SEEDS OF LIFE
PHASE III

(SoL III)

"Towards a sustainable national seed system for Timor-Leste"

PROGRAM DESIGN DOCUMENT

Volume 1

MAIN REPORT

24 September 2010

VOLUME I: MAIN REPORT

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ABBREVIATIONS AND ACRONYMS

ACIAR	Australian Centre for International Agriculture Research
AP	Annual Plan
APC	Australian Program Coordinator
AusAID	Australian Agency for International Development
CGIAR	Consultative Group on International Agricultural Research
CLIMA	Centre for Legumes in Mediterranean Agriculture (UWA)
CSPG	Community Seed Production Group
DG	Director General (of MAF)
DPs	Development Partners
EC	European Commission
EIRR	Economic Internal Rate of Return
EoPOs	End-of-Program Outcomes
EU	European Union
FAO	Food and Agriculture Organization
FSMG	Farmer Seed Marketing Group
GDP	Gross Domestic Product
GoA	Government of Australia
GoTL	Government of Timor-Leste
GTZ	Gesellschaft fur Technisch Zusammenarbeit (German Agency for Technical Cooperation)
LT	Long Term
M&E	Monitoring and Evaluation
MAF	Ministry of Agriculture and Fisheries
MEF	M&E Framework
Mt	Metric tonne (1,000 kg)
MTR	Mid Term Review
NDA&H	National Directorate of Agriculture and Horticulture (MAF)
NDACD	National Directorate of Agricultural Community Development (MAF)
NDP	National Development Plan (replaced by National Strategic Plan in April 2010)
NDP&P	National Directorate of Policy and Programming (MAF)
NDR&SS	National Directorate of Research and Special Services (MAF)
NGOs	Non-Governmental Organizations
NPD	National Program Director (DG of MAF)
NPP	New Policy Program (AusAID funding mechanism)
OFDTs	On-Farm Demonstrations and Trials
PDD	Program Design Document
PMO	Program Management Office
PSC	Program Steering Committee
PY	Program Year
RDPs	Rural Development Programs – II, III and IV (EU-funded)
SDP	Strategic Development Plan (Prime Minister's National Development Plan)
SEOs	*Suco* Extension Officer (MAF extension officer)
SoL I	Seeds of Life I (AusAID)
SoL II	Seeds of Life II (AusAID)
SoL III	Seeds of Life III (AusAID)
SoLTL	Seeds of Life Team Leader (Australian)
SOSEK	Social Science and Economics Unit within SoL
SPC	Seed Processing Centre
SPOs	Seed Production Officers

ST	Short Term
TA	Technical Assistance
TAG	Technical Advisory Group
TL	Timor-Leste
UWA	University of Western Australia
WHHs	Women-headed Households

EXECUTIVE SUMMARY

"Towards a sustainable national seed system for Timor-Leste"

Background: The Seeds of Life (SoL) Program was supported by ACIAR from 2001 to introduce and test new genetic stocks of food staples on research stations (SoL I, A$1.2 million). In 2005, AusAID and ACIAR jointly sponsored a 5-year second phase focusing on the identification of more productive food crop varieties through participatory testing of crops with farmers (SoL II, A$10.4 million). The scope of SoL II was subsequently expanded in late 2008 to initiate the production of formal seed of released varieties for distribution to farmers. In August 2009 a Concept Mission assessed the potential for a third phase of Seeds of Life (SoL III). The mission found widespread support to continue the current Program. A Design Mission was fielded in mid-March to prepare a design framework for SoL III, resulting in the production of this Program Design Document (PDD).

Development context: Timor-Leste (TL) is predominantly an agrarian economy. Agriculture provides employment for 80% of the active population, and accounts for 30% of GDP. Around 40% of all households rely on subsistence agriculture. A large proportion of these are food insecure, experiencing a 'hungry season' of up to 4 months. During the past few years an average of about 40,000 Mt of rice has been imported per annum to bridge the national food deficit. Around half of all households are below the basic-needs poverty line.

One of the biggest challenges faced by the nation is to increase production of the main staple crops. While a range of factors contribute to this low productivity (e.g. low yielding varieties, poor agronomy, and high post-harvest losses), the limited availability of improved varieties with higher yield potentials in comparison to local varieties is where the most immediate and significant gains can be obtained. SoL has made considerable progress in introducing new varieties. However, the task is far from complete.

SoL III therefore maintains SoL II's focus on increasing the yields of staple food crops by selecting and distributing improved varieties of superior genetic quality. This focus is strongly justified by the substantial and rapid gains that are still on offer in this area. These gains can be achieved largely independent of the other factors that potentially contribute to improved food security, such as improved agronomic practices, reduced storage losses, improved input supply systems, and improved rural financial services, although the Program will, where necessary, have a secondary focus in some of these areas.

Some of the remaining issues and constraints that need to be addressed include:

- to date there has been little work on identifying improved varieties of legumes or temperate crops that are important for TL;
- the quantity of seed being produced for the improved varieties already released by SoL is not yet sufficient to provide a high level of access for farmers throughout TL, or maintain the genetic quality of these varieties;
- despite MAF's aspirations, TL will not be able to afford to meet its total requirement for seed from the formal sector, demanding the development of complementary and lower-cost approaches such as the production of informal seed by community-based seed production groups;
- the scale-up benefits achieved from the limited quantities of high-cost formal seed produced to date are not being maximised due to suboptimal approaches to distribution;

- production, processing and physical distribution systems for formal seed produced by the government system require further development, with an emphasis on cost efficiency and effectiveness;
- a more mainstream role needs to be developed for MAF's extension services in relation to the distribution of formal seed and supporting the development of community-based informal seed production;
- market-based mechanisms for seed distribution are weak and require strengthening;
- farmers' own seed systems are still poorly-understood and require further investigation;
- farmer awareness of new varieties remains limited; and
- MAF's capacity to strategically plan and manage a national seed system comprising formal and informal elements, is weak.

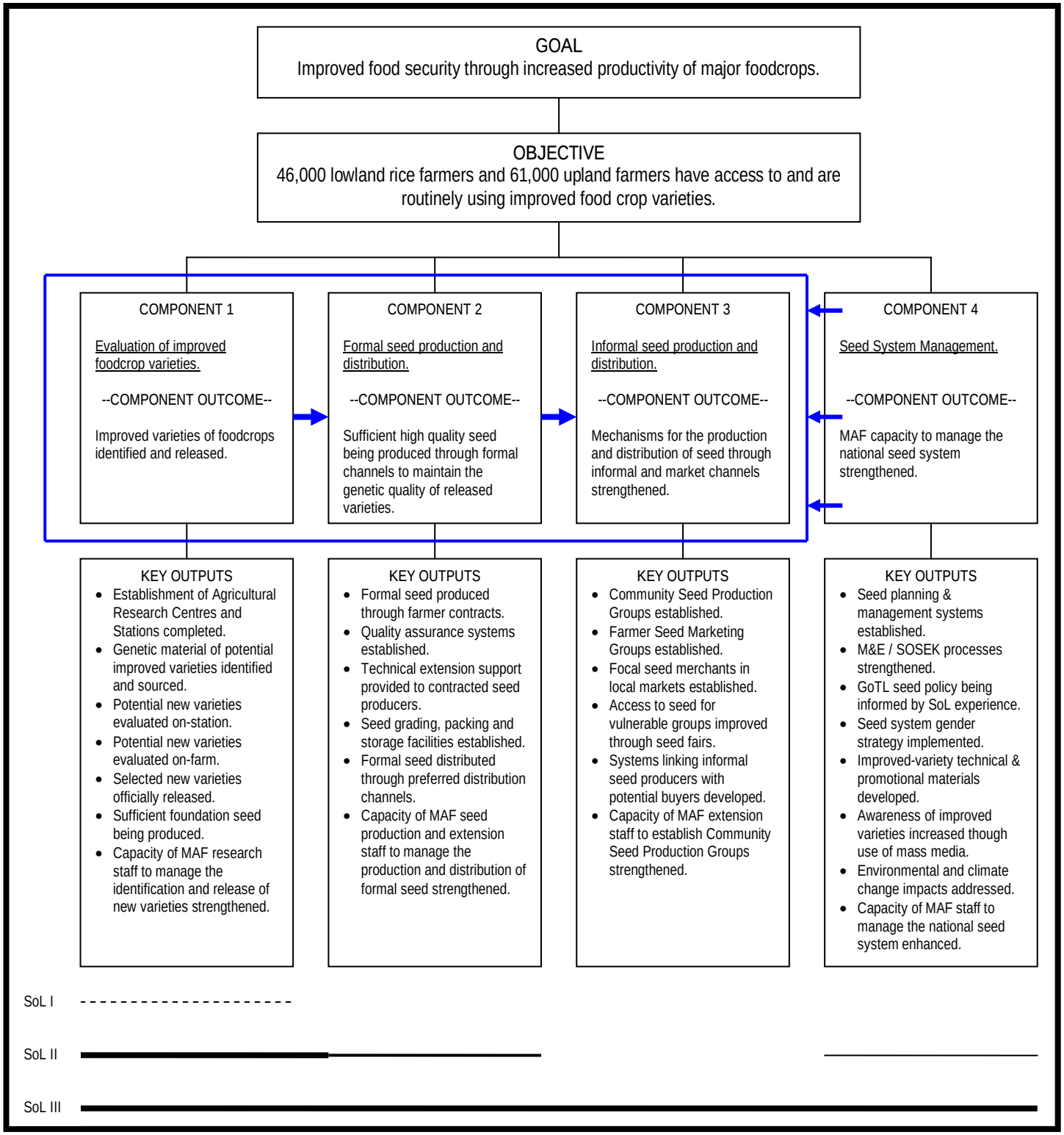
The vision: The Vision for the end of Phase III is to establish the foundations of a national seed system, providing a high level of access to seed of improved varieties to farmers throughout the country. Within this vision: (i) MAF is competently managing an adaptive research program that is regularly identifying and releasing improved varieties; (ii) MAF is competently managing formal seed production and processing activities at an appropriate scale; (iii) MAF is effectively distributing formal seed in a manner that maximises scale-up benefits; (iv) informal seed production and distribution is stimulated nation-wide through the establishment of CSPGs; and (v) MAF is actively and effectively managing overall development of the national seed system for TL.

Approach and methodology: Key features of the approach and methodology include:

- Developing a structured, strategic approach that builds on the achievements of SoL I and II.
- Developing a sustainable *national* seed system aimed at maximising access to improved varieties at minimum cost. This will be achieved by linking the production of high-cost formal seed with much lower-cost production of informal seed, as occurs in many countries. This approach explicitly recognises that utilising the informal system is the best way to develop an affordable, cost-effective and sustainable seed system for TL.
- Improving access to seed particularly for more marginalised groups, including upland farmers and women. Major emphasis will be on upland crops, reflecting the high proportion of upland farmers in the agricultural sector.
- Continuing the variety evaluation and release work initiated under SoL I and II, recognising that this work is the 'engine room' for improving crop productivity.
- Expanding the production of formal seed, initiated during the second half of SoL II, carefully balanced to drive the rapid introduction of new varieties and maintain the genetic quality of national seed stocks, but not stifle efforts to establish production and distribution of seed through informal channels.
- Concentrating formal seed production and processing activities in a limited number of specialised locations in order to achieve cost efficiencies.
- Promoting far more strategic use of the limited volumes of high-value formal seed to maximise downstream benefits.
- Stimulating production of informal seed by CSPGs, providing a low-cost mechanism for multiplying formal seed.
- Investigating initiatives to stimulate market-based seed exchange.
- Developing a mainstream role for MAF's extension service in the distribution of formal seed and supporting the production of informal seed.

- Developing the role of MAF's M&E/ SOSEK unit to manage field evaluation activities, providing a foundation for progressive learning in relation to development of a national seed system.
- Developing a cross-cutting gender strategy that focuses on ensuring equitable access to improved varieties for women.

Strategic Framework:



Duration and phasing: Phase III will run for 5 years from the close of Phase II in January 2011 to December 2015.

Geographic focus: The Program is designed to scale-up the activities of previous phases of SoL to establish the basis of a national seed system, providing sustainable access to improved varieties nation-wide.

Program cost and financing: Total Phase III cost (Australian plus GoTL funding) is estimated at A$28 million over the 5-year implementation period. The Program will be jointly financed by AusAID, ACIAR, and GoTL. On the basis of the draft transition plan, AusAID and ACIAR would finance A$ 25 million (90% of the total); and GoTL A$ 2.8 million (10%).

Governance and management arrangements: The Program will continue to operate under the Program Steering Committee established for previous Phases. To facilitate coordination across the various directorates of MAF involved in implementation (Research and Special Services, Agriculture and Horticulture, and Agricultural Community Development) the Director General will serve as National Program Director counterparted by the SoL team Leader (SoLTL) who will head the advisory team. Adaptive research and formal seed production activities will be managed directly by the relevant directorates at national level. For formal seed distribution and informal seed production activities, the Program will work directly through the MAF District Offices. To facilitate work this, the Program will establish 3 small Regional Offices, located within selected MAF District Offices.

Around 30 additional full-time MAF staff will be required to scale-up to a national program, seconded from existing positions within MAF. In addition to these full-time positions, extension staff at all levels will have a substantial involvement in distributing formal seed to farmers and in providing extension support for informal seed production activities.

Core long-term (LT) positions include the Team Leader, a Research Adviser , a Formal Seed Production Adviser, an Informal Seed Production Adviser, an M&E/ SOSEK Adviser, a Climate Change Adviser, and 3 Regional Advisers. All TA positions will be permanently counter-parted with designated MAF staff to reinforce capacity building objectives. Most of the positions will be progressively phased out over the course of the Program as core skills, systems and institutional capacity are developed within MAF. Applications will be open to all nationalities, including regional and Timorese candidates.

Key risks: Important residual risks that will require ongoing management include:

- Unrealistic expectations by MAF regarding their control over the Program's financial, physical and human resources.
- SoL Management fails to adapt to the challenges of managing the implementation of a much broader Program.
- Lack of sufficient coordination across the key MAF directorates involved in implementation.
- MAF fails to appoint a full-time NPD at a sufficiently senior level.
- MAF fails to second sufficient additional staff required for national scale-up.
- MAF's aspirations to increase the production of formal seed beyond rational limits undermines development of a national seed industry involving more efficient formal and informal sectors.
- Continued provision of free handouts by GoTL stifles development of a market for improved seed.

1. INTRODUCTION

The Seeds of Life Program was supported by ACIAR from 2001 to introduce and test new varieties of staple food crops on research stations (SoL I, A$1.2 million). In 2005, AusAID and ACIAR jointly sponsored a 5 year second phase, which involved farmer participatory assessment of food crop varieties, to identify productive varieties for official release (SoL II, A$10.4 million). The scope of SoL II was subsequently expanded in late 2008 to initiate the production of formal[1] seed[2] of released varieties for distribution to farmers.

In August 2009 a Concept Mission assessed the potential for a third phase of Seeds of Life (SoL III). The mission found widespread support to build on the current program and the potential to impact on food security nation-wide, benefiting a significant proportion of the Timorese population. In November 2009, ACIAR commissioned a Draft Preliminary Proposal for SoL III. A Design Mission[3] was fielded in mid-March to finalise the design framework for SoL III, resulting in the production of this Program Design Document (PDD) which was approved through an AusAID peer review on June 7, 2010.

2. ANALYSIS AND STRATEGIC CONTEXT

2.1. Present Situation

2.1.1. Sectoral context

Role of the agricultural sector. Timor-Leste (TL) is predominantly an agrarian economy. Agriculture employs 80% of the active population, and accounts for around 30% of non-oil GDP (excluding UN expenditures) and 90% of non-oil exports. Despite this dominant position in the overall economy, agricultural GDP grew at an average of only 2.9% per year over the period 2000-2007, lagging other sectors. The food sector (which represents 75% of agricultural GDP) failed to register any real growth in this period. On a per capita basis non-oil agricultural GDP has actually declined, reflecting high population growth.

Poverty and food security. TL is among the world's 10 poorest countries in spite of increasing oil revenues. Around 40% of households rely on subsistence agriculture and face food security issues every year, with 50% below the basic-needs poverty line. Periodic hunger is a fact of life in rural areas, with a large proportion of households experiencing a 'hungry season' of up to 4 months. Food insecurity affects the most vulnerable sections of society – the poor and women-headed households (WHH) – and is most concentrated in remote upland areas where 70% of rural households live. Storage losses for grain and seed, commonly estimated as more than 30% for

[1] The term 'formal seed' is used to refer to seed produced to stringent specifications from foundation seed under government supervision. The term 'informal seed' is used to refer to seed that is produced by farmers from formal seed, without direct government supervision.

[2] The term 'seed' is used to include both true seed (for crops such as rice, maize and peanuts) as well as planting material for species that are propagated vegetatively, such as sweet potato and cassava.

[3] Richard Holloway (Team Leader/ Design Specialist); Philip Young (Agricultural Economist/ Institutions Specialist); Dr Shawn McGuire (Seed Specialist); and Dr Endah Agustiana (Gender Specialist). The Team has been accompanied at various stages by Adalfredo Feirera (MAF Director for Research & Special Services); Gil Rangel (MAF Director for Agriculture and Horticulture); Paul Fox (ACIAR Research Program Manager); Jeff Prime (First Secretary, AusAID Dili); and Cameron Reid (Policy Advisor, East Timor Section, AusAID Canberra).

crops such as maize, further compound the food security issue. During the past few years around 40,000 Mt of rice has been imported per annum to bridge the national food deficit, at an annual cost in excess of US$ 16 million[4].

Agricultural productivity. The rural sector is, and is likely to remain, the nation's most important economic sector. Crop and livestock production are the only sectors of the economy outside petroleum that have the potential to generate economic growth and therefore contribute to sustainable poverty reduction and increased employment. The biggest challenge faced by the food crops sector is to increase production of the main staples. Crop yields are very low by regional standards[5]. While a range of factors contribute to this low productivity (e.g. limited use of fertiliser, and poor crop production practices), the limited availability of improved varieties with higher yield potentials compared with local varieties, is considered to be a critical factor. The core focus of SoL has been to evaluate and release new varieties of food crops with higher yields, and SoL has been consistently commended for its achievements. It is the major Government of Timor-Leste (GoTL) agricultural initiative outside mechanization and irrigation for rice production, and the Ministry of Agriculture and Fisheries (MAF) has shown strong ownership and leadership for the Program. Progress achieved to date is briefly reviewed in following sections.

2.1.2. Evaluation of improved varieties

Before SoL, there was no capacity for systematic, strategic crop research in TL. The only improved varieties commonly sown were two older maize varieties, developed in Indonesia. Under SoL, two Research Centres have been established (at Betano and Loes); and a smaller Research Station at Aileu. This research capacity is being effectively and efficiently utilised with an active and well-managed adaptive research program in place. Germplasm assessment practices, and related training of national staff, are well-advanced. Through international breeding programs (generally CGIAR centers and selected national programs), SoL has obtained many lines of major foodcrops for testing. These have been assessed through on-station yield trials, with promising lines taken to On-Farm Demonstration Trials (OFDTs), under farmer management. At present, around 700 OFDTs are being conducted each year spread across 7 districts[6]. Varieties that are acceptable to farmers, have good yield potential, and perform well across a range of environments are considered for release. Since 2001, 9 varieties of 5 crops (maize, lowland rice, peanuts, sweet potato and cassava) have been released and have considerable potential to increase food production[7]. Other promising lines are in the pipeline for release.

Comparisons with Indonesia suggests that SoL's variety selection work is reasonably well-advanced in terms of yield potential of released varieties. Further yield gains are certainly possible, but these will probably be much lower than the dramatic gains achieved with the first generation of releases. Moving away from yield, future SoL varieties may well address other concerns, such as moisture stress tolerance, ease of processing, or storage-ability. The number of varieties available to farmers is also low compared to elsewhere in the region, and SoL should seek to release more varieties to improve the range of choice and adaptation to specific locations. Continued variety development is also necessary to address changing conditions arising from

[4] 110,000 Mt in 2008/09.

[5] 25% of the regional average for maize; 24% for cassava; 36% for sweet potato; and 32% for paddy rice.

[6] Over 3,000 on-farm demonstrations and trials have been supported by the Program to date.

[7] Improved yields over local varieties vary by between 23 percent (for rice) and 80 percent (for sweet potato), with an improved variety of maize (Sele) out-yielding local varieties by, on average, 50 percent.

disease, socio-economic shifts (e.g. in labour or markets), or environmental change. Finally, there are important food crops that have received little attention to date, including legumes (which could make important contributions both to nutrition and development of farming systems), and temperate highland crops.

2.1.3. Seed production and distribution

Before SoL, formal seed production in TL was limited to use of the Loes station as a 'mother seed' production site covering all major crops, with some related but limited seed multiplication activities supported by MAF. At present, almost all farmers retain their own seed, or obtain it from other farmers. Providing farmers with access to good quality seed (i.e. seed that is genetically uniform, and which has good physical and phyto-sanitary status) can lift productivity by 10-20% compared with using lower quality seed of the same variety, due to increased uniformity, low contamination, and high germination rates. To maintain this yield advantage, farmers need to replace their seed with high quality seed every 4-5 years to maintain purity.

In times of emergency (e.g. drought, civil unrest), the immediate response of government and aid organisations has been to organise the distribution of imported seed, usually from Indonesia, perpetuating a cycle of dependency. Imported seed is often not well adapted to the local environment; seed-lines are often of substandard quality by the time they reach farmers; and deliveries often arrive too late.

Seed production. Systematic efforts towards organised production of formal seed of released varieties did not start until after the SoL MTR in 2008[8], when a Seed Production Advisor was appointed to co-ordinate seed production activities, and Seed Production Officers (SPOs) were appointed by MAF in six target districts. Foundation seed is currently being produced mainly at the Betano Research Centre for most true seed crops, and for cassava. This seed is then multiplied by specialised seed growers, under contract to MAF. The SPOs assess production sites (e.g. isolation distances, previous tuber cultivation), offer advice on the management of genetic and phyto-sanitary purity, and provide support for harvesting. Once harvested and sorted, MAF purchases the crop at guaranteed prices, well above market rates for grain. For sweet potatoes, only a single production site per district has been established to date – 5 in total in 2008 – with a total area of 0.3 ha nationally. Cuttings are harvested regularly throughout the growing season, with growers paid a monthly management fee. Seed crops are taken to Seed Processing Centres (SPCs) for further processing and storage, while sweet potato cuttings are distributed directly in nearby areas, mostly via *suco* Extension Officers (SEOs). Cassava varieties have only recently been approved for release, and so far are being multiplied on-centre in Loes and Bobonaro. For 2009, clean seed production was approximately 60 Mt of rice, 20 Mt of maize, 18 Mt of peanuts, and just under 100,000 sweet potato cuttings.

There are as yet no regulated quality control standards governing formal seed production for TL (though a Draft Seed Law is in preparation). SPOs monitor quality, largely through regular visits throughout the season, visual checks for purity at harvest, moisture tests, and germination tests conducted at the SPCs. Skills of the SPOs are increasing through on-going training and experience, and they are providing a good level of support to contract farmers. There may be opportunities to develop a stronger link with district and subdistrict extension specialists to provide additional extension support to seed producers outside of SoL's contracted formal production arrangements.

[8] Prior to this, onward distribution of SoL seed came largely via OFDTs and farmer-farmer exchange.

There have been some attempts to use third parties to produce formal seed – mainly bilateral projects – but these have not been particularly successful in terms of quality or total production, due to lack of technical oversight, and attempts to include too many farmers.

Seed processing. Seed storage and processing facilities vary considerably. SPCs have already been established by MAF under SoL II in the Baucau and Manufahi Districts (at Betano). Each centre includes storage for approximately 60 Mt of seed, together with drying, seed cleaning and packing facilities. The centres are well designed and equipped, and appear to be operating well. MAF has a number of other 'seed centres' but these lack processing equipment, and generally have sub-standard storage facilities.

Seed distribution. Distribution of formal seed has been through MAF's District offices, NGOs, and bilateral programs, as well as indirectly through SoL's own use of seed for OFDTs and seed growers. Many OFDT farmers also commonly retain some of the formal seed tested on their farms, and roughly a third have distributed this to others. FAO emergency programs were the predominant users of improved rice seed in 2009. The effectiveness of the various formal seed distribution channels varies considerably in terms of achieving scale-up benefits from the seed distributed. CARE, for instance, gives extensive support to farmer groups, and has helped these groups scale-up production from small initial supplies of formal seed – in some cases selling seed beyond the group. Other channels have not been particularly well-targeted, executed or monitored. Requests for seed from districts and SEOs largely reflect existing relationships with SoL and SPOs, and the level of awareness of SoL varieties. Major distributions are signed-off by MAF, but are not linked to any wider strategy. NGOs generally pay for their seed, while distribution via MAF channels is free. As awareness about SoL seed grows, so is the evidence of high and increasing demand, which has largely not yet been met by supply.

The embryo of a formal seed system has been developed under SoL, with a clear focus on improving quality standards. Even with the relatively limited quantities of formal seed produced so far, there is clear evidence of onward distribution. This onward spread comes through informal channels: farmer-farmer exchange, and, in some cases, sales.

2.1.4. Institutional settings

Institutional structure. MAF is responsible for designing, executing, coordinating and evaluating the policies approved by the Council of Ministers for the agricultural sector, including setting standards, regulation and inspection (Decree Laws 07/2007 and 18/2008). The Ministry is organised into 12 National Directorates and 13 District Directorates (1/district). Nine National Technical Directorates are responsible for the development of the various sub-sectors; one is responsible for planning, monitoring and policy development, one for administration and finance, and one for regulatory services. National Technical Directorates involved in the implementation of SoL II include the National Directorate for Research & Special Services (NDR&SS - responsible for variety evaluation work); and the National Directorate for Agricultural and Horticulture (NDA&H - responsible for seed production and distribution). Under SoL III the National Directorate for Agricultural Community Development (NDACD, which includes extension services) will also become involved. Organizationally MAF is partially 'de-concentrated', with staff in the National Directorates working in Dili and field staff working in the 13 districts under a District Director of Agriculture. By 2009, MAF was employing 1,823 national and district staff, an increase of 125% over the staffing complement in 2008. Fifty three percent of MAF's staff are posted in the districts - this high number is due to the recent recruitment of 376 SEOs. There is currently a cap on further increases in staffing.

MAF Budgets. Operating and capital budgets have increased dramatically in the last few years reflecting GoTL's prioritization of agricultural development (especially irrigated rice production and mechanisation), reaching US$30 million in 2009. However, the budget for 2010 has been reduced to less than US$13 million, and is likely to remain constrained for some years as other sectors get 'their turn' of an increasing GoTL national budget.

Policies and programs. Increased food security and agricultural productivity are recurrent themes throughout the various policies and programs governing the sector. The new National Strategic Development Plan (SDP) (2010-15)[9] stresses the role and potential of the agricultural sector, and within this the importance of staple food crops, the impact of low yields on standard of living, and the need for more modern technologies and cutting-edge research[10]. The National Development Plan (2002) lays down the vision 'to have by 2020 sustainable, competitive and prosperous agricultural…..industries that support improved living standards for the nation's people.' Relevant development objectives include increased food production and rural incomes, and improved crop productivity. MAF's Policy and Strategic Framework (2004) is the general guiding policy document for the development of TL's rural sector, and emphasises improved food security; increased value-adding of agriculture; sustainable production and management of natural resources; and increased income and employment in rural areas. The Policy and Strategic Framework has recently been revised as part of the new Prime Minister's SDP, but specific details on MAF's responsibilities are not yet available. In recent years, MAF's program addressing its food security and improved productivity goals has been heavily skewed towards irrigated rice production and mechanisation, providing little benefit for the majority of upland farmers.

2.1.5.Gender

Overall gender situation. In TL, women are at a considerable disadvantage to men in terms of participating in community activities and accessing new technologies and information. Contributing factors include: (i) women have a longer working day than men and spend almost twice the amount of time as men on agricultural activities and reproductive roles around the house; (ii) in many cases they are constrained by their husbands from working outside the home for socio-cultural reasons; (iii) they are less literate than men, are less likely to speak the mainstream languages of Tetum, Portuguese and Bahasa Indonesia; (iv) they interact less than men with people outside their villages; and (iv) they generally do not have rights to land[11]. The situation is compounded by a prevailing bias in the male-dominated extension service. The above constraints have particular implications for the approximately 20% of WHH in TL.

Women and girls are particularly vulnerable to food insecurity. Around 28% of women suffer from malnutrition with 7% severely malnourished and in need of treatment. Malnutrition contributes to maternal, infant, and child mortality rates that are among the highest in SE Asia. The National Fertility Rate is among the highest in the world (7.8 children per woman), and is increasing.

[9] Launched by the Prime Minister April 2010.
[10] The NSP encompasses the 'National Priorities' previously established by the 4th Constitutional Government in 2008 and 2009. NPs 1 and 2 for 2009 focused directly on agricultural development: (i) increased domestic food production, and improved food security monitoring and response; and (ii) Rural Development.
[11] Unless from matrilineal communities, generally limited to the *Bunak*-speaking ethnic communities in Bobonaro, Manufahi, and Covalima districts.

Gender division of labour in agriculture. Men are traditionally considered as the heads of household. In terms of productive roles, both women and men are involved in subsistence and non-subsistence farming systems. In general, women are more involved in subsistence agriculture, taking care of small livestock and non-farm income activities such as petty trading, making and selling handicrafts and selling vegetables. In agricultural production women are normally involved in all activities, except land preparation. Activities that are predominantly performed by women include seed selection, planting, harvesting and post-harvest processing (food storage, processing and preparation). Also, women are mainly responsible for reproductive roles related to child rearing and care and maintenance of the household, such as cooking, washing and cleaning, and fetching water and firewood. In terms of community roles, men are normally assigned as community leaders and play the dominant role in decision making, administration and management of the socio-cultural, economic and political life of communities. Women in many cases participate in formal activities, such as attending district meetings, however they are normally passive participants.

Gender and SoL II. SoL II has been committed to integrating a gender perspective into all aspects of Program implementation and has made considerable progress in a number of areas: it has (i) supported the formation of 28 women's seed production groups to ensure involvement by women in the formal seed production activities supported over the last 2 years; (ii) actively promoted women's participation in the OFDTs ensuring that women's preferences are assessed and they benefit from the associated exposure to new varieties[12]; (iii) produced technical materials that meet the needs of women as well as men; (iv) actively recruited female staff (40% of all Program staff are female); and (v) supported a range of gender research activities, including the production of gender-specific agricultural calendars that document gendered roles and responsibilities.

Lack of control over land and limited access to technical information potentially marginalizes women's involvement in agricultural and seed systems. Establishing community seed production groups is one means of addressing this issue that has been tried successfully by both SoL II and CARE, resulting in substantial impact for the women involved. Participants claim that they have more food and in some cases cash; increased sense of self-confidence and solidarity; increased skills related to seed production; and improved opportunity to exercise leadership skills and demonstrate to society that they can also be leaders. Groups consulted expressed strong support for the activity despite the increased workload that has resulted in some cases.

Institutional settings. Equal rights for men and women are enshrined in the National Constitution, and TL has ratified the UN Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and its optional protocol. Other important steps taken by GoTL include establishing a Parliamentary Committee and Secretary of State to promote gender equality and women's empowerment; enacting legislation to ensure gender-responsive budgeting; and creating Gender Focal Points in all Ministries. MAF has drafted a Gender Policy and Strategy for Agriculture, and has created a Gender Working Group[13].

2.2. Summary of Key Issues and Constraints

2.2.1. Seed production and distribution[14]

[12] Women farmers make up over 30% of total participants in the OFDTs .
[13] Currently inactive.
[14] Refer to Appendix 1 for further analysis.

Key issues and constraints related to seed production and management include:

- To date there has been little work on identifying improved varieties of legumes or temperate crops important for TL.
- The quantity of seed produced for the improved varieties already released by SoL is not yet sufficient to provide a high level of access for farmers throughout TL, or maintain the genetic quality of these varieties.
- MAF's expressed desire to significantly expand formal seed production activities and SPCs as the *primary* means of improving access to improved varieties gives little consideration of the cost-effectiveness of the approach, or the potential of utilising other, less costly informal channels for seed production and dissemination. There is little understanding of the value of seed produced through the formal system, or of how this could be used to drive more strategic engagement with third parties that are able to multiply or distribute formal seed at lower cost. A greatly expanded formal seed system as envisioned by MAF is unrealistic in terms of the current stage of development of agriculture and markets in TL. It would be expensive, require strategic management capacity and a policy framework that is currently lacking, divert scarce MAF resources from other areas, and ultimately do little to address the priority needs of farmers.
- Approaches being used for production of formal seed need to be modified to ensure seed quality, and improve production efficiencies.
- Increasing formal seed production volumes, combined with a potential expansion of the range of crops and varieties to distribute, will stretch current capacity to manage supply, quality, and distribution. MAF's existing 'Seed Centres' (with the exception of the 2 dedicated SPCs established under SoL II) vary considerably in their capacity for quality control and storage.
- Strategic oversight for coordinating requests for formal seed with supply, targeting priority farmers, and for improving production from this seed, is lacking. As a result, distribution of formal seed tends to reflect individual preferences, rather than a plan, and scale-up benefits from this seed are not being maximised. Impacts of formal seed distribution through third parties (such as NGOs and other donor programs) are rarely assessed, and appear to be highly variable.
- A more mainstream role needs to be developed for MAF's extension services in relation to the distribution of formal seed as well as supporting the development of community-based informal seed production systems.
- Farmers' own seed systems are still poorly-understood. There is very limited knowledge on why and how farmers use different seed sources across different crops, contexts, and social groups. This hampers the effective use of informal channels for seed production and dissemination, and limits understanding of wider impact.
- Farmer awareness of new varieties remains limited at national scale[15], particularly around the potential performance of different varieties (a growing issue as more varieties become available for each crop), sources of seed for these varieties, and related crop management. Awareness within MAF and NGOs is also variable.
- Market demand for seed of major staple food crops in TL is generally weak, with little evidence of proactive purchases. Only with improved maize seed is there any evidence of a price margin above grain prices at sowing time, but the volume of market demand – excluding NGO buyers – is low. Produce markets also appear to be thin, limiting the scope for traders to build supply relationships for (potential) seed. Factors contributing to the current lack of market development include: (i) low purchasing power for the majority of farming households in upland food-deficit areas; (ii) limited perception of

[15] With considerable variation between SoL and non-SoL districts.

'added value' for high yielding seed types, with little evidence of premium prices being paid for seed over and above grain; (iii) many households can access new varieties free-of-charge through kinship networks; (iv) the predominance of self-pollinated and vegetatively propagated species which facilitates on-farm propagation and distribution through non-market mechanisms; and (v) GoTL and some NGOs commonly distribute seed free of charge, reflecting post-conflict and humanitarian agendas. This reinforces the prevailing hand-out mentality among the rural population.

2.2.2. Policy and institutional issues[16]

Key issues and constraints related to seed production and management include:

- The fluid policy environment, involving multiple policy and planning documents, indicates the need for a flexible and programmatic approach. As SoL becomes a truly national Program it is likely to also face increased pressure to comply with GoTL policies that may be inconsistent with the Program's approach, such as the free distribution of agricultural inputs, including seed.
- GoTL policy is heavily oriented towards the production of irrigated rice, with upland farming systems relatively neglected. The poorer sections of TL's rural population are not rice growers – they live in the rainfed highlands and subsist on maize, subsidized rice and mixed roots and tubers. In addition, a high percentage of the nation's rice growers also grow these other crops to mitigate against the risk of rice crop failure. SoL III needs to be cognisant of the interaction between crop types (rainfed and irrigated) and the location of pockets of severe rural poverty, and to ensure that biases are avoided.
- MAF's capacity to strategically plan and manage a national seed system comprising formal and informal elements, is generally weak.
- The scale of capacity building required within MAF, spanning all 12 national directorates and 13 district offices, is beyond the remit of SoL III, both in terms of focus and budget. The design for Phase III focuses specifically on aspects of capacity building that need to be strengthened in the context of developing a national seed system.
- Government budget allocations to support the agricultural sector are highly uncertain and constrained. In the medium term MAF's capacity to provide additional support for adaptive research and the production/ distribution of formal seed is likely to be constrained.
- The newly-appointed SEOs have relatively limited technical and extension skills and negligible operational budgets, severely constraining their ability to work with farmers on improved seed production and distribution activities[17]. Implications for SoL III include the need to engage with the SEOs in a way that does not rely on their access to GoTL budget, and where appropriate to assist with their professional development – but only to the extent necessary to facilitate their potential role in development of a national seed system.
- GoTL's plan to decentralize its governance structure down to municipalities with elected mayors as the chief administrators has implications for SoL III. At present SoL is considered to be a national Program, run out of MAF's central office in Dili. However, decentralization will mean that Phase III will have to engage more closely with MAF's district and sub-district offices as local development plans and associated budgets will be formulated and implemented at this level. This situation also has implications in terms of chains-of-command, and accountability.

[16] Refer to Appendix 2 for further analysis.
[17] This issue may be addressed to some extent through the forthcoming RDP IV.

- Numerous development partners continue to attempt to establish 'their strategic niches' within MAF with some focusing on selected geographic areas (districts) such as the EC-funded Rural Development Programs and others focusing on specific products, e.g. Portugal's support for the coffee industry. This causes some confusion in MAF and makes implementation coordination and monitoring difficult. In addition, under this scenario the Ministry of Finance is tempted to limited MAF's operational budget because there is a perception that the ministry is 'over-supplied' with bilateral support. Lack of development partner coordination means that SoL III will need to carefully define and engage with its cooperating partners (e.g. for seed distribution) and ensure that it remains fully aware of the myriad of development initiatives that are being implemented in its target districts by other donors.

2.2.3.Gender[18]

Strategic approach. Despite commendable efforts to promote women's empowerment and gender equality in SoL II, a clear strategy for integrating gender issues across all components has been lacking. Efforts have largely focussed on women's participation and gender balance, rather than addressing gender-related impediments and gender inequality in a more strategic way. Key elements of a more strategic approach need to involve: (i) gender sensitization and/or awareness raising for MAF senior staff, farmers, and women's groups/organizations, around issues related to seed production; (ii) systematic use of gender/ sex disaggregated M&E and reporting; and (iii) establishment of a wide range of partnerships to promote gender equality, including with MAF's Gender Unit, women's groups/organizations, and mass media. Efforts to promote gender equality have also been constrained by a lack of gender-specific resources including staff with gender expertise.

Development issues and opportunities. Reflecting the generally disadvantaged position of rural women in TL, there are a number of features that should be included in the design of SoL III. These include the need to:

- Continue to emphasise women's specific needs and preferences in the evaluation of new food crop varieties.
- Where feasible, consider nutritional status in the variety selection process, reflecting the particular benefits that this can provide to women and children.
- Develop mechanisms for giving women farmers, and particularly WHHs, equitable access to the high quality formal seed (and associated technical information and training opportunities) that will increasingly be provided through MAF's extension service.
- Place increased emphasis on establishing women-only seed production groups (formal and informal sectors) as a means of actively channelling Program benefits (inputs, information) towards women.
- Rigorously assess women's specific development needs when establishing seed production groups, including appropriate mechanisms of delivery, training approaches, training materials, provision of equipment and hand-tools, storage location, and processes for group management and decision-making.
- Rigorously assess the implications of proposed activities on women's workload, and ensure that potential participants make informed decisions. Activity design should mitigate any increased demands on women's labour to the maximum extent possible (e.g. through provision of labour-saving devices such as maize shellers; appropriate location of storage, appropriate location and timing of training courses).

[18] Refer to Appendix 3 for further analysis.

- Improve the understanding and skills of MAF staff related to the integration of gender equality into seed production and distribution activities.
- Promote the involvement of women in decision-making processes regarding seed production and distribution at the *suco* level.

2.3. Relevant Past or Current Initiatives and Lessons Learned

2.3.1. Summary of relevant donor programs

SoL is the only program in TL supporting the evaluation of improved food crop varieties and associated seed production/ distribution activities. Other donor programs and possible linkages with SoL III are reviewed in Appendix 4. These linkages can be categorised as follows:

- Programs that provide a potential model for SoL III activities. Foremost in this area is CARE's Local Initiatives for Food Security Transformation Project (LIFT), which is successfully promoting seed production in the informal sector through the establishment of Community Seed Production Groups (CSPGs), and linking these groups with local markets. SoL III will replicate this model in districts where CARE is not working.
- Programs that provide a potential conduit for SoL seed to farmers. There is a wide range of such activities, both NGO and donor-funded. Links have already been established with several of these projects under SoL II. Under SoL III, increased emphasis will be placed on developing their role as potential buyers of *informal* seed produced by the CSPGs. Distribution of *formal* seed to NGOs and other programs will be subject to guidelines designed to ensure the most efficient use of this high-value seed in terms of maximising scale-up benefits.
- Programs that are involved in developing the capacity of MAF's extension services, such as the EU-funded Rural Development Program (Phases II & III, and particularly the upcoming Phase IV). SoL III will utilise MAF's extension services for the distribution of formal seed to farmers, and to support the production of informal seed by CSPGs. Developing the capacity of the SEOs to function effectively in these roles is vital, and the Program will need to coordinate closely with other programs working in this area.
- The upcoming AusAID-funded Multi-Country Market Development Facility, based on a 'markets for the poor' approach. This facility provides a possible scale-up mechanism for the market-based seed exchange approaches that will be promoted under SoL III.

2.3.2. Lessons learned

Relevant lessons learned, both from SoL and other programs, include:

- Investment in the identification of new varieties and production/ distribution of seed for these varieties can produce substantial on-farm benefits over relatively short periods of time.
- SoL's tight focus on core issues (increased production of staple food crops) and activities (variety evaluation and seed production/ distribution) has been a major reason for the success achieved to date.
- Varieties should only be released after they have been carefully selected and farmer-evaluated against a range of production, storage and consumption criteria.
- Production of informal seed using CSPGs is a viable mechanism for scale-up.
- Bilateral support needs to be embedded in institutions where there is consistent leadership and ownership (in the case of SoL II, MAF's NDR&SS and NDA&H).

- Development of sustainable capacity within MAF takes time, and needs to be founded on mutual respect and effective partnerships between the international team, the MAF team, and other local partners.
- Patient leadership and mentoring is required to develop and maintain a coherent team of technical staff within MAF. This requires a long term vision for capacity building based on improving basic skills (especially English and numeracy) as well as technical skills.
- Building networks and 'win-win' partnerships with a range of development partners with common development objectives can provide a viable mechanism for scale-up, provided the partners work to a commonly-agreed plan.
- Functional coordination within MAF requires a management structure that can span multiple directorates effectively.
- Gender needs to be fully integrated across the program, and appropriately resourced, if it is to be adequately addressed.
- Utilisation of GoTL financial systems for disbursement is risky and should follow a cautious, step-by-step approach.

2.4. Alignment with Recipient Government and Australian Policy

GoTL Policy. SoL III is an excellent fit with current GoTL policy and program settings, as reviewed in section 2.1.4 (agriculture) and 2.1.5 (gender).

GoA Policy. SoL III is also a good fit with current Australian Development Assistance policies and strategies[19] which stress that generating shared and sustainable economic growth is the single most important objective for the Asia-Pacific Region. Areas of major emphasis related to SoL III include the central role of economic growth in reducing poverty; strengthening support for private sector-led rural development; and addressing environmental challenges including climate change adaptation. AusAID funding for SoL III will come from the 'Food Security through Rural Development' NPP initiated in the 2009-10 budget, which emphasises lifting agricultural productivity and improving rural livelihoods. This is further reflected in the draft Australia/ TL Country Strategy (2009-14), a key objective of which is to improve food security by increasing agricultural production through increased distribution of higher yielding seeds and improved storage of harvest.

2.5. Program Justification

The justification for SoL III includes:

- It is an excellent fit with the current policy settings and development objectives of both GoTL and GoA.
- There is a demonstrated high level of need, evidenced by widespread household-level food insecurity and reliance on grain imports.
- There is significant potential to improve food security through the introduction of higher-yielding food crop varieties, already demonstrated under SoL II.
- Previous Phases of SoL have laid a solid foundation on which to build a national seed system, but the task is far from finished.
- Australia has well-developed relationships with key institutional partners, and is able to offer highly relevant technical expertise, both to support adaptive research and to build a national seed system that integrates formal and informal sectors.

[19] As set out in the April 2006 White Paper 'Australian Aid: Promoting Growth and Stability'; and further articulated in the Budget Statement from the Ministers of Foreign Affairs and IDA, 12 May 2009.

- There is sufficient baseline institutional capacity within MAF for the Program to be successfully implemented. Further building this capacity will be an important focus of Phase III..
- There is strong support for the Program from GoTL.

3. PROGRAM DESCRIPTION

3.1. Fit with the Broader Food Security Agenda for Timor Leste

The general positioning of SoL III within the broader agenda of improving food security through food crop production in TL is represented in Figure 1. Key aspects of this broader agenda include:

- increasing yields. As noted in section 2.1.1, present yields of most major food crops in TL are extremely low. Yields can potentially be increased through improved genetics and adoption of improved agronomic/ farming system practices.;
- reducing post-harvest storage losses (estimated at over 20% of total production for cereal crops);
- strengthening of input supply systems, so that critical crop inputs such as seed, fertilizer and agrichemicals are more reliably available to farmers; and
- improving rural financial services so that farmers are resourced to shift from low input/ low output subsistence production systems to higher input/ higher outputs systems.

Continued focus on genetic improvement. Building on the success of previous phases, SoL III maintains a core focus on improving yields through improved genetics. As already demonstrated under SoL I and II, large production gains are available from genetic improvement alone, *without any change in other parts of the overall system*. SoL I and II have made considerable progress in evaluating and releasing new varieties with significant yield advantages, but there remains considerable potential to identify additional varieties both of crops that are already being targeted as well as crops that have received little, and in some cases no attention. Access to seed of released varieties also remains highly constrained, even within districts presently covered by SoL II, and substantial work remains to be done in developing effective seed multiplication and distribution systems.

The justification for a continued focus on improving food crop varieties, encompassing variety evaluation as well as seed multiplication and distribution, includes the following:

- It provides a logical, sequenced approach to improving food security, building on the sunk costs of SoL I and II in a way that will further increase the return on this investment. SoL II has already released varieties with major yield advantages. SoL III will continue this work, but more importantly will further develop the systems required to ensure that access to improved varieties for farmers is maximised.
- With the potential yield gains that are achievable, it is probably the area of greatest potential to increase food production for a given level of investment. Investment in improved rural financial services as a means of improving food security, for example, would require prior development of more profitable production systems (of which higher yielding varieties is a vital component); would be far more difficult to tackle; and is unlikely to generate anywhere near the on-farm impact as variety improvement.
- The desirability of developing the institutional capacity of MAF to the point where it can continue to support the introduction of improved varieties without external support. Although SoL I and II have made a substantial contribution to building the capacity of

MAF in key areas, this is coming off an extremely low base and the organization remains weak.
- The fact that SoL is the *only* program providing support in this area in TL.

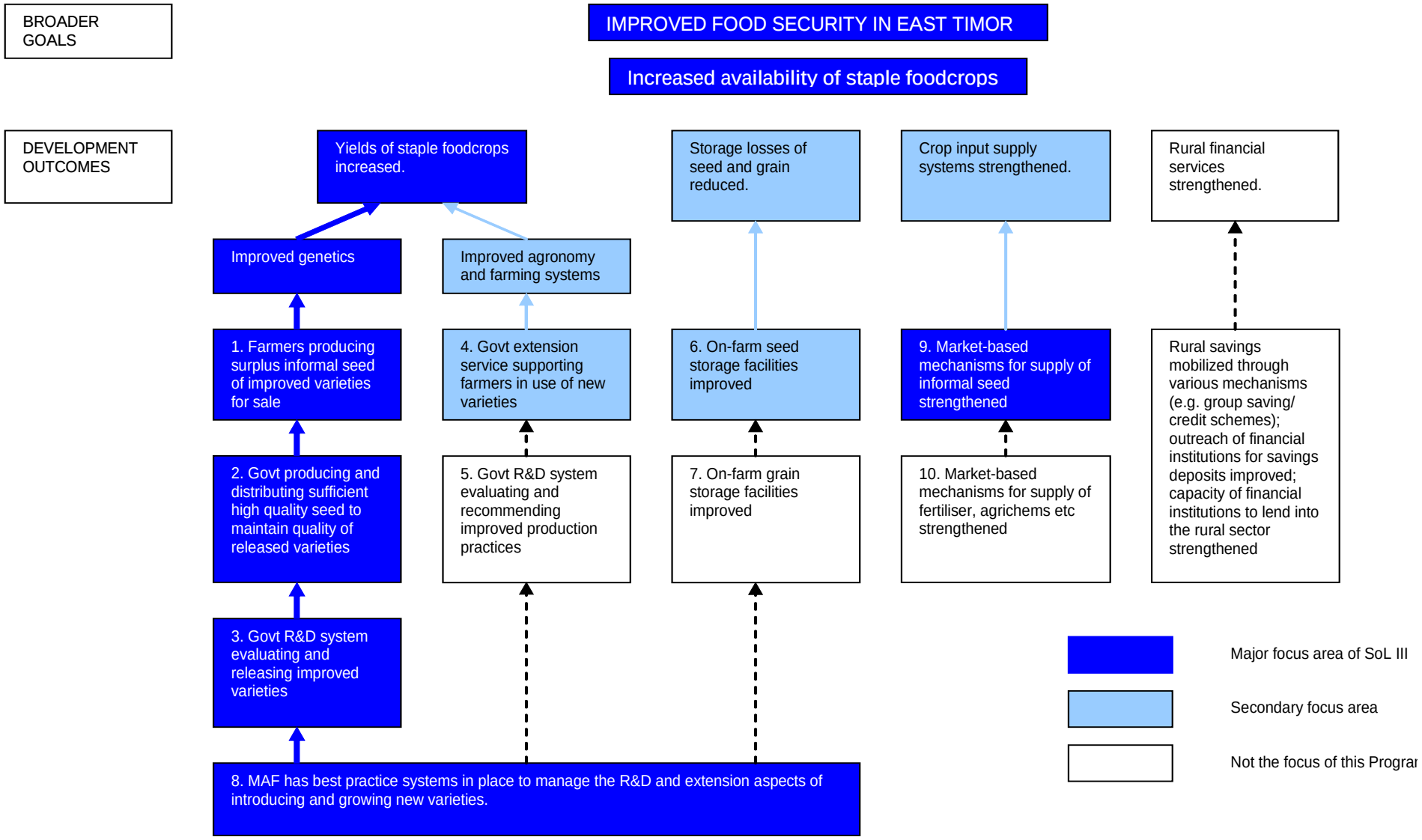
The best returns in terms of improving food security through increased food crop production over the next 5 years are likely to be in relation to finishing the job of variety evaluation and seed production and distribution already initiated under SOL I and II.

Improved agronomic and farming system practices. Although not a primary focus of the Program, SoL III will have a secondary focus on improving agronomy and farming system practices associated with use of new varieties. SoL II is already involved in selecting and trialing legume cover crops (particularly velvet bean or macuna) for use in upland areas and this work will continue under SoL III. In addition, under SoL III the extension service will play a key role in the distribution of formal seed of improved varieties to farmers, and in promoting the production of informal seed. These extension efforts will involve the conduct of farmer training activities demonstrating how to gain maximum advantage from improved varieties.

In the longer-term, as TL's agriculture shifts towards more intensive land-use practices, additional attention will need to be paid to agronomic and farming system practices (e.g. plant spacing, nutrition, pest and disease control, weed management, soil moisture management etc), both to ensure that soil health is maintained, and also to maximize the return on the investment in improved genetics. A number of other programs are, or will be, working on crop agronomy and farming system practices, including (i) RDP I and II (GTZ-funded) which have had a major focus on improving the agronomy of irrigated rice production over the past five years, and in the case of RDP II is now turning its attention to improved agronomy of upland crops; (ii) RDP IV (EC-funded) which will have a major focus on training SEOs in all aspects of improved food crop production; and (iii) the forthcoming ACIAR-funded adaptive livestock research project, due to commence in late 2010, which will introduce forage legumes into mixed farming systems with the aim of increasing the production of animal fodder, nitrogen, ground cover and animal manure. Further (and more focused) investment in improving agronomic and farming system practices may also be a logical follow-on activity for AusAID/ ACIAR funding post-SoL III.

Reduced post-harvest losses. Seed and grain storage losses are an important variable in the food security equation. SoL III will directly address storage losses of *seed* to the extent that all CSPGs that become involved in the production of informal seed will be provided with secure storage vessels. Addressing storage losses of *grain* in a comprehensive manner and at scale is a project in its own right with very substantial funding requirements. IFAD is in the early stages of designing a project that will focus on minimizing post-harvest losses of grain, including provision of improved storage. This activity, which will have national coverage, will probably be cofinanced by ADB with ongoing support from FAO and NZAid.

Figure 1: Fit with the Broader Food Security Agenda



Improved input supplies. Improved input supply is an important component of improving food security through increased food crop production. In this regard, building systems that can deliver farmers with appropriate quantities of reasonable quality seed of improved varieties, at the right time, is an integral part of SoL III. The limited quantities of high quality formal seed produced under contract to MAF will be delivered directly to farmers through the extension system. More importantly, SoL III will also trial various methods designed to strengthen the market-based exchange of informal seed between farmers, including establishment of Farmer Seed Marketing Groups (FSMGs); establishment of focal seed merchants in district markets and linking these with the FSMGs; and conduct of seed fairs. Improving supply systems for other farm inputs, such as fertilizer, pesticides, tools, equipment and contract cultivation services will become increasingly important as production shifts towards higher input models, but is not a focus of SoL III. Various GTZ-funded initiatives have worked to develop input supply capacity; and the upcoming AusAID-funded Making Markets Work Program may also be able to contribute in relation to developing private sector involvement in input supply. One area of input supply that will require particular attention in the future is import sources, distribution logistics and regulatory frameworks for bulk inputs such as fertilizer.

Rural financial services. Rural financial services (RFS), which are absent in most areas, will need to be strengthened if farmers are to become full participants in TL's nascent market economy. This will require the mobilization of rural savings through various means (e.g. group saving/ credit schemes); establishment of savings deposit facilities; development of improved outreach for rural finance institutions; and development of appropriate loan products and collateral arrangements. While there is a wealth of microfinance experience available from other countries at a similar stage of development, TL (with donor support) is only just beginning to invest in RFS. AusAID is already providing some support in this area through the Inclusive Finance for Under-Served Economy (INFUSE) program which supports active microfinance agencies in TL, including Moris Rasik and Instituicao de Microfinancas de Timor Leste (IMfTL). While the lack of RFS does not appear to be a binding constraint now in relation to increasing crop production and improving food security, it is likely to become increasingly so in the medium to longer term.

Collaboration and harmonization with other projects/ programs. As noted above, there are various programs and projects involved in addressing the broader food security agenda where collaboration would be desirable. Collaboration and harmonization in terms of sharing technical information, results, and particularly MAF's staff resources will to some extent flow automatically from the fact that SoL III will be the largest Program being implemented by MAF, and will directly involve many of MAF's senior management as well as field-level staff. Cooperation will be achieved through formal and informal processes, the former being regular meetings and workshops organized by MAF's DG (the proposed 2-weekly management meetings will be an important forum) and the latter through regular dialogue between Team Leaders from various initiatives of development partners. The latter process is used by SoL II's TL who attends informal inter-project meetings organized by GTZ. No additional, specific resourcing is required to facilitate inter-project collaboration.

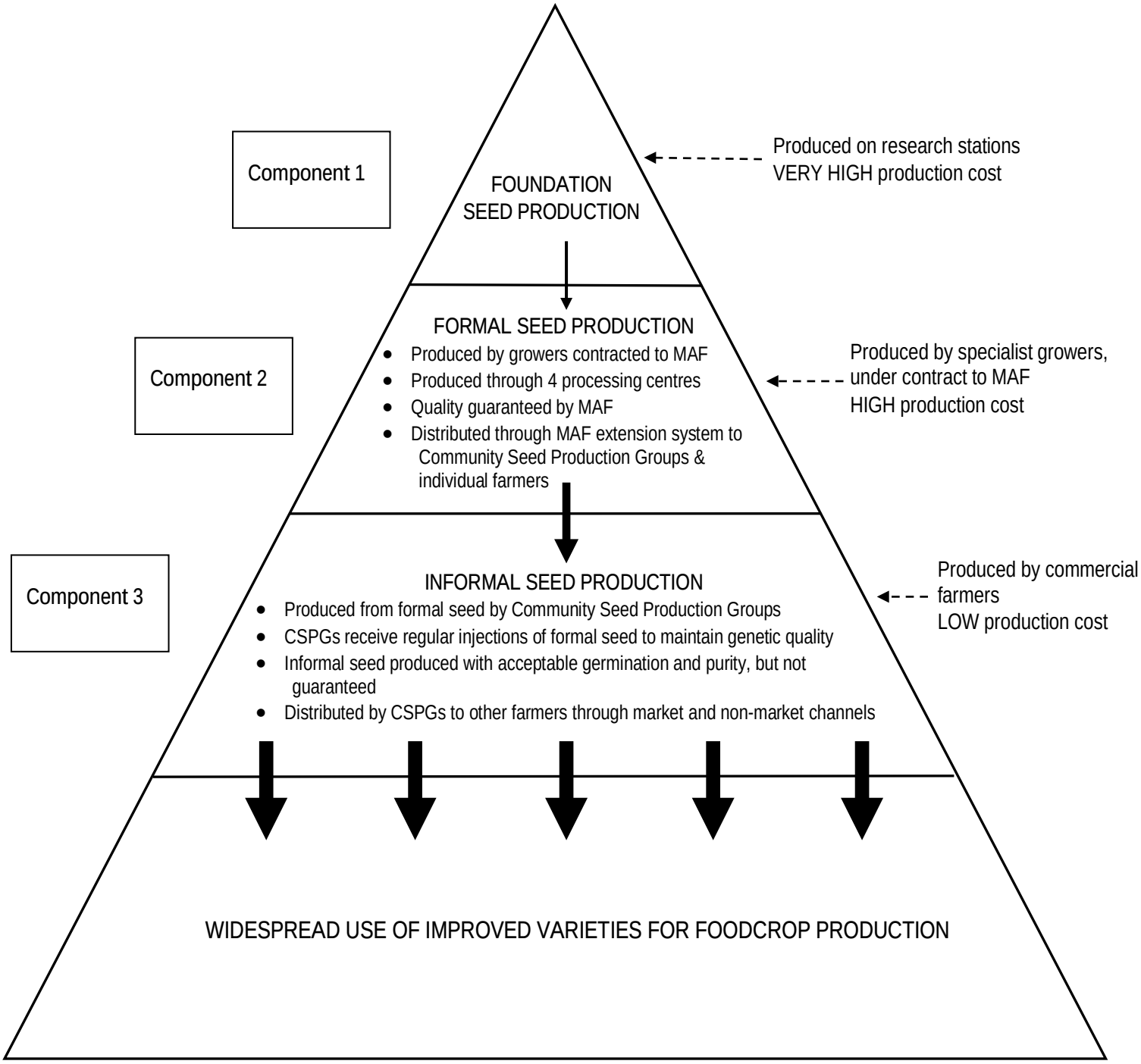
Summary. SoL III is focused primarily on increasing the yields of staple food crops by selecting and distributing improved varieties of superior genetic quality. It also has a secondary focus on some aspects of improving agronomic practices, reducing storage losses of seed, and improving input supply arrangements for seed. The core focus on variety selection, and seed production and distribution is strongly justified by the substantial and rapid gains that are still on offer in this area.

3.2. Principles Underpinning Approach and Methodology

Key features of the approach and methodology for SoL III, represented in Figure 2 and further elaborated in following sections, include:

- Developing a structured, strategic approach that builds on the achievements of SoL I and II.
- Developing a sustainable *national* seed system aimed at maximising access to improved varieties at minimum cost. This will be achieved by linking the production of high-cost formal seed, with much lower-cost production of informal seed. This approach explicitly recognises that utilising the informal system to the maximum extent possible is the best way to develop an affordable, cost-effective and sustainable seed system for TL.
- Improving access to seed particularly for more marginalised groups, including upland farmers and women. Major emphasis will be placed on upland crops, reflecting the high proportion of upland farmers in the agricultural sector.
- Continuing the variety evaluation and release work initiated under SoL I and II, recognising that this work is the 'engine room' for improving crop productivity.
- Expanding the production of formal seed, initiated during the second half of SoL II, but carefully balanced to drive the rapid introduction of new varieties and maintain the genetic quality of national seed stocks, but not stifle efforts to establish production and distribution of seed through informal channels.
- Concentrating formal seed production and processing activities in a limited number of specialised locations in order to achieve cost efficiencies.
- Promoting far more strategic use of the limited volumes of high-value formal seed produced so as to maximise downstream benefits.
- Stimulating production of informal seed by CSPGs, providing a low-cost mechanism for multiplying formal seed.
- Investigating initiatives to stimulate market-based seed exchange.
- Developing a mainstream role for the MAF extension service in relation to distributing formal seed and supporting the production of informal seed.
- Developing a cross-cutting gender strategy that focuses on ensuring equitable access to improved varieties for women.
- Obtaining a substantial commitment from MAF towards the cost of implementation through provision of staff and contribution to operating costs.
- Providing flexibility for management to make adjustments during implementation through the adoption of a programmatic approach.

Figure 2: Proposed Seed Industry Structure



3.3. Theory of Change Summary

Section 3.1indicated that SoL III should maintain a core focus on increasing the yields of staple food crops *by selecting and distributing improved varieties of superior genetic quality*. It was emphasised that these gains can be achieved largely independently of the other factors that can also contribute to improved food security through increased food crop production, such as improved agronomic practices, reduced storage losses, improved input supply systems, and improved rural financial services. The objective of the Program is therefore framed around improving food security by providing farmers with increased access to improved, higher-yielding, food crop varieties. It is emphasised that the environment is conducive to effecting this change. Average yields of existing varieties are very low by any standard, and there is demonstrated strong demand by farmers for seed of improved varieties released by SoL II, based on their field experience with these varieties.

The proposed strategic framework for SoL III is summarised in Figure 3. The sequence of events required to meet the overall objective includes: (i) higher-yielding varieties are evaluated, selected and released → (ii) limited quantities of high quality 'formal seed' are produced by specialist seed growers under contract to MAF and distributed to Community Seed Production Groups (CSPGs) and other selected end-users → (iii) CSPGs multiply the supply of seed and distribute this to other farmers through both market and non-market channels → (iv) …resulting in widespread access to seed of improved varieties for the majority of farmers, increased production of staple food crops and improved food security. In order to maximise benefits and ensure longer-term sustainability of the system, it is also essential that MAF develops the required capacity to manage those aspects of the system for which it is responsible, including R&D, formal seed production and distribution, and extension support. The key steps required to achieve the Program objective and EoPOs are summarised below and expanded in sections 3.4 and 3.5.

Evaluation of improved varieties (Component 1). Adoption of new, higher yielding varieties first requires the evaluation and release of these varieties. Under SoL III this will involve continuation of the germplasm introduction and screening programs successfully initiated under previous phases of the Program. As noted, there is considerable potential to identify additional improved varieties, not only of crops that are already being targeted by SoL, but crops that are important in various farming systems of TL that have received little attention to date. On-farm screening to ensure that released varieties are fully acceptable to farmers is an essential part of evaluation. Varieties that are selected have to be officially released, and a sufficient quantity of genetically pure 'foundation seed' produced on an on-going basis to support larger-scale production of formal and informal seed. Given the lack of any viable alternatives in TL at this stage of its development, variety evaluation and release activities will be managed by MAF through its research centres and stations.

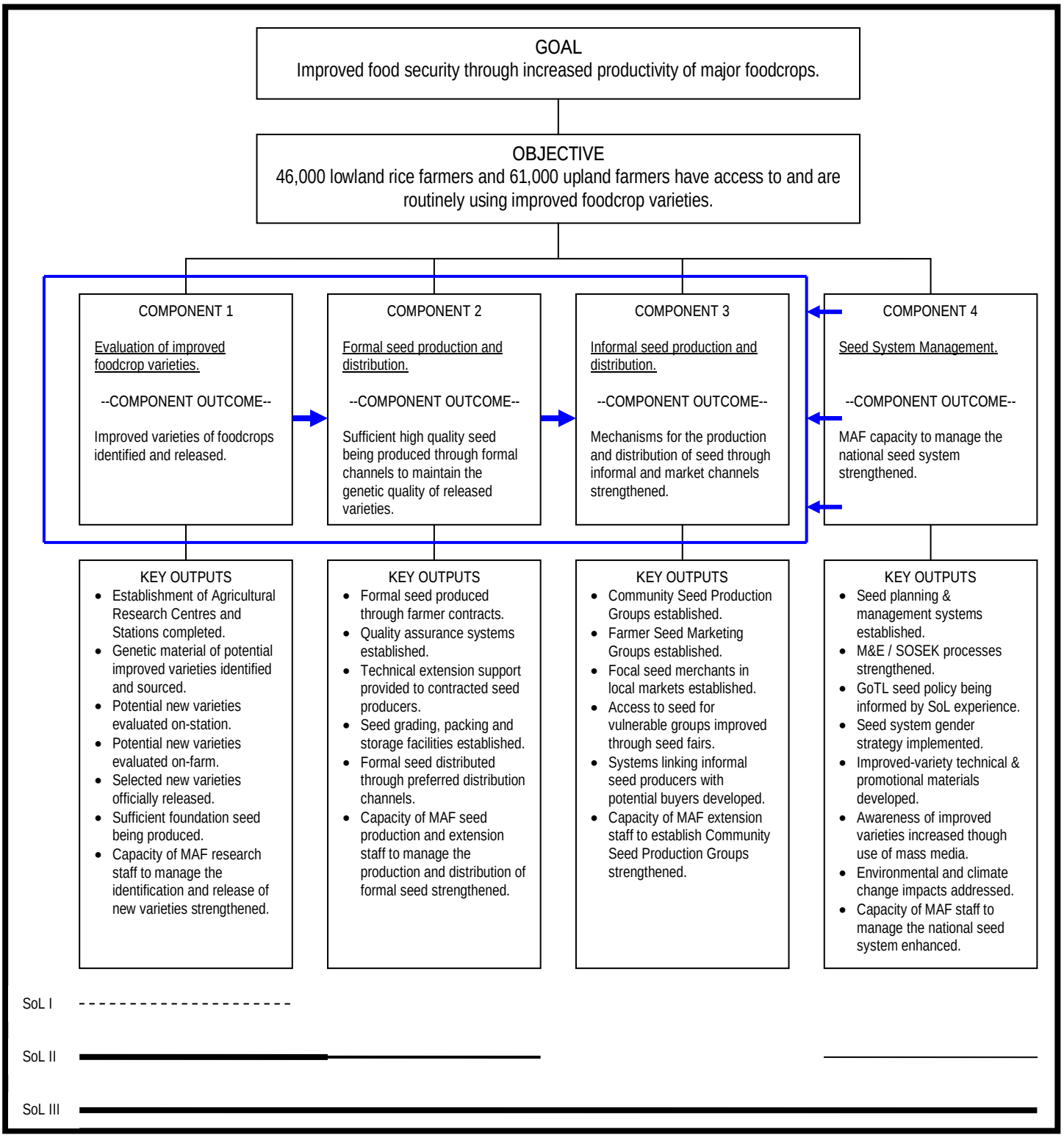
Formal seed production and distribution (Component 2). Maximising access to improved varieties for farmers requires a systematic and structured seed production and distribution effort. In developed countries, this usually involves a regulatory role for government, and a dominant production/ distribution role for the private sector. Given the extremely thin nature of the private sector in TL, the Program proposes an increased (but limited) direct role for the Government in the production of 'formal seed' (under Component 2), which is then provided to the private sector (in the form of CSPGs) for multiplication and distribution as 'informal seed' (under Component 3). Note that production of formal seed by MAF under Component 2 is deliberately limited to a level sufficient to drive the introduction of new varieties and maintain the genetic quality of national seed stocks over time, but not stifle efforts to establish production and distribution of seed through informal channels under Component 3.

Formal seed will be produced by farmers under contract to MAF, with appropriate extension support provided by MAF. Given the importance of developing and maintaining farmer confidence in the seed produced by the contract seedgrowers, reasonably high quality assurance standards will need to be established and maintained. The (deliberately) limited volume of formal seed produced by MAF under Component 2 must be used as strategically as possible so that scale-up benefits are maximised. The Program will establish guidelines to ensure that this happens, including giving the CSPGs (established under Component 3) priority access to this valuable material. Formal seed will be distributed to end-users like CSPGs through MAF's extension system, which will be resourced to provide farmers with extension support to maximise potential yield benefits of the seed.

Informal seed production and distribution (Component 3). The desirability of developing a role for the private sector in producing and distributing seed of new varieties, in line with the structure of seed industries in most developed countries, is explicitly recognised in the design through Component 3 activities. The objective of developing private sector involvement is driven by the need to maximise access to seed of improved varieties while minimising public sector expenditure; to maximise the long-term robustness and sustainability of the seed system; and to develop mechanisms that allow price signals associated with the use of improved varieties to develop and guide resource allocation decisions. At the seed production level, SoL III will support the establishment of CSPGs, a model that has been successfully trialed by CARE in various districts. CSPGs, which will be established in all Districts where CARE is not already working, will provide an important mechanism for multiplying the limited volumes of formal seed produced under Component 2 and distributing this to a significantly increased number of farmers. The Program will also trial, evaluate and if successful replicate a number of initiatives designed to improve market-based transfer of seed, such as establishing focal merchants in district markets and staging seed fairs. It is emphasised, however, that not only is the private sector in TL thin, but seed in particular has historically been treated as a 'free' good. Slow progress towards establishing an active seed market is expected.

MAF's capacity to manage the national seed system (Component 4). MAF has a critical role in promoting the adoption of higher-yielding varieties: it has direct responsibility for managing the evaluation and release of new varieties; for managing the production and distribution of formal seed; for stimulating the development of production and market-based exchange mechanisms for informal seed; and for providing extension support to farmers (both seed producers and seed users). Some progress has been made under SoL II in developing the required capacity in some of these areas, but the organisation remains generally weak. SoL III has a major focus on further developing the capacity of MAF to manage the various components of a national seed system, both at a technical component level (through Components 1-3), and also at an overall management level (Component 4). Building on international best practice for institutional development, the Program will actively target improvement in core skills, operating systems, and institutional capacity.

Figure 3: Strategic Framework Summary



3.4. Program Goal, Objective and Vision

The **goal** of the Program is 'Improved food security through increased productivity of major food crops'.

Baseline production of major staple food crops is 220,000 tonnes per annum[1].

The **objective** is '46,000 lowland rice farmers and 61,000 upland farmers have access to and are routinely using improved food crop varieties'.

The EoPOs at objective level, against which overall performance of SoL III will be assessed, include[2]:

- 70% of lowland rice farmers (equally to approx 46,000 farmers) are using one or more SoL varieties.
- 45% of upland farmers (equally to approx 61,000 farmers) are using one or more SoL varieties. Within this:
    - 40% of maize growers are using SoL varieties;
    - 70% of peanut growers are using SoL varieties;
    - 50% of sweet potato growers are using SoL varieties; and
    - 20% of cassava growers are using SoL varieties.

Baseline adoption of improved varieties is estimated at 15% for lowland rice farmers and 10% for upland farmers. Baseline rates for specific upland crops are: maize (10%); peanuts (10%); sweet potato (15%); and cassava (5%)[3].

Projected adoption rates are based on the scope and scale of seed production and distribution activities set out below. Note that adoption will continue to increase beyond the end of SoL III, reaching a plateau of about 70% for all species except cassava by the end of year 12.

The **Vision** for the end of Phase III is to have the foundations of a national seed system for TL established, capable of providing a high level of access to seed of improved varieties to farmers throughout the country. Within this vision: (i) MAF is competently managing an adaptive research program that is regularly identifying and releasing improved varieties; (ii) MAF is competently managing formal seed production and processing activities at an appropriate scale; (iii) MAF is effectively distributing formal seed in a manner that maximises scale-up benefits; (iv) informal seed production and distribution is stimulated nation-wide through the establishment of CSPGs; and (v) MAF is effectively managing overall development of the national seed system for TL.

3.5. Program Scope and Activities

3.5.1. Component 1: Evaluation of improved food crop varieties

Component objective: Improved varieties of food crops identified and released.

[1] As reported by MAF, based on FAO data. Other estimates are slightly lower.
[2] Detailed projection of adoption rates is provided in Appendices 1 and 9.
[3] To be confirmed through conduct of a baseline survey during Inception.

Under this component, the variety evaluation and release work initiated under SoL I and II will be continued, recognising that this work is the 'engine room' for improving crop productivity. Improved varieties need to be evaluated on an on-going basis to drive future productivity gains, and to respond to new opportunities and challenges (e.g. identification of varieties that are resistant to new variants of pests and diseases). The overall scope of variety evaluation work will be expanded to include: (i) staple food crops that are important in temperate upland areas, where poverty is most concentrated (e.g. wheat, barley, and potatoes); (ii) legumes (especially beans) providing an important opportunity to impact on the nutritional status of target communities, with particularly benefits for women and children, and to develop improved and more sustainable crop rotations; (iii) rice – at present there is limited capacity for evaluating improved rice varieties, despite the substantial investment by GoTL in developing local rice production; (iv) food crop varieties that are broadly adapted and consequently more robust to the projected effects of climate change, such as reduced/more variable rainfall, and higher temperatures). This adaptive research work is likely to remain in the public domain (through MAF) for the foreseeable future. The proposed expansion of the current research program is relatively small, and builds directly on the capacity established under previous Phases of SoL.

End-of-Program outcomes: EoPOs, against which performance of Component 1 will be assessed, include:

- National network of Research Centres and smaller Research Stations established, sufficient to cover major crop types and agroecological zones.
- 10-15 new varieties of food crops evaluated and officially released.
- MAF competently managing all phases of the research cycle including objective setting, planning and implementation of trials, analysis, and reporting.

Key outputs and activities:

National Agricultural Research Centres and Research Stations established. Larger Research Centres have already been established under previous phases of SoL at Betano and Loes, and a smaller (and significantly less costly) Research Station at Aileu. No further investment is required at these sites with the exception of establishing irrigation capacity at Loes. Under SoL III, three additional Research Stations will be established: (i) at Darasula (Baucau District) for evaluation of varieties at mid-altitude on red acid soils; (ii) at a high altitude site (probably in Ainaro District) for evaluation of temperate crops; and (iii) in an irrigated rice growing area (probably in Bobonaro or Baucau District) for evaluation of rice varieties. The expanded network of research stations and the expanded work program will require the appointment of an additional 6 research staff. MAF will cover the cost of professional salaries associated with running the research station network, with SoL III continuing to fund operational costs.

Genetic material of potential improved varieties identified and sourced. To date, the main emphasis has been on evaluation of rice, maize, peanuts, sweet potato and cassava. Under SoL III the range of species evaluated will be broadened to include food legumes, and temperate species such as wheat, barley and potatoes. The scope of the adaptive research program will also be broadened to identify improved varieties and farming systems that will be resilient to projected climate change impacts (see Component 4). Appropriate genetic material of potential new varieties will continue to be sourced through the CGIAR centres. Under SoL III provision is made to fast-track the process of pre-screening new varieties by supporting visits to TL by CGIAR researchers to directly assess local conditions and performance of varieties previously supplied. In addition to using the CGIAR network, material will be sourced directly from national programs e.g. Indonesia (mung and soybean); Australia (wheat and barley); Thailand (cassava); and the Philippines and Africa (maize). The principles of the International Treaty on Plant Genetic Resources for Food and Agriculture will

be followed and the Standard Material Transfer Agreement from the Treaty will be used for all germplasm introductions. SoL III will also continue with the collection of seed of local cultivars of TL's main food crops, initiated under SoL II, with the objective of preserving valuable genetic material which has cultural and risk management roles in indigenous farming systems.

Potential new varieties evaluated on-farm. Support will continue to be provided for on-farm demonstration trials (OFDTs), as an essential final stage of variety evaluation. The OFDTs provide a mechanism for evaluating performance under farm conditions across all agroecological zones, and exposing communities to improved varieties that are about to be released. The overall scope of the OFDT program will remain approximately the same in terms of the number of trials conducted each year, and districts where the trials are conducted. However, as additional species and varieties come on-stream, this will require rationalising the number of OFDTs conducted per species, in order to ensure that the program remains manageable and quality is maintained. Assessing women's preferences regarding the varieties being evaluated will continue to be a prominent feature of the OFDTs. The increasing complexity of the OFDT program (in terms of number of species being covered) will require the appointment of an additional 2 OFDT Coordinators. Efforts will also be made to formally involve SEOs in OFDT implementation. This will be facilitated through provision of a small operational budget for the SEOs for seed distribution and associated farmer training activities, included under Component 2.

Selected new varieties officially released. A Variety Release Committee was established under SoL II, chaired by the Minister of Agriculture, and is functioning well. No changes are proposed to this arrangement.

Sufficient foundation seed being produced. Foundation seed is currently being produced only at the Betano Research Centre. Production will be expanded to the Loes Research Centre once irrigation facilities have been developed, spreading the risk associated with locating all production at one site.

Capacity of MAF staff to manage the identification and release of new varieties strengthened. The overall objective of training provided under this component will be to improve the performance of research and OFDT staff to the point where they can competently manage all phases of the research cycle. Training will be provided against pre-identified required competencies[1], with regular assessment of progress in relation to these competencies following established Program procedures. Three general types of training will be supported: (i) a range of short courses of up to 1 week in duration on topics including statistics, plant breeding, agronomy, soils, and English language; (ii) on-the-job placements at Research Centres outside of TL for periods of up to 2 months; and (iii) post-graduate studies in Australia or Indonesia.

3.5.2. Component 2: Formal seed production and distribution

Component objective: Sufficient high quality seed being produced through formal channels to maintain the genetic quality of released varieties.

Under this component, the multiplication and distribution of formal seed, initiated during the second half of SoL II, will be expanded. Production of formal seed is an essential component of any national seed system. However, there needs to be: (i) a clear limit on the quantities of seed produced through this channel; (ii) far more strategic use of the limited volumes of high-value seed being produced so as to maximise downstream benefits; (iii) development of a strong linkage between formal and informal seed production activities so that the latter benefit from regular

[1] Core skills required and current capacity are described in Appendix 2.

injections of seed of good phyto-sanitary and genetic quality; (iv) increasing emphasis on cost-recovery; and (iv) rationalisation of seed production locations and seed processing/ storage infrastructure and activities, in order to improve production efficiency.

End-of-Program outcomes: EoPOs against which performance of Component 2 will be assessed, include:

- Four Seed Processing Centres established (2 new) for receiving, grading, drying, storing, and packing formal seed, with a combined capacity of approximately 175 Mt per year.
- Production of 100 Mt of formal maize seed, 50 Mt of rice seed, 25 Mt of peanut seed, 600,000 sweet potato cuttings, and 600,000 cassava canes per year[1].
- Formal seed and planting material effectively and efficiently distributed to CSPGs and farmers.
- MAF competently managing the production and processing of targeted quantities of formal seed, and the effective distribution of this seed to farmers.

Key outputs and activities:

Formal seed being produced through farmer contracts. For species that are propagated from true seed (e.g. maize, rice and peanuts), the current mechanism of contracting farmers to produce seed is working well and will be expanded. Farmers are directly contracted by MAF and provided with foundation seed produced at the Research Centres; field production activities are supervised by MAF's Seed Production Officers (SPOs) to ensure quality standards are met; and the resulting harvest of seed is purchased by SoL for processing, packaging and distribution. SoL will continue to finance the purchase by MAF of seed produced under this arrangement. An upper limit will be placed on the quantity of seed financed by the Program, balanced to ensure the genetic quality of the total national seed stock is maintained through regular injections of high quality seed, but not so much that it hinders the development of market-oriented informal seed channels. This limit has been set at the tonnages listed in the EoPOs. Seed demand and production potential vary regionally, and there is a strong case for concentrating formal seed production activities on a more limited number of areas and specialised seed growers than at present, in order to improve production and processing efficiencies. Possible production bases are Baucau and Bobonaro for rice, and Baucau for peanuts. For maize, consideration should be given to concentrating production in (possibly irrigated) lowland areas where higher yields can be obtained. Contract farmers who show the potential and interest to increase seed production for sale outside of their contractual arrangements will be encouraged to do so.

For sweet potato and cassava, which are propagated vegetatively, more decentralised production bases are necessary given the perishability of the propagating material. There is also far less potential for developing secondary market-based distribution of improved planting materials of vegetative species, and therefore a stronger case for planning a higher level of distribution though formal channels. The current mechanism of contracting farmers to establish sweet potato and cassava production nurseries will be expanded. To facilitate onward distribution and spread risk, the Program will support the establishment of 30 x 0.05 ha sites for sweet potato and 15 x 1 ha sites for cassava, located in all districts. In addition to the above species, the Program will support formal seed production activities for varieties of other species released during the course of SoL III.

The projected increased production of formal seed and planting material will require the appointment of an additional 5 SPOs by MAF. Specialised SPOs will be located in the 4 districts

[1] Production to progressively increase to reach these targets over the first few years. Additional formal seed production targets will be specified as other improved species and varieties are released.

where production activities are to be concentrated. In districts where seed production activities are *not* directly supported through SPOs, utilisation of district-level Agriculture & Horticulture Directorate staff will be pursued to support sweet potato and cassava production activities.

Quality assurance systems established. Quality assurance processes underpinning the production of true seed crops are already reasonably well developed, encompassing crop production monitoring, roguing, monitoring of harvest operations, routine measurement of moisture content (and drying if necessary), routine assessment of germination percentage, lot management procedures, inventory control, and labelling. Implementation of these measures is a major responsibility of MAF's SPOs, who will continue to receive training support on an on-going basis. Quality assurance for vegetative crops, particularly to minimise pathogen load, is more difficult and will remain dependent on careful field inspection[1]. Maintenance of genetic purity is assisted by the distinctiveness of most current SoL varieties, but if new varieties are released that are similar to existing ones, more careful protocols (such as specifying minimum isolation distances between contract growers' fields) may be needed to limit contamination of seed stocks.

Technical extension support provided to contracted seed producers. At present, farmers contracted for seed production receive little additional extension support beyond that provided by the SPOs. SoL III will establish stronger linkages with district extension staff for extension support. Provision is also made for exposure visits by leading specialist seed producers within TL and to Indonesia.

Seed grading, packing and storage facilities established. SPCs have been established by MAF under SoL II in Baucau and Manufahi Districts. MAF will be supported to establish an additional 2 SPCs under SoL III, located in districts where seed production activities will be concentrated. Each SPC will include storage for approximately 60 Mt of seed, together with associated drying, seed cleaning and packing facilities. The centres will be purpose-built to ensure low storage temperatures, good access, and security.

Formal seed distributed through preferred distribution channels. Seed distribution is controlled by MAF at the national level, and is currently based on a 'first come first served' basis rather than on any prior planning. The main distribution channels are through MAF's extension system direct to farmers, and through intermediary NGOs and other donor programs. Improved planning and management of the distribution process will become increasingly important as the production of and demand for improved seed increases; as the inter-relationship between formal and informal seed production develops; and as the need to move seed from one district to another increases reflecting the establishment of specialised production bases[2]. Providing seed for the Program's internal needs (e.g. for OFDTs and contract seedgrowers), and for the CSPGs established under Component 3, will take priority over all other users.

Distribution to NGOs and other development programs will be subject to clear 'rules of engagement' aimed at maximising the production of informal seed from the high-value, high-quality formal seed distributed. These should cover the need for timely requests, clear and workable plans for the distribution of seed, agreement on the minimum quantity distributed to each farmer, plans for assuring access to seed for vulnerable groups, an established track-record in agriculture and good knowledge of TL farming systems, farmer engagement that is not tied to provision of free inputs or otherwise breed dependency, and a commitment to monitoring the uptake and impact of distributions.

[1] In the absence of facilities for pathology testing or insect-free greenhouses.
[2] See Component 4 for further description of development MAFs capacity to plan/ manage the distribution process.

Under SoL III formal seed will be distributed to CSPGs and individual farmers through the MAF extension service, which has permanent staff located in all districts, subdistricts and *sucos*. The DACD will be responsible for planning the logistics of distribution. Provision is made for the Program to support the transport of seed from the SPCs to secure storage facilities located at the District Extension Centres being developed by MAF; and from the District Extension Centres to distribution points within sub-districts. SEOs will be responsible for final distribution to CSPGs and farmers. The Program will support training of extension staff at district, sub-district and *suco* levels on seed handling, and the benefits and use of improved varieties. It will also provide a small operating budget to SEOs for field demonstrations and monitoring activities, aimed at improving farmer awareness of improved varieties and ensuring that distributed seed is used in the most effective manner[1]. Strategies will be developed to ensure equitable access for women to formal seed, technical information, and training opportunities.

All distributions to third-party users (e.g. NGOs) will be on a cost-recovery basis. While acknowledging the difficulty of selling seed to farmers in the current climate where government (and development agencies) provide, and farmers expect, free handouts, the Program should progressively move towards at least partial cost-recovery from farmers over the longer term.

Capacity of MAF staff to manage the production and distribution of formal seed strengthened. The overall objective of training provided under this component will be to improve the performance of the SPOs responsible for supervising the production and processing of formal seed, and extension staff (at all levels) responsible for managing seed distribution activities, to the point where they can competently manage these activities. Training will be provided against pre-identified required competencies[2], with regular assessment of progress in relation to these competencies following established Program procedures. Three general types of training will be supported: (i) a range of short courses of up to 1 week in duration in topics including field management of seed crops, assessing and controlling seed quality (both genetic and phyto-sanitary), storage management, equipment O&M, breeding systems, and seed planning and inventory management; (ii) on-the-job training at seed production/ processing sites within TL and Indonesia, for periods of up to 2 months; and (iii) post-graduate studies in Australia or Indonesia.

3.5.3.Component 3: Informal seed production and distribution

Component objective: Mechanisms for the production and distribution of seed through informal and market channels strengthened.

Under this component, a range of new approaches will be supported to begin building the foundation of a commercial seed industry in TL and hence increase farmers' access to improved varieties, outside of government channels. These include the production of informal seed by CSPGs, which will complement and provide a scale-up mechanism for the seed produced through formal channels (Component 2). A range of initiatives will also be supported to stimulate market-based seed exchange. These activities will be implemented on a pilot basis, and will therefore require particularly close monitoring to assess outcomes, providing a basis for possible future expansion.

It needs to be recognised that the potential for developing market-based approaches for vegetatively propagated species is much lower than for seed-based species. The central role of tubers and root

[1] Supplementing capacity building and operational support for the SEOs to be provided under RDP IV.
[2] Core skills required and current capacity are described in Appendix 2.

crops in food security also indicates a strong public-good argument for continued investment in non-market approaches for these species.

End-of-Program outcomes:

EoPOs against which performance of Component 3 will be assessed, include:

- Around 1,000 CSPGs established and producing a marketable surplus of informal seed.
- CSPGs linked with market outlets and selling seed.
- Mechanisms for strengthening market-based exchange of informal seed trialled, evaluated, and where appropriate replicated.

Key outputs and activities:

Community Seed Production Groups established. Establishing and developing CSPGs, based on the model successfully implemented by CARE in Bobonaro, Liquica, and Ermera Districts, will be a key activity of this Component. CSPGs provide a means of increasing the volumes of seed produced and diversifying production sites, both of which can help widen access to seed. Initially, CSPGs will increase seed access and seed security of their own members, but eventually they should be able to supply other farmers, in some cases beyond the immediate locality. CARE's experience indicates that CSPGs may also be able to generate sales of seed.

Under SoL III, CSPGs will be established in rural districts where CARE is not already working, with a target of around 1,000 groups established by the end of the Program. A typical CSPG will comprise 10-15 farmers, self-selected, and will receive 2 years of intensive support. Support will include a package of inputs and training, including seed, seed storage, production and processing advice, tarpaulins, basic hand-tools and equipment including labour-saving devices such as maize shellers, and facilitation of links to potential buyers and to other services. Groups will be specialised on a particular variety, with an initial focus on maize, rice and peanuts. Where possible, pre-existing groups of households that already have strong (informal) collaborative links will be utilised. The formation of women-only groups will be actively promoted and facilitated. Additionally, groups with existing market-oriented activities should also be sought out. Youth groups supported by GTZ and the Youth Employment Program are obvious candidates.

Establishment of CSPGs will be supported by extension staff at district, sub-district and *suco* levels. A small operating budget will be provided to facilitate their involvement in and oversight of the activity.

Farmer Seed Marketing Groups established. Farmer Seed Marketing Groups (FSMGs) are organisations that cluster together several CSPGs as a way of facilitating their marketing of seed and overall scope of activities. This activity is also modelled on similar initiatives being supported by CARE. It will focus on bringing together only the more successful CSPGs, provided they are in close enough proximity to each other (ideally, within the same *suco*, or even *aldeia*). Contracted formal seed producers (under Component 2) that are able to produce seed surplus to their contracts could also provide a basis for forming a FSMG, provided they, too, are close together. The advantages of such groups include developing an increased scope for trade, having expanded storage capacity, establishing an institutional presence to engage better with government, and becoming a conduit for formal seed to be passed on to CSPG members.

Establishment will involve provision of infrastructure (e.g. a small office) and some equipment and materials (e.g. storage). Support and training for organisational and enterprise development will also be required, as will support to help groups tap into demand for seed and other produce. The

longer-term viability of the FSMGs will depend on delivering tangible benefits to members (i.e. profitable sales), and possibly on their ability to provide other services to their members and communities, such as serving as a local grain bank. Regular supply of new varieties to the FSMGs is likely to be a good way of ensuring sustained income for these groups.

The Program will initially support the establishment of up to 6 FSMGs as a pilot, covering maize, rice and peanuts. Groups will be located where the density of CSPGs is highest, and should not be established until after member CSPGs are well-established and producing a surplus.

Focal seed merchants in local markets established. Though market infrastructure and activity is weak in TL, many farmers do acquire seed from the market, and local seed/grain merchants are potentially a key channel for dissemination of both formal and informal seed. Focal merchants in district markets will be assisted to access seed of new varieties, with the eventual aim of establishing links, and possibly contracts, with CSPGs and FSMGs. Business development support and advice will be provided, as well as training on the management of improved varieties and the essential aspects of maintaining seed quality. Seed storage containers will be provided if required, as well as promotional materials. Promotional work to raise farmers' awareness of SoL varieties, as well as the higher quality of the seed offered by these merchants (supported under Component 4) will also help to direct trade towards these merchants. Possible criteria for selecting focal merchants include having a permanent base in the market; regular trade at that market through the season; a good reputation with buyers; access to secure storage; access to transport; and (where possible) existing supply links to areas where CSPGs/ FSMGs are being established. The Program will initially support, as a pilot, the strengthening of a single 'focal merchant' in each district market.

Access to seed for vulnerable groups improved through seed fairs. Seed vouchers and fairs are increasingly used in post-disaster situations to help monetise seed producers and improve access to seed for seed-insecure farmers. Potential benefits include giving farmers choice over which varieties (and quantities) they can obtain; increasing awareness among all participants of the crops and varieties farmers use (both SoL and local); supporting CSPGs and FSMGs with a ready outlet for seed; and possibly encouraging merchants to become more involved in trading seed. Vouchers are distributed to target households in advance, allowing them to purchase the seed they require during the day of the fair. As improving access is the primary aim, careful targeting of voucher recipients will be needed – wherever possible, the identification of beneficiaries should be in collaboration with another established program that already has identified and works with vulnerable groups. Program-supported CSPGs, FSMGs, and focal merchants will be invited to participate in the fair. The net could be cast wider still by advertising for EOIs from vendors who do not specialise in seed or grain, but who nevertheless are able to source seed, as done by CARE in previous emergency-response activities in 2003/04, with good results. Potential vendors will require some indication of which crops and varieties might be in demand, guidance about the seed quality expected, and linkage to CSPGs and FSMGs with surpluses to sell. The scale of operations should be defined carefully, to balance the size of fairs (large enough to be worthwhile for traders) with the distance farmers need to travel. Prices may or may not be set in advance, though fixed prices are one way to encourage merchants to attend. Quality of seed on offer should be evaluated prior to, and during, the fair, by farmers or SoL staff, or both. As farmer choice is a key goal, seed on sale should not be restricted only to SoL varieties. Monitoring of sales will provide a robust check of demand for SoL varieties over others. The Program will initially support, as a pilot, up to 6 seed fairs in selected areas with concentrations of seed-insecure farmers.

Systems linking informal seed producers with potential buyers enhanced. Unknown or unpredictable local demand for seed is often a major constraint to local seed enterprise

development. The Program will support a set of activities intended to improve the flow of information on potential seed suppliers, and areas of demand, to facilitate trade. This will entail: (i) gathering information on surplus production from CSPGs and FSMGs; (ii) gathering timely information about the potential demand for seed, from projects, local NGOs, and SEOs; (iii) collating and managing this information at a higher level; and (iv) facilitating links between buyers and potential sellers.

Capacity of MAF extension staff to establish CSPGs strengthened. MAF extension staff will be provided with training so that they can support the establishment of the CSPGs, in addition to that included under Component 2. Specific training needs are likely to include group establishment, group dynamics, and monitoring. Gender aspects will be given particular emphasis. Experienced trainers will be mobilised from CARE if possible.

3.5.4. Component 4: Seed system management

Component objective: MAF capacity to manage the national seed system strengthened.

The focus of this component is on developing MAF's capacity to manage strategically a national seed system, balancing formal (Component 2) and informal (Component 3) seed production and supply, and linking with on-going improved variety evaluation work (Component 1). Higher-level management capacity is necessary not only to efficiently plan and manage seed supply to farmers, but also to ensure that cross-cutting issues (gender, environmental change, and policy engagement) are addressed. It is difficult to overstate the difficulty of developing the desired capacity given the current institutional and policy constraints confronting MAF. This is reflected in the focus on working to develop institutional capacity in a relative limited number of core areas[1].

End-of-Program outcomes:

EoPOs against which performance of Component 4 will be assessed, include:

- National seed planning, allocation and inventory control systems established.
- M&E/ SOSEK unit competently managing field evaluation activities, providing a sufficient basis for progressive learning.
- Policy issues identified and advice provided on key issues related to development of the national seed system.
- Gender issues reflected in the implementation of the national seed system.
- Widespread awareness of SoL varieties in all districts.
- Improved varieties and management practices being identified taking into consideration projected climate change impacts.

Key outputs and activities:

Seed planning and management systems established. At present there is little concept of systematic planning and management of a national seed system that encompasses formal and informal sectors. This results in high opportunity costs from the sub-optimal use of high-value formal seed, and from the failure to capitalise on the benefits (and reduced cost) of producing and distributing seed through the informal system. The current focus of MAF is limited to producing as much formal seed as possible, and distributing this seed in a relatively unplanned, *ad hoc* manner. Effective management requires clearer identification of the strategic priorities for seed production and

[1] Institutional capacity development is further discussed in section 3.9.

distribution activities, and systems that can help direct and manage flows of formal and informal seed in ways that maximise access and impact. On the supply side, this requires production planning, contract management and inventory control for formal seed, as well as managing information on informal seed production. On the demand side, it requires collation of requests for seed, definition of priority users and areas for receiving seed, and distribution in relation to a wider plan. The Program will support the development of systems to address the above, with particular emphasis on forward planning systems, allocation procedures, and development of a simple inventory management system.

M&E systems established. The SOSEK Unit established under SoL II will be expanded and refocused under Sol III. It will become responsible for the routine assessment of performance against EoPOs, as well as for conducting the range of field evaluations necessary to guide the refinement of implementation approaches. The Unit will link to the MAF's National Directorate of Policy and Planning. Further detail is provided in Section 4.2.6.

GoTL seed policy being informed by SoL experience. Capitalising on its central position in the national seed system and its strong field presence, there is a prime opportunity for the Program to influence seed-related policy. This requires identification of policy issues; analysis of evidence based on field experience; and reporting to relevant government officials. Some areas where SoL III might play a role include: (i) finalisation of the draft seed law, particularly in terms of regulation of quality and permission to trade; (ii) MAF strategies for seed purchase and distribution; (iii) MAF strategies for input provision, particularly targeting and terms; (iv) emergency relief policies, particularly around assessing seed needs and approaches for seed interventions; and (v) procurement policy regarding direct purchase of seed from farmers. The Program will also aim to support MAF in the annual budget dialogue process, by providing hard evidence of the benefits of public investment in the seed system, appropriately packaged for the target audience.

Seed system gender strategy implemented. A draft gender strategy for SoL III has been prepared as part of the design process (Appendix 3). Key elements of the strategy include: (i) awareness-raising and advocacy; (ii) strengthening commitment and leadership for gender equality; (iii) promoting gender-sensitive research, data collection, analysis and dissemination of sex/gender disaggregated data and information into all aspects of seed programming (design, planning, implementation, M&E); (iv) strengthening institutional and technical capacity for gender mainstreaming; (v) promoting women's access, participation and leadership in decision making; (vi) promoting women's access to agricultural inputs, extension services, information and technology; (vii) building and strengthening strategic networks and partnerships; and (viii) involving and working with men to promote gender equality and women's empowerment in seed production, distribution and management. This strategy will be systematically implemented across all components, with particular emphasis on ensuring that: (i) variety evaluation is responsive to women's needs (Component 1); (ii) women have equitable access to formal seed and associated technical support (Component 2); (iii) CSPGs are specifically targeted to women and women's needs, as well as men's (Component 3); and (iv) gender equality issues are integrated in national seed policies, programming and management, thereby strengthening MAF's capacity to manage the national seed system from a gender perspective. A concise (max 2 pp) gender 'action plan', based on the draft gender strategy, will be prepared during start-up. Implementation of this action plan will be supported by a national Gender Coordinator, assisted by ST TA.

Improved-variety technical and promotional materials developed. SoL is already producing a range of high quality technical and promotional materials, including brochures, posters, calendars, and banners. Additional materials will be developed as new varieties are developed and new activities are initiated.

Awareness of improved varieties increased. As seed supply increases, a key challenge will be increasing the awareness of improved varieties amongst farmers to stimulate the demand for seed, especially from the informal sector. This is a challenge even when there are established seed enterprises with their own marketing activities (such as with maize in East and southern Africa), and is even more-so for informally produced and supplied seed. While in the short-term, the distinctiveness of SoLs' sweet potato (large roots), maize (yellow grain), and peanut varieties (large seeds) will help with promotion and awareness, farmer awareness of SoL varieties will be a growing issue as new varieties are released. The Program will develop strategies to further promote SoL varieties using mass media such as radio, text messaging, and television.

Environmental and climate change impacts addressed. SoL II recently commenced work assessing the likely impacts of climate change on food crop production in TL. Under SoL III this ongoing assessment will be applied to help inform the selection of species/varieties that are better adapted to climate change. It will also provide a basis for identifying possible adaptations to farming systems (e.g. use of velvet bean as a cover crop, and identification of farming systems that are based on a more diverse range of crop types). Multi-year OFDT yield data will be correlated with local climate data providing a field-based assessment of the impacts of variation in weather patterns on yields, providing a possible basis for crop yield and food security projections.

Capacity of MAF staff to manage the national seed system enhanced. Provision is made for targeted training of national MAF staff as an integral part of developing the above systems. Provision is also made for exposure visits by senior staff to review the structure and operation of seed systems in other countries such as Australia and Indonesia.

3.6. Duration and Phasing

Phase III of SoL will run for 5 years from the close of Phase II in January 2011 through to December 2015.

The 3 additional Research Stations under Component 1 will be established during the first 3 years of the Program. Production of formal seed under Component 2 will reach targeted annual volumes by the end of PY1 for peanuts, sweet potato and cassava; end of PY2 for rice; and end of PY4 for maize. The additional 2 SPCs will be established in PY1 and 2. Establishing the CSPGs under Component 3 will start in PY2 and continue through to PY5, reflecting seasonality and the need for this activity to occur after the ramp-up of formal seed production. Other activities under Component 3 designed to stimulate market-based seed exchange will be implemented from PY2 on.

3.7. Geographic Focus

SoL III is designed to scale-up the activities of previous phases to establish the basis of a national seed system, providing sustainable access to improved varieties nation-wide. Location of key elements of this system, by component, are summarised below:

Component 1. Adaptive research will be located at the existing 2 Research Centres at Betano and Loes, and the Research Station at Aileu. Additional Research Stations will be established at Darasula, at a high altitude site (probably in Ainaro District), and in an irrigated rice growing area (probably in Bobonaro or Baucau). OFDTs will continue to be focussed in the 7 districts where they are currently conducted.

Component 2. Production of formal seed will be concentrated in a few areas to improve production and processing efficiencies. Possible production bases are Baucau and Bobonaro for rice, and Baucau for peanuts. For maize, consideration should be given to concentrating production in (possibly irrigated) lowland areas. SPCs have already been established under SoL II in Baucau and Manufahi Districts. An additional 2 SPCs will be established under SoL III, located in districts where seed production activities are to be concentrated. For species that are propagated vegetatively, field production sites will be established in all districts given the perishability of planting materials.

Component 3. CSPGs will be established in all districts where CARE is not already supporting similar activities. Other activities under Component 3 designed to stimulate market-based seed exchange (e.g. establishment of FSMGs, strengthening of focal seed merchants in district markets, and seed fairs) will be implemented in selected locations as pilots.

3.8. Program Funding

3.8.1. Total cost by component and year

Program Cost by Component (Million A$)

	Million A$	**% of total**
C1: Evaluation of improved food crop varieties	4.74	17.4
C2: Formal seed production and distribution	5.40	19.8
C3: Informal seed production and distribution	3.01	11.0
C4: Seed system management	4.66	17.1
Program Management	9.48	34.7
TOTAL	27.29	100

Total Phase III cost is estimated at A$27.3 million over the 5-year implementation period. Of this, the precentages of the four components and Program Management are listed directly above. Program Management costs include: (i) all Program vehicle costs (purchase of new fleet to replace existing vehicles, purchase of additional vehicles and motor-bikes, and all vehicle O&M costs); (ii) 60% of the SoL Team Leader's time and 100% of the program Coordinators time; (iii) all unallocated short-term TA; (iv) the cost of establishing and operating the 3 regional offices; (v) the cost of operating the PMO (including an allowance to expand the current SoL II office); (vi) all Program workshops, meetings, etc.; (vii) replacement and additional office equipment; and (viii) all Program publicity costs. Note that the allocation between components is indicative, given the programmatic approach to be adopted with activities decided on an annual basis through the annual planning process. Technical Assistance (TA), included within the component totals, accounts for approximately 44% of total Program cost. Detailed resource schedules and cost tables are provided in Appendix 6.

Program Cost by Year (Million A$)

	Projected cost
PY 1	6.62
PY 2	5.40
PY 3	5.99
PY 4	4.92
PY 5	4.36
TOTAL	27.29

3.8.2. Program financing

Program Cost by Funding Source (Million A$)

	Australia	GoTL	Total
C1: Evaluation of improved food crop varieties	3.51	1.23	4.74
C2: Formal seed production and distribution	4.05	1.35	5.40
C3: Informal seed production and distribution	2.86	0.15	3.01
C4: Seed system management	4.49	0.17	4.66
Program Management	2.65	6.83	9.48
TOTAL	17.56	9.73	27.29

The Program will be jointly financed by AusAID, ACIAR, and GoTL. On the basis of the draft transition plan outlined in section 3.11, Australia would finance around A$ 23.2 million (or 89% of the total); and GoTL A$ 2.9 million (11%).

3.9. Institutional Capacity Development

Capacity building is defined as the process of developing competencies and capabilities in individuals, groups, organizations, and sectors that leads to sustained and self-generating performance improvement for the *management of TL's national seed system*. Capacity building activities for SoL III will therefore be wide-ranging and include: (i) training and development, mentoring, twinning, lead firm models; and (ii) organizational assessment and development, institutional strengthening and sector/ economic reform, as needs are identified during implementation.

Objective and scope. The capacity building objective is to strengthen and embed the skills, systems and institutional capacity required for the successful and sustainable operation of a national food crop variety testing and seed management and distribution system within MAF. It is beyond the scope of SoL III to address some of MAF's more widespread and entrenched capacity limitations. Phase III will therefore focus on building research, planning and managerial capacity in the NDR&SS, the NDA&H, and the NDACD, the latter to the extent required to operationalize the SEOs. A wider and more broadly focused capacity building strategy for all of MAF, while necessary, would detract from SoL III's goal, purpose, and component outcomes. Furthermore, the budget is only sufficient for SoL III to focus on its specific objectives. Under SoL III resources or

budget will not be available for the more generic improvement of MAF's overall performance as a Ministry[1].

Lessons and guidelines. The institutional analysis provided in Appendix 2 identifies a range of lessons and guidelines on how a capacity building strategy for SoL III should be designed and implemented. These lessons and guidelines are drawn from SoL II; other capacity building projects in TL such as the AusAID-funded Public Sector Capacity Building Program (PSCBP) and the World Bank managed /AusAID co-financed Planning and Financial Management Capacity Building Program (PFMCBP); capacity building reviews undertaken by the European Centre for Development Policy Management (ECDPM) [2]; and various reviews of capacity building projects in the Solomon Islands, Papua New Guinea and Indonesia.

Key principles outlined in Section 8.3 of Appendix 2 indicate that capacity building under SoL III: (i) should include activities tailored to the level at which the Ministry is operating and to the needs of the specific target group; (ii) should be unique to the situation for which it is designed – i.e. there is no single overall framework or common set of activities; (iii) must lead to performance improvement for the target group, such as improved farmer service delivery, increased food crop productivity, etc; (iv) must be sustainable, so that the improved performance continues after SoL III-funded activities cease; and (v) should also be self-generating to enable target groups to continue to build capacity with little or no assistance following the initial intervention.

Experience indicates that capacity building within MAF can only succeed with active participation by target groups. This means that capacity building under SoL III should: (i) be clearly based on the real needs of target groups; (ii) recognize that during the Program, these needs and priorities will change; (iii) use a facilitative and consultative process that is based on the principles of 'change management'; and (iv) be sensitive to constraints and demands on the target group which will influence the rate at which capacity building activities can take place.

SoL III's capacity building should, through various dynamic processes, build competencies and organizational arrangements within the scope and purpose of the Program. In the long term, relevant MAF staff should be better-able to plan and implement TLs national seed system. However, in the first instance this aim requires building the capacity of staff working directly with Sol III, embedding new systems within MAF, and improving MAF's institutional capacity to develop and manage a national seed system.

Strategy. Reflecting the overall programmatic approach, SoL III's capacity building strategy must be flexible and non-prescriptive. Circumstances will change over the life of Phase III and new demands for capacity building and institutional strengthening will arise. Section 8.3 in Appendix 2 lists: (i) guiding principles under which SoL III's capacity building activities should be implemented; (ii) general indications of where the overall strategy and component-specific strategies should focus; (iii) relevant target groups within MAF; and (iv) the resources needed.

[1] See page 25, Appendix 2.

[2] ECDPM. 2008. Capacity Change and Performance: Insights and implications for development cooperation. (Policy Management Brief No. 21). Maastricht. Inputs from: Tony Land, Niels Keijzer, Anje Kruiter, Volker Hauck, Heather Baser and Peter Morgan. This research provides new perspectives on the topic of capacity and its development. It does so by highlighting endogenous perspectives: how capacity develops from within, rather than focusing on what outsiders do to induce it.

The details on specific capacity building activities, events, study tours, workshops, training programs, systems development, and institutional strengthening will be determined as part of the annual planning process and take into account progress during the previous year and the need to address issues and constraints which are impacting on progress and success. Table 5 in Appendix 2 provides a matrix of recommended core skills, systems and institutional capacities that are required for a sustainable national seed system in TL. This table lists the activities, events, programs, etc. which are required to: (i) build the capacity of MAF's staff; (ii) build a national seed system within MAF; and (iii) develop MAF's institutional capacity to manage a national seed system and provide food crop production support to TL's farming communities. This listing also details the recommended scope and focus for SoL III's capacity building – within MAF and across those areas/ disciplines which need to be strengthened if SoL III is to be sustainable in the longer-term.

Table 5 in Appendix 2 also lists: (i) the MAF staff positions (and staff numbers) involved across SoL III's four delivery components and the management component; (ii) the core skills required; (iii) an estimated current core skills rating; (iv) targeted end-of-Program outcomes (EoPOs) (skills, systems and institutional capacity); (iv) the activities/ programs/ events needed over the life of SoL III to achieve the EoPOs[1]; (v) criteria by which to measure progress; and (vi) risks/ issues related to the activities/ programs/ events for SoL III's deliverable components and the PMO. Budgets for these capacity building programs are detailed in Appendix 6.

Capacity building TA. The SoL Team Leader will take prime responsibility for implementing the capacity building program detailed in Appendix 2, Section 8. However there is one possible area where additional Short term TA support may be required. This relates to the broader and more generic capacity constraints which currently constrain MAF's ability to fulfil its overall mandate – national support for TL's rural sector. The 'boundary' between SoL III's national seeds system capacity building mandate and MAF's non-seed system capacity constraints is not particularly clear, hence the recommendation that some of the unallocated TA time might be used to fund a short-term institutional capacity building specialist, subject to agreement by the core management team.

3.10. Transition Strategy

Introduction. During the design process for SoL II (2005) it was agreed by MAF, ACIAR and AusAID that MAF would progressively assume funding of the incremental Timorese staff that were selected, appointed and initially funded by Australia. This transition process has worked well with MAF already funding 32 (out of 37) national staff, with these positions fully absorbed into the Ministry's overall staffing structure. There was no such agreement for the sharing of operational and investment costs for SoL II.

MAF's annual budget increased from about US$5 million in 2005/06 to US$30 million in 2009, then decreased to US$13 million in 2001/10 due to a large reduction in the mechanization and irrigation budgets. Over the same period MAF's total staffing has increased from around 500 to 1,823 and the Ministry has established a national agricultural extension service. This increase in annual budget and staffing has been possible due to a large increase in TL's petroleum export earnings.

[1] These will include: (i) formal, informal and on-the-job training and mentoring in technical and managerial topics; (ii) short- and medium-term overseas training placements (in academic institutions, seed retail and wholesale businesses, seed production and distribution businesses [i.e. lead firm models and twinning], government departments responsible for national seed policies, etc.); (iii) post-graduate and masters studies at international universities and colleges; and (iv) international exchanges (to and from TL) for representative from all sectors of functional seed value chain systems.

TL's improved national budget situation, together with MAF's strong buy-in to the objectives of SoL and demonstrated willingness to contribute staff resources to the Program, provides a solid foundation for development of a transition strategy for decreasing operational and staffing costs funded by Australia, and a corresponding increase in funding by MAF.

It is recommended that the SoLTL and the NPD, working with the 3 key Divisional Directors, be assigned responsibility to prepare this strategy by the end of PY1, using the preliminary guidelines and suggestions set out below. These guiding principles should be used as the starting point to develop the strategy, based on on-going dialogue with MAF around issues such as timing, evidence of readiness for assumption of responsibilities, appropriate targets, etc. Nothing should be 'set in stone' until all parties have agreed that a particular aspect of the move towards changed funding and responsibility arrangements is fair and reasonable.

1. **Tasks, capabilities and responsibilities.** This section of the strategy should identify the tasks (and associated capabilities) for which MAF will assume responsibility. The plan must differentiate the requirements for different staff positions (skills, knowledge and capacity), particularly for staff with management roles. It must also articulate the institutional requirements in terms of resourcing, policies, processes and structures. As a guide, it is suggested that MAF might progressively take full operational and managerial responsibility for Component 1 (Evaluation of improved food crop varieties) and Component 2 (Formal seed production and distribution) activities.

2. **Timeline.** The strategy will also need to include agreement on the timing of the handover of agreed tasks and responsibilities. As a guide, it is suggested that MAF should be largely responsible for all activities under Components 1 and 2 by the end of PY4. This section of the transition strategy should list what MAF will be managing by when, with the objective of handing over full responsibility for identified components and associated activities by agreed dates. The intention is that SoL III's Advisors should have mentoring roles only towards the end of Phase III.

3. **How will the transition be achieved and measured?** The strategy will provide a description of the progressive steps and training/ capacity building required for MAF to take full responsibility for all aspects of agreed activities. Such progress will need to be measured and assessed against specified criteria before handovers are finalized. Handover of responsibilities should be dependant on MAF meeting specific staff capability and financial contribution requirements.

4. **MAF's concerns re: operational funds for research stations/ centres.** During the design process MAF has expressed a level of concern regarding funding of the ongoing operational costs for the 3 research centres and stations established under SoL to date. The design for Phase III includes the construction of three additional small research stations (1 mid-altitude, 1 highland and 1 irrigated rice site), which will further increase the requirement for operational funding. Further discussions are required on the need for these stations, and on MAF's ability to eventually fund the operational costs of all research centres and stations (both existing and proposed). It is suggested that Australia's funding of the 3 new research stations should be predicated on MAF's prior agreement to fund the operations (and staffing) of all stations/centres by an agreed time within Phase III. This suggestion needs to be further discussed between MAF and AusAID/ACIAR as part of the broader dialogue signalled above around cost sharing and transitional arrangements.

5. **Transition management.** The final transition strategy will be developed, and implementation overseen, through ongoing and expanded dialogue between all parties with implementation roles. The proposed fortnightly meetings between the DG of MAF (who will be the National Program Director), relevant Divisional Directors, and the SoLTL, will provide an important forum for finalizing and monitoring the implementation of the strategy. AusAID should be invited into these meetings if required for strategic or funding decisions. These meetings will also include discussions on the development of opportunities for MAF to progressively assume increased management of the Program, and the required financial co-commitments necessary for the handover of specific SoL III functions.

6. **Possible MAF contributions.** In order to facilitate discussion around the preliminary suggestions outlined above, the following table lists MAF's annual funding requirements *if*: (i) the costs of operating all research stations and centres (including the proposed 3 new stations) under Component 1, and all Component 2 costs (including the cost of seed grown under contract) are shared 50/50 in PY4, with MAF assuming full responsibility for these costs in PY5; and (ii) MAF funds all Timorese positions with the exception of the PMO administration staff from the commencement of Phase III. In summary, if these suggestions are included in the final transition strategy, then over the 5-year duration of SoL III MAF would be required to fund: (i) US$0.90 million for staff[1]; (ii) US$0.59 million for research station and research centre operational costs, (US$0.22 million in PY4 increasing to US$0.37 million in PY5); and (iii) US$0.97 million for Component 2 costs (US$0.35 million in PY4 increasing to US$0.62 million in PY5).

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
All Timorese Staff	$180.97	$180.97	$180.97	$180.97	$180.97	$904.87
Tim. Costs Cpt 1				$218.03	$368.05	$586.08
Tim. Costs Cpt 2				$345.10	$622.20	$967.30
Total (US$'000)	$180.97	$180.97	$180.97	$744.10	$1,171.22	$2,458.24

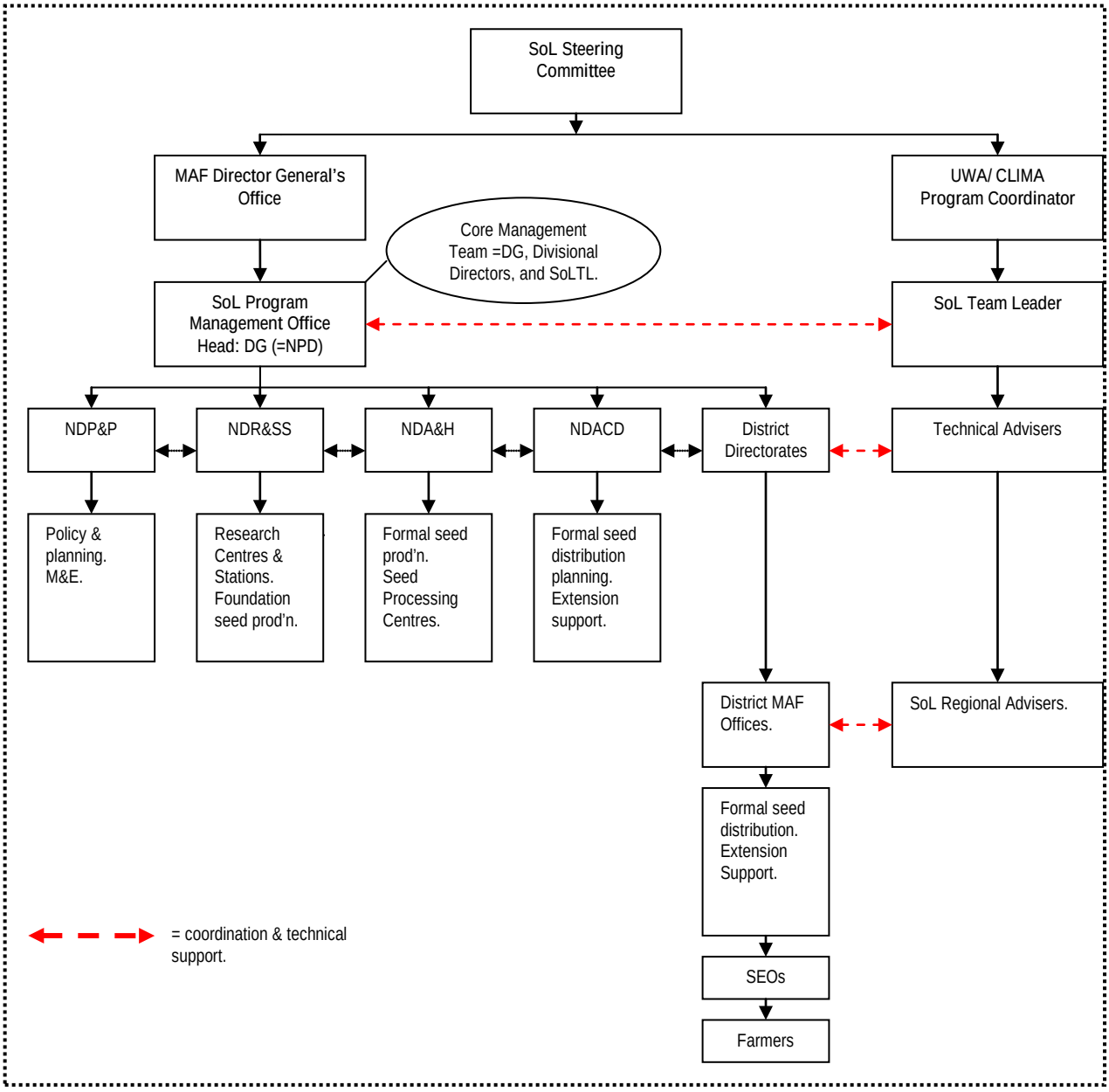
[1] Note: this is not an incremental cost – MAF is already paying these staff and therefore the cost is a fixed cost.

4. IMPLEMENTATION ARRANGEMENTS

4.1. Program Management Structure

Program management arrangements are depicted in Figure 4 and further detailed below.

Figure 4: Program Management Arrangements



4.1.1. Summary of AusAID/ ACIAR/ UWA roles

As for SoL II, ACIAR will have lead responsibility for implementation, operating under a Record of Understanding to be established with AusAID. The collaborative partnership established between ACIAR and the University of Western Australia (UWA) will be continued. AusAID will

provide financial support, participate in joint monitoring and review exercises, and provide other support to the in-country team as required, through its office in Dili. ACIAR will provide financial support and management oversight. UWA will be responsible for day-to-day administration of the Program.

4.1.2. Program Steering Committee

A Program Steering Committee (PSC) already exists, chaired by the Minister of Agriculture. Membership includes representatives from AusAID, ACIAR, UWA, the Director General (DG) of MAF and the Directors of NDR&SS and NDA&H. Under SoL III the Director of NDACD (responsible for extension services) should also be included. The PSC is responsible for providing high-level governance oversight of the Program. It currently meets a minimum of once a year, coinciding with approval of Annual Plans, with other meetings scheduled when required. The PSC should also be used as a forum for ensuring adequate coordination occurs across the various MAF directorates involved in implementation; and for overseeing implementation of the transition plan including appropriate mobilisation of required GoTL resources.

4.1.3. Organisation at national level

To facilitate coordination across the various directorates involved in implementation (NDR&SS, NDA&H, and NDACD)[1], it is recommended that a Program Management Office (PMO) be established directly under the DG's Office. The DG will fill the role of National Program Director (NPD) and in this role will head the PMO. The NPD will be directly counterparted by the SoL team Leader (SoLTL) who will head the advisory team. These arrangements are designed to address some of the coordination issues that have confronted SoL II, including the lack of a defined counterpart arrangement for the SoLTL. The NPD will play a central role in planning and coordinating SoL III activities, and in particular will be responsible for ensuring appropriate coordination across the technical directorates involved in implementation.

A Management Team will be formed within the PMO comprising the NPD, relevant MAF Directors, and the SoLTL. This Team will meet formally every 2 weeks to discuss higher-level management issues including coordination between directorates, deployment and activities of TA, and progressive hand-over (with corresponding financial commitments) of key SoL functions to MAF, in line with the transition plan[2].

4.1.4. Organisation at sub-national level

Adaptive research and formal seed production activities will be managed directly by the relevant technical directorates at national level, in consultation with MAF District Offices where relevant. For formal seed distribution and informal seed production activities, however, the Program will need to work more directly through the MAF District Offices, with full involvement of district and sub-district staff in planning, implementation and monitoring of activities. To facilitate work in the districts, the Program will establish 3 small Regional Offices, located within selected MAF District Offices. Each office will comprise a Regional Adviser and a MAF Regional Coordinator (probably seconded from the NDACD or District Offices). These teams will be based in the East, West and South of the country (possibly Baucau, Same and Maliana), with each office covering up to 4 districts.

[1] There may also be merit in the National Directorate of Agribusiness becoming involved in selected Component 3 activities. This needs to be further evaluated.
[2] Refer to section 3.10.

4.1.5.GoTL Staffing

Present and proposed GoTL professional staffing of SoL is summarised in the following table:

	Positions		
	Existing	**Additional**	**Total**
Research staff – Component 1			
On-Station Research Officers (OSRO)	7	4	11
OFDT Coordinators (OFDTC)	2	2	4
OFDT Officers (OFDTO)	17	0	17
Pure Seed Officers (PSO)	1	2	3
Seed production staff – Component 2			
Seed Production Coordinators (SPC)	1	0	1
Seed Production Officers (SPO)	7	5	12
C-B seed production staff – Component 3			
C-B Seed Production Coordinators (CBSPC)	0	9	9
Program management – Component 4			
National Program Manager (NPD)	0	1	1
M&E/ SOSEK Staff[1]	2	2	4
Regional Coordinators (RC)	0	3	3
Gender Coordinator (GC)	0	1	1
Training Coordinator (TC)	0	1	1
Total GoTL positions	**37**	**30**	**67**

The 37 professional GoTL staff under SoL II are engaged full-time on SoL activities, and represent a considerable commitment by GoTL to SoL[2]. Around 30 additional full-time staff will be required to scale up to a national program, mainly associated with the expansion of research activities under Component 1 and their linkage with Component 2; the expansion of formal seed production and processing activities under Component 2; oversight of informal seed production activities under Component 3; and the provision of additional management support at national level. These staff will be seconded from existing positions within MAF, and will be fully funded by MAF from the commencement of Phase III. Most of the positions will be based full-time in relevant operating units in the districts (e.g. Research Centres and Stations, Seed Processing Centres, and Extension Departments), and will report through their respective directorates to the NPD. Brief (1 page) position descriptions will be developed for all national counterparts during startup, in consultation with MAF. Note that in addition to the above full-time positions, there will be substantial involvement from extension staff at all levels for distribution of formal seed to farmers (under Component 2) and informal seed production activities (under Component 3).

[1] Including a specialist Gender Research Officer.
[2] 32 of these positions are currently funded by GoTL.

4.1.6. Technical Assistance

Overview and justification for TA. The following table provides a summary of key information from Appendix 2 Table 5 detailing MAF's current core skills, operating systems, and institutional capacity related to its ability to implement the Program. This information provides context to the issue of the need for TA during Phase III if: (i) Sol III is to achieve its objectives and targets in the short-term; and (ii) the Program is to build MAF's capacity so it is able to manage a national seed system by the end of Phase III.

Adding the scores listed in the table below gives aggregates of: (i) core skills (14/25); (ii) operating systems (11/25); and (iii) institutional capacity (9/25). This indicates that Phase III will need to focus more on the latter two areas – systems and capacity. Phases I and II successfully utilized TA to develop some core skills, particularly those technical and analytical skills required to implement and manage Component 1. However, as shown in the table, all ratings decline in component order (from 1 to 5), and also across the table from left to right (core skills to systems, to institutional capacity). These trends indicate the need for further investment in capacity building and where these efforts need to be focused, and also show that Phase III will require different technical and capacity building skills from those provided during Phase II.

MAF's Core Skills	MAF's Systems	MAF's Institutional Capacity
Summary (and edited) Conclusions from Institutional Analysis – see Appendix 2, Table 5 for details		
Component 1: Evaluation of improved food crop varieties Outcome: Improved varieties of food crops identified and released		
➢ Reasonable: SoL I and II made good progress in terms of developing the required skills. Rating (4/5)	➢ Reasonable: SoL I and II made reasonable progress in terms of developing the required systems. Rating (3/5)	➢ Fair, SoL II made some progress developing the required capacity, with the exception of being able to present cases to for additional budget. Rating (2/5)
Component 2: Formal seed production and distribution Outcome: Sufficient high quality seed being produced through formal channels to maintain the genetic quality of released varieties		
➢ Good, but small scale – SoL II made good progress with component 2, and established examples of how to contract with seed growers; collect, process, package and distribute seed. Rating (4/5)	➢ Reasonable, informal (SoL II) records are good, but not institutionalized into a national system within NDA&H. Rating (3/5)	➢ Reasonable, but national seed planning and coordination tends to be *ad hoc* in response to crises rather than longer-term planning for a sustainable formal seed production system. Rating (2/5)
Component 3: Informal seed production and distribution Outcome: Mechanisms for the production and distribution of seed through informal and market channels strengthened		
➢ Very limited, with exception of Care International's experience with 300 CSPGs and (in 2010) an unspecified number of FSMGs. No skills within MAF. Rating (1/5)	➢ No system within MAF, simple system currently operated by Care International. Rating (1/5)	➢ NDA&H staff have very limited knowledge and understanding of how markets for agricultural inputs (including seed) work and function. Rating (1/5)
Component 4: Seed management system Outcome: MAF capacity to manage the national seed system strengthened		
➢ Varies between outputs, but low. Rating (2/5)	➢ SoL's M&E/ SOSEK system is functioning but needs to be embedded within MAF. ➢ Good start made on use of analytical system to predict impact of climate change. Rating (2/5)	➢ Currently very little capacity within MAF to operate the systems need for component 4. Rating (1/5) ➢ Reasonable capacity for other outputs. Rating (2/5)
Component 5: Program coordination and management Outcome: PMU functional efficiently and effectively		
➢ Good progress in some areas achieved during SoL II, (in report	➢ Limited progress during SoL II (except that SoL II used a	➢ MAF's capacity to undertake the key tasks for Component 5

preparation and presentation, technical report preparation and presentation, and writing and publishing scientific articles and reports) but other skills still lacking in work programming and resource allocation, data and information management, and PMO management. Rating (3/5)	satisfactory internal financial reporting system) ➢ All systems need to be improved considerably during Phase III. Rating (2/5)	continues to be constrained ➢ Phase III will rely heavily on the ability of MAF's NDACD's SEOs to distribute seed and work with farmers and farmer groups. Therefore it will be essential for SoL III to improve MAF's capacity at the national directorate, district/ sub-district, and suco/ aldeia levels. Rating (2/5)

Utilisation of advisers, both long and short term, is proposed as a key mechanism for building the required capacity within MAF, building on the productive use of TA in Phase II. Phase III is breaking new ground in a number of areas where targeted TA is particularly justified: (i) initiation of an expanded variety evaluation program including investigation of improved varieties for new agro-ecosystems (Component 1); (ii) considerable expansion of contract seed production and distribution activities (Component 2); (iii) development and support for TL's fledgling informal seed sector (an area where MAF has *no* experience) (Component 3); (iv) development of capacity within MAF for overall management of a national seed system (Component 4); (v) expanded and broader support for capacity building within MAF's three key National Directorates (NDR&SS, NDA&H, and NDACD); (vi) expansion of the scope of enquiry of the SOSEK/M&E Unit, with particular emphasis on gaining a better understanding of informal seed systems and measuring Program impact; (vii) ongoing assessment of the likely impact of climate change on food crop production systems in TL; and (viii) development of extension capacity required to support the distribution of seed to 46,000 rice-growing and 61,000 upland households throughout TL.

Proposed positions. Proposed TA is summarised in the following table:

	Positions
Long term TA	
SoL Team Leader (SoLTL)	1
Research Adviser (RA)	1
Formal Seed Production Adviser (FSPA)	1
Informal Seed Production Adviser (ISPA)	1
Regional Advisers (RA)	3
M&E/ SOSEK Adviser	1
Climate Change Adviser	1
Total LT positions	**9**
Other TA	**Total person-mnths**
UWA Program Coordinator (APC)	30
Farmer Group Specialist (FGS)	3
Seed Value Chain Specialist (SVCS)	3
M&E Specialist (M&E/SA)	9
Gender Specialist	10
Environmental Specialist (ES)	3
Unallocated	16
Total ST person-months	**64**

Core long-term (LT) positions at national level include the SoLTL (responsible for management of Australian-funded staff and resources and for supporting implementation of Component 4); the Research Adviser (responsible for supporting implementation of Component 1); the Formal Seed Production Adviser (responsible for supporting Component 2); and the Informal Seed Production Adviser (responsible for supporting Component 3). The 3 Regional Advisers will work at district level across all components. The M&E/SOSEK Adviser will be responsible for on-going

development of the expanded M&E/ SOSEK Unit. In addition to the LT TA positions, provision is made for ongoing inputs from an Australian Program Coordinator (APC, from UWA); as well as from technical specialists covering a number of key areas, including farmer group establishment, seed value chain development, M&E, gender and environment. All TA positions will report directly to the SoLTL. The Program will require an over-arching Team Leader of sufficient calibre to manage a large multi-component Program and provide strong leadership to build the institutional capacity of MAF. Also note that in order to improve strategic oversight of a substantially larger and more complex Program (vis a vis Phase II), inputs from the APC have been increased from 4 months per year in Phase II to 6 months per year in Phase III.

The level of TA staffing proposed is considered to be the minimum necessary to underpin successful implementation of the Program, as scoped.

TA strategy. All LT TA positions will be permanently counter-parted with designated MAF staff to reinforce capacity building objectives. Positions can be progressively phased out (see Appendix 6 Table 2) as core skills, systems and institutional capacity are developed within MAF. The TA strategy should be reviewed mid-way through Phase III. There may be a case for changing the mix of TA positions in PYs 3 and 4, depending on progress in the development of required skills, operational systems and capacity to manage a national seed system. GoTL will continue to be represented on the assessment panel for the recruitment of all LT advisers. Applications will be open to all nationalities, including regional and Timorese candidates.

4.1.7.Equipment, vehicles and office facilities

All vehicles and equipment currently being utilised by SoL II will be transferred to SoL III. Provision is made for the progressive replacement of older vehicles and equipment and, where necessary, purchase of additional vehicles and equipment sufficient to support implementation of a national program. Provision is also made for expansion of the SoL Office to accommodate a larger TA team, and for the establishment of the 3 small Regional Offices within the District MAF Offices.

4.2. Management Processes

Management processes, summarised below, generally follow those adopted for SoL II, but emphasise a much stronger role for MAF in resource and budget planning, implementation management, and monitoring.

4.2.1.Planning

SoL III will prepare an Annual Plan (AP) each year, setting out key activities and Australian and GoTL resources required for the following year[1]. Preparation of the APs will be a collaborative effort involving the NPD, the SoLTL, and the various MAF Directors involved in implementation. Annual planning workshops will be held at national and district levels, feeding into the planning process. Plans will be submitted to the PSC for formal approval prior to the end of August each year.

4.2.2.Procurement and financial management

[1] The budget year was September 1 to August 31 in SoL II.

With the exception of civil works associated with new Research Stations and SPCs, procurement of all goods and services will be undertaken directly by the Program following standard Australian Commonwealth procurement guidelines. All expenditures and staff assignments will be in line with the agreed AP, and will be approved by the UWA Program Coordinator and/or the SoLTL. For civil works, procurement will follow GoTL bidding procedures, but with final sign-off by the UWA Program Coordinator and/or the SoLTL.

AusAID will disburse funds to ACIAR, and ACIAR to UWA, 6-monthly in advance, in line with projected expenditures in the Annual Plan. The Program will access funds from UWA on an as-required basis. All disbursements will be subject to satisfactory acquittal of previous advances. A small operating expense account will be held at district-level to cover the day-to-day cost of running the Regional Offices, managed by the Regional Advisers. Financial management (including audit) will follow existing procedures. ACIAR will have overall responsibility for ensuring the proper use of funds.

The Program will pilot the direct use of MAF's financial systems for funds disbursement and management in 2 areas:

- Operating and training budgets for district, subdistrict and *suco* staff under Component 2 will be disbursed through the Program's accounts directly to the District MAF Offices, initially as a 6 month pilot covering all districts. Disbursement will be against a workplan with specified targets, submitted by the District Offices and approved by the PMO. The average budget involved will be around A$36,000 per district for six months. The District Office will be responsible for managing these funds in line with the approved plan. Results of the pilot will be monitored by the M&E/SOSEK Team on an outcomes basis, with possible involvement of the *Chef de Suco* as a local outcome monitor ('did farmers receive the services expected?'). An evaluation, including an audit, will be carried out at the end of the pilot, which will serve as a stop-go point. If the pilot is considered successful, direct disbursement will be extended and expanded to include the operational budget for the district extension service for establishment of the CSPGs, under Component 3.
- A discretionary fund of A$50,000 per year, disbursed annually, will be established within the MAF Director General's Office. This fund will be used for small studies and study tours/conferences which focus on seed and seed-related issues, subject to prior approval of the plans and budget by the Post in Dili and ACIAR.

4.2.3.Reporting

Annual Plans, to be submitted to ACIAR and AusAID for comment by mid-August each year, prior to being submitted to the PSC.

Annual Progress Reports, to be submitted by the end of September each year. They will: (i) identify SoL III's progress against Program and component objectives; (ii) briefly describe the nature and progress of activities being implemented; (iii) identify any risks, issues, problems and delays encountered in implementing the Program and recommend specific remedial actions; (iv) update the Program staffing situation; and (v) include an updated list of Program procurement, training and reports. Major successes should be highlighted in a form that can be easily incorporated into PR materials. **Interim 6-month Progress Reports** will be submitted by the end of March, which will briefly highlight any key implementation/ context issues that have arisen over the period and how these are being addressed. They will also highlight any major events and/or progress over the period.

Six-Monthly Financial Reports, to be submitted as an integral part of the annual and 6-month Progress Reports covering March-August expenditures and September-February expenditures. These reports will summarise expenditure against budget for the year-to-date, and from startup-to-date; together with identification and analysis of any budget issues.

Annual Technical Reports, to be submitted by the end of May each year, summarising results from research work for the year and setting the framework for the following year's research program.

Phase III Completion Report, an initial draft of which should be submitted by end-March 2015. It will detail progress achieved against the EoPOs as anticipated at design. The Completion Report will be substantially informed by Annual Progress Reports.

In addition to the above, ACIAR will develop/ refine the following documents during startup: (i) M&E Framework (including a Risk Management Plan); (ii) Gender Strategy and Action Plan; (ii) Communications Strategy; and (iii) Administrative Guidelines (financial, human resource and administrative practices).

4.2.4.Coordination

Given the multiple directorates involved in implementation, together with the direct involvement of sub-national levels of MAF in some activities, particular attention will need to be paid to coordination mechanisms. Specific coordination mechanisms proposed include:

- Physical location of the PMO within MAF;
- Appointment of the DG of MAF as the NPD and head of the PMO, counterparted by the SoLTL;
- Establishment of a Management Team within the PMO comprising the NPD, relevant MAF Directors, the SoLTL, and AusAID. This Team will meet formally every 2 weeks to discuss higher-level management issues;
- Representation of all directorates on the PSC;
- Establishment of 3 Regional Offices, with high quality electronic communication capacity;
- Conduct of inception workshops at the national and multi-district level;
- Conduct of annual planning workshops at national and district levels;
- Conduct of quarterly coordination meetings at national and district levels;
- Development of a formal Communications Strategy, with clear specification of communication responsibilities and protocols.

4.2.5.Review

The Program will be supported by a Technical Advisory Group (TAG) comprising 1 AusAID-nominated member and 1 ACIAR-nominated member. The TAG will visit twice in PY1, twice in PY2 (corresponding with the start-up of Component 3 activities); and once in each of PYs 3-5. The final TAG will assess the need for and, if appropriate, prepare a draft Concept Note for a possible Phase IV.

AusAID and ACIAR will mobilise a joint Mid Term Review in early 2013. This Mission should pay particular attention to progress being achieved in Components 3 and 4.

AusAID and ACIAR will also commission an Independent Completion Report, to be prepared sufficiently in advance of completion date to inform the design of any follow-on activity.

4.2.6. Monitoring and evaluation

Guiding principles. M&E processes are designed to be central to the evolution and responsiveness of SoL III. A range of methods will be developed to ensure (i) accountability to key implementation partners ('to prove') and (ii) continuous learning and program improvement as an integral part of program implementation ('to improve'). Continuous learning will provide a basis for the fine-tuning of implementation methods and partnership approaches, as well as for operational management decision-making by the PMO. M&E should therefore be regarded as a rolling process that contributes to the effective design, implementation and assessment of strategies being implemented for development of the national seed system. M&E capacity will be institutionalised within MAF through the PMO, with linkage to the National Directorate of Policy and Planning (NDP&P).

'To Prove'. A draft M&E Framework, to be finalised during Inception[1], is presented in Appendix 7. This sets out measures for accounting against target End-of-Program Outcomes.

At goal level, impact will be assessed in terms of improved food security, and at objective level, in terms of adoption by farmers of improved varieties. These impacts will be assessed through adoption rate and food crop production surveys, to be undertaken early in PY1 (confirming the baseline), in PY3 and again near the end of PY5. These surveys should be structured with a randomly selected sample of manageable size. For the baseline exercise, there may be merit in using external enumerators. Later runs of the survey should directly involve the SEOs.

At component level, EoPOs will be assessed and reported annually, through a variety of means:

- For EoPOs relating to the establishment and operation of the Research Centres, Research Stations and SPCs, assessment will be based on relevant SoL and MAF production and operational records showing varieties released, and quantities of formal seed produced.
- For EoPOs relating to effective distribution of formal seed to farmers and establishment of CSPGs, assessment will be based on SoL and NDACD records, verified through field evaluation.
- For EoPOs relating to strengthening market-based seed exchange mechanisms, assessment will be based on field evaluation. Particularly close monitoring of outcomes will be required for these activities, given that they will initially be implemented on a pilot basis, with scale-up subject to results achieved.
- For EoPOs relating to building MAF's capacity to competently conduct adaptive research, produce and distribute formal seed, and manage the overall national seed system, assessment will be based on pre-identification of required competencies[2], with regular assessment of progress in relation to these competencies following established Program procedures.
- For EoPOs relating to development of the systems required to manage a national seed system (e.g. planning and seed allocation systems, inventory control systems, M&E systems), assessment will be based on physical evidence that these systems are in place and operating effectively.

In line with the programmatic approach adopted, the draft MEF has been specified down to outcome level only. Outputs and activities designed to achieve the above outcomes will be

[1] Advice from AusAID on areas where the draft MEF could be further improved is included as an Attachment to Appendix 7.
[2] Core skills required and current capacity are described in Appendix 2.

identified as a routine part of the annual planning process; with corresponding progress indicators incorporated into the APs and reported against in the 6-monthly Progress Reports.

'To Improve'. In addition to the above activities that are oriented towards accountability, the Program will need to undertake a wide range of field evaluation work aimed at progressively improving implementation approaches. The MAF SOSEK team, established under SoL II, has undertaken some highly relevant work to date. Under SoL III the scope of this work will be broadened and refocused. At a general level, the national seed system needs to be guided by a much richer understanding of the informal seed system. This will help to analyse the impacts of different activities on seed access, for instance, by having better estimates of the extent of farmer-farmer seed exchange for a given crop. Better appreciation of the diverse ways that farmers manage their own seed and variety security is also required in order to understand the opportunities – and risks – different interventions may present. This needs to extend beyond listing seed sources and to examine farmers' actual practices in detail.

The work of the SOSEK team also needs to be broadened to evaluate the results of specific Program interventions as they unfold. These investigations should be planned as an integral part of each major activity implemented. Some examples include: (i) details of demand for formal and informal seed, including from whom, amounts sought, and reasons for demand; (ii) effectiveness of different delivery mechanisms in terms of access and seed quality; (iii) awareness among farmers of SoL seed, its management needs, and where it can be found; (iv) contribution that CSPGs make to widening access to and spread of SoL seed; (v) quality of seed produced by CSPGs; (vi) factors contributing to the success of CSPGs; (vii) impact of seed production on livelihood diversification; (viii) effectiveness of different approaches to improved variety promotion; (ix) how vulnerable groups, including women, gain access to seed; (x) volumes and prices of seed sold by focal merchants, and comparisons with other market prices for grain; and (xi) results achieved from the proposed pilot use of MAF financial systems for disbursing funds directly to the district extension services. Given the nature of the Program most of these studies will involve targeted field investigations and case studies using key informants.

M&E/SOSEK Unit. The SOSEK Unit established within MAF under SoL II will be expanded to become the main focus for all Program M&E, covering activities aimed at accounting against target EoPOs as well as field evaluation work aimed at progressively improving implementation approaches. This move is intended to further consolidate within MAF the research, analysis, and reporting skills that are required to service all aspects of M&E. This Unit should be located either within the PMO, or the NDP&P. If within the PMO, a strong operational linkage should be established with NDP&P to ensure that M&E results for the seed system are fed into the broader M&E framework for the Ministry. The M&E/ SOSEK Unit will comprise a Manager and 3 Research Officers, one specialising in evaluation of gender issues. The annual work program for the Unit will be established by the Manager in collaboration with the M&E Adviser, in line with the overall SoL MEF as well as identified priority lines of enquiry for that year.

M&E resources. The SoLTL in consultation with the NPD will have overall responsibility for ensuring effective M&E arrangements are established. The M&E/ SOSEK Unit will be supported by a LT M&E Adviser. Provision is also made for 2 months input per year from a short-term M&E Specialist[1], which will be targeted towards finalisation of the MEF; initial set-up of M&E procedures; training of M&E/SOSEK staff; guiding the design of focused field evaluation activities that are to be conducted in the coming year; assisting with assessment of results at component level at the end of each year; and assessment of impact at goal/objective level in PY1 (baseline), PY3 and

[1] Draft TOR for the M&E Specialist are provided in Appendix 7.

PY5. SEOs will provide an important additional resource for field-level assessment of formal seed distribution and informal seed production activities. Provision is made for on-going training of M&E/ SOSEK Unit staff in areas including social research methods and analysis and reporting of results.

Assessing the quality of implementation processes. The quality of program management decision-making and implementation processes will be focused at two levels:

- Learning and improvements to the implementation approach, including: the effectiveness of Program governance mechanisms; culture of internal critical analysis; effectiveness of partnerships and relationship management processes; and adequacy of judgement skills.
- Learning and improvements to the management systems, including: the effectiveness of HR management; the level of functioning of value-added governance and implementation arrangements (PSC, PMO, Management Team); the appropriateness of partner management systems; and effectiveness of administrative and financial management systems.

These aspects will be assessed on an on-going basis and reported in the Annual Progress Reports. Internally, the UWA Program Coordinator, together with senior on-site staff, will be responsible for assessing the quality of implementation processes, with oversight provided by ACIAR. Arrangements for external review are outlined in section 4.2.5.

4.2.7. Risk and risk management

Key risks that will require on-going management are identified in the Risk Management Matrix (Appendix 8). The highest-ranked residual risks are summarised below:

Risk	Mitigation
Unrealistic expectations by MAF regarding their control over financial and physical Program resources.	Continued dialogue by AusAID with MAF prior to Phase III mobilization. Developing a meaningful role for MAF in *influencing* the allocation of resources through specified planning and implementation management procedures.
SoL Management fails to adapt to the challenges of managing the implementation of a much broader Program.	Close supervision by AusAID and ACIAR over the first 2 years. Appointment of a dedicated Team Leader position with substantial experience managing broad-based activities.
Lack of sufficient coordination across the key MAF Directorates involved in implementation.	Establish an overarching PMO. Appoint an NPD at a position above MAF's technical Directors.
MAF fails to appoint a full-time NPD at a sufficiently senior level.	Bring issue to attention of donors and PSC. Defer disbursement until a suitable appointment is made.
MAF fails to appoint or second sufficient additional staff required for national scale-up.	Bring issue to attention of donors and PSC. Be prepared to pay for some staff from Australian budget.
MAF aspirations to increase the production of formal seed beyond rational limits undermines development of a national seed industry involving formal and informal sectors.	Seek to influence policy through C4, with backing from PMO and NPD. Seek to develop planning and management capacity through C4. Only finance formal seed production up to specified limits.

Continued provision of free handouts by GoTL mitigates against development of a market for improved seed.	Seek to influence policy through broader donor engagement.

Risk management will be an integral part of routine M&E arrangements, at both output and outcome levels, in order to provide a responsive process that can contribute to organisational learning. ACIAR will be required to:

- develop a Risk Management Plan as part of the final M&E Framework, based on the preliminary risk analysis prepared by the Design Team;
- systematically identify any new risks, in collaboration with AusAID and other stakeholders, on an on-going basis;
- routinely monitor all levels of risk (management, intervention and development) and implement appropriate responses; and
- report risk status and possible consequences to the PSC and AusAID on a regular basis.

4.2.8. Branding

AusAID is currently developing guidelines covering branding of aid program outputs and activities to ensure that all branding is consistent with good development practice and the Australian national interest. A specific example is ensuring that all communications and publications use the Australian Government Aid Program logo, rather than AusAID and ACIAR logos. These guidelines will be provided to the implementation team once available.

5. FEASIBILITY, IMPACT AND SUSTAINABILITY

5.1. Feasibility

Manageability of the Program. Management responsibility for various components and activities is clearly defined and accepted. However, Phase III involves a considerable expansion in terms of geographical scope. It also involves the introduction of a range of new activities, including all Component 3 activities as well as the mainstreaming of the extension service in the distribution of formal seed and the development of informal seed production systems. This increased coverage and technical dimension will demand a very different management approach than for SoL II. This is reflected in the proposed management structure, TA and GoTL staffing. Provision for a dedicated Team Leader position (with limited technical responsibilities), and establishment of a dedicated NPD position that has authority to coordinate across the various MAF Directorates involved in implementation, is designed to improve manageability. Utilisation of MAF's extension service for field-level delivery will also enhance manageability. Establishment of the 3 Regional Offices is designed to strengthen interaction and coordination with MAF's District Offices. Given the increased breadth of the Program, AusAID and ACIAR will need to monitor performance of the management team particularly closely over the first 2 years.

Technical feasibility. The technical feasibility of identifying new food crop varieties and producing formal seed of these varieties under contract arrangements with farmers has already been proven through earlier Phases of SoL. The feasibility of using the extension service for distribution of formal seed, at scale and to maximum effect, is still largely unproven but, adequately resourced, is unlikely to be an issue. The feasibility of producing informal seed through CSPGs has been extensively trialled by CARE, and the Program will build on this approach. The feasibility of the various market-based approaches that will be supported by the Program is unknown. Accordingly, these activities are proposed as pilots, the results of which will be closely monitored.

Financial feasibility. Adaptive research to identify improved varieties, and the production of formal seed, is likely to remain within the public sector for the foreseeable future. GoTL is already allocating some budget for these activities, mainly in the form of staffing. Pressure will be maintained for GoTL to fund an increasing proportion of operational costs related to operation of the Research Centres and SPCs over the life of the Program. In the longer term, recurrent costs of these facilities should be affordable in the context of GoTL's projected fiscal position and acceptable in the context of development goals. At producer level, financial feasibility is driven by the identification of substantially higher-yielding varieties that are attractive to farmers, coupled with efforts to stimulate the production and exchange of seed through relatively low-cost informal systems.

Institutional and governance feasibility. Institutional roles and responsibilities for variety evaluation, formal seed production and distribution, and informal seed production and distribution, are clearly defined, with little opportunity for duplication or confusion. Capacity of the relevant MAF Directorates is variable and limited, but there is considered to be sufficient baseline capacity for the Program to be implemented successfully. Further strengthening of this capacity is a major focus of the Program. Of greater concern is institutional capacity to coordinate activities *across* the 3 directorates involved in a way that contributes to efficient management of the overall national seed system. This issue is addressed in the design by creating a PMO within MAF, under the DG's Office but above the directorates. The PMO will have the authority to coordinate across directorates, and is designed to eliminate an ongoing problem faced by SoL II. Seed production and distribution activities will be implemented in close coordination with district and subdistrict officials, and through them the newly established SOEs. Once again, capacity at sub-national level is highly variable. The Program will be seeking to build this capacity further, linking wherever possible with similar efforts by other programs.

In terms of overall governance, SoL III will continue to utilise the PSC established for SoL II. This forum will have high-level functions and will be required to meet only 1-2 times each year.

5.2. Impact

Benefits and Beneficiaries. Major benefits resulting from the Program will include: (i) improved food security, particularly for marginalised upland farmers, with a wide range of social benefits; (ii) increased household incomes through production of marketable surpluses; (iii) reduced imports of grain to bridge national food production deficits, with associated FE savings; (iv) stimulation of private sector activity associated with production and marketing of informal seed; and (vi) improved capacity of MAF to manage variety evaluation and seed production and distribution activities. Seventy percent of rice households in TL (46,000 households) and 45% of upland households (61,000 households) are projected to benefit directly from improved varieties released under the Program by the end of Phase III.

Institutional impact. A core focus of the SoL III design is to develop the institutional capacity of MAF to manage the various components of a national seed system for TL, building on the substantial capacity-building achievements of SoL II. Under SoL III these efforts will continue to target staff from the NDR&SS and NDA&H, and will be further expanded to also include extension staff at all levels. Particular emphasis is placed on developing a role for the newly appointed SEOs. This is expected to improve the overall effectiveness of the SEOs by providing a clear technical context for their on-going development. Emphasis is also placed through Component 3 on developing the capacity of the informal sector for production and distribution of seed, targeted towards CSPGs, FSMGs, and traders.

Economic and financial impact[1]. Assuming adopting farmers plant only 50% of their land to new varieties, household food production increases by an additional 150 kg for rice; 180 kg for maize; 50 kg for peanuts; 60 kg for sweet potato; and 0.7 Mt of cassava. Crop gross margins show an increase of about 50% for non-rice crops, and 40% for rice crops, equating to an increase in annual cash income per household ranging from $33 per year for peanuts to $119 for cassava.

SoL will also contribute substantially to TL's national objective of food self-sufficiency. By PY 10, yield increments associated with adoption of SoL varieties are projected to result in an additional 88,000 Mt of food per year – slightly less than the total tonnage of staple food imported in 2009[2]. The bulk of the additional food produced will be upland crops (maize, peanuts, cassava and sweet potato) which are staples for the poorer sectors of TL's rural community.

Total projected incremental cost associated with SoL III for 20 years (program plus on-farm) is $71.3 million. Over the same period, use of improved varieties is projected to result in incremental food production of 1.58 million Mt. This equates to an incremental cost of about $45/Mt, compared with a conservative average cost of $400/Mt CIF for food imports.

The EIRR for the overall Program is 26%, and the Benefit/Cost Ratio (at a discount rate of 15%) is 1.6. These are robust figures and confirm that investment in adaptive food crop research followed by the development of a national seed industry aimed at maximising farmers' access to improved seed has the potential to generate high returns to GoTL's and donors' funds.

Social impact. SoL III is expected to have widespread and significant social impact in the form of: (i) increased supplies of staple foods in areas that currently suffer from prolonged periods of hunger and malnutrition, with associated negative health effects; (ii) equity benefits for non-rice producing communities (particularly upland communities) that do not currently receive the same level of government support for food production[3]; (iii) political benefits in the form of enhanced peace and stability – the last period of civil disturbance in 2006 was reportedly caused by a lack of rice in Dili and district towns; and (iv) gender benefits derived from efforts to ensure that women and particularly WHHs receive equitable access to improved varieties and technical information, direct support for groups of women farmers, and recognition of the distinct roles played by women and men in the various agricultural production calendars[4]. SoL III is unlikely to result in any negative social benefits. Ongoing impact assessment will be conducted by the M&E/ SOSEK Team to track and monitor social and gender impacts, and the broader social implications of the Program's activities, providing a basis for modification of activities as-required.

Environmental impact. There are no specific Timorese environmental protection and biodiversity conservation laws or regulations which might guide Phase III. However the Program is cognisant of the need for compliance with Australia's Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act S160). In general terms, SoL III is unlikely to result in any negative environment impacts[5]. In fact, a number of positive impacts are possible e.g. introduction of

[1] Refer Appendix 9 for detailed financial and economic analyses.
[2] Grain for human consumption, mainly rice (about 110,000 Mt in 2009).
[3] In 2009, National Priority No 1 was food security, but with a strong focus on support for irrigated rice in the form of mechanisation, use of hybrid varieties, and irrigation infrastructure.
[4] Prepared by SoL II's SOSEK team and published in Tetum by the Program. These calendars are now widely available throughout Timor-Leste.
[5] Refer to section 5.3. for further discussion on the issue of whether higher production levels associated with higher-yielding varieties are likely to negatively impact on soil health in the absence of improved agronomic practices.

improved varieties of leguminous cover crops, contributing to improved soil and reduced soil erosion; and the ability to meet subsistence food production requirements from a smaller cropped area. SoL II also commenced the collection of seed of local cultivars of TL's main food crops, with the objective of preserving valuable genetic material which has cultural and risk management roles in indigenous farming systems. This practice will be continued under SoL III.

Scientific impact. Through its ongoing applied and adaptive research efforts, the Program is expected to achieve a range of scientific impacts in relation to the identification of improved varieties and improved farming systems. These scientific impacts will continue to be reported internationally.

5.3. Sustainability

Institutional sustainability. A realistic view needs to be taken of how long it will take to develop a fully sustainable seed system for TL. It is likely that support will be required well beyond the close of SoL III. This should be considered in the context of the gestation period that has been required for similar systems in other countries facing similar conditions. In the interim, some level of subsidisation is strongly justified by the substantial economic, financial, and social benefits that can be derived from the adoption by farmers of improved varieties, as described above.

The SoL III design embodies various measures designed to enhance sustainability. These include:

- Promoting development of a national seed system based on minimising public investment in the production of high-cost formal seed, and actively linking with much lower-cost production of informal seed by CSPGs. This approach explicitly recognises that utilising the informal system, linked with the formal system, is the best way to develop an affordable, cost-effective and sustainable seed system for TL.
- Explicitly recognising that there is a valid ongoing role for public sector involvement in adaptive research and formal seed production and distribution activities, and encouraging the structural organisation and allocation of MAF resources to support these roles.
- Developing the institutional capacity of MAF to conduct research, produce and distribute formal seed, provide support to the private sector for production and distribution of informal seed, and strategically manage implementation of the national seed system.
- Supporting the production of formal seed by specialised seed-growers under contract to MAF, rather than MAF attempting to produce this seed itself.
- Promoting cost-recovery of formal seed, potentially off-setting public sector investments. All distributions to third-party users (e.g. NGOs) will be on a cost-recovery basis. In the longer-term, at least partial cost-recovery from CSPGs should also be attempted.
- Limiting investment in formal seed production activities to the level necessary to support CSPGs and maintain the genetic quality of national seed stocks.
- Developing the capacity of the informal sector to produce and distribute seed.
- Rigorously selecting new varieties that have significant yield and other agronomic advantages, and which and are acceptable to target groups.
- Seeking to influence key government policies and programs relating to seed system development.
- Using established organisations, systems and management practices to the maximum extent possible.
- Linking, wherever possible, with other programs and projects (government and donor funded) that have a shared interest in promoting improved food crop varieties.
- Adopting an 'open architecture' design that is flexible enough to meet changing conditions and needs.

Environmental sustainability. Concerns have been expressed whether increased use of higher-yielding varieties might lead to increased nutrient extraction and environmental degradation, unless agronomic/ farming system practices are improved at the same time as high-yielding varieties are introduced.

In the short-to medium term this is highly unlikely to be the case, for the following reasons:

- Projected yields of improved varieties being released under SoL are still relatively low by regional standards and are considered to sustainable without a shift to higher input production systems;
- Upland farming systems in TL remain largely swidden-based, characterized by inter-planting of leguminous and non-leguminous crops; and long fallow periods during which regenerating shrub and tree species play an important role in recycling of deep nutrients and build-up of organic matter. In addition, increased crop production will lead to increased crop residue production which, provided it is left *in situ*, will reduce soil erosion on steep slopes. Under these conditions, the physical properties and nutrient balance of soils are unlikely to be adversely affected, even with the moderately higher yields associated with improved varieties.
- In a subsistence production environment, improved yields for some staple upland food crops may actually result in decreased cropping intensities in fragile upland areas, as household food crop requirements can be grown on smaller areas.

In the longer-term, as TL's agriculture shifts towards more intensive land-use practices, additional attention *will* need to be paid to agronomic and farming system practices (e.g. plant spacing, nutrition, pest and disease control, weed management, soil moisture management etc), both to ensure that soil health is maintained and also to maximize the return on the investment in improved genetics. Programs that are already, or will be, working on crop agronomy and farming system practices include:

- SoL is already involved in selecting and trialing legume cover crops (particularly velvet bean) for use in upland areas.
- RDP I and II (GTZ-funded) have had a major focus on improving the agronomy of irrigated rice production over the past five years; and in the case of RDP II is now turning its attention to improved agronomy of upland crops.
- RDP IV (also GTZ-funded) will have a major focus on training SEOs in all aspects of improved food crop production.
- The forthcoming ACIAR-funded adaptive livestock research project, which will commence in late 2010, will introduce forage legumes into mixed farming systems, with the aim of increasing the production of animal fodder, nitrogen, ground cover and animal manure.

Further (and more focussed) investment in improving agronomic and farming systems may also be a logical follow-on activity after SoL III.