Nutrition for Fini ba Moris and the Timor Leste Ministry of Agriculture and Fisheries

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Why Timor Leste?

- **80%** of the population relies on **agriculture** for both food and income
- High level of **chronic and acute malnutrition** in children and women
- **1/3 of the population experiences food shortages** and are exclusively reliant on the food they produce themselves
- Low yields of staple crops, **vulnerability** to climactic changes, and low incomes

Seeds of Life
Fini ba Moris

- SoL is a program within the **Ministry of Agriculture and Fisheries**
- Funded by MAF, Australian Agency for International Development (AusAID) and the Australian Centre for International Agricultural Research (ACIAR)
- **Core Focus:** Increasing yields by selecting and distributing improved varieties of superior genetic quality.
- **Secondary focus:** Analyzing and developing strategies to overcome climate variability and change; improving agronomic practices to reduce weed burdens and increase soil fertility; reducing post harvest storage losses and improving input supply arrangements for seed.

Phase 3 of SoL

- **Major crops:** maize, sweet potato, cassava, rice and peanuts
- **Minor crops:** wheat, barley, potato and various bean crops
- **Goal of Program:** “Improved food security through increased productivity of major foodcrops“, with the objective: “65,000 farmers have access to and are routinely using improved food crop varieties”
- **Vision for Phase 3:** To have the foundations of a national seed system for TL established and capable of providing a high level of access to seed of improved varieties to farmers throughout the country

The Components of SoL

- **Component 1:** Research, evaluates improved varieties of the 5 main staple crops (rice, corn, peanuts, sweet potato and cassava);
- **Component 2:** Formal Seed Production, produces and distributes quality seeds and cuttings of the improved varieties;
- **Component 3:** Informal Seed Production, works with community seed production groups (CSPGs) to reproduce and store sufficient seed to meet local needs; and
- **Component 4:** Program Management, includes communications, training, monitoring & evaluation, gender and administration.

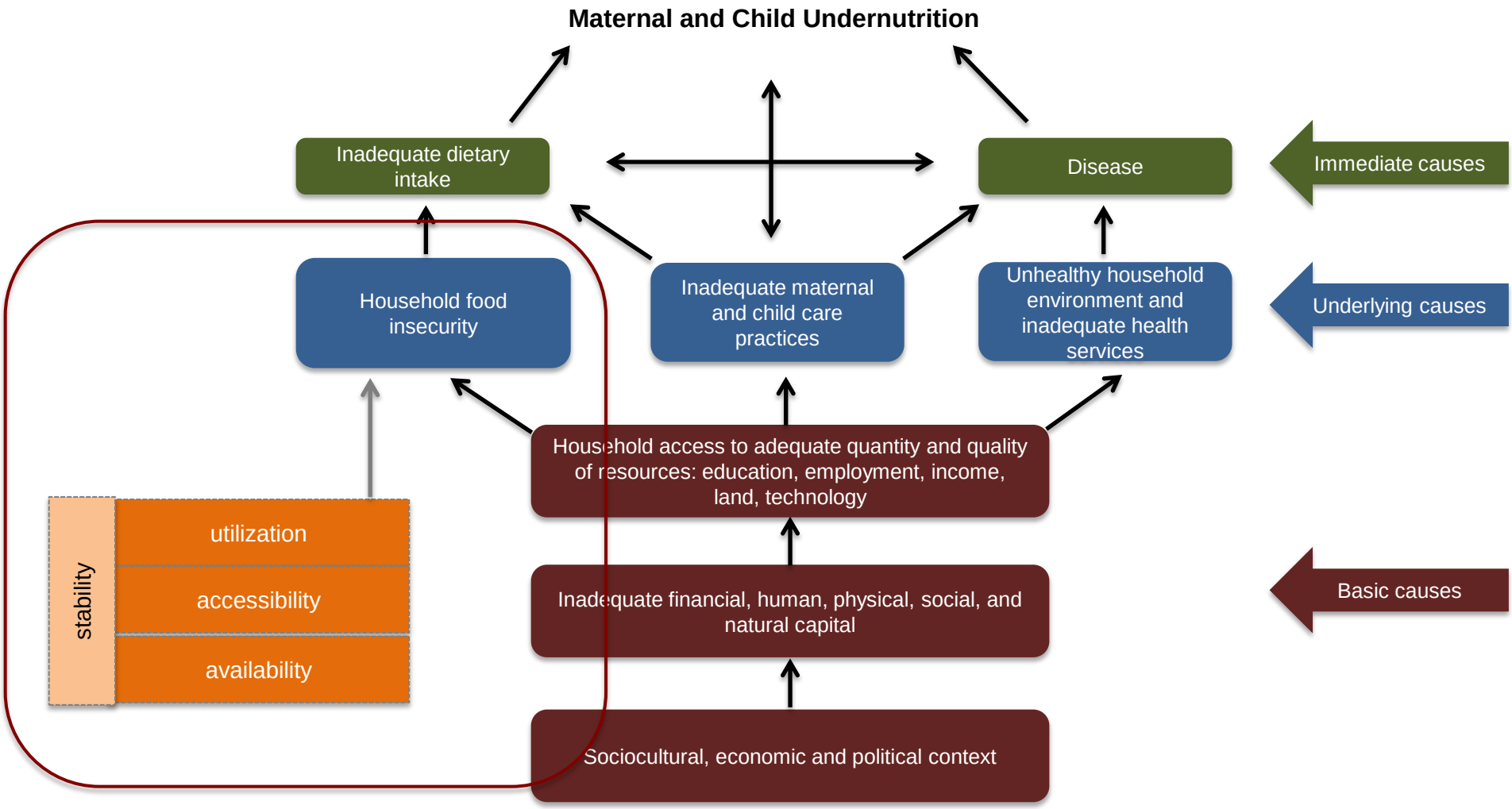
Purpose of the Strategy

- Since the year 2000, SoL has been active in reducing hunger in Timor-Leste, and is now taking steps to ***further integrate nutrition into its food security efforts***.
- Development and roll-out of an **integrated nutrition-sensitive program** within the Seeds of Life portfolio to better inform a broader "Nutrition Sensitive" Agriculture Program for Timor-Leste.
- It is hoped that this programme will contribute to the **knowledge base** that can accommodate the easy transfer of good practices to the SoL program, those of other MAF Development partners as well as national programmes of related ministries.

Nutrition Sensitive Agriculture

- Nutrition sensitive agriculture involves asking how we can add nutrition elements to existing programs. It's not creating new programs but building on what's already there.
- *Nutrition-sensitive agriculture* is an agriculture intervention in which improved nutrition is inherent in the program design, such that the improved nutritional status of targeted beneficiaries is a stated project goal with explicit, measurable indicators that prove the program's positive impact in achieving its nutrition outcomes.

Causal Pathway of Undernutrition



This Strategy Focuses on this causal pathway

Why SoL?

- Feeding Timor Leste. But why not feed them WELL?
- SoL has definite strengths to promote nutrition messages and nutrition-sensitive agriculture including:
  - a current **presence** in most districts and a plan to expand to all districts;
  - **capacity-building** work with many community groups;
  - direct working relationships with the **MAF district** offices;
  - training and support of **Suco Extension Officers** (SEOs) and
  - an expanding **communications team** that works in print, mass media and facilitation skills.

Seeds of Life
Fini ba Moris

SoL and MAF Structures

Component 1	Farmer Field Days Taste Tests Research Stations On farm demonstration trials (OFDTs)
Component 2	Seed Production Officers (SPOs) Seed Production Coordinators (SPCs) NGOs
Component 3	Community Seed Production Groups (CSPGs) Farmer Seed Marketing Groups Seed fairs Suco extension officers NGOs
Component 4	Ministry of Agriculture and Fisheries Suco extension officers

Preliminary Recommendations

- **The first step:** Development of a strategy that will undergo a review process internally with SoL as well as national experts and partners working with SoL and in Timor Leste on food and nutrition security.
- There will be four areas proposed within the Seeds of Life Nutrition Strategy. They are:
  - **Programmatic**
  - **Training and Knowledge Transfer**
  - **Communications and Management**
  - **Monitoring and Evaluation**

Overview of Recommendations

There are four major areas of work that are recommended in this strategy. They include the integration of nutrition into Programmes, Training and Knowledge Transfer, Communications and Management, and Monitoring and Evaluation.

PROGRAMMATIC

1.1) Evaluate new nutrition rich varieties of the major staple crops
1.2) Evaluate additional legumes
1.3) Evaluate and promote crops/foods rich in essential fats
1.4) Research Nutrient Rich Fertilizers
1.5) Measure and develop information on nutrition content of crops and other foods
1.6) Test aflatoxin contamination in seeds and crops post-harvest
1.7) Promote Diversification of Farms for Nutrition, Income and Ecology Benefits
1.8) Develop and disseminate horticulture production models

TRAINING AND KNOWLEDGE TRANSFER

2.1) Train on aflatoxin testing
2.2) Expand taste tests to include nutrition
2.3) Reduce post-harvest losses through improved storage and processing
2.4) Produce source seeds for nutritious crops
2.5) Train Suco Extension Officers (SEO) and other Community Workers
2.6) Pilot Orange Fleshed Sweet Potato Campaign
2.7) Develop local nutrition champions
2.8) Provide nutrition training

COMMUNICATIONS AND MANAGEMENT

3.1) Incorporate Nutrition in the MAF
3.2) Coordinate and Collaborate
3.3) Disseminate Nutrition Information

MONITORING AND EVALUATION

4.1) Incorporate Dietary Indicators
4.2) Perform household case studies on nutrition security/agrobiodiversity

Recommendation I. Programmatic

- ***Expand portfolio of crops to include nutrient rich sources:*** MAF and SoL can expand their current portfolio of crops to encompass more nutrient rich varieties including biofortified staple crops, expansion of legumes and crops that are rich in essential oils.
- ***Research nutrient rich fertilizers:*** Zinc is one potetential avenue of research.
- ***Provide nutrition information of major crops:*** Information on the nutrient content of promoted crops, their by-products and other local biodiverse foods can be provided to farmers, and this information can be disseminated during times of seed releases into the national formal and informal seed programs.
- ***Improve postharvest processes:*** To ensure that seeds are safe and provide less risk to consumers, peanuts and maize, two of the main staple crops promoted by SoL should be tested for aflatoxin.
- ***Promote diversification of farms for nutrition, income and ecology benefits:*** New models of farming with more diversity can be further developed and piloted.
- ***Develop and Disseminate Horticulture Production Models:*** Increasing horticulture production, particularly when directed to women farmers can have important nutritional and economical outcomes

Current Foodcrops Promoted by SoL and MAF with suggested areas of improvement and outcomes

	Carbohydrates	Proteins	Essential Fats	Micronutrients
Current SoL and MAF Crops	Maize Rice Potatoes Wheat Barley Cassava	Peanuts Velvet Bean Winged Bean	Peanuts	Cassava Leaves Sweet Potato Leaves
Potential Foods to Expand	• Sago • Taro -- SoL achieving outcome --	• Different legumes (soybean, pigeon pea, chickpea, mungbean, beans, and cowpea) • Nuts and seeds • Animal source foods (includes meat, milk, fish and eggs)	• Nuts and seeds • Animal source foods (includes meat, milk, fish and eggs) • Oils • Avocado	• Legumes (Iron) • Biofortified staples • Dark leafy vegetables • Orange, yellow and red fruits (mango, guava, papaya) • Animal source foods (includes meat, milk, fish and eggs) • Oil with fat soluble vitamins (vitamin A)
Potential Outcomes	• Reduce hunger • Increase caloric consumption • Reduce wasting	• Improve immunity • Reduce Micronutrient Deficiencies (Iron, Vitamin A, Zinc)	• Reduce Hunger • Increase caloric density • Improve cognitive capacity • Reduce stunting	• Reduce Micronutrient Deficiencies (Iron, Vitamin A, Zinc) • Improve cognitive capacity • Improve work productivity

SoL Major Crops and Potential areas of Nutrition Expansion

Maize	Quality Protein Maize (QPM)*
Rice	Zinc fortified rice; Golden Rice (Vitamin A)
Cassava	Vitamin A cassava; Biocassava plus
Peanuts	*---Aflatoxin control---*
Potatoes	Orange fleshed sweet potatoes (Vitamin A)*

*Currently being tried in Timor-Leste

Release dates of Harvest Plus Biofortified Crops

Crop	Nutrient	Location	Date
Beans	Iron	DR Congo, Rwanda	2012
Cassava	Vitamin A	DR Congo, Nigeria	2011
Maize	Vitamin A	Nigeria, Zambia	2012
Rice	Zinc	Bangladesh, India	2013
Sweet Potato	Vitamin A	Mozambique, Uganda	2007
Wheat	Zinc	India, Pakistan	2013
Pearl Millet	Iron	India	2012

Legumes are important for Nutrition: Protein content of cereals, tubers and legumes

Cereals and Tubers (100g)	*Protein content (%)*
Maize	9.4
Rice (white	7.1
Wheat flour	10.3
Millet	11
Cassava	1.3
Potato	2.1
Legumes (100 g)	*Protein content (%)*
Kidney beans	23.6
Cowpea	23.5
Peanut	25.8
Soy	33.7

Vegetables are important for micronutrient consumption:

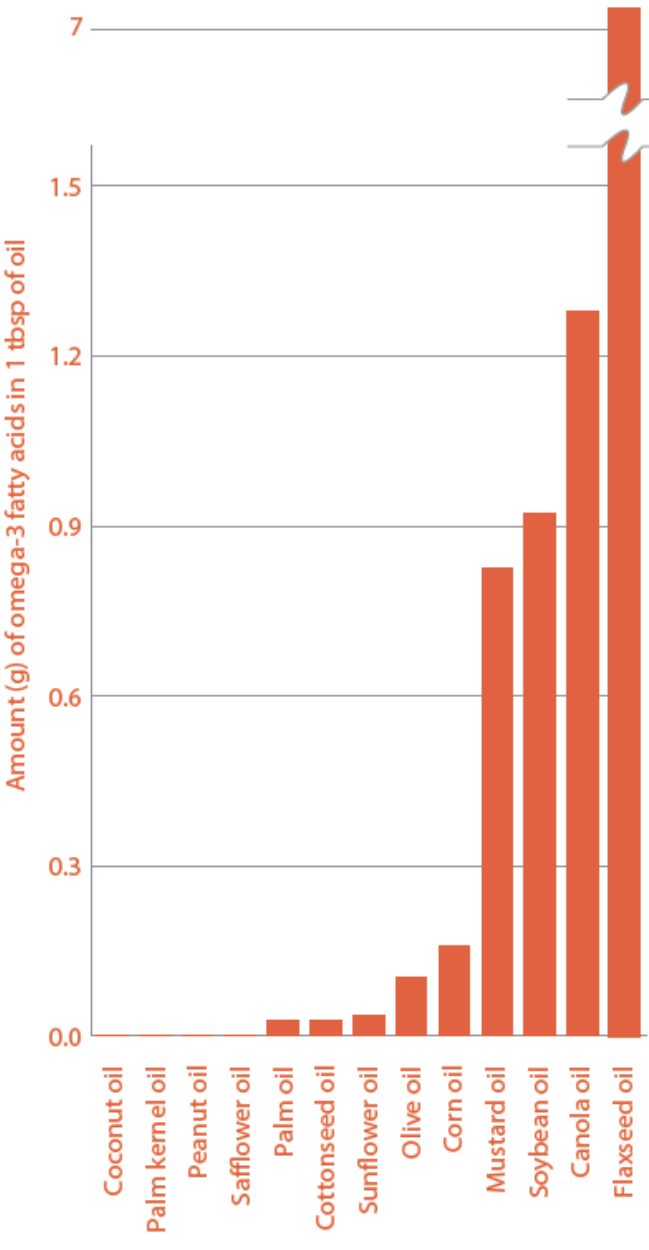
Nutrient composition of Green Leafy Vegetables found in Timor-Leste

Per 100 g	Kailan	Kangkung	mustard leaf	bok choy	chinese cabbage	silverbeet	RDA for adult women
Protein	2.3 g	2.7 g	3.7 g	1.5 g	1.2 g	3.27 g	58 g
Calcium	173 mg	60 mg	57.7 mg	105 mg	77 mg	51 mg	400 mg
Iron	1.4 mg	2.5 mg	0.8 mg	0.8 mg	0.31 mg	1.8 mg	19 mg
Vitamin A	10,000 IU	9665 IU	5881 IU	4468 IU	318 IU	6116 IU	2500 IU
Vitamin C	140 mg	45 mg	39.2 mg	45 mg	27 mg	30 mg	30 mg
Other names	*chinese broccoli*	*water spinach*		*chinese cabbage*	*napa cabbage*	*chard*	

Essential Fatty Acids are important in growth

Essential fatty acids are those that humans are unable to synthesize and must therefore obtain through their diet (see Box 1). They include alpha-linolenic acid (ALA), the building block for the longer-chain omega-3 fatty acids, and linoleic acid (LA), the building block for the longer-chain omega-6 fatty acids.

	INFANTS AND YOUNG CHILDREN (6–24 MONTHS)	PREGNANCY AND LACTATION*
Total fat	Gradual reduction to 35% of total energy intake, depending on physical activity	20–35 % of total energy intake
Omega-6 PUFA	3.0–4.5% of total energy intake (linoleic acid only)	2–3% of total energy intake (linoleic acid only)
Omega-3 PUFA	0.4–0.6% of total energy intake (alpha-linolenic acid only)	0.5–2% of total energy intake (ALA + other omega-3 PUFA)



Fish

- Rich natural marine resources
- Develop small scale fishing activities
- Wild catch for coastal communities requires access to equipment, credit and knowledge
- Aquaculture for the mountainous rural interior (utilize ponds or the water in rice paddies to farm freshwater prawns and fish) – need equipment, fingerlings and knowldge
- The isalnd of Atauro is the country's main source of wild fish and seaweed, along with imported fish from Vietnam and Indonesia
- Fish drying – women's enterprise
- GIFT – genetically improved farmed tilapia (fast growing; and can eat vegetables [water spinach], corn meal, coffee fruit pulp

Wild Foods

87% of HHs consume wild foods throughout the year

- kumbile (45.7%)
- bitter beans (37.2%)
- sago (20.3%)
- kuan/biahulu tuber (13.5%)
- buraisa cassava, maek tuber, bianmalala tuber (each 10.1%)
- tamarind, wild fowl (8.47%)
- wild deer, uhi tuber, sinkumas/bengkoang yam bean, velvet bean/lehe (6.77%)
- mango, feral pig, rock pawpaw, pawpaw leaves, wild taro (5%)
- pawpaw, wild sweet potato, aidak fruit, bet, kabura leaf tips, monkey, reptile/meda (3.3%)
- wild buffalo, leaves (passionfruit, kleleik, aitutuk, banyan, bitterbean, aikabi, kedidilau, maek, maruingi, cassava), lelerek, ai same tuber, kalik bean, goiabas fruit, buah nona fruit, kaisake, mustard greens, large turtle dove, possum, cockatoo (each 0.84%)

Integrated Farming

Recommendation II: Training and Knowledge Transfer

- **Training:**
  - Train MAF and SoL staff and their partners on the basics of nutrition and integrating nutrition into agriculture programs
  - Train Suco Extension Officers (SEO) and other community workers on nutrition messaging
  - Develop local nutrition champions
  - Train on Aflatoxin testing
- **Knowledge Transfer:**
  - Expand SoL taste tests to include nutrition
  - Reduce post-harvest losses through improved storage and processing
  - Produce source seeds for nutritious crops

Taste Trials and OFSP

Improving Nutrient Content

- **COOKING**
  - Oil for fat soluble vitamins
  - Vitamin C with iron
- **PROCESSING**
  - Thermal processing, mechanical processing, soaking, fermentation, and germination/malting
  - Increase the physicochemical accessibility of micronutrients, decrease the content of antinutrients, such as phytate, or increase the content of compounds that improve bioavailability
  - Parboiling
  - Yogurt, jams etc
- **STORING**
  - Solar drying, sun drying, storing

Community Nutrition Champions

Utilizing the Suco Extension Officer's and PSF's Reach

Extension Workers

Suco Extension Worker (SEOs)

- Approximately 1 SEO per *suco.*
- Each SEO Interfaces with approx 300 households
- Most handle between 6-8 farmers groups per suco
- Paid $160 per month (level 3 MAF hire)

Community Health Volunteer - *Promotor Saude Familiar* ("PSF"s)

- Volunteer positions.
- Nominated by community – no clear reporting line or TOR. Literacy required
- No firm number of PSFs. Est. 2/3 per *aldeia* (*although coverage varies greatly across sucos and aldeis*).

Ministério da Saúde

Recommendation III: Communications and Management

- ***Integrate nutrition into the Ministry of Agriculture:*** Promote nutrition within the MAF and lobby for its formal inclusion within the Ministry's structure and long-term strategy. MAF should play a central role in the scale up of nutrition efforts.
- ***Partner, Coordinate and Complement:*** The MAF and SoL have extensive structures established all over the country, that provide an added benefit to ensure nutrition is promoted and institutionalized. It is recommended that MAF and SoL leverage and partner with other development partners' nutritional programs and experience to inform SoL practices and vice versa.
- ***Disseminate information***

Recommendation IV: Monitoring and Evaluation

- ***Nutrition-focused M&E and learning:*** Dietary indicators and case studies can be integrated into both the SoL's Monitoring and Evaluation System and Timor-Leste's national food information system in a streamlined fashion to track dietary and consumption indicators as well as best practices.

Principals of Recommendations

- Government leadership is essential.
- Agriculture is part of a broader multi-sectoral approach to improving nutrition.
- Set goals and measure progress.
- Meeting the hunger goal is an important contributor to nutrition.
- Empowering women.
- Strengthening Community Workers.
- Doing no harm.
- Utilizing what is already there.

Limitations and Challenges

- Capacity, capacity, capacity
  - Community workers
  - Nutritionists
- Traveling through the country and access to services is difficult
- Other major determinants of stunting are not adequately addressed
- Sociocultural issues (cock fighting, taboos, ceremonies)