

FINAL TECHNICAL REPORT / RAPPORT TECHNIQUE FINAL SCALING UP SMALL-SCALE FOOD PROCESSING FOR THERAPEUTIC AND COMPLEMENTARY FOOD FOR CHILDREN IN VIETNAM

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SCALING UP SMALL-SCALE FOOD PROCESSING FOR THERAPEUTIC AND COMPLEMENTARY FOOD FOR CHILDREN IN VIETNAM

Final Technical Report (November 1, 2015 – June 30, 2018)

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List of Abbreviations	
AFS	Agriculture and Food Security
CHS	Community Health Services
CAFS	Canadian Association of Food Studies
GAC	Global Affairs Canada
GAP	Good Agricultural Practices
CASID	Canadian Association for Studies in International Development
HFIAS	Household Food Insecurity Access Scale
HACCP	Hazard Analysis and Critical Control Point
HEBI	High-Energy Bar for Integrated Management of Acute Malnutrition
HKI	Hellen Keller International
KAP	Knowledge, Attitude and Practices
IDRC	International Development and Research Centre
IEC	Information, Education and Communication
IYCF	Infant and Young Child Feeding
IYIP	International Youth Internship Program
ISO 22000	Certification in Food Safety from International Organization for Standardization
MTBT	Mat Troi Be Tho/ Little Sun Center
MARD	Ministry of Agriculture and Rural Development
MOH	Ministry of Health
MOU	Memorandum of Understanding
NIN	National Institute of Nutrition in Vietnam
NPAN	Nutrition Plan of Action
PMF	Performance Measurement Framework
R&D	Research and Development
RUTFs	Ready-to-Use-Therapeutic-Foods
SSFP	Small-Scale-Food-Processing

Executive Summary

Marrying a nutrition sensitive approach with a sustainable food systems orientation, the project is contributing to the reduction in levels of food insecurity and chronic malnutrition among women and children in three provinces in northern Vietnam (Lao Cai, Lai Chau, and Ha Giang). It has created a value chain for fortified foods using locally grown crops, made in local manufacturing facilities, and using local distribution channels. In collaboration with the private sector, the project procures crops from small scale women farmers to produce the fortified food in small scale food processing plants to be distributed through local vendors. Knowledge regarding the value of fortified weaning foods is emphasized through project partners in the Little Sun social franchise nutrition counselling centres.

Strategy

NINFOOD developed the ECOSUN product line of Fortified Complementary Foods for children and ran acceptability tests in local communities within the project sites in northern Vietnam. The 2 main products are CHAO NGON instant rice porridge fortified with Iron and Zinc, and VICA vegetable powders fortified with multiple micronutrients (Calcium, Magnesium, Manganese, Zinc and Vitamin D).

CHAO NGON and VICA were then scaled-up and distributed across Lao Cai, Ha Giang and Lai Chau provinces using a food systems approach. These provinces are located in mountainous regions and share a border with China. They are predominantly populated with ethnic minority groups who live in relatively remote locations and mostly depend on subsistence farming. The national as well as provincial level governments in these three provinces have made tackling child malnutrition a policy priority since these regions have some of the highest rates of child stunting in the country. We adopted a food systems approach not just to improve availability of quality food among malnourished and food insecure women and children but also to ensure sustainability by involving the local community, local producers, local businesses, local health services and other local partners. After 32 months of setting-up the model and putting it in motion, we are beginning to see some positive signs of its influence:

Outcomes

- 10 year public-private partnership formalized between NIN and a local business woman in Lao Cai for ECOSUN production.
- ISO 22000 compliant small-scale food processing (SSFP) facility established and operating to produce 100 tons of fortified instant porridge and 2 million vegetable packets annually.
- 8 local workers trained in food safety and quality assurance at the SSFP facility.
- 5 of the 8 positions at the SSFP facility are held by women.
- 450 farmers trained in Good Agricultural Practices (GAP)
- Local co-op of 17 women farmers that use GAP to supply carrots, pumpkin, and sweet leaf to the SSFP facility
- 15 easy to access Little SUN nutrition counselling centers set up at community health centers.
- 36 health workers at these Little SUN centers have been trained on preparing ECOSUN

- products to teach during counselling sessions.
- 2913 consumers purchased 28,133 sachets of ECOSUN Chao Ngon porridge during the market launch and 9 mini promotion events held in project communes.
- 2550 children in 21 pre-schools in Lao Cai are eating the fortified instant porridge as part of the school meal programs.
- 14438 children under the age of 2 have been reached through 10,561 family nutrition counseling sessions (particularly to mothers).
- In total approximately 20,000 rural women have been reached through the individual and family nutrition counselling sessions, training workshops for farmers and marketing events in the 9 project communes and are using the ECOSUN fortified complementary foods for their children.

By adopting a food systems approach to pull together multiple project elements as well as partnering with the private sector to scale-up production of the nutrition solutions we were able to test the effect of the model while incorporating gender sensitive strategies and develop experiences and learn lessons for future successful replications.

- Six participants (3 from NIN and 3 from the Vietnam Women's Union -VWU) built capacity in gender and food security by completing an online course offered by Ryerson University.
- 750 child/caregiver pairs were assessed on nutrition, food security and related knowledge, attitudes and practices during baseline and follow-up surveys.
- Rates of complementary feeding timing were found to increase from just over 80% to 100% and complementary food consumption rich in iron also increased by 10% between baseline and follow-up surveys.
- NIN, VWU and Ryerson researchers did a knowledge exchange trip to Brazil to learn about agro-ecological practices, urban food security, school meals program model and governance in food security. Upon returning to Vietnam, NIN leveraged the private partner's connection with school meal programs in Lao Cai to establish a supplier buyer relationship in 21 local pre-schools.
- The final dissemination workshop engaged 114 stakeholders from provincial, national and international areas of agriculture, health, education and gender.

Partnership was a running theme throughout the project. The collaboration between NIN and Ryerson has led to many other partnerships: between countries, academic institutions, farmers, local businesses, and government and non-government sectors. As a result of this IDRC-funded project, we have developed a stronger research partnership between Canadian and Vietnamese scholars, particularly in the area of food security. We are confident that collaborations between the two groups will continue to increase in years to come.

The Research Problem

Despite remarkable socio-economic growth, and significant improvements in the health status for many in the past two decades, Vietnam continues to face significant problems with food insecurity and chronic malnutrition among women and children, particularly in rural areas. The table below provides some indicators of the problem in the three provinces of project implementation:

Nutrition Profile 2014 (data from the Vietnam Nutrition Surveillance System)

Issue	Lao Cai	Lai Chau	Ha Giang
Prevalence of women aged 15-49 years with chronic energy deficiency	12.7%	9.2%	15%
Prevalence of stunting, children < 5	35.2%	36.7%	35.2%
Prevalence of underweight, children < 5	20.0%	23.2%	23.1%
Prevalence of wasting, children < 5	5.8%	6.9%	9.8%
Prevalence of overweight and obesity, children < 5	3.5%	2.0%	2.8%
Proportion of children 6-23 months receiving a minimum acceptable diet	27%	31.1%	30.9%

Poverty and related barriers to accessing healthy foods and diets are exacerbated by low dietary diversity, low exclusive breast feeding rates, and sub optimal traditional weaning practices. These areas are also predominantly populated by small-scale women farmers from ethnic minorities.

Utilizing a food systems approach, the project calls for the integration and scaling up of two previously successful models implemented in other parts of Vietnam: 1) NINFoods™ development and production of Ready-to-Use-Therapeutic-Foods (RUTFs) and fortified complementary foods for children using Small-Scale-Food-Processing (SSFP) facilities; and 2) the Mat Troi Be Tho (MTBT or “Little Sun”) counselling program for infant and young child feeding (IYCF) practices developed using a social franchising approach. Direct procurement of crops from small-scale women farmers will further contribute to food security by providing a more stable source of income and a more diversified crop profile. Hence, this project will contribute to Vietnam’s goals of improvements in public health and rural development.

Components of the project include:

- A. Developing fortified complementary food products for young children
- B. Developing a system for direct procurement of crops from small-scale women farmers
- C. Establishing a local small-scale food processing (SSFP) facility
- D. Establishing a system of local distribution of SSFP products through health counselling centres (Little Sun franchise) and local stores.
- E. Partnerships with the private sector include those with small-scale women farmers, SSFP operator, and store owners.
- F. Exchange of information, knowledge, and ideas among researchers and practitioners in Canada, Vietnam and Brazil.

Some of the research questions in the project include:

1. Does this approach increase food security among women and children in the areas of the project?
2. Does it establish viable commercial supply chains for women farmers?
3. How does it support local economies?

In reflecting on its overall progress, we find that our understanding of the problems have evolved since the inception of the project. While the first half of the project saw both the public and private partners coping with challenges in collaborating with each other, the second half of the project challenged us to focus on the commercial integration of farmers into the value supply chain. Gender issues and opportunities for gender inclusivity and transformation were most prevalent in this component of the scale-up strategy. In the final months of the project we conducted a follow-up survey to our initial baseline research and tested whether there were any impacts in pre-school children that were receiving our instant porridge at school feeding programs.

The project's contribution to knowledge encompasses areas in food security, local fortification of complementary fortified foods, predictors for stunting, wasting and underweight, public-private partnerships, gender issues and barriers to transformation, and sustainable food systems. It will contribute to the base of evidence in these areas, as well as to the design of effective, gender-sensitive, standardized and sustainable programming. It will also feed into higher level decision-making and evidence-informed policy development.

Project Results

The milestones (below) outlined in the grant agreement for each objective have been described in detail in the previous 5 technical reports. This section describes the various components of the food systems model that we worked on over the span of the project to achieve our objectives and also provide the full picture.

Objective 1: Increase capacity of the supply chain for fortified complementary foods and ready-to-eat therapeutic foods (from crop supplies to processing, distribution, and consumption) to address barriers to food security for targeted populations, particularly women and children, in the three selected provinces of Northern Vietnam.

Objective 2: Assess and quantify effectiveness of the proposed scaling-up model, its delivery mechanisms and approaches, through measured indicators of food security in the areas of intervention.

Objective 3: Enhanced integration of food security analysis into public policy and programming at the National Institute of Nutrition and other government institutions in Vietnam.

Objective 4: Strengthen capacity of Vietnamese entities (NIN, Vietnam Women's Union, universities, farmers' and women's organizations) in technical areas of food security programming to secure the sustainability of project models and results.

Objective 1	Objective 2	Objective 3	Objective 4
Inception Workshop with key partners and stakeholders held; report prepared and circulated.	Key project implementation strategies and documents developed including: research protocols, monitoring and evaluation strategy, communication plan, scaling up strategy and gender strategy.	Preparatory activities completed including: recruitment of project staff, identification of roles and responsibilities of stakeholders, site selection for the three Small Scale Food Processing facilities (SSFP), initial consultations with small scale women farmers and a Memorandum of Understanding signed with local partners.	Capacity built among NIN staff in the areas of food security research and gender and food security.
Equipping of SSFP facilities finalized, standard operating procedures for facilities established; and training of SSFP workers completed	Baseline data collector recruitment, training and supervision completed; Household Food Insecurity Access Scale (HFAS) applied; Other anthropometric and socio-economic data collected; circulated	First workshop to share research findings with local communities held and report prepared	Approval from Research Ethics Review Boards in Vietnam and Canada secured.
Production of complementary foods started at the SSFP facilities along with introduction and marketing of products	Focus group discussions with key stakeholders conducted; and research data analysis finalized, report prepared and	Research data analysis adapted into draft papers assessing public policy implications of program and circulated to key government/practitioner stakeholders in Vietnam	Feasibility study to identify crop profiles and weaning practices in each of the three provinces conducted. Report prepared and circulated (NIN).
Documentation demonstrating that all SSFP facilities are fully operational with established supply chain	First workshop on basic nutrition and feeding practices held to enhance the chances of adoption and acceptance of the new nutritious products by the local population	Draft of principles for a food security strategy for Vietnam completed	Exchange/seminar/workshop with counterparts in Brazil conducted; report on experiences and lessons prepared and circulated
	All end-line surveys including income, food access, nutritional status completed and data analyzed		First workshop (capacity building) for women farmers on agroecology practices, sound post-harvest techniques, and basic organization skills completed

Objective 1: Increase capacity of the supply chain for fortified complementary foods and ready-to-eat therapeutic foods (from crop supplies to processing, distribution, and consumption) to address barriers to food security for targeted populations, particularly women and children, in the three selected provinces of Northern Vietnam.

In order to realize Objective 1, we strived to create a *nutrition sensitive agricultural value chain* to produce and distribute high quality fortified foods while also integrating gender sensitive strategies. The need for a nutrition sensitive approach to the multifactorial causes of undernutrition in the first 1000 days is clear, and marrying a nutrition sensitive approach with a food systems orientation to enhance food and nutrition security is one of the innovative characteristics of this particular project.

A. Developing fortified complementary food products for young children

As the first step in our food systems approach NIN and their business oriented subsidiary NINFOOD developed fortified complimentary foods for children under the age of 2 as part of the ECOSUN product line. As diets in the region tend to be poor in Iron and Zinc and prevalence of iron deficiency and anemia are high in women and in children, there was a need to develop complementary food products fortified with iron and zinc. The ECOSUN brand has been created as a result of this project. NINFOOD developed and locally tested an instant porridge fortified with Iron and Zinc, and vegetable powders fortified with minerals and vitamins.

The products developed are as follows:

- CHAO NGON Fortified instant porridge (with Fe, Zn): This fortified rice cereal is meant to serve as a base for the addition of home grown foods, while simultaneously reducing caregiver drudgery associated with making porridge. A 30 gram serving of Chao Ngon has been fortified with 0.9 mg of iron and 0.45 mg of zinc.
- VICA (named after the Vietnam-Canada partnership) Vegetable powder fortified with minerals and vitamins. Four flavours were chosen (mushroom, sweet leaf, pumpkin and carrot) based on local taste preferences and crops produced by women farmers. VICA is meant to be used when people do not have access to fresh fruits and vegetables to add to the instant porridge. A 3 gram serving provides 12% of the daily requirement levels of Calcium, Vitamin D, Magnesium and Zinc.

(Product composition, technical processing procedure and indicators, and organoleptic evaluations were conducted at the NIN lab and in the field at Lao Cai).

NINFOOD also researched and developed a Protein/Fat add-in to complement the ECOSUN product in cases where there is low availability or affordability of natural protein sources. This product is manufactured at their facility in Hanoi as the packaging technology for the Protein/Fat sachets is more difficult to operate, needs experienced workers, and was deemed too complicated for fast scale up in the Lao Cai facility.

The high quality fortified convenience food has been designed to be flexible and enable the addition of home produced and prepared foods and acts as a flavour bridge for the introduction of novel foods and textures. The fortified VICA powders and protein supplements enable the nutritional enhancement of preferred local foods.

B. Developing a system for direct procurement of crops from small-scale women farmers

Agricultural training was provided to 450 women farmers in total in 9 communes located in the 3 project provinces during July and August, 2017. Training comprised of both theory and practice. Each woman also received ECOSUN instant porridge, with key nutrition messages and seed

packets. The Agricultural training was supposed to be delivered by the Women's Union, however the partnership did not work out due to conflicting schedules. Instead NIN connected with and hired 4 female agricultural engineers from the local departments of agriculture in the 3 provinces to deliver the workshops. The training was delivered using the Women's Union curriculum on Good Agricultural Practices which also utilizes a Train the Trainer approach. Training materials can be found in Annex 1.

One of the inclusion criteria for participants of the Agricultural training program was that they should have children between the ages of 6 to 24 months of age (which is our target group for the project intervention). Although the women were instructed to leave their children at home, many were unable to and had to bring the children to the training. As the participants live in rural and predominantly mountainous areas, they had to travel very far to get to the training. Taking these challenges into account, the training was revised into a 1 day workshop. This made it easier for the women to participate and ensure that they showed up. Some older women who fell outside the inclusion criteria but were already practicing home gardening were also invited as models of positive deviance.

C. Establishing a local small-scale food processing (SSFP) facility

To manufacture the ECOSUN products and decentralize production, NINFOOD partnered with a local women entrepreneur to set-up a small-scale food processing facility. The partnership uses a franchising model which includes product manufacturing rights, technology transfer, human resources training and administrative support for production, supervision, distribution, and aggregation of raw materials.

It was not an easy process to find a local partner who was willing to share in the investment and risks as well as have a similar angle as NINFOOD to generate profits as well as combat malnutrition in the community. Although it took a while, NINFOOD found the ideal partner in Thuy Dung Co.

NINFOOD and Mrs. Thuy Dung signed a formal 10 year contract (Annex 2) to cost-share almost 50:50 which included the renovation of her 3200 square foot facility as well as all other operation costs. In turn NINFOOD developed the licensing agreement, developed and delivered food production protocol and food safety standards training. They also designed an ISO 22000 compliant factory space and customized equipment. And lastly they conducted the market feasibility study, as well as led the branding and packaging development. Another point to highlight is that the contract also includes a clause that says Thuy Dung Co. will procure raw materials from the Song Kim Collective, thus creating a stable market for these farmers long after the project has ended.

One unique innovation of the project is that NINFOOD designed customized equipment for the safe fortification of the complementary food products for children. The machinery supplier thus had to custom build 17 machines for the production of the Chao Ngon porridge and VICA vegetable powder. Although it was a long bureaucratic process which took a couple of months, the mechanism of bidding for tenders has now been clarified. The process involved working with the MOH to approve the bidding plan created to procure food processing equipment, preparing

and publicly advertising in the Vietnam Bidding Newspaper and then creating a bidding committee at NIN to review and select a qualified tender.

The MOH certified the SSFP to produce fortified complementary food products. The private partner received the certification on January 6, 2018 (Annex 3). This was the last major hurdle with registration in terms of barriers to production.

As a result of the long bidding and selection process in Vietnam, our timelines were pushed back and we were able to establish only one SSFP facility at Lao Cai (although we originally proposed to set up one SSFP in each project province). With that being said, the facility in Lao Cai has been refurbished and equipped to produce enough food for supplying the markets in all three provinces. The refurbishment of the facility was done following the SSFP design prepared by NIN FOOD and abides by Vietnam regulations for the production of fortified foods. It is also ISO 22000 compliant and the workers were trained on HAACP standards. The factory currently employs 8 workers, 5 of whom are women.

The ECOSUN SSFP facility in Lao Cai province was officially opened at a launch ceremony on November 15, 2017 (Annex 4). The SSFP has a production capacity of 300 kg of instant rice porridge a day and 10,000- 12,000 VICA sachets per day by processing 60 kg of vegetables per hour.

Between November, 2017 and May 2018 it has produced 4795 kg (from promotion, sales and supply to kindergartens). VICA production commenced in April 2018. The factory has yielded 30,000 packets over two months. One Chao Ngon serving sachet costs 2500 VND (i.e. 14 cents CAD) and one VICA powder sachet costs approximately 3600 VND (about 21 cents CAD), depending on the flavor. These products have been purchased by 2913 consumers in the 9 project communes during marketing events alone.

D. Establishing a system of local distribution of SSFP products through health counselling centers (Little Sun franchise) and local stores

Little SUN Nutrition Counselling Centers

As part of our project design, we identified that the health system can serve as a channel to increase demand for and acceptability of fortified complementary foods. (Fortified foods are necessary to avoid iron deficiency during the weaning period of the critical first 1000 days of life in a child). Fifteen Little SUN nutrition counselling centers were set-up by NIN in partnership with local health centers at the provincial, district and commune levels in Lai Chau, Ha Giang and Lao Cai. The centers were equipped with anthropometric measurement tools, and Information, Education and Communication (IEC) materials on IYCF and exclusive breastfeeding. Thirty-six health workers at the 15 Little Sun clinics were trained in IYCF counselling and preparing ECOSUN products (instant porridge and vegetable powder) with regular local foods to teach mothers in counseling sessions.

Currently 13 little SUN centers are operational at the provincial, district and commune levels in the 3 provinces. (Note - there are 15 Little SUNs but 2 are temporarily closed as the health facilities

where they are housed are undergoing renovations). One-to-one nutrition counselling sessions are held with pregnant and nursing women and those with children under the age of 2 using the formats of group counselling sessions, individual counselling sessions as well as other nutrition events. From February 2017 to April 2018, 14438 children under the age of 2 have been reached through 10,561 nutrition family counseling sessions (particularly with mothers). A detailed breakdown of the reach of the Little SUN centers and sessions held on IYCF practices can be found in Annex 5, slide 31.

Mixed marketing methods

The ECOSUN Fortified Complimentary Food products were released during a market launch event held in Lao Cai from January 10-12, 2018. The launch included activities for the target beneficiaries such as taste-testing, a master chef competition, mascots and dances by preschool children. The product was a hit particularly with poor segments of the community who bought the bulk of the products. All the ECOSUN Fortified Complimentary Food sold out by the end of the event. Smaller events were also held for target communities within the 9 project communes in the provinces of Lao Cai, Ha Giang and Lai Chau from January 20 - 27, 2018.

NIN also developed the ECOSUN brand identity with the tag line *Healthy Farm, Healthy Food, Healthy Kids* which in essence captures our underlying food systems approach. They also developed diverse promotion materials including: 3 ECOSUN billboards, show case booths, lucky wheels, social marketing using Facebook, flash cards and other swag such as helmets, ponchos, and travel cups to prepare the porridge. NIN and NINFOOD have learned that flexibility is critical in promoting the product and creating demand, noting that what works in one commune won't necessarily work in another with respect to promotion (Annex 6).

The total sales volume of Chao Ngon until June 2018 was 28,133 sachets. The total sales volume of VICA was 2741 sachets (half of them purchased in the 9 project commune). And the total sales volume of the Lipid protein sachets produced in Hanoi was 801 packs (501 purchased in the project communes). These products were purchased by 2913 consumers during marketing events in the 9 communes (Annex 28).

In the coming years NINFOOD and Thuy Dung Co. will build and expand their networks starting with expanding to Little SUN centers that are set up in Hai Phong, Hoa Bonh, and Thanh Hoa province, hospitals, pre-schools and urban markets.

Pre-schools as institutional buyers

As part of the distribution strategy, NIN has also targeted local kindergartens/pre-schools in areas with high prevalence of malnourished children. Normally pre-schools run snack programs which are partially subsidized by government funds. With support from our private sector partner Thuy Dung Co., who was already producing school meals, NIN was able to connect with the local education departments and negotiated it so that they can receive the subsidies and provide the ECOSUN instant porridge in bulk to 21 pre-schools in Lao Cai. NIN provides the porridge and the school has to include the meat, oil and vegetables. So far 2899 kg of instant porridge has been provided during mid-morning meal to 2550 pre-school children. It is reported that the children like the taste of the products (Annex 5).

E. Partnerships with the private sector include those with small-scale women farmers, SSFP operator, and store owners

The private sector partner Thuy Dung Co. signed a contract with a local agricultural co-op - Song Kim Collective in Bat Xat commune comprising of 17 local small-holder farming families that use Good Agricultural Practices (GAP). Carrots, pumpkin and Sweet Leaf are purchased from the local co-op to produce the ECOSUN Fortified Complimentary Foods (FCF). The women from these families are subsistence farmers who had recently formed the co-op. The collective comprises of 8 hectares of land. Thuy Dung Co. produces mushrooms and has also a contract to procure rice for the instant porridge locally in Lao Cai. The region is known for producing high quality rice.

NINFOOD developed a mixed marketing strategy combining social marketing methods such as using the Little SUN centers and the NINFOODs show room as promotion points to partnering with local vendors close to the Little SUN centers and providing them with bulk purchasing, and Buy One Get One Free incentives. Such discounts also allow the vendors to then cover the transportation and distribution costs (Annex 6).

Outcomes

As a result of the project activities and outputs to achieve Objective 1 we are influencing the following outcomes locally:

- Improving earned income (and purchasing power), income stability as well as a diversification of crop profiles of the targeted women small-scale farmers
- Improving knowledge of agro-ecological practices among small-scale farmers
- Establishing a reliable market for smallholder producers' crops accompanied by strengthened standards of post-harvest handling (lower losses)
- Increasing the availability and use of locally appropriate and affordable fortified complementary foods for children in targeted communities

It should be noted that a longer time frame would be needed to be able to measure any improvements in earned income and income stability. This project ran for 32 months.

Synthesis of Research Results to Date

Our project had explorative research elements incorporated into it. The last milestone we had to complete was the follow-up survey. We report on it here in addition to all the research and analytical activities we conducted to help us achieve Objective 2.

Objective 2: Assess and quantify effectiveness of the proposed scaling-up model, its delivery mechanisms and approaches, through measured indicators of food security in the areas of intervention.

Ethics approval was obtained at Ryerson University and NIN in October 2016 and extended at Ryerson as the project was approved for extension until June 2018.

The **formula** for the complementary fortified foods was developed based on NINFOOD's expertise in food technology. The Chao Ngon porridge is made up of rice fortified with Iron and Zinc. A 30g serving provides 118 Kcal of energy and 2.7 g of proteins. VICA vegetable powder comes in four varieties: Carrot, mushroom, pumpkin and sweet leaf. The main ingredients are pumpkin, carrot, saubropus androgynous, mushroom, green onion, potato, yeast, salt and a fortified premix of Calcium, Vitamin D3, Calcium and Zn. During the R&D process, NIN researchers consulted on composition, processing, and premix formulation. The composition of the products was determined by researchers at NIN taking into account: RDA (Required Dietary Allowance) for children of complementary feeding age (NIN 2016), and actual situation of macronutrient and micronutrient deficiencies of Vietnamese children (Fe, Zn, Vitamin A, Vitamin D, calcium). The fortifications are also within the safe levels for fortified products regulations in Vietnam. The existing food lab at NIN was used to mix and test the products.

An **acceptability test** (Annex 11) was also conducted with a sub-set of 126 beneficiaries at Quang Kim Kindergarten, Bat Xat district in Lao Cai province, with positive results, ascertaining that there is a high demand for complementary fortified foods within the target population. Parents and grandparents of students used the Chao Ngon Porridge and VICA vegetable powder with their children, the majority of whom were between the ages of 9 and 60 months. All the products received high points on its overall acceptability, smell, taste, texture and aftertaste. During this test, the frequency and time of use was also determined. About 55% of participants said they use instant porridge several times a month and 21% said that they use it for their children several times per week. The most frequently eaten instant porridge was also identified thus determining who the competitors are in this local market. Furthermore 58% of participants said that 3000 to 5000 VDD (18 to 30 cents) is an acceptable price for the product and about 19% said that 2500 to 3000 VDD (15 to 18 cents) is an acceptable price.

A **market feasibility** study was conducted in Bát Xát District in Lao Cai to assess the potential market for complementary foods by surveying local wet markets, shops and pharmacies and potential consumers and to assess the crop production patterns of women farmers. The feasibility study findings concluded the sites were appropriate based on the local retailers' base and women farmers looking for stable markets for their produce. The feasibility study demonstrated significant buy-in from local government. Details of the feasibility study including methodology, a SWOT analysis and discussion are in Annex 7.

The **marketing and distribution plan** which also included social marketing elements was created by NINFOOD and implemented during the Market Launch in January 2018. The products not only sold out but the majority of the purchases were made by poorer segments of society. Based on best practices in marketing fortified complementary food (FCF) products to Base of Pyramid (BoP) families (see the report from Hystra, 2014, *Marketing Nutrition for the Base of the Pyramid*, <https://www.gainhealth.org/wp-content/uploads/2015/02/Marketing-Nutrition-for-Base-of-Pyramid-report.pdf>), the ECOSUN product success can be attributed to the following reasons:

- The product taste was developed to match local tastes and the ECOSUN FCF products had the "bliss factor" that immediately provided satisfaction to the child.
- Convenience and ease of preparation is a strong incentive for Base of Pyramid families. This was factored in and tested in the product development phase.
- Low-income families are ready to pay for food that they perceive is better for their children.

The marketing messages for ECOSUN products also included nutrition messages thus aligning it with what families hear at health and little SUN centers.

- The ECOSUN products highlighted that it was made from local produce and marketing messages included making consumers aware that by buying the product they were also supporting local farmers who use GAP.

The **Baseline survey** (Annex 8) was conducted between October 23 and November 15, 2016 in the three provinces of the project:

- 750 mother-child (less than 24 months) pairs were interviewed and assessed.
- Blood samples of children 6-11 months were collected.
- Interview topics covered food security, IYCF practices, hygiene, crop production, and gender.
- Key informant interviews were conducted with local stakeholders (local government, health workers, agriculture extension workers, education workers, and women).

The results revealed that the prevalence of underweight and stunting was as high as 23% in children within the ages of 18 and 23 months in the 3 provinces. Rates of anemia were also very high in children within the ages of 6 to 11 months (approximately 45% in each province). Depending on the season, there was large variations in household food security. It was also found that 72.5% of the women were agricultural producers, however only 7.5% of the women interviewed held any decision making power in agricultural production in their household. On the other hand, with respect to food purchases, 44% of women were the main deciders of what food their families eat. 41% of women also reported that both the husband and wife make the decisions in family spending.

A logistic regression analysis was performed on the baseline data to explore factors associated with stunting and underweight. Factors looked at were: access to perinatal health care counseling, core infant and young child feeding practices indicators, Household Food Insecurity Access Scale (HFIAS) and questions on sanitation, hygiene, and gender equality. The research is being drafted into a manuscript to be submitted for journal publication. The analysis revealed that stunting rates decreased among households with indoor water sources and among those that had received nutrition training (<3months). Stunting was highest among male children and increased with age (months). Higher fecundity/reproduction rates and food insecurity (i.e. HFIAS scores) also predicted stunting. Furthermore, the probability of being underweight increased with age (months) and was higher among children of underweight mothers. Underweight was also predicted by higher Household Food Insecurity Access Scale scores. Also of note is that the risk of being underweight decreased with the number of perinatal healthcare visits.

With respect to gender, there was a considerable amount of questions that weren't answered during the baseline, making it difficult to analyze due to missing data. However the questions that were answered the most were: Who in the household has decision-making power? Does the respondent/caregiver belong to a local Women's Union? And whether there is a system of completing chores in the household?

To address the **qualitative component** of the research, focus group discussions were conducted

from 8th to 19th March 2017. The purpose of the focus group discussions was to further explore the results of the baseline research, particularly that of Knowledge, Attitudes and Practices (KAP) related to IYCF; challenges, capacity building and integration of women farmers to supply the SSFP facilities; and gain a better understanding of the gender dynamics at play such as barriers faced by women in decision-making within the household (especially as they relate to IYCF and crop production). Sixty-three farmers participated, of which 41 were women. In each province, 3 agro-ecological extension workers were also present and participated in the focus groups.

We rationalize that the sensitive nature of the gender questions in the baseline survey required that some rapport first needed to be developed between the interviewer and respondent as well as more time be devoted to the questions. However the qualitative research activities which included 2 focus group discussions with household members in each of the 3 provinces, and key informant interviews with stakeholders (local agricultural extension workers, NIN staff and local Women's Union employee) captured a more accurate understanding of the complex gender issues at play. A gender analysis was conducted and is currently being drafted into a paper examining the household's relationship with the food system as it relates to: agriculture and food production, the marketing of food, and food consumption patterns such as purchasing food products, knowledge about food and decisions about food consumption. Annex 24 provides a synopsis. A key finding of the analysis is that although nearly equal proportions of men and women work in agriculture and agricultural work plays a significant role in household food security, only a quarter of women farmers receive agricultural training. Furthermore women also have the responsibility of completing household tasks (e.g. cleaning, cooking and child rearing) and receive little help from men. Language barriers for ethnic minorities also presented itself as a gender issue as men from these minorities are more likely to know Vietnamese than the women, and are then better able to access and benefit from training when workshops are delivered in Vietnamese.

The **Follow-up study** (Annex 5, slide 49) was conducted during the month of May in 2018, when 995 child caregiver pairs were sampled and assessed on the same measures as in the baseline survey. The sample also contained a follow-up cohort of 147 children from the baseline assessment.

Among the larger sample of children, it was found that 20.8 % of children were moderately stunted and 8.1 % were severely stunted. 11.6 % were moderately underweight and 2.3 % were severely underweight. When broken down by province the stunting rates in each province were similar hovering around 28%. When compared to the baseline survey, the initial analysis found a decline in malnutrition rates. Underweight prevalence in children dropped from 17.2 % to 13.9 % (i.e. a 3.3 % reduction) and wasting decreased from 7.9 % to 3.4 %.

According to the preliminary analysis, rates of anemia in the cohort of children showed dramatic declines in anemia rates (61 % to 16.1%). This requires further in-depth analysis as it could be due to a myriad of factors. The small sample size also warrants caution from extrapolating it to the larger population.

Some improvements in the maternal nutrition status in mothers were also seen. Mainly the total number of women with BMI below 18.5 decreased between baseline and follow-up. More women had BMI's in the normal range and surprisingly there was a large increase in BMI's in the upper

range (less than 5% of women at baselines to more than 20% at the time of the follow-up).

The breastfeeding indicators showed an increase in breastfeeding rates up to 1 year of age, however after 1 year the rates dramatically declined (only 14.8% of women). Exclusive breastfeeding rates also declined (less than half of the sample population) – a fact for concern and further detailed analysis.

With regard to complementary feeding indicators, meal diversity increased slightly, as did minimum meal frequency and acceptable diet. However, complementary feeding timing increased from just over 80% to 100%. Complementary food consumption rich in iron also increased by 10%.

With regards to household food insecurity indicators, declines were also noted on indicators such as worrying about not having enough of food (38.2 % to 22.5%); the number of people reporting lack of dietary diversity and limiting dietary preferences due to lack of resources was also cut in half (36.6 to 20.2 % and 42% to 20.4% respectively). A breakdown of the values can be seen in Annex 5, slide 59.

Research to **test the nutrition status of kindergarten children before and after Chao Ngon** was given as part of consumption in school meal program was also conducted. Anthropometric measurements were taken on 1173 children under the age of 60 months in the pre-schools in Lao Cai before and after they received the instant porridge. The aim was to investigate the impact of eating 2 extra snacks of fortified complimentary foods in preschools with high levels of malnutrition. The study population included 2612 children in the baseline and 1896 in the end-line study. Participants with missing data were subjected to list-wise deletion and two participants were excluded. Also there were 15 outliers with a SD +/- 5 that were also excluded from analysis. The rates of stunting, wasting and underweight were compared in the preschoolers before and after the 6 month intervention of two extra meals of Chao Ngon. The Fisher's Exact Test was used to observe significance. A secondary analysis also looked at the relative risk for age, gender and location.

There was as strong significant decrease in the proportion of stunted children over the 6 month period. Stunting decreased by about a third and this was very statistically significant (P<0.001). However there was a non-significant trend towards the increase in underweight and wasted individuals which may be due to environmental factors such as flooding that was experienced in some areas (in Lao Cai) but this needs to be further examined.

	Stunted	Underweight	Wasted
Baseline (n=2600)	28.7% (745)	13.5% (350)	9.6% (250)
Endline (n=1892)	19.5% (368)***	19.5% (368)	14.0% (264)
Change	Decrease	Increase	Increase

*** P<0.001

Outcomes

As a result of the project activities and outputs to achieve Objective 2 we have formed an analytical framework with consideration of replication in other contexts by gathering data that will demonstrate that the ECOSUN model has been influencing the following outcomes regionally:

- Lower prevalence of underweight, stunting and wasting among children in these communities
- Improving indicators of food security in the regions of the project (such as lower prevalence of severe food insecurity among women subsistence farmers' households)
- Improving knowledge of basic nutrition and food safety among women in the project regions
- Improving weaning and feeding habits

It is important to note that a longer time frame would be needed to be able to measure any improvements in stunting in children. This project was only able to follow a cohort of children up to the age of 2.

Contributions to Policy

NIN holds a strategic position in the Ministry of Health in Vietnam as being the voice of expertise in nutrition. Since incorporating principles of food security in policy-making is vital to tackling malnutrition, the development and testing of a comprehensive food systems has enabled us to build an evidence-base to support Objective 3.

Objective 3: Enhanced integration of food security analysis into public policy and programming at the National Institute of Nutrition and other government institutions in Vietnam.

Increased reference to food security in national policy and documents

The development of the National Plan of Action for Nutrition (NPAN) 2018-2020 which was led by NIN was completed and ratified by the Vietnamese government (Annex 9). ECOSUN team member Dr. Huynh Nam Phuong from NIN sat on the joint committee developing the National Plan of Action and contributed actively to the Nutrition and Food Security component which has been integrated into the framework of policies elaborated in the NPAN document. The learnings from the ECOSUN project will also directly support the following specific proposals made in the NPAN: the supplementation of legislation to support and ensure food security for poor areas and disaster-affected areas; policies to encourage private sectors in investing in production and provision of specific nutritional products for poor, disadvantaged and ethnic minority areas, especially for pregnant women and children under 5, and children with difficult circumstances (Annex: 9, Pg.7).

Prime Minister's Directive on Enhancement of Nutrition

The Prime Minister issued a directive calling for the enhancement of nutrition (Annex: 10). The directive outlines a multi-sectoral approach and identifies the role of multiple government ministries such as Labour, Education and Agriculture in nutrition programming and policies. Furthermore the MOH will promote this interdisciplinary cooperation and work closely with Vietnam's Women Union to address nutrition issues and fulfill the country's commitments to the Sustainable Development Goals. The directive also incorporates elements of food security by

calling for the promotion of local foods and protection of the environment in rural areas.

Although the project did not see a lot of multi-sectoral collaboration across national ministries, NIN was exceptionally successful in collaborating with provincial and district authorities such as local departments of health, education and agriculture as well identifying the relevance of partnering with the local Women's Union to reach ethnic and indigenous minorities (as opposed to the national Women's Union body). Bringing such learnings to the table will be invaluable in supporting the Prime Minister's Directive.

Food Security Strategy for Vietnam

The Prime Minister launched the Zero Hunger Program as a proposed model for food security improvement on Saturday June 6, 2018 ([News report](#)). Key features of the program involve support to farmers to develop a sustainable food system by participating in co-operatives and production chains while tackling malnutrition in children under two particularly in the north and central provinces. As the project has contributed to NIN's experience in food systems, they will be well-positioned to speak to best-practices in implementing the strategy.

Increased reach of project evidence

In November 2017, Dr. Huynh Nam Phuong shared the experiences and learnings from the ECOSUN project to the Indonesian delegates in the, "Country Learning and Knowledge Exchange on Stunting Reduction and Improving Child Health" event in Hanoi. The Indonesian delegates represented different aspects of the Ministry of Health and leaders of the nutrition department of Indonesia. There were over 40 people in attendance including Rodger Mathisen, the Director of Alive and Thrive for Southeast Asia. The presentation increased the visibility of the working food system model and possibilities of adoption by other NGOs and in other countries.

NIN also participated in a consultation workshop, "National Scheme – Care for comprehensive development of children in early years" organized by the Vietnam government where food security was prominently discussed. Currently NIN is working on the review of the nutrition policy for Ethnic minority children and review of the nutrition intervention model for Ethnic minority children. The research findings and learnings from the ECOSUN project will support and inform these reviews as the majority of the project beneficiaries were from Ethnic minorities.

A joint mission of NIN, World Bank and development partners is underway to review intervention models to scale up nation-wide. It includes ECOSUN as one model for consideration (See Annex 12 for Terms of Reference)

Strengthened dissemination of intervention model and results

Meetings to review progress of the project and disseminate the findings from the baseline analysis were held in January 2017 with local authorities of the 3 province's (People's committee, Department of Health, Department of Education, Women's Union, Farmer Association) as well as local health administration (Provincial Reproductive Health Centers, District Health Centers, and Commune Health Centers). The project was well received and also caught the attention of a local newspaper who published an article on January 1, 2017. Local newspapers have also reported on the official opening ceremony of the ECOSUN facility in November 2017.

As part of research dissemination with a global reach the team has presented at 12 international conferences including the Canadian Institute of Food Science & Technology National Conference and the Annual Meeting of the Canadian Association for Studies in International Development (CASID), and at the 22nd International Congress of Nutrition in May, 2018 (Annex), the Canadian Association of Food Studies (CAFS) Conference in May, 2017, the 21st International Congress of Nutrition in October, 2017, Food Secure Assembly 2016, Food Secure Assembly 2016 in Canada, Conference on Rural Studies in 2016, Nutrition Conference on Responding with the Private Sector for Greater Nutrition Impact, 2016 . Presentations covered the topics of Gender and Food Security, Private-Public Partnerships, Integration of Farmers into Food Value Chains, and the food systems model to scale-up production. Both Ryerson and NIN team members were able to attend most of these conferences together. The presentations are being drafted into 13 publications to be submitted to international journals. A list of presentations can be found in Annex 5, Slide 44. All the presentations are located in Annex 22.

Outcomes

As a result of the project activities and outputs to achieve Objective 3 we are contributing to:

- Increased reference to food security activities in NIN's activities and documents;
- Key tenets of a food security strategy for Vietnam;
- Strengthened dissemination of the intervention model and results in Vietnam;
- Strategic dissemination of project results to targeted stakeholders such as international organizations;
- Increased reach of project-evidence base to influence decision makers.

Due to the high-level nature of developing policy we recognize that the project contributes to an evidence-base and informing policy as opposed to being the center of the creation of national policies. However building the capacity in food security, enables NIN in advocating for incorporating principles of food security into national nutrition policies and programming.

Capacity Building

In the project, capacity building for the sustainability of the project's food systems model is being promoted through the exchange of ideas, information, and experiences, as well as the mutual support among Canadian and Vietnamese colleagues and experts. The following activities occurred with the intent of supporting Objective 4.

Objective 4: Strengthen capacity of Vietnamese entities (NIN, Vietnam Women's Union, universities, farmers' and women's organizations) in technical areas of food security programming to secure the sustainability of project models and results.

Training in Gender and Food security

Six participants from Vietnam (3 from NIN and 3 from the Vietnam Women's Union) completed the online course on Gender and Food Security offered by Ryerson University. Given the difficulties with following courses in English and online, the project did not offer other courses online in food Security.

A Gender and Food Security workshop was also held in Hanoi on February 21-23, 2017. Twenty-two participants from NIN, the Vietnam Women's Union, universities and NGOs attended. The workshop was facilitated by Ryerson and Firetail (a UK-based NGO) consulting over 3 days and saw enthusiastic discussions on how to integrate gender during implementation activities. Participants felt that the workshop was a good opportunity to build capacity in their organizations to become more intentional about gender. When participants engaged in an activity on actor profiles, it particularly contributed to a rich discussion on how gender roles in local communities could be better integrated into nutrition counselling at the Little SUN centers for more effective results. Participants also found the workshop useful in addressing some of the gender related challenges they faced while conducting the baseline research. As an example, they found that women preferred not to answer questions around sensitive matters such as domestic violence or answered as per what was perceived to be a socially acceptable answer. The group at the workshop also decided to incorporate a gender lens and revised the topical guide for the qualitative research. In the revised guide, a set of probing open-ended questions replaced specific set questions. This was done to allow the facilitator to focus on a topic and go deeper into issues affected by the language, culture and gender dynamics at play.

NIN reported that another side output of this training was that the staff that received the training are now able to work on project design of health promotion campaigns as opposed to mainly administrative tasks. Applying what they learned to program design means that future programming will begin to see nutrition programming with food security principles and gender elements incorporated into it. This is a promising direction towards gender transformation and one that has the potential to last long after the project has ended.

Exchange to Brazil

Five participants from NIN/NINFOOD and WVU including the Deputy Director of NIN visited Belo Horizonte, Brazil as part of knowledge exchange and best-practices in food security. Brazil's multi-sectoral approach to tackling nutrition and food security along with supporting frameworks such as the institutionalization of engaging civil society and public food procurement programs (e.g. National School Meals program), make it a model to be considered. During the visit, the project team visited the Federal University of Minas Gerais to learn about the work done in food policy at the national level, and engagement of civic society; the Secretariat for Nutrition and Food Security in Belo Horizonte to see and understand the variety of food security programs -many of which are required to procure from small-scale farmers (e.g. school meals program, popular restaurant, and the food bank); and a visit to a farmer supplying to government run public food procurement and distribution programs. Based on the school meal programs they visited in Belo Horizonte, the NIN team used the private partner's connection with school meal programs in Lao Cai to establish a supplier-buyer relationship in 21 local pre-schools (Annex 5, Slide 34).

Final Dissemination Workshop

The Final dissemination conference was hosted by NIN on June 18, 2018 in Hanoi. The workshop was attended by 114 participants, including the First Secretary of Development at the Canadian Embassy in Vietnam – Harriet Roos (Annex 26), Santiago Alba Corral (Associate Director, Food

Security at IDRC), Dr. Le Danh Tuyen (NIN Director), Nguyen Duc Vinh (Head of Maternal and Child Health at the Ministry of Health) and Dan Xuan Thanh, the Vice President of Lao Cai province and a strong proponent of the ECOSUN project and tackling child malnutrition.

Principle Investigator from Ryerson University Dr. Cecilia Rocha stressed the successful collaboration Ryerson and NIN had and commended NIN and NINFOOD for partnering with many diverse stakeholders ranging from private sector, to agricultural departments and local health centers to implement the food systems approach on the ground (Annex 25).

Dr. Huynh Nam Phuong presented the project results (Annex 5) and Do Thi Boa Hoa, the Head of NINFOOD, presented the scaling-up process and marketing strategy (Annex 6). The private partner, Ms. Phung Thuy Dung, also spoke about her involvement, opportunities the partnership presented, and challenges faced.

Dr. Fional Yeudall spoke about the multiple learnings gained from collaborating on the two year project (Annex 13) and Principle Investigator from NIN, Dr. Nguyen Do Huy spoke about sustainability of the model and addressing the challenges encountered (Annex 5, slides 63-71).

The Gender component was addressed by Dr. Andrea Moraes who walked the audience through how the project strived to support women's empowerment but we first had to start with building institutional capacity to do so. Some examples mentioned were: improving women's agency in agriculture and food production through access to training; and needing to address underlying gender and social norms. We realized that there is a transversal nature of gender in food systems and came to understand that it is a continuous learning process (Annex 14).

The information gathered from the workshop in conjunction with the discussions with stakeholders during the site visits will be used to create opportunities to further promote the ECOSUN products among communities across Vietnam.

Among the attendees at the dissemination workshop were representatives from international organizations (HealthBridge, Save the Children, Plan, FAO and World Vision), the Vietnam Government (Ministry of Health), academia (Hanoi Medical University, Namdinh Nursing University), and official representatives from the provinces where the project is to be implemented (Provincial People's Committees, Departments of Health, Reproductive Health Centres, District Health Centres Commune Health Centres, Education Department, Agriculture Department and Agriculture promotion Centres). When compared to the public launch the stakeholders engaged came from a diversity of fields (as opposed to solely health). This can be attributed to the comprehensive nature of the food systems model that necessitates partnering and engaging a variety of sectors. Many of these provincial officials also visited the SSFP, Little SUN centers and farming collective. They were impressed upon seeing the project working in its entirety. The Agenda and a full list of participants at the Dissemination Workshop is given in Annex 15 and 16.

The event was also covered by the press and samples of the media reports (Annex 17) are included with this report.

Community-level capacity to initiate and sustain food security programming

The NIN team and private partners participated in a day of knowledge sharing and visited food security programs in Toronto during the project review meetings in May 2018 (Annex 18). They visited school nutrition programs in one Public School, Toronto Public Health department and Foodshare - a local organization that supports schools with distribution and logistics of the meals. By seeing this model (which has a completely different mechanism from the Brazil model), NIN will be able to get a sense of alternative strategies, funding mechanisms as well as draw their own conclusions of what works well and what doesn't.

Supporting students

NIN hosted 2 PhD and 2 Masters Students who have done research as part of the ECOSUN project. The students came from Belgium, Vietnam and Australia.

Proposals for further collaboration and funding

Ryerson University submitted a preliminary intent application in response to Global Affairs Canada's call for proposals to the Small and Medium Organizations Innovations Fund (Annex 19). Identifying NIN and NINFOOD as local partners, the project team is proposing to scale-up up the ECOSUN model by setting up similar food system models in South and Central Vietnam.

VWU submitted a proposal to the Canadian Embassy in Vietnam to create a food security and gender assessment tool (Annex 20). The initiative and effort on the part of the partners show their growing understanding and application of the principles in technical areas of food security.

NIN created job descriptions to host Food Security interns as a partner for Ryerson's submission to GAC's International Youth Internship Program. Although the application was rejected it opened the way for other opportunities. Ryerson and NIN applied to Global Affairs Canada-ASEAN Scholarships and Educational Exchanges for Development (SEED) Program and were successful. PhD student Tran Chau Quyen, will do part of her research at Ryerson University under the supervision of Dr. Sharon Wong from the School of Nutrition.

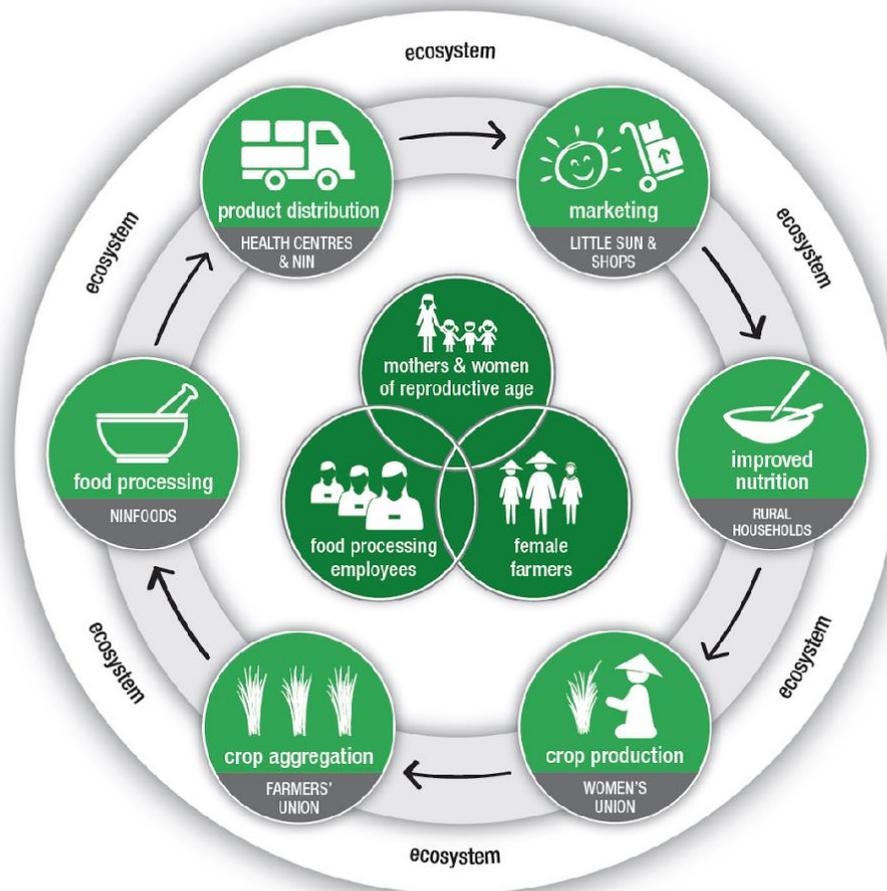
Outcomes

The project activities and outputs to achieve Objective 4 has led to the following outcomes:

- Entrenched technical capacity of key Vietnamese leadership on food security programming
- Established community-level capacity to initiate and sustain food security programming
- Establishment of a model for scaling up production and use of NIN's foods in other provinces of Vietnam
- Dissemination of research results through the final dissemination workshop involving project partners, stakeholders and policy-makers (including all objectives, key recommendations, for future scaling up in Vietnam and other countries.)

Synthesis towards AFS themes

The conceptual model of the project's food systems approach (below) illustrates how the project impacts all of the AFS themes:



Increasing agricultural productivity (Availability): by training and supporting small-scale farmers in adopting sustainable agricultural practices.

450 farmers in 9 communes from across the 3 provinces were trained in Good Agricultural Practices (GAP) in July and August of 2017. They were provided with seeds to apply what they learned and were also given ECOSUN instant porridge samples along with nutrition information

(detailed in the technical report submitted October 31, 2017).

Improving access to resources and/or markets and income (Accessibility): by establishing the local food processing plant that will serve as a stable purchaser, creating a value chain for local crops and contributing to successful partnership models i.e. through private-public sector collaborations.

The private sector partner Thuy Dung Co. signed a contract with a local agricultural co-op in Bat Xat commune comprising of 17 local family farmers that use Good Agricultural Practices (GAP). Carrots, pumpkin and Sweet Leaf will be purchased from the local co-op to produce the ECOSUN Fortified Complimentary Foods (FCF). The women of the households are subsistence farmers who had recently formed the co-op. The project implementers from NIN and NIN FOOD approached them with the idea of selling their produce to make FCFs. The presence of the SSFP as a stable buyer has given them the impetus to grow their produce for selling purposes (Annex 5, slide 37). As a cooperative they have 8 hectares of land to grow on.

Improving nutrition (Utilization): by the counseling of pregnant women and young mothers on nutrition and IYCF practices; by increasing local availability of fortified foods.

15 Little SUN centers provide IYCF counseling services. They are located in convenient and accessible CHS. They are well equipped with anthropometric measurement tools, cooking sets and IEC materials. 36 health workers at these Little SUN centers have been well trained on preparing and promoting the ECOSUN products (instant porridge and vegetable powder). They add it to other local foods so that they will be able to teach mothers about dietary diversity and appropriate child weaning practices during the IYCF counselling sessions at the CHS 2 times a month. The nutrition counseling services are also integrated with regular activities of the clinics (See Annex 5 for photos). The Little SUN centres also send monthly reports on sessions with clients to document that the activities are being implemented as planned.

Informing policy: by working with local, provincial, and national, health service officials and other policy-makers.

NIN has successfully collaborated with government, health service officials and civil society organizations at the provincial and commune level to conduct workshops in Good Agricultural Practices, set up Little Sun counselling centers and supply to school meal programs in kindergaartens. They have also identified the opportunity to partner with the local Women's Union to reach ethnic and indigenous minorities. There have been multiple consultations with local governments and communities in each of the three provinces as opportunities to promote principles of good governance. A variety of stakeholders have been engaged through review meetings and focus groups. This has included 24 policymakers, 22 agricultural extension staff and 63 farmers). Attention to specific needs of ethnic minorities in the areas of project implementation is also highlighted in our approach by looking at adapting IYCF materials for minority groups.

In addition the market launch and opening ceremony of the SSFP engaged local government

officials and civil servants from the provincial, district and commune levels.

The official closing of the project was styled in the form of a dissemination workshop which engaged 114 provincial, national and international stakeholders. Presentations on the ECOSUN model, product line, private-sector partnerships, research components and project results to these stakeholder create opportunities for further support, buy-in and collaboration.

Project Outputs

The project team has prepared a number of outputs to date which include:

- Promotional ECOSUN material (for local consumers) – see photos Annex 6
- Agricultural training material (for women farmers) – Annex 1
- You Tube video (thanking Canadians): https://youtu.be/rv-CqJ_BFDc
- Promotion Flyer (general public and field practitioners) – Annex 21
- Posters (academics) –Annex 22
- Drafts of research papers list (researchers, policy-makers and practitioners) –Annex 23
- Newsletter articles (students and academics) – Annex 17
- Presentations (researchers, practitioners and funders) – Annex 22

Challenges

Challenge 1: Product Marketing and Distribution

Lao Cai, Lai Chau and Ha Giang are mountainous regions and many areas where the target beneficiaries reside have limited road access. This made finding distributors difficult within the short time frame of the project. However as the project revolves around testing a food systems model while partnering with private sector – it is a “learn as you go” process. Furthermore through the 10 year agreement signed by Thuy Dung Co. and NINFOOD, the partners will continue to build and refine the marketing strategy to increase product demand. So far NINFOOD has leveraged the Little SUN nutrition centers to promote the product and find local vendors within close proximity of the centers to sell it. As the private partners have mostly worked with the government sector in the past, her business networks are mainly hospitals and schools. Hence the plan will also include expansion to hospitals, pre-schools and little SUN centers in other provinces. Furthermore the partners plan to also sell in urban areas (where distribution will be much easier) where the product can be sold at a slightly higher price. This price discrimination strategy will help offset costs in the rural areas, which could be higher due to transportation expenses.

Challenge 2: Gender Integration

Dao Phuong, the gender representative from the Vietnam Women’s Union who worked on integrating gender into the project, moved to a different role within her own organization mid-project. As a result she could no longer be involved as an official representative of the WU. Although NIN has worked with different representatives from the Women’s Union since, the relationship between the two institutions never really took off. The gender representative at

Ryerson, Andrea Moraes also provided some input to support NIN with their strategy to integrate gender into the programming (Annex 27). As different components of the project began to be implemented, NIN found that working with local Women's Union departments would be more relevant particularly with those representatives working with Ethnic minorities.

Challenge 3: Partnering and negotiating with many different stakeholders

Partnering with the private sector, putting out a call, equipping and operationalizing small-scale food processing plants through private tenders were completely new areas for NIN staff. The bidding procedure and laws in Vietnam presented an administrative challenge as they translate into complicated and time-consuming processes. Despite presenting a learning-curve for the project team members and delaying operationalization of the SSFPs, NIN staff is now familiar and has the know-how to partake in future bidding for tenders to partner with the private sector. The private partner Thuy Dung Co. also noted many challenges in the start with partnering with government (for example, in most cases a private business wouldn't need to register the facility like in this case), but as the partnership proceeded, the roles, responsibilities and timelines became clarified.

Recommendations to IDRC

While this was a very cost-effective, successful project, it could have benefitted from a longer timespan for implementation. Thus, for similar projects, we recommend a longer period.

We had great support from IDRC throughout the implementation of the project. Their flexibility allowed us to revise and adapt some original plans so as to meet the objectives proposed. Hence our recommendations are to reinforce the need for this flexibility, trusting the Canadian and Vietnamese partners in their decision-making.

The project was developed and undertaken under a new partnership for both the Centre for Studies in Food Security, Ryerson University, and the National Institute of Nutrition (NIN) in Vietnam. As such, there were a number of challenges to overcome, mostly in communications, due to language, distance, time zones, and cultural/practice differences. The presence of a Canadian research assistant at NIN, who could speak Vietnamese and had good knowledge of the country and its people, was important in providing a bridge between the two teams and reduce these challenges. It was also important to have an early Inception Workshop in Vietnam, which created the opportunity for more close interactions among key team members, and for consolidating a common vision of the project. The trust and respect we developed in the early days were essential in giving us confidence that we would achieve our goals despite some occasional setbacks. We recommend that, as much as possible, one or two meetings of the full team happen in the first few months of projects to consolidate the partnership.

As a result of this IDRC-funded project, we have developed a stronger research partnership between Canadian and Vietnamese scholars, particularly in the area of food security. We are confident that collaborations between the two groups will continue to increase in years to come.

Annexes

Annex 1 Agricultural training material
Annex 2 Public private partnership contract agreement
Annex 3 Government Certification of SSFP
Annex 4 News article SSFP opening
Annex 5 NIN Final Report
Annex 6 NINFOOD Product Report
Annex 7 Market feasibility report
Annex 8 Baseline Survey Questionnaire
Annex 9 Nutrition Plan of Action for Nutrition (NPAN) 2018- 2020
Annex 10 Prime Minister's Directive on Enhancement of Nutrition
Annex 11 Acceptability trials
Annex 12 World Bank-Vietnam Multisectoral Nutrition Action Plan (MNAP)
Annex 13 Final Dissemination workshop – Lessons Learned
Annex 14 Final Dissemination workshop – Gender
Annex 15 Final Dissemination workshop – Agenda
Annex 16 Final Dissemination workshop – Attendee List
Annex 17 Media and newsletter links
Annex 18 May Technical Meetings Agenda
Annex 19 SMO Proposal to GAC
Annex 20 Project Proposal by WVU
Annex 21 Promotional poster flyer
Annex 22 Project presentations
Annex 23 Drafts of research papers
Annex 24 Gender Analysis
Annex 25 Dissemination workshop Speech by Dr. Rocha
Annex 26 Dissemination workshop Speech by Embassy of Canada
Annex 27 Gender recommendations
Annex 28 ECOSUN Consumer numbers