

SEED SYSTEM SECURITY ASSESSMENT

ESTUDU SISTEMA SEGURANSA FINI (ESSF)

TIMOR-LESTE

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This SSSA was strongly informed by an unusual amount of background documentation and verbal sharing of implementation experience. The MAF/Seeds of Life Project has completed (and is still effecting) an impressive amount of pioneering work in the areas of plant breeding, seed production, and livelihood analysis. The UN-FAO for its part, offered key insights on seed relief analysis and possible response. In terms market value chains, the generous sharing of data and reflections from the new Market Development Facility was greatly appreciated. Further, Mercy Corps and CRS have a strong track record with seed storage work and novel kiosk variety delivery/sale experiments.

In field itself, the insights of diverse and many people shaped this seed system security assessment. Men and women farmers, government ministry personnel, crop and livelihood specialists, local seed producers, agro-dealers, traders, agro-enterprise entrepreneurs, humanitarian relief personnel, (and others) provided information, offered critique of practice and, often, pointed a clear way forward. Thanks to all for providing extensive reflections and helping to sharpen the results.

Finally, we do aim for this assessment to lead to practical action in the short and medium-term. There have been important, positive, seed system developments in Timor Leste within the last decade. This assessment aims to catalyze further positive developments and to broaden and strengthen seed availability, seed access and seed quality for all Timor-Leste farmers.

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EXECUTIVE SUMMARY

A Seed System Security Assessment (SSSA) was carried out in Timor-Leste in October 2013 just before planting time for the main agricultural season. It reviewed the functioning of the seed systems farmers' use, both formal and informal, and assessed whether farmers could access seed of adequate quantity and quality in the short and medium term. The work covered three Districts, Alieu, Baucau and Ainaro, chosen as they represent contrasting ecologies and are key areas where partners have ongoing implementation programs.

The rationale for conducting the SSSA in Timor-Leste was four-fold:

- Substantial progress has been made in seed system development over the last decade, spurred especially by the Ministry of Agricultural and Fisheries (MAF) and the Seeds of Life Project (funded by AusAID and ACIAR). Other newer investments, by OFDA/USAID and others, mean that significant work has been unfolding in the general areas of planting breeding, seed production, and seed storage (etc.). The SSSA aimed to catalyse this seed security work even further, focusing on gap knowledge and identifying novel areas for action.
- There have been repeated seed aid programs particularly in Timor-Leste fairly regularly since post-independence. These emergency practices, and the assumptions guiding them, were deemed in need of review.
- Ongoing climatic disturbances as well as high malnutrition rates suggested seed security strategy vision and action could have a more central place in combatting chronic stresses. System resilience, nutritional additions and crop-related developmental opportunities were among the themes to be explored.
- Finally, the work took place to build assessment capacity. Seed security assessment tools are linked to food security assessments, but are also quite distinct. The *Seed System Security Assessment* (SSSA) Timor-Leste was designed to give honed technical insight and to train professionals in fast-evolving seed security assessment and intervention design methods.

For a better understanding of the dynamics of seed security in Timor-Leste, Catholic Relief Services, Mercy Crops, MAF/Seeds of Life, CARE, the UN-FAO, The International Center for Tropical Agriculture, and the University of East Anglia/Dev all joined together to conduct this assessment.

Key findings are summarized below, grouped into short-term findings (***Acute seed security findings, 2012-14***) and longer term ones (***Chronic seed security findings and emerging opportunities.***) A set of 20 ***Recommendations for action*** follows.

FINDINGS

Summary: Acute Seed Security Findings: 2012-14

1. This assessment revealed no significant acute seed security stresses. Sowing rates were stable for the 2012-13 season (varying across sites from -1.4 to + 0.3%) with projections of sowing increases for the 2013-14 season (+3.74%). Yields, across crops, were also assessed as generally 'good' or 'average' (90% cases).
2. Among the minority of households indicating a reduction in sowing amounts for the 2012-13 and 2013-14 seasons, labor constraints were cited as the driving factor (over 1/3 of reasons for both seasons). Lack of money and poor weather also figured important in about 10% of cases. A positive development was the fourth major factor cited: use of less seed due to better integrated crop management (ICM on rice,). Lack of cash particularly affects sowing rates for purchased seed such as common bean. Note that 'lack of seed' (i.e. non-availability) was not highlighted —except in a small number of cases associated with cassava cuttings.
3. For those 'sowing more than usual', 'having access to more land' and 'getting new varieties' were important positive factors.
4. Overall, over 90% of the seed farmers sowed came from local channels, including from farmers' own stocks, the local market, or through social networks of neighbours, friends and relatives. This suggests the importance of informal seed systems as the core seed sources. Farmers' own stocks were, by far, the main source of seed, supplying 71.8% of total seed sown.
5. The local seed/grain markets were the second major source for seed. Across crops, these markets provided 12% of the seed. Local seed/grain markets proved particularly important for the legumes (supplying 15-50% of the seed of peanut, common bean, long beans, mung beans and black beans). Support of this seed channel might be key for those interested in supporting nutrition.

Can the markets deliver seed for 2013-14?

6. Agro-dealer outlets and networks are just starting to function in Timor-Leste and, during the assessment periods supplied <1% of the seed sown (and only of maize and vegetable seed). Likewise, kiosks- that is, general goods stores also selling agro-input supplies, were just being catalyzed 2012-14.
7. Local seed/grain markets, important for legume seed, were functioning at normal levels of quantity and quality, as assessed by a large group of traders (N=62). Mapping of actual supplies and potential seed flows indicated there would be no availability problem.
8. Linked to #6, seed flows from one region to another are so extensive that lacks in any one area, are likely to be compensated by incoming supplies from another (for instance, moving bean seed from Baucau to Alieu). Any seed security district-level plans might practically

project for inter-district flows rather than (falsely) assume 'self-sufficiency' within any one District entity.

9. The wide availability of vegetable seed, sold in packets, was an unexpected finding. Packaged vegetable seed is being sold in open markets, general stores, and even in hardware and motorcycle supply stores. Demand is rising and sellers are responding by putting on offer variability (e.g. in a single store, 16 different types of seed, a greater range than in the formal agro-dealer enterprises).
10. The vegetable seed phenomenon flags some concerns. Packet information was often printed in 'foreign languages', that is not Tetum or English. Farmers could not interpret the expiry date or make informed choices around management requirements. Also, it is not clear if the crops/varieties would actually be adapted to specific Timor-Leste regional agro-ecological conditions, or if they had even been tested in country. Third, an unknown supplier cannot be held accountable for the quality of planting material.

Can farmers afford to buy supplies available?

11. Expenses slated for seed purchase seem relatively modest and affordable for most farmers. The sums needed per farmer roughly fell between \$US 9 and \$18 for 2012-13 and \$11-\$19 for 2013-14. The cash needs were markedly higher for Baucau due to the emphasis on common beans (where seed is routinely purchased on local markets). Of more general note is that farmers *do* buy seed.

Communities' assessment of seed security

12. The communities themselves deemed their members as 100% seed secure for the 2013-14 season. Seed security was defined as having the seed in hand or being able to access seed for the major crops

Hence, the 2012-13 season was a stable if not promising one. There are some seed system stresses, but are chronic ones, rather short-term constraints.

Summary: Chronic Seed Security Findings + Emerging Opportunities

The review of longer-term trends in seed security in Timor-Leste showed both positive moves forward as well as ongoing bottlenecks.

1. There has been modest dynamism in seed channels. The catalyzing of agro-dealers networks and kiosks to sell certified seed are notable steps. The blossoming of the informal vegetable seed sector shows strong demand and quick informal seed sector response.
2. There is important crop diversification with communities, although few crops are transformed beyond local domestic use. Also of concern is the degree to which legumes and

vegetables are targeted for sale, rather than home consumption. This may have important negative ramifications for household nutrition.

3. Overall, 43% of farmers in the SSSA sample indicate they had accessed a new variety within the last five years, which seems a relatively promising figure. However, upon closer look, access to new varieties is quite constrained: About 85% of the new entries were either of maize or rice with few farmers accessing a new variety of key legumes.
4. The lion's share of accessions (> 95%) has been obtained free (through government or NGO/FAOs). Few sustainable channels can supply farmers with an array of new varieties on a continuing basis.
5. Decentralized seed multiplication initiatives are growing: In 2012/13, 681 Community seed producer groups (CSPGs) covered 135 of 442 sucos in the country. In 2013/14, MAF/SoL has plans to expand CSPGs from 681 to 1200, covering 370 sucos, excluding urban ones. The scale of operation is impressive. This model of production might now be reviewed for its sustainability and for its ability to move new varieties quickly and widely.
6. Increased attention to cassava and sweet potato will be required to move the planting material of these vegetatively-propagated crops. Efforts are being catalyzed for sweet potato vine production. Cassava planting material presents a next major challenge.
7. Manure/compost are used by about ½ the population and pesticide/foliar sprays by ¼ of households. Other inputs are used at only modest levels (e.g. mineral fertilizer, storage chemicals).
8. Storage loss raises among the more marked constraints. The large majority of farmers, 86.3%, reported average losses of over a third of their stocks, across a range of crops. In response, very few farmers (4%) applied protective chemicals to halt especiallybruchid damage.
9. To help combat such storage losses, the rise in use of storage drums has been a positive development. By February 2013, 3378 rural farmers had accessed seed storage units, with 1,041 paying full price (an average cost of \$US 27.60). Attention to a market based approach, with local blacksmiths producing the drums, holds promise for this innovation to be both profitable and sustainable.
10. In terms of male-headed versus female-headed households, three statistically-significant trends were noted revolving around seed security: Female-headed HH tend to have smaller family sizes and small field sizes. They also used compost and manure less frequently than male-headed HH. Important is that there seemed no major differences in terms of access to new varieties and seed aid.

Having summarized the findings, we now move to Recommendations for Action. Each constraint (and opportunity) will require a focused set of initiatives.

RECOMMENDATIONS

The opportunity to conduct assessments in distinct sites provided the field teams a useful perspective on seed security in select regions of Timor-Leste.

Below, we put forward a set of recommendations that is applicable across sites. All can be moved forward in the short to medium term: 1-5 seasons. Of special note is that the SSSA teams identified no problems in the assessed zones that might be labeled as ‘emergency ones’. All constraints require actions linked to chronic stress and developmental opportunities.

The recommendations below are clustered into distinct sections. These include: a) seed system actions linked to addressing chronic stress and developmental possibilities; b) emergency response and seed system security assessment; and c) broader seed security goals and vision for Timor-Leste.

Overall, substantial progress has been made in Timor-Leste over the last decade in developing systems that strengthen seed security for smallholder farmers. Recommendations below are put forward to stimulate further these positive processes.

I. **Seed-linked responses linked to chronic stress + development concerns.**

Practical recommendations are made here in the following domains: decentralized seed production, variety delivery systems, seed storage improvements and information systems for helping farmers make informed choices

Decentralized seed production

Decentralized seed production needs to become a strategic and effective force in serving smallholder farmers: the formal seed sector alone will never be able to handle a) the range of crops needed for diverse agro-ecological zones; nor b) the range of varieties. At this point, the seed multiplication initiatives in Timor-Leste are new and seem to be having modest impacts among farmers. They are being propped up by institutional buyers rather than from demand of smallholder farmer clients. At this point, they are also operating at small scale and focus on a handful of crops and varieties. Sustainable decentralized seed production models need to be confirmed that can operate at scale.

1. **Cost-effectiveness seed production models.** The cost-effectiveness of existing seed production models need to be carefully assessed, examining separately the organization of certified production, registered commercial seed producers and community seed producer groups (CSPGs). (What are the costs of maintaining these groups? At what scale can they feasibly operate? What is the cost of seed being produced?)
2. **Developing ongoing links among diverse segments of seed chain.** Ongoing links should be further catalyzed between a) the registered commercial growers and the CSPGs and b) between the registered growers and the *Loja Agrikultura* (Agriculture input shops). For moving new

varieties (rather than certified seed), links between the CSPGs and local seed/grain traders might also be promoted.

3. **Maintenance of seed producer/institutional inventory.** The countrywide seed producer inventories initially amassed for the SSSA might be usefully maintained to ensure that producers can be more efficiently linked with buyers, at varied scales. In this vein, information available with MAF in Dili needs to be shared systematically out to the Districts. Feedback mechanisms also have to allow District local authorities to routinely add information to Ministry level databases.
4. **Merging /paring down CSPGs.** The community seed producer group model, in particular, might be honed to focus on the few more effective producers who can serve many (rather than a widespread diluted network). Linked to this concentration, the CSPG's might logically move to marketing seed, so as to become self-sustaining.
5. **Training CSPGs in enterprise skills.** In addition to seed production training, CSPG's will require capacity building in agro-enterprise and marketing skills. These groups need to develop realistic business plans. They might be better geared to serving a large smallholder client base (rather than focus on a set of institutional aid buyers). Possible links to select agro-enterprises might also be analyzed.
6. **Modeling of options for moving varieties fast and widely.** Ultimately, the goal of much of the seed production work is to move the new varieties being evaluated by MAF/Sol. Different options should be modeled to do this quickly and efficiently—recognizing that a good number of crops and varieties need soon to be in diffusion. For instance, would the sale of 50,000 small packs of certified seed (in 25g sizes) be a quicker way to get new germplasm out than assuming diffusion through CSPGs (and relying on farmer-to-farmer gift or exchange)?

Variety Delivery systems

Currently, Over 95% of new varieties are obtained by Timorese farmers through government and NGO aid, and free. This type of system creates a ethic of farmers dependency and undermines the development of more ongoing systems, based either formal or informal seed channels. Simply, giving away free seed, repeatedly (across crops and varieties) is bad practice. Further, as the Uma Ita Nia and vegetable packet experience show, Timorese farmers are willing to buy seed if it is available, accessible and of a quality that meets there needs.

Variety delivery systems need to move from a 'donor aid optic'—to market-oriented ones that can serve all farmers on an ongoing basis.

Across Crops

7. **Outlet channels expanded.** While the formal agro-dealer network (Loja Agrikultura) is slowly growing, it will never be able to reach deep into rural areas. Certified and truthfully labelled commercial seeds can be sold in additional ways : for example by building on general good shops

(the Mercy Corps, kiosk model), commissioning vendors at open markets, and selling seed through faith-based groups. These are but a few options to be tested for stimulating multiple variety delivery channels.

8. **Kiosk sale model- evaluation.** The Kiosk sale model heralds to be a particularly promising one as no new institutional infrastructure is required. Key here is to reinforce shopkeepers' capacity to a) keep seed viable; and b) pass on refined technical information along with the physical seed sale.
9. **Linking CSPGs to grain traders.** For non-certified seed of new varieties, to be sold as grain, CSPGs might best be specifically linked to seed/grain traders. Such traders need to be brought into the 'variety information circles (though field days? Organized visits in Districts?).
10. **Testing small seed size packaging.** The small pack model of sale, 50g, 100g, etc. has proven useful for making seed more accessible to farmers in many regions of the world. This packaging option might be tested in both the Loja Agrikultura and the kiosks.

Vegetable seed

The abundance of vegetable seed packets found in multiple venues outside of formal agro-dealers (Loja Agrikultura) proves to be a positive sign of demand. This phenomenon also flagged some concerns. Most of the packets had information printed in 'foreign languages'. Also, there was not always evidence that the crops/varieties on offer would be adapted to specific Timor-Leste regional agro-ecological conditions, or if they had even been tested in country.

As a way forward in promoting more transparent vegetable packet seed sale and use, several actions are proposed

11. **Organized vegetable seed screening.** The wealth of vegetable seed packet material (found in open markets, general goods shops) might be collected and systematically screened by researchers in on-station trials at diverse agro-ecologies and elevations.
12. **Translation of seed packet information into Tetum.** Seed Sector services should be leveraged to encourage that seed packet information is intelligible to smallholder farmers. Mechanisms for doing this need to be tested. Posters at suco offices? Via Radio? Labels added to seed packs?

Seed storage improvements

The seed storage work and particularly the development of storage bin enterprise, represent impressive achievements with a short three-year period. The scale of the task, however, is formidable given that farmers lose 1/3 of stored crops countrywide. Two additional areas are signaled for action.

13. **Seed/grain traders and storage- diagnostic.** To-date, the seed storage options have been focused at the farm household level. Traders, however, also report high storage losses, especially for maize and the legumes. Trader storage management concerns might require a novel diagnostic, especially as traders save in bulk quantities and may move potential seed cross considerable distances.

- 14. Farmers' management information needs on storage.** To-date, storage work has focused on the vessels for storage. Complementary emphasis needs to be put on management options and farmer knowledge: e.g. how to do better selection the field; varied types of drying strategies.

Information systems to help farmers make informed choices

As a final thrust in the area of addressing chronic stress and developmental actions, we make a general recommendation on developing farmer-oriented information systems. Simply, Timorese are eager for new knowledge in a large range of areas. As one example, focusing on new varieties, they seek information on: a) what range of varieties might be available; b) what their suitability is for different types of stresses; c) how farmers can access these; d) how farmers can quickly share information with others.

- 15. Farmer-oriented information systems on technical options.** Substantial and explicit efforts need to be devoted to developing farmer-oriented novel information systems. Primary conduits signaled during the assessment included: rural radio, schools, Lafaek Magazine, SISCA, and 'social events in the evenings'. Certainly, there may be others.

II. Emergency Seed aid + Seed Security Assessments

The SSSA teams also reviewed actions related to acute or emergency responses. While no 'emergency' was ongoing, past practice and programs gave cause for reflection.

Seed aid frequency and targeting

- 16. Repetitive seed aid and programmed review.** Emergency seed aid is becoming repetitive (and farmer dependency was particularly noted in Ainaro). In zones where emergency seed aid has been implemented three seasons in a row, decision-makers (donors, GoTL, NGOs and other humanitarian partners) should program a formal review so as to determine the necessity of the aid. Also, repeated distribution over multiply years to the same groups should be closely scrutinized.
- 17. Better coordination seed security actors- District Committee?** Those involved in the SSSA lamented 'poor coordination between the government and NGOs on a range of seed-linked issues'. Seed security groups might be catalyzed by MAF, especially giving focus to District-level complementary field activities.

Seed aid responses

- 18. Testing range of seed aid responses.** Seed assistance in Timor-Leste in crisis periods unfolds around a single response: 'Direct seed distribution'. This response gives farmers no choice in deciding which crops and varieties might be needed; it assumes seed is not available in a region;

it also is currently being affected only with maize and rice (as these are crops for which certified seed is available in bulk). Depending on the problem encountered, alternative aid responses might be tested which address other seed security problems (e.g. farmers having problems with seed access).

- Voucher models might be tested in Timor-Leste, with and without accompanying fairs. This needs to be done in ways which do not encourage further dependency and which promote farmer choice
- Vouchers might be better used to link those in need (i.e. vulnerable households) to those who provide seed commercially (at Loja Agrikukturur; CSPGs).
- Voucher models might be tested to address problems of 'labor shortage'. Note that this would be high exploratory work and would have to be monitored closely.

Seed system security assessment

Need assessments in Timor-Leste inevitably conclude that 'seed is needed' and advise that the response should be a direct seed distribution- and with maize and rice. While perhaps innovative at their inception (as they distinguished seed aid need from food aid need), such assessments now need to be sharpened. Worldwide, understanding of what happens to seed systems during disaster has become markedly more refined in the ten years: experience shows that *distinguishing among seed security constraints is key for recovery*. In Timor-Leste seed security assessment methods might usefully be revamped.

19. Seed security methods and processes. National and regional formats for assessing seed security status should shift from those which calculate simplistic 'seed needs' to frameworks which recognize different types of seed security problems, and which tailor responses accordingly. These problems might include diverse constraints of seed availability, seed access and seed quality, which are distinguished by their presence in the short and in the long term.

- Linked to this general shift, seed security assessment capacity needs to be built at regional and local levels. Technical tools already exist to help NGO and government agricultural officials move forward on seed security assessments.
- More generally, a political environment for 'real seed security assessment' has to be established. This is no easy task. *Technical advances in methods alone will not lead to more accurate assessments. Political leaders need to spearhead the change*.

III. Seed security goals and vision

We end this section on needs for implementation with a 'higher level' recommendation. There is a need for review and basic reflection on the overall seed security strategy that shapes actions on the ground.

20. **Sharpening goals of seed security vision.** Seed security vision in Timor Leste has been shaped largely around visions of moving towards food security, particularly in the staple foods. Realities on the ground suggest that this ‘brute seed security for food security’ vision could be usefully broadened.

Seed Security for Nutrition

High stunting and malnutrition rates in Timor-Leste suggest that ‘**Seed Security for Nutritional Security**’ is one avenue that needs to be promoted much more aggressively. In practice, this might mean such actions as (*inter alia*):

- Testing and promoting a large range of legumes;
- Linking voucher use to ‘nutritional’ agricultural options (as is done in the ‘DiNERS’- fair for Diversity, Nutrition, and Environmental Resilience’);
- Promoting production of nutrient-dense foods.

Much has been written on nutrition and agriculture in Timor Leste (e.g. Fanzo, 2013) We need not repeat the multiple suggestions for quite detailed programming. Simply, seed security actions might be pragmatically tied to enhancing better nutritional outcomes. This will not happen ‘naturally’: it needs to be programmed in deliberate, smart ways.

Seed Security for Resilience

The abundant and repeated nature of climatic stresses, (drought, flood, typhoons) suggests that seed systems have to be designed to built greater resilience. ‘**Seed security for Resilience**’ will take many forms. Attributes/actions , *inter alia*.

- *Widen **portfolio of crops** on offer (speed process up?)*
- *Screen **local as well as improved varieties** for ‘best bets’*
- *Develop/identify **varieties tolerant to stress** (flood, drought, wind, pests)*
- ***Identify ongoing and diverse delivery channels***
- ***(Focused) Information:** suitability, sourcing, options to address constraint*
- ***Choice:** farmers need room to strategize in stress periods*

Again, there is a growing literature on seed security and resilience and detailed information can be found elsewhere (e.g. McGuire and Sperling 2013) . Here we emphasize that a resilience-perspective will demand a re-thinking of a range of seed security actions.

Overall, there has been great progress in strengthening seed systems in the last decade. These 20 recommendations aim to catalyze even further positive changes geared to meet the needs of Timorese farmers.