
4	3.6	1.6.1	DNAH	General supportive Infrastructure	1,200	1,300	1,200	90	800	4,590	3%
5	3.6	1.6.1	DNAH	Plant protection laboratories	1,530	21,610	11,870	7,450	7,405	49,865	36%
6	3.6	1.6.1	DNAH	Infrastructure for horticulture centre	850	1,100	900	1,000	1,300	5,150	4%
7	3.6	1.2	DNADCA	Extension infrastructure Development	1,050	1,575	1,575	1,525	1,525	7,250	5%
8	3.6	2.1	DNQBS	Facilities to enforce SPS standards	535	138	93	50	50	866	1%
9	3.6	1.6.4	DNPV	General infrastructure for livestock development	204	180	3,390	1,416	1,444	6,634	5%
10	3.6	1.4	DNIGUA	Infrastructure - approved irrigation rehabilitation	9,440	20,358	10,918	-	-	40,716	29%
				TOTAL	27,209	52,792	31,484	12,880	13,862	138,227	100%

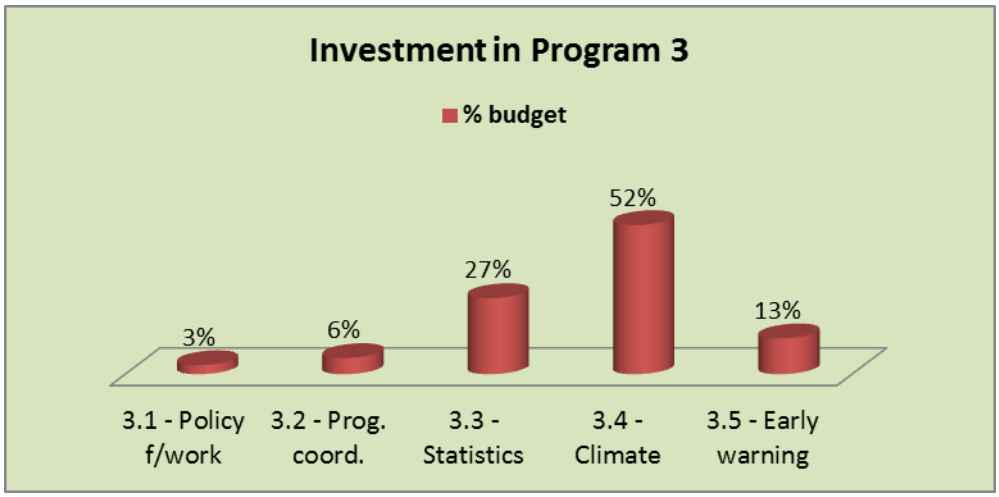
Total Investment in Program 3

The total investment needed to implement Program 3 over the five year period is about $11 million, excluding investment in infrastructure (see Table 28 and Figure 7). Note that there are considerable investment allocations for policy analysis and implementation under Program 4 as well. Twenty seven percent of the proposed Program 3 budget has been allocated to the establishment and maintenance of a functional agricultural statistical system, and about 50% to the collection, management and utilization of agro meteorological data (including an inventory on irrigation potential). The early warning system will require about 13% of the Program 3 budget.

Table 28: Total investment in Program 3

SO	SP	Projects	2014	2015	2016	2017	2018	5 years	% budget
3	3.1 - Policy f/work	1	100	100	50	50	50	350	3%
3	3.2 - Prog. coord.	1	125	150	150	100	100	625	6%
3	3.3 - Statistics	3	704	1,751	182	121	199	2,957	27%
3	3.4 - Climate	4	1,130	1,050	1,123	1,200	1,294	5,797	52%
3	3.5 - Early warning	2	623	232	204	164	169	1,392	13%
	TOTAL	11	2,682	3,283	1,709	1,635	1,812	11,121	100%

Figure 7: Percentage investments in Program 3



Program 4: Organizational Development of MAF

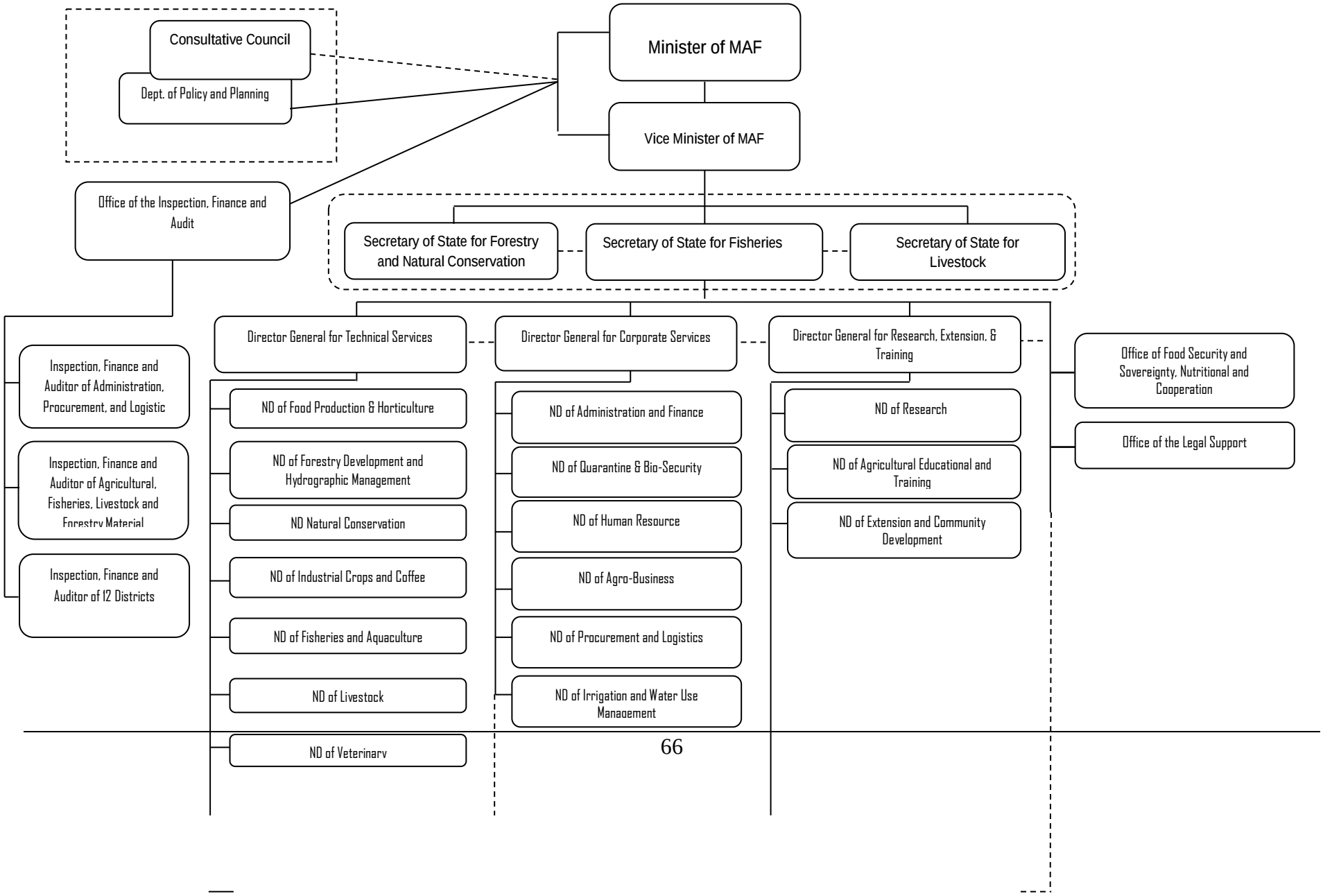
The aim of this Program is to transform MAF to enable the Ministry to function as a modern, efficient, client-oriented, impact-driven, accountable organization which is equipped to provide services and deliver the TLSDP and the MAFSP targets. Within MAF a framework of good governance to build a coherent, customer-oriented and transparent agricultural sector must be a top priority in order to ensure a sound foundation to achieve strategic and developmental goals and targets. Therefore the overall objective of this Program is to strengthen the organizational framework and institutional arrangements through which MAF delivers its mandate, and supports agricultural development.

Sub-Program 4.1 – Support for MAF's reorganization and transformation

The objective is to support MAF to enable the Ministry to complete its transformation as expressed in the MAFSP. Good governance and an appropriate structure will ensure that MAF and its staff serve their intended purposes effectively under all conditions. This will require procedures, and transparent and accountable systems to be in place, plus incentives for enhanced work-place performance.

Subsequent to the development of the MAFSP, the Vth Constitutional Government is in the process of revising the decree law related to MAF's structure (see Figure 8).

Figure 8: MAF proposed structure (2014)



The salient features of MAF's proposed new structure are:

- consolidation of core and related functions: (i) research, development and extension; (ii) administrative and support services; and (iii) technical services, under three Directorate Generals;
- elevation of the FNSTF (with redefined roles and responsibilities) to report directly to the Minister;
- creation of an analytical capacity within MAF to facilitate effective decision making;
- creation of a Ministerial Agriculture Advisory Council (TLAAC) to advise the Minister on cross cutting thematic and sectoral policy issues; and
- redefining the roles and responsibilities of the National and District Directorates, and decentralization of decision-making processes

The pillars of action for the proposed investments are:

- establishing and operationalizing the Ministerial Agriculture Advisory Council (TLAAC);
- establishing and operating the Agricultural Research and Development (R&D) Institute (TLARDI), included in Sub-Program 1.1;
- developing a strategy and program for the newly created Food Security and Food Sovereignty Unit; and
- adequately staffing and supporting an elevated DNPP so that it can contribute effectively to policy and organizational development.

4.1.1. Ministerial Agriculture Advisory Council

The TLSDP indicates that by 2015 the Ministerial Agriculture Advisory Council (TLAAC) will be formulating national policies and overseeing their implementation (TLSDP, p.121). The Council will advise the Minister on the broader issues of agricultural and rural development and on issues which cut across other sectors and ministries, but which have implications on the sustainability and performance of the agricultural sector. The Agriculture Advisory Council will be embedded within MAF's organizational structure (Figure 8) and will provide guidance on policies and priorities, the latter with the objective of facilitating efficient resource allocation.

The reconstituted DNPP will serve as the secretariat for the Ministerial Agriculture Advisory Council. The Directorate will organize meetings, including the preparation of agendas and recording proceedings and decisions/recommendations. The Agriculture Advisory Council will meet three times a year at mutually agreed convenient times and locations including one meeting in a region.

Table 29 details the investment required to formulate and operationalize TLAAC; and to prepare a national food security and soverenity strategy, and associated food policy.

4.1.2. Agricultural Research and Development Institute

The proposed Timor-Leste Agricultural Research and Development Institute (TLARDI) will set priorities and conduct research, extension and technical training activities to facilitate agricultural transformation in Timor-Leste. The details of the proposed Institute will be defined during 2013, and staffing needs addressed with the objective of appointing a core team of research and extension specialists who are well-qualified and experienced. In addition, operational modalities will be established so that TLARDI staff can collaborate effectively with other Directorates in terms of improved service and extension delivery.

This institute will:

- prioritize strategic and adaptive research for all important commodities;
- conduct research, extension and technical training exercises, taking into consideration priorities expressed by farmers and other clients through the use of participatory approaches;
- strengthen the technical and delivery capacities of research, extension and technical staff;
- apply an holistic approach to research, extension and technical training;
- develop a permanent system for continuous staff training; and
- develop and utilize regional and international linkages (research institutes, universities, private sector and user organizations) for collaborative programs and enhancing knowledge exchange.

The estimated investment required to establish and operate TLARDI is outlined in Table 6 as this project best fits into Program 1.

4.1.3. Strengthening the National Directorate of Policy and Planning

DNPP's staff are over-loaded with routine compilation of data and the preparation of numerous and repetitive plans and reports. The Directorate does not have qualified staff to conduct analysis of contemporary policy issues and to provide much needed accurate data and information for decision making. A revitalized and capacitated DNPP will serve as the analytical arm of the Ministry for the analysis of broader agricultural developmental issues, and also as the Secretariat to the Agriculture Ministerial Advisory Council. The proposed functions of a strengthened DNPP operation as the LAAC Secretariat are:

- setting priorities and guidance for decisions on resource allocation;
- formulating (including advocacy) and overseeing the implementation of national agriculture policies;
- coordinating and implementing periodical reviews/ assessments of policy and program implementation (including impact studies);
- developing guidelines and best practice recommendations;

- coordinating bilateral and multilateral cooperation activities within MAF;
- housing and managing an information management system; and
- organizing "think tank" meetings as and when necessary.

Until fully-fledged capacity is established and TLAAC is constituted and functional, there will be a need for a full-time technical adviser to guide and facilitate analytical work and MAF's transformation process. This adviser will: (i) assist with the development of the Directorate; (ii) lead analytical studies, and in particular assist with the application of agriculture economics techniques in decision making, impact analysis and resource allocation; and (iii) mentor and provide on the job training for Directorate staff. The Directorate may also need specialist short term international technical assistance to complement the full-time advisor. The investments for this Sub-Program are presented in Table 29.

Table 29: Investment in agricultural policy advice and support for DNPP

SO	SP	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
4	4.1	DNPP	Support to ministerial advisory council - TLAAC	1,014	776	596	596	596	3,577
4	4.1	DNPP	Development of national food security and soverenity strategy; and food policy plus support for DNPP capacity building	250	100	100	50	50	550
4	4.1	DNPP	T.A for NDPP support	200	200	150	150	100	800
			TOTAL	1,464	1,076	846	796	746	4,927

Sub-Program 4.2 -Strengthening MAF's capacity

The objective is to design and implement a human resource development and capacity building strategy and program to enhance the productivity of MAF's staff. This is required because many developmental efforts have failed in the past due to lack of human capability. Based on core competency analysis, clear job descriptions and training needs assessment, MAF will therefore develop and implement a comprehensive capacity building strategy. This strategy will focus on long-term, degree-oriented training as well as short-term skills building, and increasing the skills of existing staff, all of which are important for enhanced agriculture productivity.

The most critical resources used by MAF are its human resources. Although over the years the number of staff in MAF has increased significantly (and currently stands at 2,247 personnel) the competency and skills needed to effectively support and deliver the MAFSP are still inadequate. Only 1% (19) of current staff have a MSc Degree and there is only one PhD holder in the entire Ministry. About 20% of staff have a Bachelor's degree. The vast majority of staff (61%) only have 12 years of schooling. The newly appointed Suco Extension Officers (SEOs) have very limited technical and extension skills. Proposed institutes (Agricultural Service Centres, Training Institutes, etc.) also need well qualified staff. In addition, the Ministry is also in the process of re-deploying a major proportion of its staff to the districts.

Currently, and based on National Directorate's mission statements, capacity building activities are planned and implemented within each Directorates. For example in the DNPP short courses are conducted on a yearly basis on the following topics: (i) monitoring and evaluation; (ii) statistics; (iii) food security; (iv) international cooperation; (v) planning and finance; and (vi) agro-meteorology. Simultaneously, long-term degree-oriented training is planned in the following disciplines: (i) agricultural economics; (ii) applied statistics; (iii) food security and nutrition; (iv) agro-climatology (v) remote sensing; and (vi) rural development. The planned investment to strengthen the capacity of MAF's staff is presented in Table 30.

Table 30: Investment in training and capacity building

SOB	STO	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
4	4.2	DNPP	Training and capacity strengthening	303	392	598	624	540	2,457
4	4.2	DNQBS	Training and capacity strengthening	50	50	50	50	50	250
4	4.2	DNPA	Training and capacity strengthening	130	138	150	259	244	921
4	4.2	DNFA	Training and capacity strengthening	220	242	266	293	322	1,343
4	4.2	DNF	Training and capacity strengthening	235	187	205	225	247	1,099
4	4.2	DNPV	Training and capacity strengthening	44	100	145	200	268	757
4	4.2	DNPSE	Training and capacity strengthening	220	242	466	513	564	2,005
4	4.2	DNAF	Training and capacity strengthening	300	300	300	300	300	1,500
			TOTAL	1,502	1,651	2,180	2,464	2,535	10,332

Currently the training offered to MAF's staff is an uncoordinated effort and is generally determined by opportunities. There is an urgent need to conduct a Ministry-wide training needs assessment to establish training requirements, and to formulate and implement a program of technical capacity building, including leadership development.

In order to deliver the services demanded by key stakeholders (farmers), MAF needs to have the right number of staff, with the appropriate levels of qualifications, and based in the 'right' locations places. Therefore it will be important to develop a long-term training and capacity building program which is demand driven and responsive to the identified needs of MAF's staff.

MAF will immediately embark on an aggressive human resources development program which incorporates short- and long-term activities, and skills-oriented programs. An initial investment (seed money) will be allocated in the 2014 budget to develop this plan. Appropriate annual operational budget allocations for subsequent years will be incorporated into the Investment Plan and applications made to the Human Capital Development Fund for funding. However, in the interim and to be cautious, it has been assumed that MAF will have to directly-fund the investments listed in Table 30.

Sub-Program 4.3 - M&E Strategy

The objective of this Sub-Program is to develop and implement a Ministry-wide M&E strategy and program. This is because the ability to define, measure and evaluate performance is an essential condition for an organization's improvement and accountability. The

mechanisms currently in place to review and evaluate MAF's performance are various periodic reports which generally focus on activities, financial expenditure, deliver of subsidized inputs, etc. with very little impact analysis or reporting at the outcome and output levels.

Monitoring and evaluation of MAFs activities and programs is currently the responsibility of the DNPP. In addition, other Directorates also undertake the monitoring and evaluation of their respective activities. The investment required for MAF to be able to operate an effective, efficient and reliable M&E system during the MTOP the period is presented in Table 31.

Table 31: Investment to support M&E

SOB	STO	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	TOTAL
4	4.3	DNPP	Monitoring and Evaluation system for all projects and programs	280	250	275	300	330	1,435

At present, very little effort is being made to monitor and report on outcomes and impacts. There is also very little evidence that monitoring information is used for management, planning and decision making. Therefore MAF will use the TLSDP, the MAFSP, and the MTOP as a guide to develop a strategic results framework and an integrated M&E system with relevant sets of indicators, leading to a needs-based M&E system. This will: (i) identify data collection methods and frequency; (ii) define which Directorate will collect the data; and (iii) describe how the data will be stored, managed and used. Each project will have its own results framework with an M&E component as an integrated part of overall planning and implementation. This M&E system will cater for the needs of all decision makers in MAF.

Establishing a needs-based M&E system to monitor the implementation of projects and programs, and to obtain feedback from stakeholders, is critical for accountability purposes. As a part of this program it will be necessary to define progress, results and outcome indicators for projects and programs. This should be closely linked to the MAFSP log-frame and to the national-level annual targets sets by the various Directorates. The measurement of and reporting of these indicators should complement present reporting systems.

In designing such a system it will be necessary to: (i) establish statistical baselines to monitoring progress (including agronomic, economic and social variables); (ii) develop procedures to obtain feedback on programs and projects from farmers and other stakeholders; (iii) put in place an evaluation system which considers not only implementation progress but also measures social and economic impacts. If possible, it will be constructive and useful to include Cost-Benefit or Rates of Return analyses when projects are designed as pilots and when projects are associated with significant investment, such as irrigation refurbishment and nation-wide crop promotion activities. This type of assessment/evaluation will provide decision makers with important criteria with which to evaluate future investment programs.

It will be important to ensure that each project and/or Program has its own log-frame, and that responsibilities for overseeing the implementation process (and therefore M&E) are established: First by Program, then by Sub-Program and finally by Project. An essential step in the implementation process is a review of Program indicators in the log-frame, followed by translation from the Sub-Program level down to 'lines of action' or Projects. It will also be important to review targets periodically, and to change some indicators.

Sub-Program 4.4 - Support to develop complementary strategies

The aim of this Sub-Project is to develop a series of strategies and programs which will improve MSAF's ability to maintain a pool of qualified and skilled staff which is supported with systems which encourage knowledge sharing and constructive partnerships, efficient resource allocation, and respect for the Ministry's gender strategy.

Therefore, this Sub-Program has five components: (i) human resources policy and practices; (ii) knowledge management and communications; (iii) partnerships; (iv) resources mobilization; and (v) gender.

Component 4.4.1: HR policy and practices

Along with the human resources development plan (Sub-Program 4.2) the current human resource management strategy and policy will be reviewed and updated. This will ensure staff retention and provide the necessary incentives, including improvement in the conditions of service, to enhance the productivity of human capital. MAF will also assess its human resources requirements (including in management areas) to implement the TLSDP and the MTOP, and ensure that its pool of human resources reflects the newly proposed structure and organization. The Ministry will then develop a plan for human resources development which includes staff development and appropriate incentives (training, salary scales, incentives, etc.).

Appropriate investment has been included in the 2014 budget (Table 32) to complete this exercise. An operational budget for human resource management will be included in the Investment Plan for subsequent years, based on the output from this study. However the fund allocations shown in Table 32 include forward estimates for the sake of completeness.

Component 4.4.2: Knowledge management and communication

This Component will focus on two important requirements for an efficient MAF, namely knowledge management and communications. The aim is to build an integrated and systematic approach to identifying, managing, and sharing agricultural knowledge and information. Effective linkages with knowledge generation processes are critical to carry out this function effectively. Key tasks will include the development of guidelines, and an institutional framework and processes for agriculture knowledge management.

An effective communication mechanism to widely distribute and share outputs, outcomes, lessons learned and best practices (in the form of an agricultural innovation system [AIS]) will be important to raise the visibility, impact, and accountability of MAF's investments

across the sector. MAF will also develop and disseminate targeted "promotional" materials for key stakeholders and knowledge users, including policy makers. Given the current funding scenario (MAF is under-funded compared with the Health and Education sectors in Timor-Leste) there is an urgent need for MAF to develop and implement a knowledge management and communication system which projects a positive and progressive image of Timor-Leste's agriculture sector

As part of the reorganization of MAF, a Department of Knowledge Management and Communication will be created in the DNPP. Once planned and established a budget will be included in the Investment Plan. The seed money to develop this strategy has been allocated in the 2015 budget (Table 32). Activities will be planned and an appropriate budget incorporated into the Investment Plan for subsequent years, based on the output from this study.

Component 4.4.3: Partnership strategy

Responding to the diverse needs and multifaceted challenges of the agriculture sector requires the cultivation and ongoing operations of strategic partnerships. Thus implementation of the MTOP should be grounded in strategic partnerships - based on common goals and shared values which build trust and foster a culture of innovation and learning from experience. The partnership strategy will therefore focus on internal as well as external collaboration. External partnerships will focus on: (i) inter-governmental relations, public-to-public and public-to-private partnerships; and (ii) partnerships with farmer and civil society organizations, non-governmental organizations.

The partnership strategy will: (i) clarify roles and responsibilities between National and District Directorates, and local governments; (ii) establish a framework to guide and manage the formulation, alignment, implementation, and monitoring and evaluation of policies and programs; (iii) establish a framework for integrated coordination of budget planning and expenditure; (iv) introduce an information management system; (v) introduce a framework (norms and standards) for a human resources development plan; and (vi) facilitate organizational capacity building for National and District Directorates, and their staff.

MAF's strategic partners will also have to determine how their resources are committed and managed in the process of implementing the various strategies, Programs and projects. Therefore ways to establish and strengthen national and international networks and co-operation will be identified and built into the partnerships strategy.

The DNPP is embarking on a project entitled 'Development of Partnership and Cooperation'. Activities will include: (i) the development of a partnership strategy and policy; (ii) regular harmonization meetings between MAF and its development partners; (iii), preparation and signing of memorandum of understanding; (iv) regular monitoring of joint activities and the provision of timely feedback; and (v) participation in regional meetings. The Directorate will also develop best practices to be incorporated in the design of future collaboration activities.

The newly proposed MAF structure will include a Department of Development Partner Coordination and Resource Mobilization. This will be primarily responsible for managing external partnerships. The partnership strategy will cover the roles and responsibilities of this Department and based on experience, the required investments will be estimated and incorporated into the Investment Plan. The initial funds to develop this partnership strategy have been allocated in this MTOP (see Table 32).

Component 4.4.4: Resource mobilization strategy

MAF's success will depend to a large extent on the success with which funding is mobilized for (and from) the services delivered by MAF. Sustainable funding is vital for MAF to deliver its mission and to achieve the TLSDP targets.

Achieving the ambitious targets set by the TLSDP, and the effective implementation of the MAFSP and the MTOP, will require additional financial and human skills. The current allocation of funds from the Government of Timor-Leste is inadequate to deliver the TLSDP and the MTOP, as almost 50% the current (2013) budget will be used for staff salaries and benefits, operational costs, and the maintenance of equipment and facilities. Increasing the current budget allocations will improve the effective delivery of MAF's services and thereby contribute to the achievement of the TLSDP targets.

To a large extent MAF depends on development partner development partner support to implement its field activities. However, the value of development partner funding over the next five years will decline. This trend has implications for the success and impact of the MTOP. While every effort should be made to solicit more funding from Government, MAF will therefore need to identify innovative ways to mobilize additional resources, including cost sharing, use of trust funds, private/public partnerships, etc. Accordingly, MAF will develop a resource mobilization strategy and aggressively mount a resource mobilization campaign to fund implementation of the MAFSP. Seed money to develop this strategy has been included in the 2015 budget. Further investment in this Component will be addressed by the proposed Department of Development Partner Coordination and Resource Mobilization, once it is established and functional.

Component 4.4.5: Gender strategy

The TLSDP and the MAFSP recognize the importance of and contribution of women to Timor-Leste's agriculture sector. Gender has been incorporated as a cross cutting theme in the MTOP and where appropriate special programs and projects will be included to reduce women's burden and contribute to their welfare.

MAF already has a gender policy and the Ministry will continue to make every effort to mainstream gender in the routine processes of: (i) agricultural service delivery; and (ii) project development, implementation, monitoring and evaluation, and reporting. MAF will establish a mechanism to undertake needs assessments of gender-responsive technologies and services. MAF will also assess ways in which gender-related issues are currently handled and

addressed, and develop a sector-wide gender strategy which will embrace all projects. Gender-related training will be available for all Ministry staff. Funding for this Component has been allocated, see Table 32.

Table 32: Investment to support complementary strategy development

SOB	STO	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
4	4.4	DNPP	Institutional support to develop complimentary strategies						
	4.4.1		Human resources policy and practices	100	50	50	50	50	300
	4.4.2		Knowledge management and communication strategy	-	50	50	50	50	200
	4.4.3		Partnership strategy and donor coordination	100	150	50	50	50	400
	4.4.4		Resource mobilization strategy	50	50	50	25	25	200
	4.4.5		Gender strategy	50	75	25	25	25	200
			TOTAL	300	375	225	200	200	1,300

Total Investment in Program 4

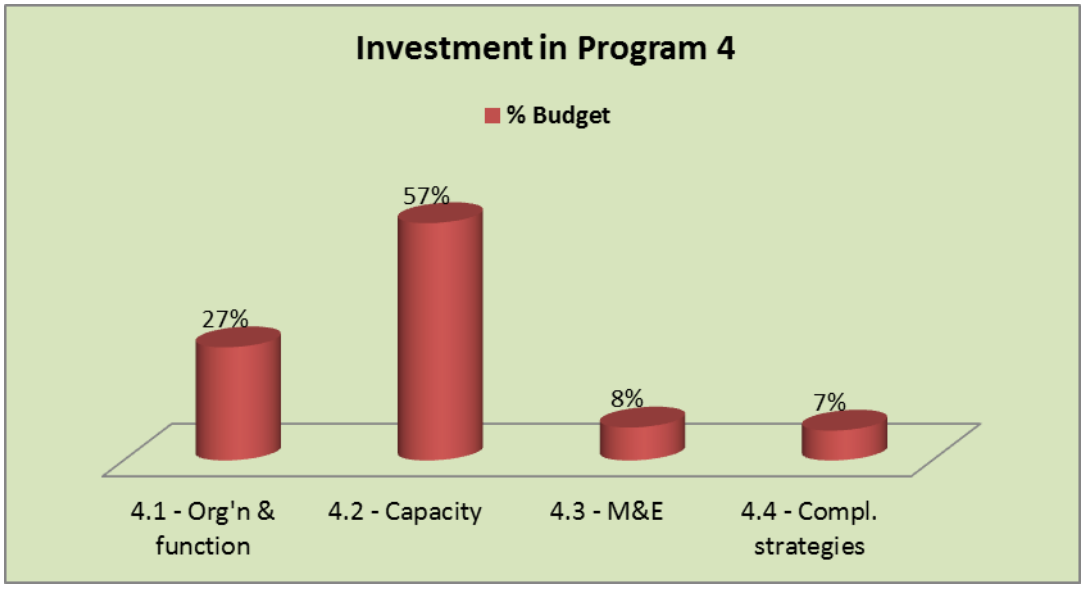
The total investment required to fully-implement the proposed projects in this Program is nearly $18 million (see Table 33 and Figure 9). Program 4 has been designed to accelerate the on-going reorganization of MAF as well as to enhance the Ministry's policy analytical capacity to facilitate decision making and effective service delivery. Twenty seven percent of the estimated Program budget has been allocated to the completion of the reorganization process, including the establishment of the Ministerial Advisory Council, and strengthening policy analysis and planning capacity. Provision has also been made for long term technical assistance to support the DNPP through mentoring and the provision of on-the-job training for staff.

About 60% of the budget for Program 4 has been allocated to empowering development, including both short-term skills building and long-term training (degree oriented training) in selected fields. Building the necessary capacity within MAF staff is a high priority. Resources have also been allocated to the development of a comprehensive human capital development strategy and plan. If adequate funding support is not allocated to Program 4, MAF's organizational transformation process will slow down and immediately affect its service delivery capacity.

Table 33: Total investment in Program 4

SO	SP	Projects	2014	2015	2016	2017	2018	5 years	% Budget
4	4.1 - Org'n & function	3	1,464	1,076	846	796	746	4,927	27%
4	4.2 - Capacity	8	1,502	1,651	2,180	2,464	2,535	10,332	57%
4	4.3 - M&E	1	280	250	275	300	330	1,435	8%
4	4.4 - Compl. strategies	5	300	375	225	200	200	1,300	7%
TOTAL		17	3,546	3,352	3,526	3,760	3,811	17,994	100%

Figure 9: Percent investments in Program 4



Program 5: Natural Resources Conservation and Management

By nature agriculture is the major user of natural resources – land, water, forest, marine resources and bio-diversity. Thus managing the connection between agriculture, natural resources conservation, and the environment must be an integral part of basing national development on the agriculture sector. Whilst natural resources conservation and sustainability should be an explicit consideration in every project design and implementation, additional measures are needed to being taken to address ecological sustainability. Against this background it is important to note that this issue has been implicitly addressed in all other strategic objectives and Program areas.

Program 5 will focus on land care, land use, zoning of high potential agricultural land, the preservation of sensitive land areas, biological diversity, and water resources.

Sub-Program 5.1 - Natural resources management

The objective of this Sub-Program is to enhance the capacity of the primary users of natural resources to use these resources in a sustainable manner, recognizing traditional- and locally-based natural resources management systems. Therefore assistance will be provided to rural communities to enable them to obtain formal recognition of their local natural resource management systems (*Tara Bandu*).

The pillars of action for this Sub-Program are:

- promoting the capacity of local communities to protect and manage their natural resources;

- developing and implementing local management plans to enable communities to manage important sites and/or key species;
- improving the knowledge of marine and coastal habitats used by local communities;
- promoting the cooperation of regional parties to improve joint management and conservation of the marine environment and its ecology, including the protection of Timor-Leste's exclusive economic zones; and
- recovering degraded forest areas.

The proposed projects and the investments needed for this Sub-Program are is presented in Table 34. The recovery of degraded forests is by far the largest project - $16.5 million out of a total budget of $17.8 million.

Table 34: Investment in natural resource management

MP	STO	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
5	5.1	DNF	Development and management of watershed areas	117	117	117	117	117	585
5	5.1	DNF	Establish appropriate management for coastal areas	128	130	134	148	162	702
5	5.1	DNF	Recovery of degraded forests	2,705	2,975	3,273	3,600	3,960	16,513
			TOTAL	2,950	3,222	3,524	3,865	4,239	17,800

Sub-Program 5.2 - Bio-diversity

The aim is to increase the knowledge, protection, and utilization of all types of bio-diversity. Focus will be on the conservation and utilization of the genetic bio-diversity of plants, animals, terrestrial and marine biodiversity. The main project planned is 'protection and conservation of biodiversity in land and water' and the funding needed is detailed in Table 35. In addition, funding for germ-plasm collection, characterization, and conservation; and utilization of local plant species has been allocated in Sub-Program 1.1.

Table 35: Investment in biodiversity

MP	STO	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
5	5.2	DNF	Protect and conserve land and water biodiversity	135	135	149	164	180	763

Sub-Program 5.3 – Environmentally-sustainable agricultural industry practices

The objective is to develop and disseminate environmentally-friendly agricultural industry practices. This is because the issue of sustainability should be a key consideration when using natural resources for economic transformation. Therefore every attempt will be made to develop industry-best practices which are environmentally-friendly.

The pillars of action under this Sub-Program are:

- developing and disseminating environmentally-friendly technologies such as integrated crop management, integrated agriculture/livestock production systems, integrated agriculture/ aquaculture systems, organic farming, and the introduction of more robust farming systems through improved crop rotations;

- sensitization and consensus building of stakeholders to support sustainable development of the forestry sub sector; and
- introducing and promoting sustainable community-based forage management systems.

The proposed projects under this Sub-Program and the financial resources required are listed in Table 36.

Table 36: Investment in environmentally-sustainable agricultural industry practices

MP	STO	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
5	5.3	DNF	Sensitization and consensus building of stakeholders to support the sustainable development of the forestry sector	446	483	531	584	643	2,687
5	5.3	DNF	Introduction and promotion of community-based sustainable forestry resource management	10	26	68	128	179	411
			TOTAL	456	509	599	712	822	3,098

Sub-Program 5.4 - National and cultural heritage

The objective is to promote the conservation of national and cultural heritage. This Sub-Program will focus on national parks and protected areas, as well as other heritage sites of important cultural value to society and nation. This objective will need to be supported by collaboration with other relevant ministries.

Reducing deforestation and watershed degradation along with protecting biological diversity requires cooperation between MAF's forestry, crops and livestock sub-sectors as the drivers of forest losses and degradation are generally caused by the farming sector. Fundamental changes in farming practices can only be brought about by working closely with rural communities in a participatory manner.

The pillars of action under this Sub-Program include:

- development and management of potential watershed and forest areas; and
- conservation of wildlife parks and cultural heritage sites.

The proposed project and resources required are presented in Table 37. Watershed-based management systems for subsistence communities include support for participatory planning on a watershed basis, in cooperation with MAF's agricultural Directorates and NGOs. This project will be based on the provision of planting materials which will be mainly native species, but also fast growing exotic species for fuel wood supply and fodder species for livestock.

Table 37: Investment in natural and cultural heritage

MP	STO	Directorate	PROJECT TITLE	2014	2015	2016	2017	2018	Total
5	5.4	DNF	Development and management of protected areas	359	378	344	378	416	1,875

Total Investment in Program 5

The estimated investment for natural resource conservation, and management and utilization is about $23.5 million, see Table 38. Sub-Program 5.1 (natural resource management) has been allocated the highest percent of budget (76%, see Figure 10). The investment areas include: (i) integrated crop-livestock-fisheries management practices; (ii) conservation and sustainable management of aquatic and marine resources; (iii) development of five protected forest management areas; (vi) construction of check dams and river control systems on three rivers; (v) conservation of wildlife parks; (vi) establishment of management regimes and strategies for degraded coastal areas; and (v) the protection and conservation of biodiversity in forest and coastal areas.

An essential part of the Program will be the key roles played by district offices and extension staff. This will depend to a considerable extent on their skills and capacity to work with rural communities who are dependent on local natural resources for their livelihoods. Hence there will need to be strong linkages with the Civil Society Organizations and NGOs who are capable of assisting with skills development. A policy dialogue will be developed and extended with the objective of developing conservation concepts within target communities.

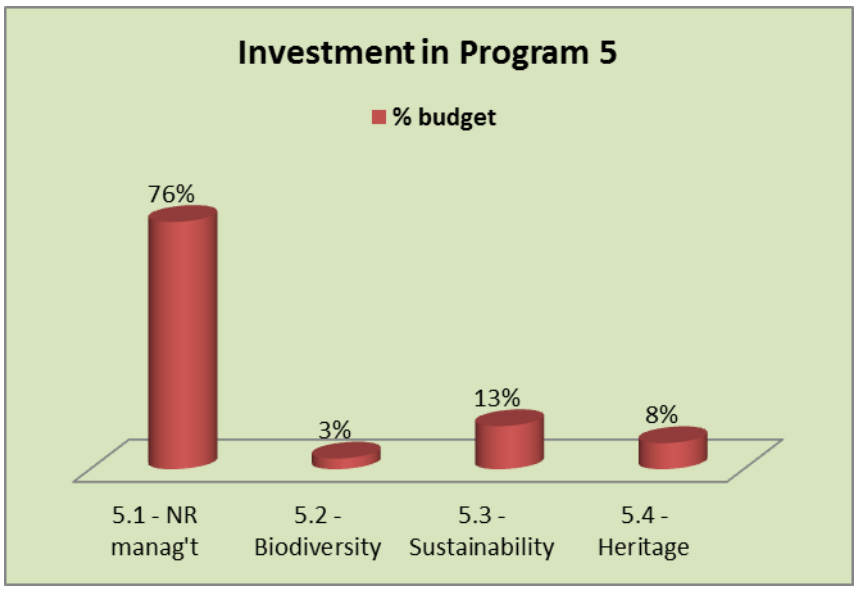
Promoting local communities as stewards of their natural environment is desirable but this will require programs which compensate these communities for refraining from unsustainable or damaging actions, for example, fire wood vs. deforestation and livelihood vs. overgrazing. Many of these conflicts are a consequence of external interventions in the past, and now, increased population pressures.

A strategy for the development of communities as stewards of natural resources will be prepared. This will require considerable institutional thinking and analysis in terms of rights to resources such as water, land, forests, and wildlife; and obligations related to water and soil conservation, forest management, and licensing systems.

Table 38: Total investment in Program 5

SO	SP	Projects	2014	2015	2016	2017	2018	5 years	% budget
5	5.1 - NR manag't	3	2,950	3,222	3,524	3,865	4,239	17,800	76%
5	5.2 - Biodiversity	1	135	135	149	164	180	763	3%
5	5.3 - Sustainability	2	456	509	599	712	822	3,098	13%
5	5.4 - Heritage	1	359	378	344	378	416	1,875	8%
TOTAL		7	3,900	4,244	4,616	5,119	5,657	23,536	100%

Figure 10: Percent investments in Program 5



4 Investment Needs and Budget Analysis

The investments required to implement the MTOP were based on information obtained from MAF's National Directorates, with some adjustments following discussions with the Minister, the Vice Minister and the Secretaries of State. Current Government commitment to providing the budget required to implement the MTOP was then estimated, using the expenditure framework. The budget deficit was then calculated by using these figures and current development partners' commitments.

The resulting combined budget and the allocation of estimated investment requirement across the five Strategic Objectives, and MAF's Directorates, are presented and discussed in this section of the MTOP. Note that these budget figures do not include the infrastructure investment required to effectively implement the MTOP.

4.1 Total investment to implement the MTOP

The MAFSP has five Strategic Objectives and 25 Sub-Programs. These have been identified as essential to the achievement of the agricultural developmental goals set out by the Vth Constitutional Government. A total of 134 projects have been listed in the MTOP. The total investment required to implement the MTOP over the 2014 – 2018 period (excluding infrastructure) is $271.4 million, as shown in Table 39.

Sub-Program 1.6.1 has been allocated nearly 40% of this total budget in recognition of the critical importance of national food self-sufficiency and sovereignty. Note, however, that about 80% of this total covers the cost of direct production subsidies, and that this policy is currently under review by MAF and Government.

Table 39: Total investment by Strategic Objective and Sub-Program

SO	SP	Projects	2014	2015	2016	2017	2018	5 years	%
1	1.1	19	2007	2128	4561	6225	5759	20,681	7.6%
1	1.2	9	3,336	3,126	3,764	3,946	4,027	18,198	6.7%
1	1.3	0						-	0.0%
1	1.4	9	2,785	3,043	3,320	3,055	3,354	15,557	5.7%
1	1.5	0							0.0%
1	1.6.1	14	13,005	16,911	21,447	25,764	30,404	107,530	39.6%
1	1.6.2	6	3,800	3,700	3,700	3,700	3,700	18,600	6.8%
1	1.6.3	6	1,103	2,099	983	892	588	5,665	2.1%
1	1.6.4	9	1,602	1,646	1,793	1,956	2,145	9,142	3.4%
1	1.6.5	6	1,635	1,587	1,574	1,625	1,500	7,921	2.9%
2	2.1	7	440	400	360	360	360	1,920	0.7%
2	2.2	0							0.0%
2	2.3	11	369	521	635	662	748	2,935	1.1%
2	2.4	1	-	-	-	1,740	2,500	4,240	1.6%
2	2.5	1	2,075	2,075	1,000	1,000	500	6,650	2.4%
2	2.6	1	-	-	-	-	-	-	0.0%
3	3.1	1	100	100	50	50	50	350	0.1%
3	3.2	1	125	150	150	100	100	625	0.2%
3	3.3	3	704	1,751	182	121	199	2,957	1.1%
3	3.4	4	1,130	1,050	1,123	1,200	1,294	5,797	2.1%
3	3.5	2	623	232	204	164	169	1,392	0.5%
4	4.1	3	1,464	1,076	846	796	746	4,927	1.8%
4	4.2	8	1,502	1,651	2,180	2,464	2,535	10,332	3.8%
4	4.3	1	280	250	275	300	330	1,435	0.5%
4	4.4	5	300	375	225	200	200	1,300	0.5%
5	5.1	3	2,950	3,222	3,524	3,865	4,239	17,800	6.6%
5	5.2	1	135	135	149	164	180	763	0.3%
5	5.3	2	456	509	599	712	822	3,098	1.1%
5	5.4	1	359	378	344	378	416	1,875	0.7%
		134	42,285	48,114	52,987	61,439	66,865	271,690	100.0%

4.2 Investment by Strategic Objectives

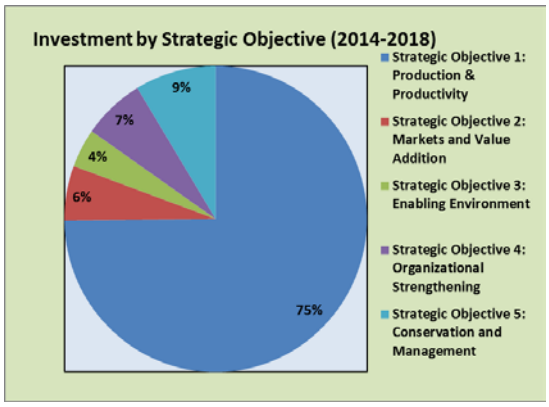
The distribution of investments across the five Strategic Objectives is presented in Table 40 and Figure 11. As expected, about 75% of the investment has been allocated to Strategic Objective 1 – Sustainable Increase in Production and Productivity. It is important to reiterate that this figure includes the high subsidy element.

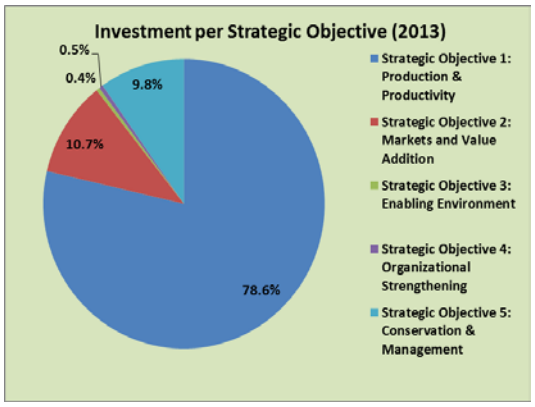
Comparison with current (2013) budget allocations is informative – see Figure 11. The MTOP predicts a significant increase in the budget allocated to organizational development, and to improving the enabling environment, but the budget allocated to Strategic Objective 2 (improving market access and value addition) is less than the current allocation.

Table 40: Investment by Strategic Objective

SO	Projects	2014	2015	2016	2017	2018	Total	%
1	78	29,272	34,240	41,141	47,163	51,477	203,294	75%
2	21	2,884	2,996	1,995	3,762	4,108	15,745	6%
3	11	2,682	3,283	1,709	1,635	1,812	11,121	4%
4	17	3,546	3,352	3,526	3,760	3,811	17,994	7%
5	7	3,900	4,244	4,616	5,119	5,657	23,536	9%
TOTAL	134	42,285	48,114	52,987	61,439	66,865	271,690	100%

Figure 11: Investment by Strategic Objective: 2013 and 2014-2018





During stakeholder consultations held as part of the preparation of the MTOP, workshop participants were asked to comment on the proposed budget allocations across the five Strategic Objectives. The suggested budget allocations were about 47% for 1; 22% for 5; 19% for 3; and 12% for 2 and 4, combined. This outcome clearly suggests that as MTOP implementation progresses, additional resources should be gradually allocated to Strategic Objectives 2 to 5, depending on the final policy decision in relation to subsidized production inputs.

The production of surpluses (mainly annual crops) by subsistence farmers is the first step in an agricultural transformation process. If this surplus production is not marketed or value added by feeding to livestock, there won't be any incentive for the farmers to produce over and above their subsistence requirements. The projects listed in the MTOP reveal that limited investments in marketing and value addition of agricultural commodities are proposed. This situation is largely due to inadequate socio-economic input into the planning process. However, once the proposed Department of Agribusiness and Marketing is established, this lack of budget prioritization is expected to be reversed.

4.3 Investment by Directorate

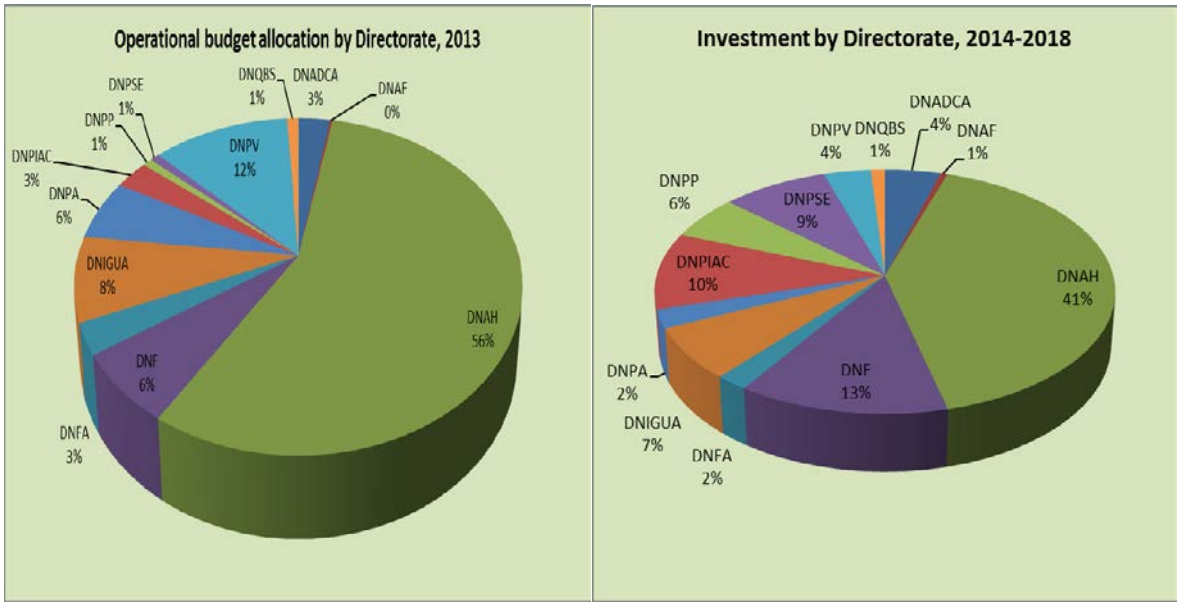
The investment requirements for the 12 existing National Directorates are presented in Table 41 and Figure 12. Once again it is not surprising that 41% of the total proposed investment

has been allocated to the DNAH as all staple food crops are the responsibility of this Directorate. As the forestry sector is crucial for the sustainable management of natural resources and provides alternative livelihoods for rural communities, this sector has been allocated 13% of the proposed investment. Although the DNADCA has only been allocated 4% of the total budget, this Directorate receives by far the largest share of development partners' support for MAF.

Table 41: Investment by Directorate

Directorate	2014	2015	2016	2017	2018	Total	%
DNADCA	1,823	2,112	2,712	2,712	2,712	12,071	4
DNAF	300	300	300	300	300	1,500	1
DNAH	13,005	16,911	21,447	27,504	32,904	111,770	41
DNF	6,253	6,548	6,943	7,652	8,218	35,614	13
DNFA	1,427	850	962	1,087	1,197	5,522	2
DNIGUA	3,341	3,649	3,941	3,715	4,084	18,730	7
DNPA	1,233	2,237	1,133	1,151	832	6,586	2
DNPIAC	6,151	6,194	5,228	5,249	4,829	27,651	10
DNPP	3,730	4,467	2,645	2,581	2,482	15,904	6
DNPSE	2,267	2,492	5,144	6,848	6,332	23,084	8
DNPV	1,730	1,767	2,030	2,180	2,515	10,222	4
DNQBS	1,025	588	503	460	460	3,036	1
TOTAL	42,285	48,114	52,987	61,439	66,865	271,690	100

Figure 12: Distribution of investment by Directorate



The budget for the DNPP (6%) is high because most of the investment needed to complete the reorganization of MAF, and the development of complementary strategies, has been allocated to this Directorate. The allocation for the NDFA is only 2% because most of the

aquaculture development activities are covered by a development partner; and the proposed special project for marine fisheries needs significant revision (based on a Fisheries Sector Master Plan) before it can be included in a revised MTOP. Given the potential of the marine fisheries sub-sector, and its importance in terms of improving the nutritional status of most Timorese, this sub-sector will warrant significant additional investment in the future. The importance of technology in improving productivity, and the proposed launch of TLARDI, also indicates that increased funding may be required for the DSNPSE. As livestock have an important role in improved food and nutrition security, there is also a need in the medium-term to increase the funding allocated to DNPV.

In order to compare current and planned (MTOP) budget allocations, MAF's budget for financial year 2013 by National Directorate is presented in Figure 12. In summary, in 2013 56% of MAF's budget will be allocated to the DNAH, and 12% to the DNPV. The DNF, DNPA and the DNIGUA will each receive about 7% of the budget. The other Directorates will be allocated less than 3% of the 2013 budget.

4.4 Development partner support for MAF

As part of the MTOP development exercise, MAF's development partners and key NGOs were requested to provide information on their ongoing and planned projects and activities, and actual and targeted investments up to 2018. A template was provided with a view to collecting a uniform set of data across projects and development partners. With the exception of one case, most of the ongoing projects supported by development partners will close by end of 2015. Although the development partners have some ideas regarding what could happen beyond the current life of these projects, given the economic climate in many development partner countries, development partners were reluctant to indicate future commitments with any certainty. Therefore the information provided in Table 42 refers only to the current commitments by development partners. Details are listed in Annex 6 which is a list of current MAF development partners.

Estimated development partners' contribution to MAF in financial year 2014 is about $15.9 million. A significant proportion of this funding is allocated to six key areas: (i) support for extension services; (ii) construction of irrigation systems; (iii) support to community-based natural resources management; (iv) evaluation of improved crop varieties and seed/ seedling production and distribution; (v) linking small holders to markets; and (vi) promoting on-farm storage of cereals. This funding support is expected to decline to $13.3 million in 2015 and to $6.1 million in 2016. When estimating investment needs for the MTOP, funding was allocated for MAF to continue some of the currently development partner-funded projects – for example evaluation of improved crop varieties (Seeds of Life) and on-farm grain storage (IFAD Maize Storage Project).

Table 42: Development Partners' and NGOs' support for MAF

SO	SP	Directorate	2014	2015	2016	2017	2018	Total	Remarks
1	1.1	DNPSE	433	433	-	-	-	866	
1	1.2	DNADCA	4,138	3,698	90	-	-	7,926	
1	1.4	DNIGUA	1,163	25				1,188	
1	1.6.2	DNPIAC	1,275	1,000	1,000			3,275	
1	1.6.3	DNPA	1,020	1,020	1,020	1,020	1,020	5,100	NZ AID
1	1.6.5	DNF	500	500	500			1,500	
2	2.2	DNPSE	1,311	1,311				2,622	SOL
2	2.4	DNPIAC	96	-	-	-	-	96	CRS
2	2.4	DNAH	1,398	1,478	2,070	1,740	2,500	9,186	IFAD
2	2.5	DNPIAC	2,075	2,075				4,150	
3	3.4	DNPP	413	-	-	-	-	413	AGROMET
3	3.5	DNPP	914	64	-	-	-	978	NIEWS
5	5.1	DNF	1,122	1,635	1,429	-	-	4,186	
		TOTAL	15,858	13,239	6,109	2,760	3,520	41,486	

As MAF now has a Strategic Plan and an MTOP, it is an opportune time to initiate discussions with development partners to ensure that future collaborative programs and projects are in line with MAF's strategic objectives and priorities. The Minister of MAF has commenced this process by initiating a regular dialogue with development partners. The first meeting was on 30th October 2012 during which the Minister presented the MAFSP. A second meeting was held on 2nd May 2013 to present a draft of the MTOP. Development partners' comments and suggestions were incorporated in the final version of the MTOP, and the associated MTIP.

There is renewed interest on the part of some Development Partners to support Timor-Leste's agricultural sector. For example the World Bank has included the sector as one its core pillars in its new five-year County Program Strategy. To support this improved scenario, MAF is aggressively searching for alternative sources of additional funding, such as the Global Environment Facility (GEF), the Institutional Development Fund (IDF) and the Trust Fund for Statistical Capacity Building (TFSCB). As discussed at the end of the description of Program 1, MAF is conceptualizing a project (SAPIP) which would support the reform of the current subsidies strategy. Additional commitments by development partners may also encourage increased Government support and reduce the MTOP's budget deficit – see Section 4.5.

4.5 Investment requirements and gap analysis

The current funding scenario in relation to the budget required to implement the MTOP (excluding expenditure on infrastructure which would have to be sourced from the Infrastructure Fund separately from the allocation from Government budget) and based on the current expenditure framework, is presented in Table 43 and Figure 13.

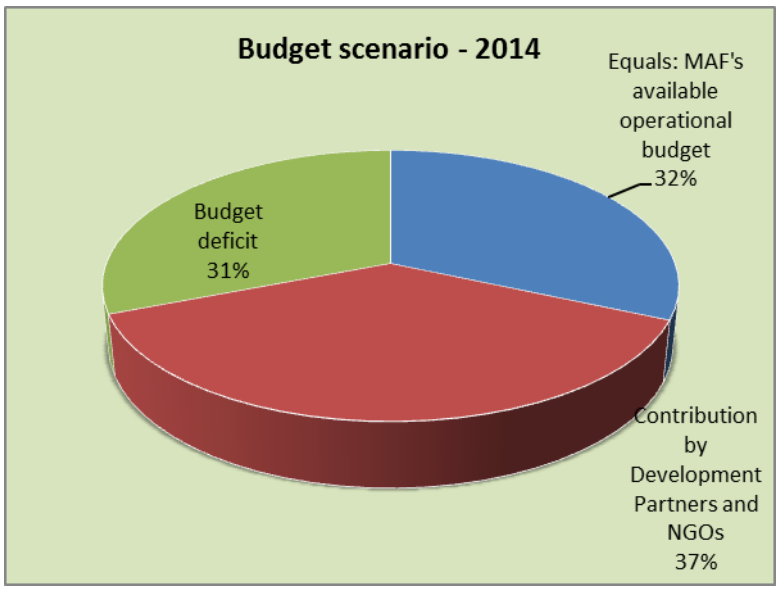
Table 43: Budget gap analysis

Item	2014	2015	2016	2017	2018	Total
Total investment required	42,285	48,114	52,987	61,439	66,865	271,690
Annual budget allocation to MAF (GoTL's Exp. F/work)	25,143	26,149	27,194	28,282	31,110	137,878
Less: MAF salaries and overheads	11,783	11,159	10,714	10,162	11,180	54,998
Equals: MAF's available operational budget	13,360	14,990	16,480	18,120	19,930	82,880
Contribution by Development Partners and NGOs	15,858	13,239	6,109	2,760	3,520	41,486
MAFs total operational budget	29,218	28,229	22,589	20,880	23,450	124,366
Budget deficit	**13,067**	**19,885**	**30,398**	**40,559**	**43,415**	**147,324**
Investment in infrastructure development	26,179	31,682	20,114	5,430	6,457	89,862
Total deficit	39,246	51,567	50,512	45,989	49,872	237,186

The budget figures in Table 43 have been calculated as follows:

1. MAF's available operational budget is the Ministry's annual budget allocation from the Government's expenditure framework, less MAF's salary and overhead costs. For example (for 2014): $25.143 million less $11.783 million equals $13.360 million. It was assumed that this figure would increase by 10% compound over the five-year period.
2. Development partners' contribution in 2014 will be $15.858 million which when added to MAF's available operational budget ($13.260 million) equals $29.218 million.
3. The total investment required to implement the MTOP in 2014 is $42.285 million.
4. This leaves an unfunded budget gap of $13.067 million, excluding the requirement for infrastructure investment of $26.179 million.
5. Therefore the total unfunded gap in 2014 is $13.067 million plus $26.179 million, equals $39.246 million.
6. Over the five year period, the MTOP funding gaps increase (excluding infrastructure) from $13.067 million in 2014 to $43.415 million in 2018, mainly because development partners' commitments decline from $15.858 million to $3.520 million over this period.

Figure 13: 2014 Budget scenario



Except for one project, all development partner-supported projects and programs will close by the end of 2016. This is one of the reasons for increased deficits over the years. Discussions are already underway with current as well as potential development partners (China and USA) to develop the next generation of projects. Depending on the level of support provided by development partners, MAF's budget deficit may not be as large as described above. The total budget deficit over the MTOP period is about around $147 million. If development partners' contributions remain constant at about $16 million per year (an optimistic scenario) then the total finding deficit over the five year period will be about $109 million. In addition, improved planning and programing capacity in MAF should lead to greater efficiency and spending quality, and may ultimately motivate an increased allocation of Government budget, both in absolute as well as relative terms.

Given the sector's importance in terms of feeding the nation, driving non-petroleum growth, protecting the environment and employing about 75% of the population, such reallocation would have its merits. However, a realistic operationalization of the MTOP has to be based on the expenditure framework and the budget ceiling set by the Government for MAF, and the funding commitment by development partners. This is in fact the actual working budget for any given year. Therefore, further prioritization will be required within the MTOP's identified priorities so that the budget for annual planned activities fits within the funds available for that year. This process will be part of the preparation of annual work plans and budgets. When undertaking this process it should be kept in mind that continuity, consistency and focused-funding over a number of years are prerequisites for the success of many agricultural development activities. Thus the importance of MAF's MTOP and MTIP, and the longer-term commitment by development partners.

5 Lessons learned and the way forward

The TLSDP and the Vth Constitutional Government's five-year plans emphasize the need for: (i) improved productivity; (ii) regional specialization; (iii) market-led development; (iv) crop-livestock-tree-fisheries integration; (v) improved soil, water, forest and fisheries management; (vi) diversification of export crops; (vii) promotion of import substitutes; and (viii) greater participation of communities and the private sector in the agricultural and rural development processes.

As a first step in this agricultural transformation process, and to achieve Government's developmental objectives, MAF developed the MAFSP (2014-2020) towards the end of 2012. This MTOP complements the TLSDP and the MAFSP, and reflects the high priority afforded by Government to developing agriculture at an accelerated rate. This fully-understandable national objective is based on: (i) the urgent need to reduce poverty, food insecurity and malnutrition (all of which are more prevalent in rural rather than urban areas); and (ii) the predominant role the sector plays in determining the livelihoods of majority of East Timorese people.

It has been increasingly recognized that the Government's development objectives cannot be achieved without the transformation of Timor-Leste's agricultural sector. Experience in many developing countries, supported by a substantial amount of scientific literature, has shown that fast agricultural growth is the most effective way to reduce rural and urban poverty, and to achieve food security and food sovereignty. This MTOP is essential for such a strategy to have effect. It also gives the MAFSP value, and will make a real contribution towards achieving Timor Leste's developmental objectives.

It will be important to address a number of major issues when implementing this MTOP. These issues, and the lessons learned during the preparation development of the MTOP, are discussed in this section.

5.1 Redefining MAF's role in agricultural development and designing appropriate planning mechanisms

Currently most of the services provided by MAF are free and most inputs are distributed to farmers free-of-charge (100% subsidized). This strategy is not sustainable in the longer-term and also places an undue burden on MAF's service delivery budget, which in turn limits the extent of MAF's other services. Therefore there is an urgent need to review policies and strategies which define service delivery to farmers, and the roles of the private sector and civil society. MAF needs to gradually move towards cost-sharing arrangements and to define and implement a modified system for nation-wide service delivery. There is also a need to redefine and clearly articulate public sector roles, and to implement policies and programs which will enable the private sector, civil society, community-based organizations, NGOs and development partners to actively engage in and contribute to agriculture in Timor-Leste.

This process will require a redefinition of the roles of change agents, and a change in attitude and behavior towards the farming community.

As mentioned in Section 3, MAF's current priority activities are planned and implemented by individual Directorates based on their respective mandates, without much consultation with other stakeholders and Directorates. This type of planning is purely disciplinary oriented, does not allow the system to exploit potential synergies and complementarities, and at times leads to duplication of effort and wastage of resources. In addition, there is minimal beneficiary participation in planning and priority setting processes.

The TLSDP suggests that the definition of agricultural production zones and conservation areas will be completed by 2015, thereby anticipating that the future planning will be based on production systems which often cut across administrative boundaries. In order to conserve and sustainably manage natural resources, there is a need to develop watershed-based, production system oriented farming systems in Timor-Leste. Thus as a matter of priority the determination of these zones should be completed with clear identification of production systems and sub-systems. Only then can an integrated participatory approach be used to identify constraints and planning interventions for each zone. Such an approach will enable MAF to reconcile national (policy-guided) and local (farmer-based) priorities in the planning process, and provide opportunities for Directorates and all stakeholders to work together in a coordinated manner. During 2014, pilot studies will be undertaken (funded by Seeds of Life) to develop and fine-tune such a planning process for subsequent scaling-up at the national level. Government's existing decentralization policy will need to be integrated into this planning process.

It will also be important for small holder farmers to 'graduate' from the current 'subsidy dependency syndrome'. Farming should be viewed as business. This does not mean MAF should completely remove all subsidies. Instead, MAF should make every effort to promote the commercialization of small holder farming. The 100% production subsidy which is currently provided to selected farmers (due to budget limitations) should be gradually removed, whilst at the same time identifying and investing in other innovative ways to support farmers, such as: (i) promoting collective action; (ii) empowerment through learning and the allocation of funding for agro-enterprise development; (iii) public-private partnerships and development of agribusiness services; (iv) development of local trader networks; and (v) establishing supply change for agriculture products and other services identified through district needs assessments.

When identifying how to support farmers, it will be important for MAF to recognize the threats and potential impacts of climate change and rainfall variation, and to heed the guidelines to address these phenomena which are outlined in Timor-Leste's National Adaptation Program of Action (NAPA) – see Annex 7 for details. Field work completed as part of the preparation of the NAPA confirmed that across all sectors that people's main concerns are changes in rainfall and temperature patterns, and their effects on drought,

flooding and landslides. In this way, MAF will need set agricultural development on a path where land, water, and forests are managed sustainably, and where the objective is to develop resilient farming systems, hence the importance of biodiversity and agro-biodiversity, and the sustainable management of soil nutrients. Such a task requires a good understand of the inter-relationships between the numerous factors which determine the health of a nation's agricultural environment. Plans based on only one or two factors will not be sustainable in the longer-term and can lead to irreversible environmental damage. This is why Timor-Leste's NAPA covers nine priority adaptation measures, ranging from food security and water resources, to livestock production and physical infrastructure.

5.2 Complementary policies and programs

Poverty is multifaceted, and similarly agricultural and rural development is inherently a multi-sectoral undertaking. Accordingly the agricultural sector cannot achieve its goals and mission without complementary and supportive programs and actions by other sectors – health, education, energy, water, and transport, etc. In addition there are three over-arching factors which must be considered when planning how to achieve agricultural targets and longer-term goals. These are: (i) the impact of the current rural land tenure system (which requires urgent review and redesign); (ii) the promotion of effective farmer and civil society organizations; and (iii) the importance of strategic partnerships, and linkages between the various actors operating in the innovation systems along commodity value chains.

It is clear from international experience that security of long-term land tenure rights is important to encourage on-farm investments, as well as providing an inheritable asset for future generations. The reform of Timor-Leste's land tenure system is considered to be essential to under-pin sectoral transformation, and to ensure that there are sufficient incentives for the private sector to invest and create employment in agriculture. This is a sensitive issue and if not managed carefully and astutely could lead to undesirable consequences such as land grabbing by foreign investors.

Collective actions by farming communities and farmer organizations are vital for agricultural transformation. Although developing countries have mixed experiences, depending on historical, cultural and economic contexts, if properly organized and managed co-operatives can be a very successful means through which to achieve effective farmer participation in rural service delivery. There is a current collaborative agreement between MAF and the Ministry of Commerce, Industry and Environment (MCIE) to establish co-operatives with the objective of delivering production inputs, technical services, and market outputs. A key lesson from international experience is that cooperatives function best when they are formed at the local level, and based on farmers' and villages' real needs, rather than being organized in a top-down fashion. Therefore it will be important to incorporate this lesson into cooperative programs in Timor-Leste and to encourage local cooperatives which have well-defined purposes. These could focus on marketing agricultural products or larger-scale purchase of inputs with the objective of reducing unit prices. It will be equally important to

strengthen cooperatives with financial management training as many cooperatives collapses are due to financial miss-management.

Accordingly, any agenda to transform small holder agriculture should follow a multi-sectoral approach and capture the synergies between technologies (seeds, fertilizer, livestock breeds etc.) sustainable soil and water management practices, institutional services (extension, credit, insurance, etc.) and human capital development (education, health, and nutrition) – all of which need to be linked to market-oriented development (World Development Report, 2008).

5.3 Strengthening linkages and partnerships in the development process

For the TLSDP and the MTOP to be operational effectively, it will be necessary to reinforce old and new linkages for sectoral planning and implementation processes. These linkages can be established through four mutually reinforcing approaches:

(i) putting in place a mechanism for communication between and coordination of various sectoral stakeholders, i.e. strategic innovation platforms and innovation clusters;

(ii) linking national and decentralized levels of administration and service delivery in an operational way – this is well-defined linkages between public sector agricultural service providers at the national, district, sub district and suco levels;

(iii) linking fiscal and financial flows to decentralized implementation levels and multi-stakeholder environments; and

(iv) linking the commercialization and market orientation of small holder agriculture to food and nutrition security, environmental management, and sustainable economic growth.

Bringing together different stakeholders within an appropriate framework will allow the public and private sectors, and civil society organizations, to work together with a view to sharing roles and responsibilities, as well as harmonizing concepts, strategies, approaches and modalities of implementation for various development interventions. Creating such platforms will help MAF to ensure efficient and effective coordination of technical and financial support from development partners.

Government's current decentralization policy creates opportunities by placing decision making on many issues at the local level. The way in which local Government organizations function, and how they relate to farmers on one hand, and to the central organizations, on the other, still need to be carefully worked out (this is the roles of sucos, sub-districts, districts and Dili). The current Government policy shift offers opportunities to establish a sound basis to reorient MAF's service delivery mechanisms at all levels.

There are 15 International Agricultural Research Centres (IARCs) under the Consultative Group on International Agricultural Research (CGIAR). The primary mandate of these

organizations is to assist and support developing countries. Whilst Seeds of Life has established good working relations with the IARCs which focus on food crops, it will be important to broaden the focus under the MTOP and to establish close working relationships with IARCs which can assist TLARDI to fulfill its mandate. This will enable MAF to benefits from their experienced staff and to accumulate knowledge and skills over time.

5.4 Monitoring and evaluation of Program implementation

Based on various logical frameworks (TLSDP, MAFSP, MTOP and individual projects) a needs-based M&E system will need to be developed and integrated into all stages of MTOP implementation. As an integral part of this M&E process, MAF should introduce an annual planning and priority setting process across all Directorates. During this process each Directorate should present the activities completed during the year, results accomplished, problems encountered, new issues identified, lessons learned, and projects and activities planned for the following year. Periodic review of major programs and impact assessment studies will also be required to assess performance, and document and disseminate best practices and lessons learned. This process will facilitate effective planning, accountability, communication, inter-departmental collaboration, and learning from past experiences.

5.5 Development of annual work plans and budgets

Formulation of MAF's 2014 Annual Work Plan and Budget will be based on the MTOP and its associated Five-Year Investment Plan. In each subsequent year, and based on the monitoring and evaluation of activities, the investment plan for that year should be revised to respond to the changing context, needs and client priorities, with the objective of keeping the annual plan dynamic and relevant. There will also be a need for a robust round of prioritization each year as part of decision making in terms of short-term investment decisions.

The 'rolling' Medium Term and Annual Work Plans and Budgets should be guided by the Strategic Objectives and sub-objectives set out in the MAFSP, and the MTOP priorities identified by Directorates and Districts in consultation with the key partners and stakeholders. However, the actual portfolio of activities included in work plans for any given year will be largely determined by resource availability. For the 2014 financial year, priority should be given to organizational redevelopment, including completion of the reorganization of MAF, the development of the complementary strategies identified in Program 4, plus the various Master Plans required to guide future sub-sector and key commodity activities.

5.6 Lessons learned

5.6.1 Lessons from the planning process

This MTOP marks the first attempt by MAF to develop an operational and investment plan as the basis for transforming the Ministry into a 'strategic management organization'. MAF is the first Ministry in Timor-Leste to complete this exercise. Moving from a plan based on an

historical allocation of funds (adjusted by about 4% every year) to developing a strategy-driven five year MTOP and MTIP was a very challenging task.

The MAFSP (2014 -2020) was developed by the end of 2012. MAF's senior management realized the potential benefit of the planning exercise and started to manage the process directly from the first phase. The tight time-line and other changes in the country, including a new Government, and associated priorities and changes in decree laws, made this task more challenging. MAF's staff had 'to climb a very steep learning curve' in a short period of time.

Despite these challenges, this exercise has contributed significantly to MAF's planning and budgetary experiences and processes, as follows:

- Logic has been introduced into the planning and budgeting process. Participants in these processes now recognize the logical linkages between the TLSDP, the MAFSP, the MTOP and MTIP, and Annual Work Plans and Budgets. The process has also demonstrated the logical linkages between the problem tree, objective tree, programs and projects.
- Participants have started thinking in terms of a results framework, especially in relation to outputs and outcomes.
- There is now a move to a medium-term focus in terms of planning and priority setting. This is a major mind set change which will require follow up.
- MAF's middle-level managers are more familiar with the data which were used to develop the MTOP and MTIP. This progress will assist with the future planning, budgeting and prioritization processes.
- The planning exercise also provided an opportunity for MAF's senior and middle level managers to become more familiar with Government's policies and priorities, and the targets in the TLSDP. The TLSDP targets and the MAFSP guided the design and costing of the MTOP and the MTIP (2014-2018).
- The process paved way for a regular consultation between MAF and its development partners. These 'harmonization meetings' are now chaired by the Minister of MAF.

5.6.2 Outcomes from review of investment allocations

An important part of preparing an MTOP is a budget allocation review, once all investment tables have been assembled and summarized. This process was completed as part of this MTOP design exercise, with the following key conclusions and recommendations:

1. There is an understandable investment 'bias' towards increasing the production and productivity of food crops, with the objective of achieving food self-sufficiency and sovereignty (the core objective listed in the TLSDP).
2. There appears to be under investments in areas of (i) enhancing market access; (ii) value addition; (iii) rural market infrastructure development; (iv) support for the

development of private sector services and input supplies; (v) improved governance; and (vi) sustainable resource management.

5.7 MTOP implementation challenges

5.7.1 MAF's transformation

MAF is confronting a number of immediate challenges related to the Ministry's proposed transformation.

- Changing the culture of the organization, and the mindset and attitude of the staff.

  MAF needs to be reorganized to do 'business unusual', and to become an impact oriented, and accountable organization. There is also a need to redefine the role of the change agents (researchers, extensionists, educators and other service providers) and their attitudes and behavior towards the farming community. Such cultural change is a slow and evolutionary process which requires long-term commitment and champions within an organization. There is also a need to create a conducive environment in which to allow these changes to occur, plus incentive systems to support this process.

- Building the necessary capacity.

  Although the number of staff in MAF has increased significantly, the majority of these need further technical and on-the job training to effectively deliver the services demanded by the Ministry's various clients. Effective service delivery requires both technical and personal ('soft') skills. The latter relate to the social and personal traits which complement individual expert's technical skills. The skills required include: (i) leadership training; (ii) planning and priority setting; (iii) monitoring and evaluation; (iv) partnership development and management; (v) mentoring and coaching; (vi) team building and exposure to the new concepts such as innovation systems; and (vii) value chain analysis. More often than not these 'soft' skills are more important than technical know-how (qualification and experience).

- Mobilizing the necessary financial resources.

  The current (2013) Government budget for agriculture is about $24 million and the operational budget for programs and projects is approximately $13 million. Despite a stagnating budget over the past few years[9] MAF's staff numbers have increased considerably. The implications of this trend are: (i) expenditure per staff member has declined; (ii) a major portion of the total budget has been allocated to cover salaries

[9] Note: MAF did receive a budget increase in 2013, from about $19 million to $24 million but this is still not approaching the internationally-accepted figure of 10% of Government's sustainable budget which is about $100 million. The CFTL for 2013 is over $1.0 billion.

and benefits, as well as the maintenance of equipment and facilities; and (iii) the funds available to support projects and programs have been declining, particularly in real terms as inflation has been running at about 10% per year. This situation also inevitably leads to increased development partner dependency. In summary, delivering the services required to achieve the TLSDP's and the MAFSP's targets with a meager operational budget is a huge challenge for MAF.

Current public sector expenditure on agriculture in Timor-Leste is much lower (about 2%) than the international best practice of 10% of the total Government expenditure on all sectors of a country's economy. Similarly, international best practice for budget support for agricultural R&D is at least 1% of a country's Agricultural GDP. Mobilizing the additional resources required and ensuring financial sustainability is an immediate challenge which MAF need to address.

- Strategic partnerships and effective co-ordination of activities.

  Challenges related to coordination are both internal (district - national; and between National Directorates and departments within MAF) and external (other ministries and partners). Most projects will be implemented at the district and sub-district levels. Therefore MAF will need to establish coordination and linkage mechanisms (including decentralized decision making) with district administrations and other relevant bodies.

  It is now recognized that agricultural growth cannot be achieved through projects and programs which are implemented by MAF and its development partners agencies alone. Considerable complementary investments are required in transport and access/farm roads, water and sanitation, power, health and education. Therefore cross-sectoral and inter-ministerial co-ordination needs to be improved between MAF and other sectors of Timor-Leste's economy which provide complementary investments and services that have a bearing on the agriculture sector.

  Increased participation of the private sector and more support from development partners are critical for successful implementation of the MAFSP. Therefore it will be important to ensure that future investments and support from development partners are aligned with and contribute to the implementation of the MAFSP, and the associated MTOP and MTIP.

5.7.2 Summary

Translating the MTOP in action will require a series of reviews, and continuous learning and adaptation towards optimizing implementation activities. This process will also require continuous dialogue between key players to 'smooth"' implementation processes and structures in order to result in maximum efficiency and benefits. The strategies, Programs and

Sub-Programs identified in the MTOP will guide MAF and its Directorates to develop short- to medium-term investments and implementation plans with clearly defined milestones/ indicators and targets which, if achieved, will lead to desired outcomes and impacts. Good governance, integrated sustainable development, knowledge and innovation, international cooperation, and peace and security are all essential for the successful implementation of the MTOP.

Changes (external) as well as resistance to change (internal) will need to be managed carefully and astutely during MTOP implementation. This will also require mindset and cultural changes in 'the way business is done within MAF'. Such organic change is evolutionary, will take time to achieve, and requires long-term commitments from all stakeholders. It will be important to keep in mind that once the ongoing reorganization of MAF (and the development of various complementary strategies and Master Plans has been completed) it will necessary to revisit the MTOP. Continuous adjustment and further refinements will be required on an annual basis to keep the MTOP 'ever-green'.

6 Annexes

6.1 Annex 1 - MAF's ambitious five-year targets

As outlined in Section 2.3, there was considerable debate within MAF when setting the MTOP targets. Therefore, Table 4 in the main text outlines a conservative and realistic set of targets and Table 44 in this annex list MAF's more ambitious MTOP targets. Publication of these two sets of targets is expected to encourage healthy debate and discussion within MAF and between its development partners, and eventually lead to an agreement on a realistic set of targets which does not encumber MAF with a set of unachievable targets.

Table 44: MTOP targets under a 'high-case' budget scenario

Product			Yields (Mt/ha), Areas (ha) and Production (Mt) a/							
		07-'11	2011	2012	2013	2014	2015	2016	2017	2018
Cereals										
Maize	*Production (Mt)*	*96,453*	*30,596*	*96,471*		*173,840*	*192,270*	*223,440*	*246,750*	*267,300*
	Areas (ha)	63,041	21,699	44,870		82,000	87,000	98,000	105,000	110,000
	Yield (Mt/ha)	1.53	1.41	2.15		2.12	2.21	2.28	2.35	2.43
Rice (paddy)	*Production (Mt)*	*96,488*	*98,148*	*133,054*		*157,050*	*174,930*	*186,660*	*205,150*	*242,420*
	Areas (ha)	39,064	35,561	41,884		45,000	49,000	51,000	55,000	62,000
	Yield (Mt/ha)	2.47	2.76	3.28		3.49	3.57	3.66	3.73	3.91
Food Crops										
Cassava	*Production (Mt)*	*33,425*	*21,979*	*23,493*		*24,000*	*53,750*	*93,000*	*131,625*	*175,000*
	Areas (ha)	8,773	5,784	5152		6,000	10,750	15,500	20,250	25,000
	Yield (Mt/ha)	3.81	3.80	4.56		4.00	5.00	6.00	6.50	7.00
Sweet Potato	*Production (Mt)*	*9,756*	*9,687*	*5,620*		*10,800*	*19,000*	*28,600*	*39,360*	*50,000*
	Areas (ha)	3,738	3,229	1784		3,000	4,750	6,500	8,200	10,000
	Yield (Mt/ha)	2.61	3.00	3.15		3.60	4.00	4.40	4.80	5.00
Irish Potato	*Production (Mt)*	*1,868*	*918*	*209*		*1,500*	*5,688*	*11,000*	*17,438*	*25,000*
	Areas (ha)	907	437	120		500	1,625	2,750	3,875	5,000
	Yield (Mt/ha)	2.06	2.10	1.74		3.00	3.50	4.00	4.50	5.00
Soya bean	*Production (Mt)*	*1,025*	*1,539*			*2,100*	*3,825*	*5,120*	*7,225*	*9,720*
	Areas (ha)	899	962			1,500	2,550	3,200	4,250	5,400
	Yield (Mt/ha)	1.14	1.60			1.40	1.50	1.60	1.70	1.80
Green gram	*Production (Mt)*					*3,000*	*5,100*	*7,150*	*9,450*	*12,000*
	Areas (ha)					3,000	4,250	5,500	6,750	8,000
	Yield (Mt/ha)					1.00	1.20	1.30	1.40	1.50
Peanut	*Production (Mt)*	*2,779*	*4,128*			*4,800*	*8,775*	*13,300*	*17,763*	*22,500*
	Areas (ha)	2,074	3,753			4,000	6,750	9,500	12,250	15,000
	Yield (Mt/ha)	1.34	1.10			1.20	1.30	1.40	1.45	1.50
Mung beans	*Production (Mt)*	*1,647*	*2,562*							*12,000*
	Areas (ha)	1,752	2,847							8,000
	Yield (Mt/ha)	0.94	0.90							1.50
Horticulture										
Onion/garlic	*Production (Mt)*	*1,778*	*1,864*	*1,427*		*2,144*	*3,485*	*4,860*	*6,365*	*8,000*
	Areas (ha)	671	632	626		670	1,025	1,350	1,675	2,000
	Yield (Mt/ha)	2.65	2.95	2.28		3.20	3.40	3.60	3.80	4.00
Fruit	*Production (Mt)*	*14,128*	*14,865*	*12,409*		*18,000*	*26,125*	*35,000*	*43,775*	*52,500*
	Areas (ha)	1,534	1,842	1,593		2,000	2,750	3,500	4,250	5,000
	Yield (Mt/ha)	9.21	8.07	7.79		9.00	9.50	10.00	10.30	10.50
Vegetables	*Production (Mt)*	*4,127*	*4,096*	*4,141*		*4,620*	*10,370*	*16,450*	*23,178*	*30,000*
(leaf)	Areas (ha)	543	642	638		700	1,525	2,350	3,175	4,000
	Yield (Mt/ha)	7.60	6.38	6.49		6.60	6.80	7.00	7.30	7.50
Vegetables	*Production (Mt)*	*865*	*1,234*	*1,404*		*3,300*	*7,200*	*11,520*	*16,320*	*21,000*
(other)	Areas (ha)	211	375	390		600	1,200	1,800	2,400	3,000
	Yield (Mt/ha)	4.10	3.29	3.60		5.50	6.00	6.40	6.80	7.00
Industrial Crops										
Coffee	*Production (Mt)*		*8,151*	*8,177*		*8,800*	*8,800*	*9,350*	*9,350*	*9,900*
	Areas (ha)		54,341	54,516		55,000	55,000	55,000	55,000	55,000
	Yield (Mt/ha)		0.15	0.15		0.16	0.16	0.17	0.17	0.18
Coconut	*Production (Mt)*		*8,894*	*9,042*		*9,300*	*9,450*	*9,600*	*9,900*	*10,200*
	Areas (ha)		14,823	14,823		15,000	15,000	15,000	15,000	15,000
	Yield (Mt/ha)		0.60	0.61		0.62	0.63	0.64	0.66	0.68
Candlenut	*Production (Mt)*		*1,837*	*1,856*		*1,848*	*1,875*	*1,904*	*1,932*	*1,923*
	Areas (ha)		3,466	3,501		3,553	3,606	3,661	3,715	3,771
	Yield (Mt/ha)		0.53	0.53		0.52	0.52	0.52	0.52	0.51
Cashew nut	*Production (Mt)*		*147*	*150*		*153*	*157*	*160*	*161*	*165*
	Areas (ha)		1,635	1,651		1,668	1,685	1,701	1,718	1,736
	Yield (Mt/ha)		0.090	0.091		0.092	0.093	0.094	0.094	0.095
Livestock										
Buffalo	Nos			94,664		96,557	98,488	100,458	102,467	104,517
Cattle	Nos			161,650		165,691	169,834	174,079	178,431	182,892
Sheep	Nos			41,854		46,039	50,643	55,708	61,278	67,406
Goats	Nos			152,360		167,596	184,356	202,791	223,070	245,377
Pigs	Nos			330,435		396,522	436,174	479,792	527,771	580,548
Poultry	Nos			702,474		772,721	849,994	934,993	1,028,492	1,131,341
Dairy cows	Nos					100	200	300	400	500
Cow milk	('000) litres						548	548	1,000	1,500
Dairy goats	Nos					1,100	2,200	3,300	4,400	5,500
Goat milk	('000) litres					1,431	1,750	2,000	2,500	3,000
Fisheries										
Aquaculture	*Production (Mt)*			*156*						*348*
Fish ponds	Fresh (ha)			78						132
Yield (Mt/ha)				2.0						2.6
Aquaculture										
Fish ponds	Brackish (ha)									511
Marine fisheries	Mt			3,877		4,459	5,127	5,896	6,781	7,798
Forestry										
Rehabilitation	ha/year					75,000	75,000	75,000	75,000	75,000
	cum. ha					75,000	150,000	225,000	300,000	375,000
Protected area	ha					4,600				15,000
Protected area	nos					5				20
Popular forest	ha					200				12,500
Watershed protec	ha									62,000
Honey	Mt			1						2
Rattan	ha					4	4	4	4	4
Bamboo	ha			6						26

a/ Source: (i) baseline (2012), MAF report to IV Government; and (ii) predictions, supplied by National Directors.

6.2 Annex 2 - MTOP development process

This strategy-driven MTOP was prepared using numerous interactive and iterative processes. Once the MAFSP had been reviewed and approved internally, a one-week workshop was organized for MAF National Directors and selected District staff. During this workshop the MAFSP was presented and discussed so that all attendees had the same understanding of the goal, vision, mission and strategic objectives. Feedback received from participants was used to revise and finalize the MAFSP.

The planning and priority setting procedures were demonstrated using a problem-tree approach, and through a series of exercises. The concepts of programs and projects were then discussed. Output targets for all commodities and Directorates were set for the next five years (2014-2018)[10]. Then each Directorate, in consultation with its major clients, was requested to prepare programs and projects which were considered necessary to achieve the targets.

A template was designed to obtain a uniform set of information for each project, from the National Directorates and development partners, including NGOs. A workshop was then held with the planning staff from all Directorates to discuss and explain the template in order to facilitate the project formulation and budgeting processes.

Information from all Directorates and development partners was then compiled, and based on this information an attempt was made to estimate the investment needed to implement all of MAF's proposed activities. Based on this plan, the total investment required for 2014 was estimated to be $354.7 million which is almost 15 times MAF's current total budget. The estimated investment requirement declined to $210.7 million in 2016 and then increased to $558 million in 2018. A feature of this initial plan and budget was very little correlation between the proposed projects and the capacity of MAF's Directorates to deliver results.

In addition, there were a number of problems with the data and information provided, and no rigorous priority setting involved in the estimation process. The underlying assumptions with respect to subsidies were not in line with the current Government policy. There was no uniformity in the budget estimation process used by the Directorates and there were considerable gaps in the information provided, especially in relation to deliverables and outcomes. Given the current economic climate it was inconceivable to expect over 90% of the proposed budget to be provided by development partners.

The issues listed above were then discussed by MAF's senior management team. There was general consensus that there needed to be an increase the current level of public sector investment in agriculture, and acceptance that strong reliance on uncommitted development

[10] Note: this MTOP is based on conservative and "realistic" targets, given MAF's budget limitations.

partner funds would not produce a realistic operational plan. However, the budget required for the proposed plan was considered to be very unrealistic within the context of the current Government expenditure framework. Therefore in discussion with the Minister of Agriculture MAF it was decided that an operational budget of $35-$40 million was realistic and possibly an achievable budget target in the medium-term. This level of budget was also within MAF's current absorptive capacity.

Based on this Ministerial decision, each Directorate was given an operational budget ceiling and requested to develop programs and projects which could be implemented within this guideline. Three criteria were used to allocate the overall budget envelope amongst the Directorates: (i) the importance of their activities in achieving developmental goals and targets; (ii) their existing delivery capacity; and (iii) the current level of support from development partners. The resulting prioritized project concept notes and the major infrastructure development projects for Government funding were considered separately as the latter will be funded through the Infrastructure Fund if they pass a feasibility study/ appraisal assessment. The project templates were then revised and another round of training provided for Directorate planning officers. The resulting plans were compiled and face-to-face meetings held with relevant staff from each Directorate to clarify the logic and priority of the information provided on project concepts.

MAF's Directorates were encouraged to use the following prioritization criteria when finalizing the list of projects to be implemented during the five-year MTOP: (i) contribution to food and nutrition security; (ii) capacity to implement and deliver; (iii) contribution to poverty reduction (through income generation); (iv) effects on the environment; (v) effects on vulnerable groups; and (vi) contributions to organizational development. Food security was weighted heavily compared with the other criteria.

A zero draft of the MTOP was then presented and discussed during five stakeholder workshops; three in the districts and two in Dili, during the second half of April 2013. This final version of the MTOP incorporates comments and feedback received during these workshops. Detailed information on the accepted individual projects is provided under separate cover as there are more than 100 Project Information Sheets.

MAF's MTOP was prepared once the MAFSP had been finalized and MAF had prepared a new Ministry organogram and associated organic law. As mentioned in Section 6.2, the MTOP was presented to a series of Dili- and District-based stakeholders. A summary of these workshops is presented in Table 45.

Table 45: Summary of the MAFSP and MTOP planning processes

Date	Activity	Purpose	Venue	Participants	Outcome
Preparation of the MAF Strategic Plan					
September 2012	Joint workshop (I) for MAF's staff from national and district level	1. To initiate the process of prioritizing programs for agricultural and rural development over the period 2014-2020 2. Draft Strategy reviewed and receiving feedbacks	Dili, MAF Conference Room	Representatives of Ministry of Agriculture and Fisheries from national level and also district level, MAF District Directors, MAF District Planning Officers, and District Administrator). Meeting was chaired by the Minister	Inputs from participants.
September/October 2012	Review workshop (II)	1. To discuss content and provide feedback on MAF SP; 2. Reviewed and finalized the Strategic Plan 2014-2020	Dili, MAF Conference Room	Selected national and district level MAF staff. Meeting was chaired by the Minister	Feedback provided during workshop resulted in some revision of MAF SP
October 2012	Workshop with the development partners including the NGOs (III)	To present and discuss MAF SP 2014-2020	Dili, MAF DG Meeting Room	Meeting was chaired by the Minister, presentation made by Vice Minister	Development partners provided some inputs and accepted to align their program and project with MAF SP 2014-2020
Preparation of Medium Term Operational Plan (MTOP) 2014-2018 and Medium Term Investment Plan (MTIP) 2014-2015					

October - November 2012	Consultation of MAF National Directors (ND) and District Directors (DD) to operationalize MAF Strategic Plan (SP)	To revise jointly with NDs and DDs their initial priority setting (in line with the SDP 2011-2030): - Short term - Medium term - Long term And preparation for MTOP and Five Years Investment Plan	Dili, DG Meeting room	1. Representatives of Ministry of Agriculture and Fisheries from national level and also district level 2. Meeting was chaired by the National Director of Policy and Planning (NDPP) and Sr. Faustino, Chief Planning.	National stakeholders actively involved in process leading to formulation of medium-term operational plan (MTOP) and medium-term investment plan (MTIP)
Dec 2012-March 2013	Meetings with MAF NDS and Development Partners	1. Development of Medium term Operational Plan (MTOP 2014-2018): - Projects - Activities - Resources, - Targets	MAF Conference Room, NDs' offices.	1. Meeting with MAF Planning Officers and presented the PIS template 2. Sent the template to development partners 3. Followed by Individual meetings with National Directorates and assisted them in preparing their PIS	The process of preparing Project Information Sheets (PIS 2014-2018) on annual basis (from MAF National Directorates and development Partners)
18 April 2013	Presentation of draft MTOP/MTIP for final comments to ND	Share and get final comments of the National Directors (ND) on the MTOP/MTIP	Dili, MAF meeting room	National Directors of the Ministry of Agriculture and Fisheries	National Directors refined MAFs medium-term operational plan
22-26 April 2013	Presentation of MTOP/MTIP to DD and district stakeholders (3 regional consultations)	Share and get final comments of the DD and other stakeholders on the MTOP/MTIP	MAF or DA office in 3 districts	National Directors and planning officers of the Ministry of Agriculture and Fisheries	ND Directors and planning officers informed about MAFs medium-term planning framework and budget deficit

2 May 2013	Harmonization meeting of MAF with its development Partners and stakeholders	Share MTOP/MTIP with development Partners and stakeholders. Also introduce GAFSP proposal to address the MAF budget deficit	Dili, MAF Conference Room	The harmonization meeting was attended by 60 participants from government, private sector, non-governmental organizations (NGOs), Farmers Organizations and international organizations.	ND, development Partners and stakeholders informed about MAFs medium-term planning framework, budget deficit and GAFSP proposal
14 May 2013	Meeting with MAF Planning Officers	To align the MAF priority projects 2014-2018 with SDP Goals 2013-2017 annually and quarterly as instructed by the office of the Prime Minister	Dili, MAF DG Meeting Room	MAF Planning Officers and chaired by Sr. Raimundo and Sr. Faustino from NDPP	The exercise was completed and submitted to the Office of the Prime Minister

6.3 Annex 3 – MTOP workshop outcomes

This document has been published as an attachment.

6.4 Annex 4 – Results framework: MAF's Medium Term Operation Plan (2014-2018)

Results Framework: MAF's Medium Term Operational Plan (2014-2018)

Narrative	Standard results indicators	Target for 2018	Means of verification/data needed	Assumptions
Development Objectives				
• Improved household food and nutrition security and reduced hunger	• Number of food deficits days. • Agricultural output and food production index. • Percentage stunting in children -under 5	• Total staple food supply exceed demand except for rice • Average number of food deficit days reduced	• Publications, statistics and reports from the Government, FAO, World Bank, ADB, MDG,IFPRI and WHO	• Government continue to support agriculture, poverty reduction and food and nutrition security as priorities.
• improved rural income and livelihood and reduced poverty	• Average income of rural households/percentage increase in agricultural income • Rural poverty level (percent below poverty level)	• Percentage of Timorese living below poverty line reduced by 50 percent • Ranking based on global poverty index improved. • Diversification of crops, consumption of fish promoted to improve nutrition.	• Various survey reports including household surveys • Publications, statistics and reports from the Government, FAO, World Bank, ADB, MDG,IFPRI and WHO	• Active support from the development partners and other stakeholders in the implementation of TLSDP and MTOP
• Support the transition from subsistence to commercial farming	• Marketed surplus by farmers. • Growth in agricultural value addition and export • Value of agricultural imports	• Agricultural exports doubled • At least 50 percent of fruits and vegetables grown locally • Increased marketable surplus from small holder producers	• Export/import statistics and reports • Farm level survey data	• Continuous political and social stability in the country. • Adequate staff capacity and infrastructure to deliver the services in place.
• Promote environmental sustainability and conservation of national resources.	• Decline in deforestation • Percentage of protected areas • Percentage change in biodiversity and forest.	• Determination of agricultural production zones and conservation zones completed. • Percentage of land area under sustainable management practices increased	• Various reports.	• Investments will demonstrate positive impacts on food and nutrition security and broader economic development. • No natural disasters and drastic climate change • Enabling policy environment for agricultural transformation exists.
Program 1: Sustainable increase in production and productivity				
Sub Program 1.1: **Enhanced contribution of agricultural research**	• Number of demand driven technologies and innovations generated • Number/technologies/manage	• Site specific fertilizer recommendations for major commodities made available • A fully operational R&D	• Annual report of MAF and collaborative projects	• Partnerships with adequate capacity for generation and uptake of technologies • Adequate human, financial and

	ment practices/ Recommendations available for uptake • Number of socio-economic studies completed • Public investment in agricultural research as a percentage of agricultural GDP (research intensity) • Number of collaborative research programs implemented with sub-regional and international partners • Increased productivity of major staple and export crops	institute in place • An R&D master plan completed and being implemented • Research intensity improved significantly and approach 1 percent of agricultural GDP • Improved germ-plasm/ (seeds and seedlings) for all major crops made available to farmers. • At least a total of 10 recommendations released by 2018 • Technological packages for improving cropping efficiency in irrigated areas developed and promoted in selected irrigation schemes • 15-20 percent increase in yields/livestock productivity over the base period. • Watershed based, integrated, decentralized, participatory planning approach tested and implemented in 3 major production zones.	• Various research reports • Master plan document. • Recommendations for extension • Crop cutting surveys adoption studies	physical resources available to implement projects.
Sub Program 1.2: **Improved extension services**	• Number and extend of adoption of technologies • Number/percentage of farmers receiving extension advice • Number of functional farmer groups by districts • Relevant demand driving agricultural extension education system • Number of extension staff trained on agricultural/facilitation skills	• 100,000 farmers having access to agricultural extension services (training field days, campaigns and other resources) • 50,000 farmers adopted at least one improved technique/production practice with corresponding increase in productivity • Agricultural vocational schools instructing at least 300 students per year. • Agricultural vocational schools have adequate and relevant curricula for different levels and different target groups (post - secondary students, extension workers, agricultural professionals and farmers).	• Regular progress reports • Adoption surveys • Human resources development (HRD); surveys conducted by MAF; graduation list; tracer studies; workshops reports • Revised curricula	• Curriculum approved by relevant authorities • Infrastructure development plan approved and completed for vocational schools • Government continue implement the upgrading of the extension education systems • Good collaboration of research and extension with districts, sub-districts and suco level staff • Adequate financial and technical support.

		• At least 2 training modules reviewed per year. • Agricultural extension education system giving annually at least 2 regular training to extensionists, MAF's service providers and other rural service providers. • Capacities of teachers are strengthened through formal and short courses to teach the new curriculum. • Two commodity based extension campaigns and 2 demonstrations prepared and implemented each year • At least 400 extension workers have successfully participated in at least 4 in service training modules by 2018 • By 2018 all extension activities implemented through farmer groups. • Employment of agricultural secondary school graduates increased to 30 percent • MAF's agricultural information department producing three extension packages per year.	• Campaign reports • Participatory evaluation reports • Tracer study reports • Extension bulletins and brochures	
Sub Program 1.3: **Reduced field and post- harvest losses.**	• Number of control interventions undertaken and number of farmers reached • Improvement in livestock health (reduced mortality) • Relevant legislations and regulations • Percentage reduction infield and post- harvest losses.	• Pre and post- harvest losses reduced by at least 40 percent by 2018 • Relevant legislations regulations related agro-chemicals in place • Improved animal health condition throughout the country.	• Various study reports • Field surveys	• Continuous government support for relevant legislations and private sector participation • Availability of agro chemicals and drugs.
Sub Program 1.4: **Sustainable water supply to agriculture and enhanced water use efficiency**	• Area under irrigation and available water for agriculture. • Assessment and efficient utilization of ground water	• A comprehensive irrigation inventory assembled. Dam and ground water pilot projects pilots tested and results used to inform further development. • Large dam feasibility studies	• MAF's annual report • Various study reports.	• Adequate resources made available for the implementation of proposed activities • Irrigation still remains as a priority

	• Efficient irrigation methods and management of water use • Water harvesting and utilization	completed and rehabilitation will continue • Area under irrigated rice will have increase by 40% • Alternative irrigation methods pilot tested and promoted • Construction of access pass to all major irrigation schemes completed • Management of water users association in all irrigation schemes improved		
Sub Program 1.5: **Increased use of labour productivity enhancing technologies**	• Number of farmers using tractors • Total area cultivated using tractors • Number of public-private partnership to provide services • Extend of use of coffee pulping machines; shellers; motorized boats etc.	• Improved mechanization services for 25% of all farmers • Mechanization centres established in key districts to provide repairs and maintenance services and hiring tractors. • Number of pulping machines shellers and motor boats distributed increased.	• MAF's annual reports • Service records	• Enabling environment for private sector participation. • Adequate resources allocated
Sub Program 1.6 : **Accelerated production of selected enterprises.** **Component 1** **Increased production and productivity of food and horticultural crops (rice, maize, soya bean, mung bean, ground nuts, vegetables, tubers, potatoes etc.)**	• Changes in acreage, yield and production	• Tonnage of paddy production will have increased at least up to 167,000 Mt.[11] • Area under rice will have increased up to 50,000 ha • Average maize yield will have increased to 2.0 Mt/ha • Cassava production will increase to 50,000 Mt. • Sweet potato production will increase to 15,000 Mt • Production of soya beans, green	• MAF's annual report • Crop cut surveys • Project reports • Food grain import data • Field monitoring reports	• Appropriate knowledge and technology delivery mechanisms operational • Availability of inputs and targeted services • Efficient marketing system in place • Enabling policy environment for agricultural transformation exists

[11] This output target is based on 'realistic estimates' scenario. For more details for annual targets under the 'optimistic" scenario see Table 44.

		gram, peanuts and mung beans increased by about 60% • Onion/garlic; fruits, leafy vegetables and other vegetable production will have increased to 8,000 Mt; 53,000 Mt; 30,000mt and 21,000 Mt respectively.		
Component 2. **Increased production and productivity of (coffee, coconut, candlenut, cocoa, cashew nuts) Industrial crops**	• Increased production and productivity of traditional and emerging industrial crops.	• 4000 ha of old plantation of coffee rehabilitated • 2000 ha of new land under coffee • Coffee yield will increase from 0.15mt/ha to 0.18 Mt/ha • Coconut, candlenut and cashew nut production will increase at least up to 10,000 Mt, 2000 Mt, and 165 Mt respectively. • Master plans for the development of coffee and minor export crops (coconut and cocoa) developed and implemented • Increased area of coconut intercropped with cocoa.	• Export data • Various MAF's reports • Project reports • Master plans for coffee, coconut and cocoa • Field monitoring reports	• Appropriate knowledge and technology delivery mechanisms operational • Availability of inputs and targeted services • Efficient marketing system in place • Enabling policy environment for agricultural transformation exist • No substantial changes in global prices
Component 3: **Fisheries Production**	• Extend of aquaculture and quantity of fish produced. • Extend of ocean fishing and quantity of commercial harvest • Increased consumption of fish as a protein supplement.	• Inventory of available sites for commercial fisheries completed • Promoting export based fisheries including deep sea fishing and fishing in the exclusive economic zone • Three types of community based aquaculture activities tested and promoted in coastal communities • Fisheries resources assessed and management plan developed and	• Landing data and reports • Feasibility study reports	• Marine fisheries development remains as the priority of the government • Additional multi donor support secured for developing marine fisheries.

		implemented • A marine fisheries master plan developed, feasibility studies for small industrial deep water fishing completed and projects implemented. • Improved fish harvesting, preservation and utilization technologies developed and promoted • Harvest from marine fisheries and aquaculture production at least doubled. • Licensing arrangement for deep sea fishing operational	• Record of fee collection.	
Component 4: Livestock Production • Increase in livestock numbers • Increased export of livestock products • Increased livestock productivity • Improved livestock management		• A livestock sector development plan developed and implemented • Increased livestock populations of buffalo, cattle, sheep, goats, pigs and poultry by 11%; 13%; 61%; 61%; 25%; and 61% respectively over the base year. • Dairy milk production increased to 1.5 million litres; and goat milk to 3 million litres/year. • Introduction of new breeds of goats and pigs • Improved management of poultry, pigs, sheep, goats under traditional production system,. • Use of feed formulated using locally available feed sources	• Various reports of MAF • Livestock sector development plan • Adoption studies report	• Appropriate knowledge and technology delivery mechanisms operational • Availability of inputs and targeted services • Efficient marketing system in place • Enabling policy environment for agricultural transformation exist • No substantial changes in global prices
		• A forestry development management plan in place and is operational	• Forestry development plan • Seedling distribution records • Various MAF reports	

Component 5: **Forestry Production**	• Area under improved forestry production • Value of non-timber production • Improved livelihood through alternative income generation from forests.	• A number of community based nurseries established and seedlings produced and distributed (TLSDP target is 1 million per year) • A total of 25,000 ha of forest rehabilitated • Additional 12,500 ha under popular forest • At least 2 Mt of honey, 4 ha of rattan and 26 ha of bamboo planted • A national bamboo policy and marketing strategy in place.		• Strategic partnership with development partners and local communities.
Program 2: Market access and value addition				
Sub Program 2.1 **Quarantine and safety standards.**	• Number of agro chemical dealers registered • Volumes of seeds certified • Grading and quality standards • Legislation and law enforcement.	• Grading , quality assurance, and safety standards for inputs and outputs established and monitored • Effective implementation of sanitary and phyto sanitary protocols in place. • Legislations related to quarantine established and enforced • Effective disease surveillance, and monitoring and inspection of agricultural produce in place.	• Various reports, legislations.	
Sub Program 2.2: **Access to quality inputs and planting materials.**	• Growth in sales/quantities of improved seeds, planting materials, fishing equipment, breeding stocks, fertilizer and other modern inputs used (by district) • Number of private dealers engaged in modern input supply and the quantity sold	• Formal and informal seeds and seedlings produced and distributed increased by 50 percent. • Increased production and distribution of finger lings to support aquaculture.	• Seed/seedling/finger ling distribution records. • MAF's annual reports	• Conducive environment for communities and private sectors to participate.
Sub Program 2.3: **Diversification and Value Addition**	• Total area diversified by enterprises • Number of value chains analyzed and used in commodity development	• Value chains for major commodities analyzed and documented • Market research to identify high quality niche products completed	• Various MAF's reports • Research reports	• Necessary surplus is produced for agro processing • Conducive environment for private sector participation. • Support to agribusiness

	• Quantity of produce processed locally • Profitability studies for enterprise selection • Number of public-private partnerships in enterprise selection • Building capacity for business development services.	• Small industries established for cheese, butter and yogurt • Market information collected, analyzed and distributed regularly • Small scale processing developed and promoted for coconut (extraction, soya bean and bananas • Food processing and post-harvest technologies for livestock (smoked beef) and fish developed and promoted • Enterprise profitability assessment completed for all major enterprises • Promotion of small scale honey production in selected districts.		development in place
Sub Program 2.4: **Rural market infrastructure to reduce Post-Harvest losses**	• Number of new storage structures functional/units distributed • Scaling up of successful technologies • Pilot projects on rural market infra-structure improvement	• 50,000 20 litre grain storage drums distributed	• Project reports	• Continuous financial support for rural market infrastructure development
Sub Program 2.5: **Promote collective marketing, support to farmer groups and farmers associations**	• Number of farmer groups involved in collective marketing by districts • Number of farmer groups/farmers trained in business development • Quantity of output sold through collective marketing.	• A number of agricultural co-operatives revitalized for input distribution and product marketing • All farm level interventions through farmer groups and co-operatives. • Training centres established for co-operative groups		• Government desire to provide services through farmer groups and co-operatives maintained
Sub Program 2.6: **Promoting private sector engagement in input supply product marketing and other service delivery**	• Enabling environment and incentives for private sector participation. • Number of public private partnerships in marketing , service delivery and agribusiness	• Constraints to private sector participation identified, documented • Actions for greater engagements identified and implemented	• Various reports • Project documents.	• Engagement of private sector to deliver services remain a priority of the government

Program 3: Enabling environment				
Sub Program 3.1: **Policy and legislative framework and capacity for policy analysis**	• Number of policy analysis completed • Number of policies developed and implemented	• On average at least two policy briefs on strategic analysis of policy and market issue produced annually .	• Case study reports • Policy briefs	• Adequate technical assistance provided • Analytical capacity in place • Functional advisory system in place.
Sub Program 3.2: **Co-ordination in implementation and management of policies and programs.**	• Number of policy reviews completed • Number of inter and intra sectoral co-ordinations mechanisms established and functioning	• MAFSP and MTOP are widely disseminated and internalized • At least one policy review completed per year and information used in future planning.	• MAF's reports • Special case study reports.	• Functional ministerial advisory council.
Sub Program 3.3: **Functional agricultural statistical service**	• A well-functioning data collection and management system. • Number of planning activities supported • Number of progress reports, bulletin and analysis produced, disseminated and used.	• Agricultural census completed • A unified centralized data base established in MAF • Data and information system for livestock development established • More reliable data base for annual reports. • A national farmer's registry system in place.	• Census report • Existence of a reliable data base	• Adequate capacity and resources provided • A management system using data base to support decision making.
Sub Program 3.4: **Climate Information and analysis**	• An agro climate data base in place. • Advanced climate forecasts for farm level and other strategic decision making • Integrating climate change issues in planning.	• An enriched geographical information system assisting in planning and availability of remote sensing services. • Data on river system and irrigation potential assisting watershed management and further development in irrigation.	• Various reports • Weather related information sheets	• Capacity and resources for data collection and management system available.
Sub Program 3.5: **An early warning system (EWS)**	• Documentation of coping strategies adopted by farmers • Improved and timely weather	• Coping strategies documented and distributed • EWS generates regular	• Reports • Early warning bulletins • Action reports by MAF's	• Capacity to collect, analyses and disseminate information in a timely fashion available.

	data to assist planning.	information that is made available at national level • Strategic decisions made based on EW information.	agencies.	
Program 4: Organizational strengthening				
Sub Program 4.1: **Support to complete the re-organization of MAF**	• Various units and mechanisms in place and functioning effectively	• A restructured MAF with governance mechanism and modalities of operation revised and implemented • The Timor-Leste ministerial agricultural advisory council formulating national policies for the sector and guiding and overseeing implementation. • The Timor-Leste research and development institute will be guiding and planning additional investments in research, extension and vocational training for all major agricultural sub-sectors. • The revitalized NDPP conducting policy analysis and reviews. • Effective co-ordination of bilateral and multi-lateral co-operation • A strategy for national food security and food sovereignty completed and effectively implemented.	• MAF's reports • Minutes of council meetings • Minutes and regular reports • Minutes of development partners harmonization meetings. • Collaborative agreements • A strategy document	• Necessary technical assistance provided and staff capacity developed.
Sub Program 4.2: **MAF Capacity Development (CD)**	• Existence of CD strategy and its implementation • CD development responding to the needs	• A capacity strengthening strategy, completed, and implemented • Training needs assessment completed, and resources allocated/secured to address the needs • Database on agricultural census developed and maintained	• Strategy document • Training needs assessment report • MAF's annual report	• MAF maintains its priority for CS and secures additional resources needed

Sub Program 4.3: **Develop and implement an M&E strategy**	• Existence of a need based M&E strategy and system • Regular monitoring and evaluation and feedback mechanisms.	• A need based M&E strategy and system in place • M&E internalized in project/program planning and implementation • At least one program review in 2 years and five impact studies by 2018 and the lessons learned incorporated in planning • Annual planning and priority setting mechanism institutionalized within MAF • Periodical review of MTOP log-frame to keep it current and realistic.	• Project proposals with M&E components. • Program review and impact study reports.	• Adequate resources allocated in annual planning and budgeting.
Sub Program 4.4: **Support to develop and implement relevant complementary strategies.**	• Complementary strategies are in place and fully operational • Additional resources mobilized from government and development partners. • Number of new strategic and effective partnerships established • Number of projects funded by agencies outside MAF • Staff retention • Performance based reward system	• A human resources management strategy and policy in place and being used • A partnership strategy in place and is operational • A knowledge management and communication strategy in place and being implemented. • A resource mobilization strategy completed and implemented • At least 60 percent of MAF's operational budget secured from national government • A gender strategy in place and effectively implemented. • At least one gender responsive recommendation developed and disseminated per year	• Various strategy documents • MAF's reports • Gender disaggregated data in MAF's reporting.	• Once strategies are completed the necessary resources for implementation budgeted in revised MTIP
Program 5: Natural resources and conservation and management				
Sub Program 5.1: **Sustainable natural resources management and utilization**	• Number of farmer groups/communities involved in NR conservation by districts • Co-operation agreements	• Determination of agricultural production zones and conservation zones completed. • At least 25,000 ha of degraded	• Various reports • Project documents	• Government maintains its priority for NRM • A thorough understanding of implications and mitigation

	signed and implemented for the conservation of NR (including marine resources and bio-diversity)	forest rehabilitated • At least on community based resource management project in each district • Production system oriented, watershed based integrated planning in place		measures • Active community participation.
Sub Program 5.2: **Increased knowledge protection and utilization of bio diversity**	• Collection and preservation of indigenous germ plasm (plant, animal, terrestrial and marine-including in-situ conservation) • Utilization of existing genetic bio-diversity for agricultural development.	• Germ plasm collected and conserved all major crops and forest trees • Bilateral and multilateral co-operation agreements in place	• MAF's annual report • Collaborative agreements.	• Government maintains its priority for natural resources management.
Sub Program 5.3: **Environmentally friendly agricultural industry practices.**	• Explicit environment consideration in technology assessment • Use of ICM,SRI, rotation systems, cropping practices, (intercropping) organic farming, agro-forestry etc.	• Development and implementation of agro-forestry systems • Communities sensitized to support sustainable development of forestry sector • Increased areas and production using ICM, rotation system, cropping practices and agriculture –aquaculture systems	• Various reports.	• Environmental impact is used explicitly in projects/technology selection.
Sub Program 5.4: **Promote the conservation of national and cultural heritages.**	• Establishment and management of wild life parks • Percentage protected areas	• At least one wild life park developed • Based on the conservation zones protected areas will be increased • Maintenance and management of existing parks and protected areas.	• MAF's report and progress reports	• Adequate resources made available for implementation • Active community participation and support.

6.5 Annex 5 – MAF's 2013 budget

	Salaries	Goods and Services				Transfers	Minor Capital			Capital & Development		
($'000)		Vehicle Ops	Mats/Supplies	Op'n Expenses	Other		Vehicles	Other Equip	Other	Buildings	Infra	Other
Office of the Minister	$78	$18	$1	$19	$18			$2				
Legal Advisory Unit	$21	$3	$1		$6				$1			
Inspection and Auditing	$21	$5		$2	$12							
Office of Community Protocol	$15	$2		$1	$6							
Office of Deputy Minister	$130	$10	$4	$17	$17			$2				
ND of Administration	$386	$16	$17	**$118**	**$563**		$375					
ND of Research and Special Services	$222	$13	$3	$45	$23							
ND of Quarantine and Biosecurity	$200	$13	$17	$4	$70				$23			
ND of Technical Agriculture Training	$468	$25	$10	$10	**$270**				$81			
ND of Policy and Planning	$111	$10	$1	$14	$61				$3			
Office of the Director General	$26	$6	$1	$5	$10							
Office of Sec of State for Forests and Nature Conservation	$63	$6	$3	$10	$17				$2			
ND of Agriculture and Horticulture	$229	**$2,086**	**$3,642**	**$124**	**$135**							
ND of Plant Industry and Agri-business	$140	$23	**$197**	$51	$37				$1			
ND of Forests	$262	$39	$48	**$304**	$30	$35						
ND of Irrigation and Water Management	$150	**$747**	$5	$30	$93							
Office of Sec of State for Fisheries	$63	$8	$3	$11	$14				$2			
ND of Fisheries and Aquaculture	$305	$81	**$124**	$55	**$147**							
Office of Sec of State for Animal Husbandry	$63	$6	$2	$14	$13				$2			
ND of Animal Husbandry	$181	$47	**$925**	$53	**$116**				**$190**			
ND of Agriculture Community Development	$136	$7		$11	$28	$965			$15			
Sub-Total	**$3,270**	**$3,171**	**$5,004**	**$898**	**$1,686**	**$1,000**	**$375**	**$4**	**$320**	**$0**	**$0**	**$0**
ND of Agriculture Services - Aileu	$119	$8	$18	$17	$12							
ND of Agriculture Services - Ainaro	$155	$20	$5	$9	$16						**$800**	
ND of Agriculture Services - Baucau	$272	$40	$1	$20	$13						**$1,305**	
ND of Agriculture Services - Bobonaro	$267	$33	$1	$18	$20							
ND of Agriculture Services - Covalima	$256	$35	$5	$18	$15							
ND of Agriculture Services - Ermera	$166	$21	$2	$16	$12						**$478**	
ND of Agriculture Services - Liquica	$150	$31	$9	$16	$9						**$750**	
ND of Agriculture Services - Lautem	$194	$25		$23	$14							
ND of Agriculture Services - Manatuto	$207	$24	$2	$11	$20							
ND of Agriculture Services - Manufahi	$232	$38	$2	$17	$14							
ND of Agriculture Services - Oecusse	$236	$16	$5	$24	$12						**$900**	
ND of Agriculture Services - Viqueque	$255	$35		$21	$13						**$950**	
Sub-Total	**$2,509**	**$326**	**$50**	**$210**	**$170**	**$0**	**$0**	**$0**	**$0**	**$0**	**$5,183**	**$0**
TOTAL	**$5,779**	**$3,497**	**$5,054**	**$1,108**	**$1,856**	**$1,000**	**$375**	**$4**	**$320**	**$0**	**$5,183**	**$0**

6.6 Annex 6 – List of MAFs' development partners

Name	Organization	Contact Person	Address
1	ADB	Shane Rosenthal	Lecidere 77233313
2	AusAID	Gerard Cheong	AusAID – Fatuhada 77477250
		Erkulanu de Sousa	AusAID – Fatuhada 77231664
3	Camoes /IPAD – Portuguese	Manuel Moraes	RDP IV
		Filipe Alexandre Pereira Duarte	RDP IV
4	CARE International	Mirco Gomez Arias	77611862
5	CRS	Ian de la Rosa	Fomento 77230861
6	European Union	Emanuel Jose Amaral	EU Delegation - Casa Europa
7	FAO	Paula Lopes da Cruz	MAF's Compound – Comoro
	FAO – Fisheries	Enrique Alonso Poblacion	
	FAO Food Security – NIEWS Project	Maria Ann Merza	
8	GIZ	Silvio Decurtins	GIZ – Pantai kelapa – Dil Timor-Leste 77362373
9	GIZ RD PIV	Alwin Schuchmann	RDPIV- MAF's compound
10	HIVOS	Raul de la Rosa	Bairo Central
11	JICA	Hideto Daiko	Farol 77854985
12	Japanes Embassy	Tomotaka Yoshimura	Praia dos Coqueiros
13	KOICA	Kyu-Hee	Praia dos Coqueiros
14	Mercy Corps	Wahyu Nugroho	7767646
15	NZAID – New Zealand	Anna Mosley	Motael 77293257
16	OXFAM	Kunhali Muttaje	Akadiru-hun
17	Portugues Embassy	Daniel Carolo	77841613
18	Seeds of Life (SoL)	John Dalton	MAF's compound
19	Triangle	Baptiste Reverdit	77274163

20	USAID	Jessie Ryder	
21	World Bank	Luis Constantino	Lecidere 3324649
22	World Vision	Stephan Barthel	Bidau
23	WFP	Alberto Correia Mendes	Balide, 77231310

6.7 Annex 7 – Executive summary of Timor-Leste's NAPA

Following the turmoil of its emergence as an independent nation, Timor-Leste continues to be faced with enormous development challenges. Climate change represents an additional risk with the potential to cause further set-backs by undermining progress made on key development indicators, in particular food security. Due to its recent history, there is a limited store of scientific knowledge and research specific to Timor-Leste which might help to characterize the likely impacts of climate change. However, in common with its neighbours in South-East Asia and the Pacific, it is anticipated that Timor-Leste will face significant challenges as a result of climate change. In particular it is anticipated that the nation's vulnerability to climate change will be intensified by its extremely high dependency on the natural resource base, inadequate infrastructure and lack of institutional capacity.

This National Adaptation Programme of Action (NAPA) has been prepared by the State Secretariat for Environment located within the Ministry of Economy and Development (MED), Government of the Democratic Republic of Timor-Leste. The preparation process has closely followed the guiding principles outlined in the annotated guidelines of the Least Developed Countries (LDC) Expert Group (LEG) established under the United Nations Framework Convention on Climate Change (UNFCCC). A central element of the Timor-Leste NAPA has been the establishment and active participation of six dynamic Sector Working Groups on food security, water, health, disasters, biodiversity and infrastructure. Members were drawn from across government, universities, national and international NGOs, development partners, the private sector, international organizations and youth. Focal points from these groups were also actively engaged in consultation at the district level.

The Sector Working Groups adopted a two-step workshop process in order to identify the likely vulnerabilities and impacts of climate change on their individual sectors and to consider potential actions to address these impacts. Across all sectors, the main concerns raised related to changes in rainfall and temperature patterns and their effects on drought, flooding and landslides. These concerns were mirrored at consultations in the five Districts of Baucau, Bobonaro, Ermera, Manufahi and Oecusse, which were selected to represent the full range of possible climatic and agro-ecological conditions. The agricultural and water sectors were the two felt to be most heavily affected by climate change.

The overarching vision set out in the NAPA is to make the Timorese people more resilient to climate change, recognizing their high vulnerability in an economy that is dominated by subsistence agriculture. Adaptation measures will be focused on reducing the adverse effects of climate change and promote sustainable development. These measures will build on existing strategies and plans across all sectors within Timor-Leste including the National Priorities process. The following priority adaptation measures are proposed by Timor-Leste:

• Food Security: Reduce the vulnerability of farmers and pastoralists to increased drought and flood events.
• Water Resources: Promote Integrated Water Resource Management (IWRM) to guarantee water access in a climate change context.
• Human Health: Enhance the capacity of the health sector and communities to anticipate and respond to changes in distribution of endemic and epidemic climate-sensitive diseases, and reduce the vulnerability to infection of populations in areas at risk from expansion of climate-related disease
• Natural Disasters: Improve institutional and community (including vulnerable groups such as women and children) capacity to prepare for and respond to climate change induced natural disasters.
• Forests, Biodiversity and Coastal Ecosystems: Maintain and restore mangrove and forests and promote awareness rising to protect coastal ecosystems and forests from climate change impacts.
• Livestock Production: Improve planning and legal framework for the promotion of sustainable and balanced food for livestock production.
• Physical Infrastructure: Improve regulations, standards and compliance for climate-resilient infrastructure.
• Supporting the ambitious national poverty reduction target in relation to the expected increased storm intensity at sea by improving the capacity to forecast and adapt offshore oil and gas infrastructure to withstand strong storms and waves.
• A ninth priority area, underpinning all others, focuses on developing National Institutional Capacity for Climate Change through which overarching programme level coherence will be ensured.

Taken collectively, these activities provide a coherent program which, if implemented as an integrated program, would significantly reduce the vulnerability of Timor-Leste's critical development sectors to climate-related risks.

6.8 Annex 7 - Other documents

There are two other documents which form an integral part of the MTOP. These are: (i) more than 100 PISs which were prepared (in Tetun) by MAF's National Directorates as part of the planning process, and which have been translated in English; and (ii) more than 30 PISs for

development partner-funded projects. These documents have been published under separate cover and will be subject to ongoing revision and adjustment as the MTOP becomes a 'live document' and evolves over time. Readers of the MTOP are encouraged to use these PISs as the primary source of detailed information on MAF's and development partners' and planned projects and programs.