

From Field to Fork: Nutrition and Food Security in Uplands of Vietnam and Thailand

Third Interim Technical Report

Project Title:

From Field to Fork: Nutrition and Food Security in Uplands of Vietnam and Thailand

IDRC Project: 107324

Research Organizations involved in the study:

- Center for Agricultural research and Ecological studies , Hanoi University of Agriculture (CARES-HUA)
- Center for Agriculture Forestry Research and Development (CARD) – Hue University of Agriculture and Forestry
- Knowledge Support Center-Greater Mekong Sub-region (KSC-GMS), Faculty of Social Sciences, Chiang Mai University
- HealthBridge Foundation of Canada

Location of Study:

- Son La province, Vietnam
- Hue, Vietnam
- Chiang Mai, Thailand

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Abbreviations

AFS	Agriculture and Food Security
CARD	Center for Agriculture Forestry Research and Development
CARES	Center for Agricultural Research and Ecological Studies
CMU	Chiang Mai University
FGD	Focus Group Discussion
HB	HealthBridge Foundation of Canada
HBV	HealthBridge Foundation of Canada, Vietnam Office
HH	Household
HUA	Hanoi University of Agriculture
HUAF	Hue University of Agriculture and Forestry
IDI	In-depth Interview
IDRC	International Development Research Centre
IRB	Institutional Ethical Review Board
KII	Key Informant Interview
KSC-GMS	Knowledge Support Center-Greater Mekong Sub-region
MPH	Master of Public Health
NGOs	Non-Government Organization
NIA	National Institute of Agriculture
RC	Research Coordinator
RO	Research Officer
SRI	System of Rice Intensification

1. Executive Summary (1 page max.):

The third project period started with an in-person Project Coordination Workshop in Hue in March 2014 at which the three research teams met to develop the intervention protocols, based on the findings of the baseline research. Three interventions were selected to apply in all three sites including: 1) home garden improvement to provide nutritious vegetables; 2) chicken raising for eggs to provide an animal-source food for children; and 3) nutrition training to improve mother and care takers' understanding of good feeding practices. Additionally in the Son La site, the research team introduced a System of Rice Intensification (SRI), vermiculture to provide chicken feed, and recently, a variety of potato from the Netherlands. Generally, all introduced interventions have been progressing well in the three sites.

In Son La, a workshop was organized with farmer households (HH) selected for participation in the interventions in May 2014 in which HH survey results and proposed interventions were presented to farmers. Participants were also asked to select 5 good farmers to participate in and learn from project demonstrations, and then willingly share their knowlege to the other farmers. After the workshop, interventions were planned and conducted including SRI rice and vermiculture demonstrations; technical training on chicken raising and nutrition practices; and provision of several vegetable varieties and chicken breed to 85 selected HHs (2 additional HHs participated after the mid-term assessment).

In Hue, interventions started in Feb2014 and are currently underway. A workshop was organized in Hong Ha and Huong Nguyen communes with 202 HHs who have children under 5 years old, as well as commune authorities, farmers' union, and women's union, to discuss and introduce a number of agricultural interventions. At the first stage, HHs from intervention villages were selected based on certain criteria, specifically: having children under 5 years old, willing to participate in intervention and being able to manage resources and share lessons learnt with others. As of March 2015: a) 35 HHs have participated in chicken raising starting in December 2014; b) 41 HHs have participated in home gardens producing 10 species of nutritious vegetables that are appropriate for site conditions (starting from October 2014) with additional 10 HHs copying this model with their own budget; and c) 60 HHs have received nutrition training. Additionally, two workshops on nutrition training were provided to non-participating HHs in intervention villages.

In Chiang Mai, stakeholder workshops were organized in February and April 2014 to present baseline findings and discuss potential nutrition-sensitive agriculture interventions with local authorities and farmers. Ethics approval for the intervention protocol was obtained from Chiang Mai University's Human Experimentation Committee in August 2014. Agricultural interventions (improving chicken raising and home gardens) and nutrition interventions were both started in November 2014, and are being continued until April 2015. Project stories have been published as blogs, posters, and research newsletters. Land use maps of the 2 studied sub-districts were also created.

The research teams provided participating HHs with chicken breeds (already vaccinated) and chicken feed, vegetable plants and materials for shelter construction (plastic nets, fence), and nutritious food samples for demonstrations during nutrition training (eggs, vegetables, cooking oil, etc.). Research teams and local coordinators conduct regularly monitoring visits to participating HHs providing further technical support, and gathering information about nutritional products collected and used and problems experienced during the intervention.

2. The research problem (1 page max.):

Malnutrition and food security remain serious problems in both Vietnam and Thailand, particularly amongst ethnic minorities living in remote, upland areas. The prevalence of underweight children is 20% in Vietnam and 17% in Thailand, with rates in both countries being higher in the poverty-stricken highland-minority communities. Low productivity and lack of food diversity both contribute to food insecurity in these regions. Food insecurity in all study sites is further threatened by the transition from traditional shifting cultivation systems (also known as Swidden or slash-and-burn) to stationary agriculture. However, sedentary farming has additional consequences.

Thus, there is a need to identify long-term, sustainable solutions to increase local food availability in these vulnerable upland areas of Vietnam and Thailand. It is also becoming increasingly accepted that, in order to positively impact nutrition, agriculture interventions must be integrated with nutrition from the very beginning; that is, they must be *nutrition-sensitive*. However, there is very little evidence on effective nutrition-sensitive agriculture solutions in the uplands of Vietnam and Thailand. The overall objective of this research project is to identify local and practical solutions to improve nutrition and food security amongst smallholder farmers in rural upland communities in Vietnam and Thailand, through nutrition-sensitive agriculture solutions. The research is being conducted in three sites: Mae Chaem district of Chiang Mai province in northern Thailand, A Luoi district of Hue province in central Vietnam, and Yen Chau district of Son La province in north Vietnam. The project has two stages: Stage 1 assessed the nutrition and agriculture practices in the three sites and Stage 2, which is currently underway, involves developing and testing nutrition-sensitive agriculture solutions.

The research results will have important local policy implications to ensure that smallholders have an enabling environment for implementing nutrition-sensitive agriculture solutions to sustainably improve their food supply and health. The results will also contribute to the global knowledge base of the importance of effective strategies for integrating agriculture and nutrition to ensure a positive impact on nutrition. Strengthening this knowledge base is essential for providing practical guidance to donors, NGOs, policy makers and rural farmers themselves to develop and implement solutions that sustainably reduce malnutrition.

3. Progress towards milestones (3 pages max.):

- **Analysis of data on agriculture and nutrition situation across the three sites completed:** Data collected in the baseline survey on agriculture and nutrition situation were analyzed and report for each of the three sites was completed. Reports from the Son La and Hue sites have been previously submitted. A report from the Thailand site is included in Annex 2. HealthBridge is currently working on a synthesis report describing the situation across all three sites and we expect to have a draft completed in the next few months.
- **Nutrition sensitive agriculture interventions and appropriate messages identified:** Three interventions were selected to apply in all three sites: 1) home garden improvement to provide nutritious vegetables; 2) chicken raising for eggs to provide animal-source food for children; and 3) nutrition training to improve mother and care takers' understanding of good feeding practices. In addition, Son La site introduced System of Rice Intensification (SRI), vermiculture to provide chicken feed, and a variety of potato from the Netherlands.

- **Mid-term assessment of the intervention design, monitoring and implementation plan:**
 - *Son La site:* Mid-term assessment of the intervention was conducted in combination with the monthly monitoring visit in January 2015. In general, all interventions work well and the farmers are interested in continuing the models. Chicken raising, seasonal vegetable planting and vermiculture are more attractive than previously used methods, and other families in the commune have been copying them in their own capacity. Three out of the 5 HHs who applied SRI in rice planting have shown a 10% increase in production. Although 1 HH has no increase and 1 HH has a decrease in rice production, they are willing to continue with the second trial of the research. Farmers requested other vegetables with the change in season (potato) and some vitamin-rich fruit species such as papaya, guava, and grapefruit. The teams were encouraged to provide all eligible families in the intervention villages with nutrition training.
 - *Hue site:* Mid-term assessment of the interventions was conducted in combination with the monthly monitoring visit in December 2014 after about 3 months of implementation. Participating families were interested in the interventions and are committed to continuing with the models. Families have been applying the practices taught in the nutrition training. Other HHs have expressed interest in participating in the interventions, so the research team planned to expand the intervention models to other HHs in February and March 2015.
 - *Chiang Mai site:* The interventions started in Chiang Mai in late November 2014 after receiving ethical approval from the Human Experiment Committee of Research Institute of Health Sciences (Chiang Mai University). The research team conducts monthly intervention monitoring and report that the interventions are progressing well. There are some challenges for vegetable planting in the dry season and the team and communities have been discussion solutions for improving water resources. Other organizations/ groups (local health volunteers of Mae Chaem district and Chiang Mai University) have been watching the trials and approached CMU for a proposal to scale-up successful models in other villages.
- **Pilot testing of nutrition-sensitive solutions in each site completed:** Pilot testing has been completed. At this stage, solutions are in process and will be completed in the coming months.
- **Feasibility and affordability of the solutions documented:** Feasibility and affordability of the solutions was considered at the outset given that the teams only selected nutrition-sensitive agriculture solutions which were feasible in the project sites and affordable to the local farmers. This is continually assessed during monthly monitoring visits, and the team actively investigates solutions to any arising challenges. The finding that farmers in each of the three sites are planning to continue the solutions beyond the project supports that the notion that the solutions are feasible and affordable. This is further supported by the fact that non-intervention HHs are asking to participate or have already started copying the methods on their own.

4. Synthesis of intervention activities and results (8 pages max.):

The main research activities and results during this reporting period pertain to developing and testing the identified nutrition-sensitive agriculture solutions. The corresponding objective of this stage is Objective 4: To develop and test affordable and sustainable nutrition-sensitive agriculture practices that improve the nutrition and food security of participating households.

The research teams have shared their baseline findings about the local nutrition and agricultural situations in the three sites. Information across the three sites was shared and discussed in a joint in-person planning meeting in March 2014 to identify commonalities and differences amongst the sites, and potential nutrition-sensitive agriculture solutions to test. Three interventions were selected to apply in all three sites including: 1) home garden improvement to provide nutrient-rich vegetables; 2) chicken raising for eggs to provide a animal-source food for children; and 3) nutrition training to improve mother and care takers’ understanding of good feeding practices. In addition, the Son La site introduced System of Rice Intensification (SRI), vermiculture to provide chicken feed, and recently a variety of potato from the Netherlands. Generally, all introduced interventions have been progressing well in all three sites.

Son La site:

Chicken Raising

Chicken were provided to farmers in Sept 2014. By Jan 2015, chicken weight ranged from 1.7 – 2.5 kg/head and 10% of chickens were laying eggs. A total of 350 and 420 eggs were produced in Chieng Pan and Chieng Dong, respectively. Some households (HH) also started chicken hatching. In addition, some HHs are using the eggs for consumption by children. The Table below summarizes the chicken raising status of 85 HHs.

Village	No. of chickens provided	No. Survived	No. Died
Luong Me	190	176	14
Huon	70	66	4
Dong Tau	313	284	29
Keo Po	80	59	21
Pung Khoai	40	26	14
Than	110	99	11
To Pang	30	28	2
Chieng Thi	70	64	6
Chieng Phú	30	30	0
Phat	30	30	0
Total	963	862	101

Vegetable Production

Vegetables	Results
<i>Leafy sweet potato</i>	<ul style="list-style-type: none"> - 70 HHs accepted and planted sweet potato (15 HHs did not participate as they don't have land and some have no habit of using this vegetable for human consumption). - At the time of this report, 58 HHs remain with 3-7 sq.m of sweet potato. The remaining 12 HHs had their crops destroyed by cattle.

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Vegetables	Results
	- One farmer in Huon village extended the crop to 50 sq.m, for HH consumption and sell to other local HHs.
<i>Moringa</i>	- 53 HHs remain 3-5 moringa trees survived. Others were destroyed by cattle. - HHs harvest the crop for consumption
<i>Brassica</i> (<i>Broccoli & Chinese cabbage</i>)	- 85 HHs were provided 2 vegetables (broccoli and Chinese cabbage): 150 gram of seed/HH. - 82 HHs planted vegetables after receiving seeds. These start harvesting vegetables for consumption. 3 H'mong HHs have not yet plant vegetables, because of no water.
<i>Potato</i> (<i>Rosagol; Erika; Asenal; Destiny</i>)	- 455 kg of potato seed were provided to 35 HHs (with total area of 2,250 sq.m). - The rest (195 kg of seed) were provided to district department of agriculture.

Vermiculture

- Vermiculture has been applied by 5 HHs and is harvested 2-3 times per week. Participating HHs monitor the progress and regularly update the research team.
- At present, HHs are being taught techniques for protecting vermiculture during the cold winter season.

SRI Rice Demonstration

Participating farmers are pleased with the results of the SRI rice. According to the 5 farmers, SRI rice notably achieved (as compared to farmer's previous rice practices):

- Reduction of 50% seed.
- Reduction of pesticide applications.
- Increase in yield (3 HHs).

Primary results of SRI rice demonstration

Location	Area (m ²)	Rice varieties	Harvest (kg)	Yield (ton/ha)	Yield compared with last year
Chieng Thi, CP	450	RVT	230	5,11	-10%
Ban Than, CP	500	Sticky 9603	335	6,67	+10%
Luong Me, CD	450	Sticky 97	346	7,69	+10%
Keo Po, CD	600	Local var	375	6,25	0%
Dong Tau, CD	400	Sticky 97	261	6,53	+10%

Nutrition Training

- Representatives of 81 HHs participated.
- Key messages were developed on breast feeding practices and complimentary feeding and were conveyed through discussion, video clip, and cooking demonstrations.
- Participants practiced cooking 8 recipes for children using locally available nutrients/foods.

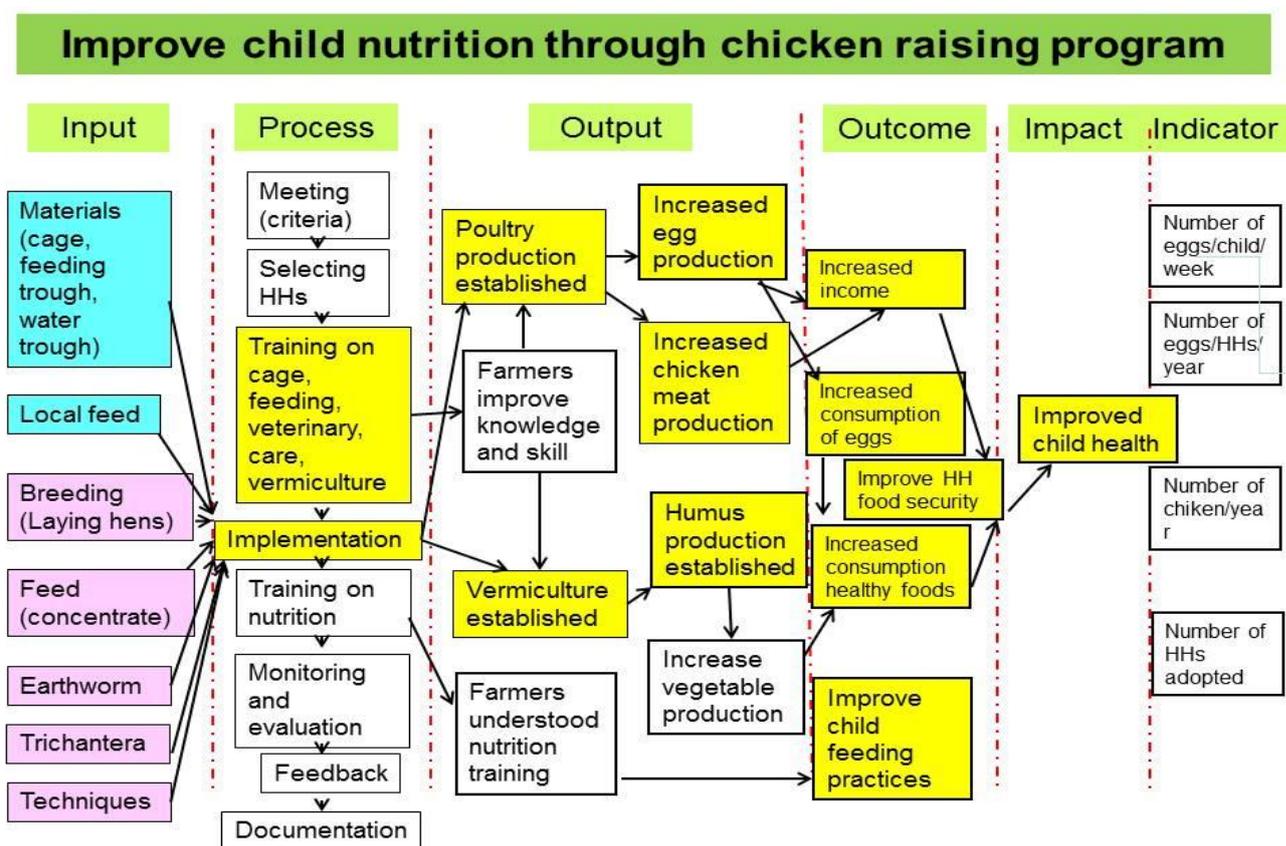
Requests from participating HHs

- Technical training
 - 75 HHs requested training on SRI
 - 29 HHs requested training on vermiculture
 - 60 HHs requested training on chicken vaccination
 - 23 HHs requested training on chicken production & multiplication
- Vegetables
 - 69 HHs requested leafy pumpkin varieties
 - 63 HHs requested Brassica varieties
 - 55 HHs requested Chinese spinach
 - 30 HHs requested additional moringa

Hue site:

Chicken Raising

Conceptual framework



At the pilot stage, 12 households were selected from the Cotu ethnic group that a) have children under 5 years old, b) have previous experience of raising chickens and c) are able to provide food for the chickens. The participating HHs were assessed on their ability to apply this model (food resource, place for setting chicken cage/ hut, etc.). Participating HHs were guided about how to make chicken cages that are cool to enable hens to grow and lay eggs and provide good

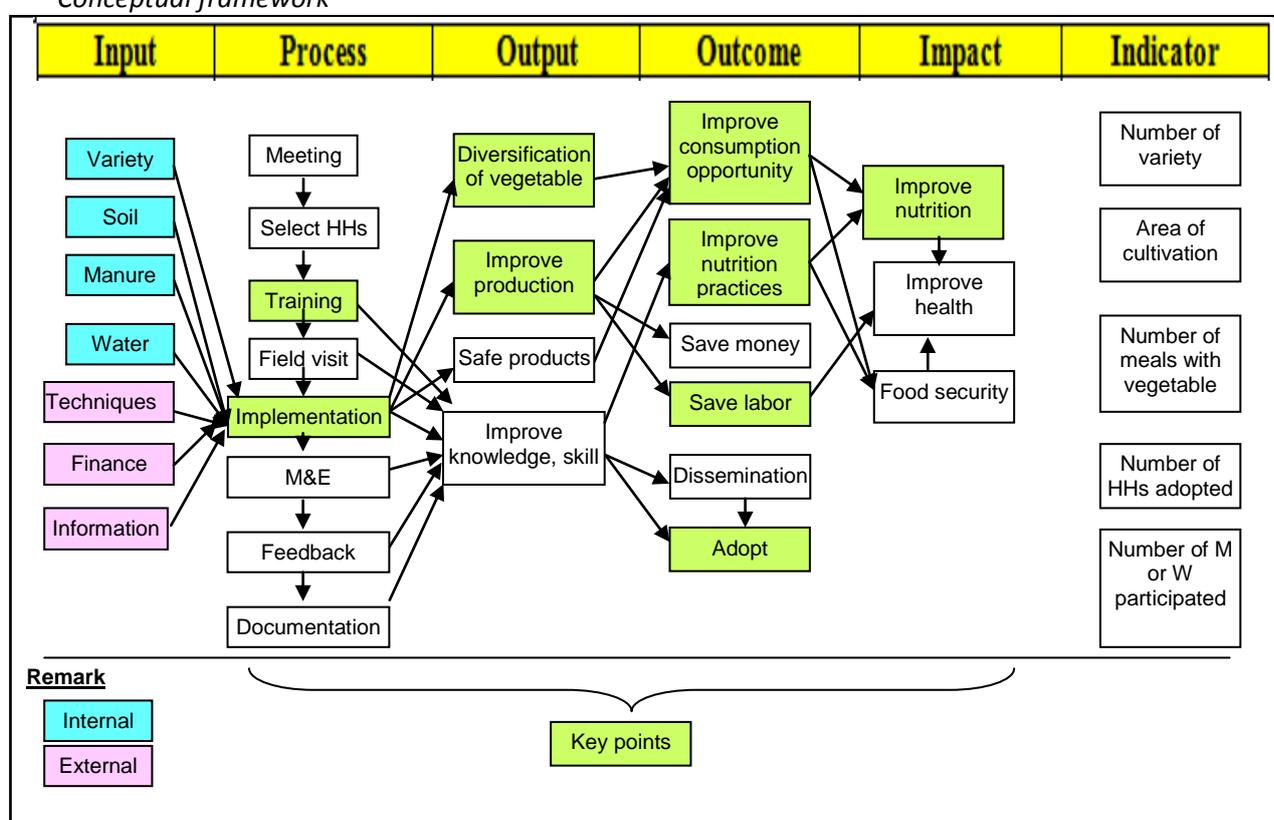
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conditions that protect chickens from harm (e.g. using nets). The HHs were also provided Trichantera tree for chicken feeding (20 trees/HH), 1 water trough, and training on how to prepare food for chickens and raise hens for eggs. Chicken breeds were purchased locally, vaccinated and provided to the participating HHs (5 hens and 1 rooster/family). After 12 weeks of age, the average weight was 1.2 kg for hens, while the cocks reached 1.4 kg. Hens started producing eggs (average 45 eggs /HH). The families were asked to monitor and record eggs collected, eaten or sold.

In late December 2015, more households were enrolled in applying this model. Non-participating (not-yet-participating) HHs seemed interested in this model and wanted to participate. The team continues to do monthly monitoring and document information that will also be used for the final evaluation.

Vegetable Production

Conceptual framework



At the pilot stage, which started in mid-September 2014, 14 HHs from population groups of Co Tu, Pa Ko, Ta Oi and one kindergarten were recruited for this model. Each HH was required to have children under 5, minimum area of 50ms, and available water source and labour for gardening. A total of 11 varieties of vegetable were selected, and HHs were fully informed about their nutrition value and requirements for planting :

No	Name in Vietnamese	Name in English	Remark
1	Rau bõ ngót	Sweet Leaf Bush / Sauropus	Original plant
2	Rau khoai	Sweet potato	Original plant
3	Rau mồngơi	Malabar nightshade.	Planted
4	Rau dền	Amaranth	Planted
5	Rau cải	Cabbage	Planted

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No	Name in Vietnamese	Name in English	Remark
6	Cà chua	Tomato	Not yet
7	Rau muốngcạn	Water morning glory	Planted
8	Rau xàlách	Salad	Planted
9	Đậucôve	French bean	Planted
10	Cà tím	Aubergine	Planted
11	Rau Tần ô/cải cúc	Garland Chrysanthemum	Planted

The participating HHs were trained in the design of the garden, fencing, land preparation, seed treatment, planting and care-taking techniques. They were provided a net for fencing and preventing rain while still allowing a high volume of sunlight, microorganism fertilizer, NPK (Nitrogen, Phosphorous and Potassium) fertilizer, steel wire, catgut and seeds.

A midterm assessment in early December 2014 found that vegetables for which the HHs produced seedling by themselves have not grown well due to heavy rain and typhoon. As a result, the research team changed their strategy to provide HHs with seedling in mid-December 2014. At the time of this report, there are a total of 27 HHs (including kindergarten and 12 new HHs) participating in this model and all the vegetables are in good status, although the weather has not changed much (it was still cold and raining in January). The lessons learnt from pilot vegetable production at this stage are: 1) Change of habits and practices of ethnic minority people should be patiently implemented step by step; 2) Providing seed or seedling should be considered, based on household characteristics and weather conditions; 3) Farmer to farmer approaches should continue to be used in transferring cultivation techniques.

Nutrition Training

HHs with children under 5 years old from intervention villages, especially the HHs' participating in chicken raising and vegetable planting, were invited to the nutrition training. Key contents of the training were: Nutrition for pregnant and lactating women, for children at different ages and when sick; and monitoring the growth of children. Total of 60 HHs have received training. Participants had opportunities to practice cooking different recipes from provided ingredients/ foods, such as vegetables, eggs, fish, and pork, which are common and available in the communes.

Chiang Mai site (update Jan 2015)

Participatory meetings with local stakeholders, community leaders, village health volunteers and villagers about the proposed agricultural and nutrition intervention strategies in Mae Chaem District were organized in early September 2014. The selected interventions were chicken raising, home garden improvement to include vegetables, and nutrition training, as in the other two sites.

Workshops were conducted in early November 2014 to provide training on: high nutrient plants; the importance of animal-source food (egg) for children under 5 years; breast milk and breastfeeding; and complementary food using local materials. The selected interventions were started right after the workshops and will be continued to April, 2015. The research team performs monthly monitoring of the interventions, and also follow up on understanding and application of the nutrition knowledge.

Chicken raising

Each HH is provided 5 hens and 15kg of chicken feed each month for 6 months (from November 2014 – April 2015). Chicken raising is going well and chickens are laying eggs regularly. The team uses monthly monitoring forms with farmers to document production and consumption of foods (how many eggs are produced and how many are given to children).

Home garden improving

Each participating HH was provided with seeds for 5 vegetable species including Yard long bean, Chinese cabbage, Ivy gourd, Thai eggplant, and Chili pepper. Some HHs are having difficulty growing vegetables during the dry season; the research team is looking into solutions.

Nutrition training

Training has been provided to participating HHs on the importance of breastfeeding, animal-source foods (eggs), and appropriate infant and young child feeding practices. Quizzes and games are used to facilitate learning. Training was also provided on recipes and food preparation using food produced through the interventions.

Table 1. Total number of pre-intervention households

Village	Karen group	Lua group	Assigned in the research	Total HHs participate in interventions
Ban Thup Sub-district				
Moo.2 Ban Mut Long	-	15	Control	
Moo.10 Ban Kong Kai	17	-	Control	
Moo.13 Ban Mae Ki Muk Noi	22	-	Intervention	22
Moo.6 Ban Tung Kae	36	-	Intervention	36
Pang Hin Fon Sub-district				
Moo.7 Ban Pae	-	22	Control	
Moo.9 Ban Mae Hae Tai/Se Do Sa	23	-	Control	
Moo.8 Ban Kok Noi	-	16	Intervention	16
Moo.6 Ban Ho	-	24	Intervention	24
Total	98	77		98

5. Project implementation and management (1 page max.):

(i) Financial and administration challenges:

- There are no financial or administrative challenges to report.
- Administrative change: Mrs. Pham Thi Mai Huong, Research Coordinator of CARES was replaced by Ms. Nguyen Thi Thanh Huyen in Nov. 2014, and of Ms. Nhi, admin/financial support of CARD by Ms. Nguyen Thi Hong in Dec. 2014.

(ii) Workplan for the next reporting period: The three sites will:

- Prepare for and conduct final evaluation of interventions.
- Integrate and analyze data within and across all sites.
- Develop and finalize evaluation report.

- Print leaflets, factsheets, and reports for dissemination of the results and recommendations.
- Organize dissemination workshops at each site and with all three sites.

6. Problems and Challenges (1/2 page):

- CARES: There are no problems to report.
- Hue:
 - Awareness of people: people still lack the initiative in implementing the model. In their minds, the model belongs to researchers.
 - Weather changes irregularly and in negative directions leading to problems in terms of implementing the models.
- CMU: There has been a problem communicating with the distant local communities using internet and phones due to weak signals in the remote areas.

7. Recommendations (1/2 page):

There are no recommendations to modify the research plan at this time.

ANNEX 1: MONITORING AFS EXPECTED OUTCOMES

This section should include highlights on how the project and its results are contributing to AFS program outcomes. It is not expected that every AFS project will respond to ALL of these outcomes. Do not repeat information that is reported elsewhere.

*Note: References to quantitative and qualitative evidence of the outcomes should be included as annex. A strong claim of an outcome should be supported by evidence.

- 1. New technologies and/or farming systems and practices.** How is the project leading to new and improved agricultural technologies and/or farming systems and practices that increase food production? (e.g. technologies and innovations; staple crops; crop-livestock interactions; agricultural water management; new seeds and plants)

In all sites in general, the teams have been introducing nutrient-rich vegetables, chicken hens for eggs, and nutrition knowledge on good feeding practices. The main point is that almost all recommended agriculture products are available in community but not commonly used by local people due to a) lack knowledge of their nutrient value; b) lack of skills and knowledge of how to cook/ prepare for eating; or c) the local seedlings produce poor yield.

Monitoring reports shown a good progress of the solutions in terms of increasing food production (particularly the SRI rice technique) and other HHs in the community express their desire to participate.

- 2. Dietary diversity & nutrition.** How is the project contributing to dietary diversity/balanced diets, particularly for women and children? (e.g. food safety practices and regulatory frameworks; food fortification; local nutritional needs)

In all sites, the nutrition-sensitive agricultural solutions being implemented were specifically selected to improve dietary diversity and intake of nutrient-rich foods, based on findings from a situational assessment. A key component of the solutions is providing nutrition training on diet, child feeding and food preparation to improve the diet of women and children. The research teams monitor and document the production and consumption of food by the families, as well as application of the nutrition knowledge, to assess the impact on the diet of women and children.

- 3. Engagement of Canadian researchers with Southern researcher organizations (for CIFSRF-funded projects only).** Is there increased use of Canadian knowledge and resources to address environmentally sustainable agricultural productivity and nutrition problems in developing countries?
- 4. Research groups.** How is the project contributing to stronger research groups for improved food security policies and decision-making?

All three research teams are very strong on agricultural aspects of the research, but less strong on designing agricultural interventions that are nutrition-sensitive.. Participating in this project will provide the teams with hands-on experience to improve their understanding and practice, and the findings will enable the teams to provide recommendations to policy makers about food security in the upland areas. HealthBridge Foundation of Canada (HB), has expertise in designing and evaluating nutrition-sensitive agricultural solutions designed to improve nutrition and food

security, and has been providing technical support to the teams throughout the project through annual workshops, field monitoring as well as regular skype meetings and email communication.

This cross-country and cross-site research will strengthen the research teams within each of the four organizations from Canada, Vietnam and Thailand, and will build partnerships between the research organizations for future research and bridge the teams to specialists in other sectors such as ecology, nutrition, agriculture and economy.

- 5. Food distribution.** How is the project contributing to more equitable food distribution for food security? (e.g. more equitable access to quality food)

The interventions, if successful and well adopted by local farmers, will be scaled up to larger areas, providing more farmers with access to techniques they can use to improve production and access to nutrient-rich foods. Additionally, the findings and recommendations will be shared with local authorities and policy makers to promote the development and adoption of policies that promote more equitable access to quality food.

- 6. Food processing and storage.** How is the project contributing to improve post-harvest food processing and storage techniques for food security? N/A

- 7. Risk-mitigation.** How is the project contributing to better risk-mitigation for food security? (e.g. mechanisms that cope with the impacts of climate change, and other shocks such as food price volatility). N/A

The study will identify sustainable practices for improving local availability of nutritious foods, so that the local people will not be dependent solely on markets and therefore, will be less vulnerable to food price volatility. The proposed agricultural interventions will be assessed for feasibility and sustainability, including their ability to adapt to environmental threats through the end-line evaluation.

- 8. Access to resources.** How is the project contributing to improved access to resources for food production and security? (e.g. land tenure, extension and credit, market access).N/A

- 9. Income generation.** How is the project contributing to improving vulnerable/poor people's ability to purchase more and better quality food, in particular for the benefit of women and children?

- 10. Policy options.** How is the project influencing the development and implementation food security policies?

The project will involve and share findings with central and local stakeholders, and will be used to advocate for policies that support smallholders in implementing sustainable and effective nutrition-sensitive agriculture solutions. Formulation for policy advocacy will be discussed during the design of the end-line survey in the next period.

- 11. Information and Communication Technologies (ICTs).** Has the use of ICTs contributed to increase access to information and improved food security for the most vulnerable? (e.g. equitable use of technologies, such as radio, television, telephones, computers, and the Internet). N/A

- 12. Gender.** How is the project considering women's specific needs in the design of the research, participation of women in the research, and potential impact of research on women? How is the

project: a) improving women's access to and control over income?; b) reducing women's drudgery or workload (time spent) in agriculture?; and/or c) improve women and children's access to adequate and diversified diets?

Focus-group discussions were done separately between the men's and women's groups to motivate their active participation without domination from the other group. Women were involved from the beginning of trials in all steps from selection of the interventions to implementing them and monitoring the gain and use of products. Men were involved in the process of preparing for interventions as well as in the training on nutrition and child care to encourage their involvement in food preparation and child care. Involving both men and women in nutrition training ensures that both understand the importance of adequate and diversified diets, particularly for women and children, with the goal of improving women's and children's access to nutrient-rich foods.

- 13. Environment.** How is the project contributing to environmental sustainability? (e.g. Is the project affecting the environment? If so, are contributions environmentally sustainable?) How is the project testing for environmental sustainability? N/A

ANNEX 2: Agricultural Production, Food Security and Nutrition in Mae Chaem District, Chiang Mai Province

Each research output submitted to IDRC must include a title page, abstract, and keywords. The kind of information that should be included is listed below. Items marked with an asterisk (*) are particularly important and must appear. A blank title and abstract page follows.

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*This report is presented as received from project recipient(s). It has not been subjected to peer review or other review processes.

***Abstract:**

Four Karen and 4 Lawa hill-tribe villages in Mae Chaem district, Chiang Mai, Thailand, were investigated for their food security and nutrition status in order to formulate nutrition-sensitive agricultural interventions. A total of 175 households (98 HHs of the Karen tribe and 77 HHs of the Lawa tribe) were surveyed for their situations on food security, dietary diversity, and child-feeding practices, using household questionnaires. Focus group discussions (FGD) and in-depth interviews (with village representatives and local authorities) on agricultural and food-security issues were also done. The FGDs were done in male and female groups of both tribes. Findings indicated that the households practice both shifting cultivation and permanent-field agriculture, with rice as the main crop. Food is locally grown, bought from the market, and gathered from the vicinity of the villages. It has also been found out that 50% of the studied population are food insecure.

Potential interventions were formed based on ideas from local stakeholders and international research partners. The resulting interventions are 1) improving chicken raising (by providing 5 chicken per household for 98 intervention HHs) for egg production, and 2) improving home gardens with nutrient-rich vegetables by providing seeds of 5 different vegetables (with high nutritive values) of the villagers' choices. Before the starting of the interventions, the 98 intervention households (58 HHs of the Karen tribe and 40 HHs of the Lawa tribe) were surveyed using questionnaires for diversity of home gardening, animal raising and purchasing of animal products, complementary food, nutrition knowledge of vegetables and fruits, assessing animal-protein knowledge, child-care knowledge, care taker's eating behaviour, and eating-behaviour of children.

***Keywords:** *Agricultural systems, Focus group discussion, Household surveys, In-depth interviews, Mae Chaem, Nutrition-sensitive agricultural interventions*

ANNEX 3 – Report on workshop in Hue in March 25-29 2014 to discuss primary findings of baseline survey and identify interventions – see attached report.