

Second 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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Table of Contents

1. Executive Summary.....	5
2. The research problem	7
3. Progress towards milestones.....	7
4. Synthesis of research activities and results.....	9
5. Project implementation and management.....	14
6. Problems and Challenges.....	14
7. Recommendations	15
8. Annexes:	15

List of Tables and Figures

Table 1: Data collected in sites, Thailand and Vietnam 2013-2014.....	10
Table 2: Main Activities and Timeline for Stage 2 of the Research.....	14
Figure 1: Map of Mae Chaem district by commune and village for data collection, Chiang Mai Thailand, 2013	11
Figure 2: Map of Yen Chau district by commune for data collection, Son La, Vietnam, 2013 ...	12
Figure 3: Map of A Luoi by commune for data collection, Thua Thien Hue, Vietnam, 2013	13

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, Vietnam Office
HH	Households
HUA	Hanoi University of Agriculture
HUAF	Hue University of Agriculture and Forestry
IDRC	International Development Research Centre
IRB	Institutional Ethical Review Board
KSC-GMS	Knowledge Support Center-Greater Mekong Sub-region
MPH	Master of Public Health
NGOs	Non-Government Organization
RC	Research Coordinator
RO	Research Officer

Executive Summary

The research project entitled “Nutrition and Food Security in Uplands of Vietnam and Thailand” is funded by IDRC and coordinated by HealthBridge Foundation of Canada (HB). It is being implemented in Thua Thien Hue and Son La of Vietnam and Chiang Mai of Thailand from March 2013 to February 2016. The three research partners are the 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; and Knowledge Support Center-Greater Mekong Sub-region (KSC-GMS), Chiang Mai University.

The project’s overall objective 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 project has two stages: Stage 1 will assess nutrition and agriculture practices in the sites and Stage 2 will develop and test nutrition-sensitive agriculture solutions.

Stage 1 of the research was completed in all three sites. Stage 1 used a descriptive cross-sectional method to evaluate current nutrition and agriculture practices and identify the factors that limit and promote nutrition and food security. The baseline research applied both quantitative and qualitative techniques in data collection, targeting different organizational levels. At the household (HH) level, data were collected from parents of children under 5 years old or household members who are responsible for household functioning and child care. At the community level, we collected information from commune leaders, agriculture staff, healthcare staff and school nurses. At the district level, agriculture and health officials were interviewed. Interpretation of the baseline data has led to the development of agricultural and nutritional practices that would be good candidates for testing as nutrition-sensitive agriculture solutions. Findings have been shared amongst the teams. The full report from CARES can be found in Annex 6, and the reports from CMU can be found in Annex 5 (see Annex 2 of the CMU interim report). The CARD team will submit their full report in the next term.

During the second 6 month period of the project, from September 2013 to February 2014, the research has progressed as planned with all sites completing data collection and analyses.

CMU: Mae Chaem district in Thailand: A total of 172 households (98 from the Karen tribe and 74 from the Lawa tribe) were surveyed. Focus group discussions and in-depth interviews with village representatives and local authorities were also conducted. Findings revealed that 50% of the population is food insecure, and water shortages during the dry season limit agricultural production results. Only 40% of children 6-23 months had adequate dietary diversity (at least 4 food groups) and only 4% had a Minimum Acceptable Diet (that is, adequate dietary diversity and adequate meal frequency). Farmers practice both shifting cultivation and permanent-field agriculture, with rice as the main crop.

A stakeholder meeting to discuss potential nutrition-sensitive agricultural interventions was held on 21 February, 2014. Some of the candidate solutions are: a) Producing agricultural products

(e.g. rice, chicken and pig) and increasing diversity of domestic animals as nutrient-rich resources (e.g. frog meat and cow milk) for children; b) Improving production systems and food preservation (e.g drying, pickling, and fermenting) and promoting preservation of nutrition foods such as pumpkin; c) Developing home gardens to address low dietary diversity; e) Promoting drought tolerance crops and building small reservoirs to overcome the problem of water shortage.

CARES: Son La district in Vietnam: In Yen Chau district of Son La, a total of 157 households were surveyed. Focus groups discussions and key informant interviews were also organized. Four major ethnic groups were included: Kinh, Thai, H'mong, Khomu in Yen Chau, Son La province. Findings indicated that at least 40% of households are poor and face shortages of staple food, mainly because of shortage of paddy land. Local households generally do cropping and raise animals in small-scale for household consumption with a small number of products for markets. Rates of underweight and stunting among children under 5 years of age are high. Food consumption patterns for children are rather unbalanced with too many sweets, little protein-rich foods, and little milk and dairy. Infants are weaned and fed with complementary foods too early.

Factors that limit healthy diets include land degradation, weather extremes, lack of techniques for production and disease control, lack of capital for cattle, and degrading natural resources that lead to lower yields, leading to a reduction in production for home consumption. Constraints in accessibility to markets of remote communities also affects diet quality. Potential solutions include: a) enhancement of efficiency in rice production by test of lower density model of paddy rice, b) improvement in efficiency in chicken raising, assistance of a canteen for the nursery school and promotion of processing skills and use of pumpkins for H'mong people.

CARD: A Luoi district in Vietnam: In A Luoi district of Thua Thien – Hue, a total of 202 households were surveyed, and focus group discussions, key informant interviews, and in-depth interviews were also conducted. Results of the baseline agricultural research revealed limitations in agricultural practices that affect quality and quantity of food availability, such as few nutrient-rich crops, poor pasturing styles and disease control practices for pigs and poultry, and inadequate methods for processing feeds and storing eggs. Many families having ponds and water sources, but these are not being used effectively to create food sources for improving nutrition. Dietary diversity is poor, both in each meal and throughout the week. The mothers' knowledge about health care during pregnancy and after birth is very limited and mothers do not have adequate knowledge of how to preserve and process foods to ensure and enhance the nutritional level.

Potential interventions include: a) Improving small scale poultry production of households; b) Improving fishpond; c) Improving home garden with nutrient-rich vegetables; c) Improving bean production and inter-cropping systems; d) Improving soil fertility in upland; and c) Improving infant feeding practices.

1. The research problem

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 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 is to assess nutrition and agriculture practices in the sites and Stage 2 is to develop and test 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.

2. Progress towards milestones

- **Completed commencement workshops conducted in Vietnam sites in September 2013 (workshop in Chiang Mai was done in August 2013).** In September 2013, the CARES and CARD teams conducted workshops with local community representatives and relevant officials in health and agricultural sectors prior to the data collection for baseline survey. In the workshops, the research teams discussed the site selection, project implementation plan, and called for support and coordination from local authorities and communities.
- **Completed institutional ethical procedures.** The research's ethical application of the CMU was approved by the Human Experimentation Committee of the Research

Institute for Health Sciences, Chiang Mai University in early November 2013 (Annex 5 – see Annex 3 of the CMU interim report). Copy of IRB approval was shared with IDRC. (The Vietnam teams were granted IRB approval in August 2013 and reported this in the first interim report).

- **Research team trained on gender, nutrition intervention design, advocacy & policy formulation, tracking affordability of interventions, data management and analyses.** Research teams in all three sites were involved in developing the research protocol and data collection tools. Rather than formal training on data management and analyses, HealthBridge developed detailed guidelines on entering data in epi-data (see Annex 6 of first interim technical report) and provided technical support to the research teams via e-mail, monthly skype calls and on-site visits from the Research Coordinator. As reported in the first interim technical report, a brief training on gender was conducted at the inception workshop in April 2013. A second coordination meeting is being held in March 2014 at which more training will be provided on gender and design of nutrition interventions. The teams will also discuss policy formulation in health and agriculture sectors and methods to track affordability of interventions during data collection at the workshop in March 2014.
- **Field staff at each study site trained on data collection tools and protocols.** Field staff and research coordinators/ assistants at each of the three sites were trained on research protocol, data collection tools and implementation plan, ethical issues in working with minority groups and consent process. The questions were discussed in-depth to ensure consistency of understanding amongst the field staff.
- **Report on farm productivity and conditioning factors completed in each of the three sites.** Preliminary findings were shared by the three teams for comments and discussions amongst the team and from HB. There is a brief overview of the findings from each site in section 4 below. The findings will be discussed in the second coordination meeting in March 2014 to prepare for Stage 2. Suggestions of candidate solutions identified from the baseline study will also be discussed in March meeting. The final reports will be completed and submitted in the next reporting period.
- **Report documenting the local nutrition status in each of the three sites.** Preliminary findings were shared by three teams for comments and discussions amongst the team and from HB. There is a brief overview of the findings from each site in section 4 below. The findings will be discussed in the second coordination meeting in March 2014 to prepare for Stage 2. The final reports will be completed and submitted in the next reporting period.

For next period, key milestones are:

- Analysis of data on agriculture and nutrition situation across the three sites completed.

- Nutrition sensitive agriculture interventions and appropriate nutrition messages identified.
- Mid-term assessment of the intervention design, monitoring and implementation plan.
- Pilot testing of nutrition-sensitive solutions in each site completed.
- Feasibility and affordability of the solutions documented.

3. Synthesis of research activities and results

The main research activities and results during the reporting period pertain to **Objective 1:** To characterize the nutrition practices and knowledge, and food consumption patterns in participating communities; and **Objective 2:** To characterize the local farming practices, including documenting the heterogeneity of agro-ecological practices to identify potential practices that could be tested as nutrition-sensitive agricultural solutions. The research activities in Stage 1 were designed to collect data to serve both of these objectives.

Prior to data collection, all three teams provided training to local partners and field assistants on data collection skills for household interviews and in-depth interviews. For CMU and CARD, the training was provided in the previous reporting period. CMU conducted this training in September 2013. To ensure consistency in the way questions were asked, the questions were discussed in depth and role play was used for practice.

Data collection on agriculture and nutrition practices was conducted during October 2013 and January 2014 in all three sites with close monitoring from HealthBridge's Research Officer and Research Coordinator. Quantitative data were entered onto Epidata and exported to SPSS for analysis. Qualitative data were entered on an excel worksheet. Data analyses were conducted during the period from December 2013 to end of February 2014 in consultation with the HealthBridge Principal Investigator and Project Monitoring Expert.

The research teams have shared their preliminary findings about the local nutrition and agricultural situations in the three sites. Information across the three sites will be discussed and synthesized in the meeting in March 2014 with all three teams to identify commonalities and differences amongst the sites. The final reports will be submitted with the next interim technical report. An overview of the results from the three sites is provided in the paragraphs below. A synthesis of commonalities and differences amongst the three sites will be provided in the third interim report.

Table 1: Data collected in sites, Thailand and Vietnam 2013-2014

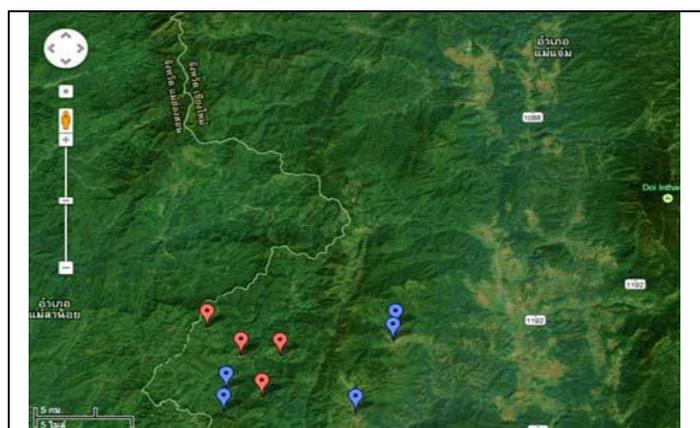
		Mae Chaem (<i>Chiang Mai</i>)			Yen Chau (<i>Son La</i>)			A Luoi (<i>Hue</i>)		
		Planned	Surveyed	%	Planned	Surveyed	%	Planned	Surveyed	%
Household survey		165	172	104.2	165	157	95.2	165	202	122.4
FGDs	No of FGDs	4	4	100.0	8	7	87.5	8	8	100.0
	<i>Participants</i>	32	30	93.8	64	44	68.8	64	48	75.0
IDIs		20	20	100.0	40	12	30.0	40	18	45.0
KIIs		10	18	180.0	10	9	90.0	10	10	100.0

Mae Chaem district in Thailand: In Mae Chaem district of Chiang Mai (Thailand), household surveys and focus-group discussions were conducted during October to December 2013. In-depth interviews and key informant interviews were conducted in January 2013. Data analyses were done in January and February, 2014. A total of 172 households (98 HHs of the Karen tribe and 74 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. A stakeholder meeting to discuss potential nutrition-sensitive agricultural interventions was held on 21 February, 2014. Four Karen and 4 Lawa hill-tribe villages in Mae Chaem district, Chiang Mai, Thailand, have been investigated for their food security and nutrition status in order to formulate nutrition-sensitive agricultural interventions. A detailed description of the findings can be found in CMU’s interim report in Annex 5 (see Annex 2): A brief overview of the findings is below:

- People in the survey villages in Mae Chaem district 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, yet 50% of the studied population is food insecure. Water shortage in dry season also limits agriculture productivity.
 - Approximately 40% of children 6-23 months had adequate dietary diversity (at least 4 food groups). Only 4 % met the Minimum Acceptable Diet (calculated from breastfeeding, meal frequency and dietary diversity).
 - Results of the FGDs showed that while there is some overlap in responsibilities, males and females tend to be responsible for managing different crops and types of livestock.
 - Potential interventions will be formed based on ideas from local stakeholders and international research partners in order to be tested in the second year of the project.
- Some of the candidate solutions are:
- Producing agricultural products (e.g. rice, chicken and pig) for household consumptions and increase diversity of domestic animals as nutrient-rich resources (e.g. frog meat and cow milk) for children.

- Improving production systems and food preservation (e.g drying, pickling, and fermenting) and promoting preservation of nutritious foods such as pumpkin to address the issues of food security and dietary diversity
- Developing home gardens to increase dietary diversity (e.g. frog meat and cow milk)
- Promoting drought tolerance crops and building small reservoirs (long-term solution) can overcome the problem of water shortage in dry seasons.

Figure 1: Map of Mae Chaem district by commune and village for data collection, Chiang Mai Thailand, 2013



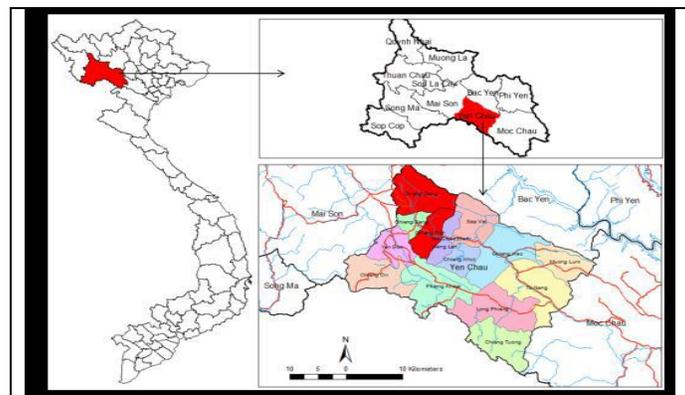
Son La district in Vietnam: In Yen Chau district of Son La (Vietnam), focus groups discussions were organized in September 2013. Household survey and key informant interviews were also conducted in September 2013 and in-depth interviews were completed in early October 2013. All quantitative and qualitative data and information were carefully processed. A detailed description of the findings can be found in CARES research report in Annex 6. Findings indicate that:

- At least 40% of households are poor and facing shortage of staple food yearly, mainly because of shortage of paddy land. Local households generally do cropping and raise animals in small-scale. Crop and animal production is mainly driven for household consumption with a small number of products serving the market demand such as maize, vegetables, pigs, and chicken.
- Data on nutritional status of children reveals that the underweight and stunting ratios among local children under five years old are high. The food consumption patterns for children are rather unbalanced with too many sweets, little protein-rich foods, and little milk and dairy. Due to lack of knowledge and other reasons, infants are weaned and fed with complementary foods too early.
- Our analysis also highlights some linkages between agricultural production, food security and nutrition. No significant correlation between maize area and food security

situation during the last one month was found, but a negative correlation between numbers of crops and animals that are being raised with shortage of staple food is detected. This suggests that diversity in crops and animals is significant to assurance of food security for local households. Under small-scale and consumption-driven production, children and mothers are able to use more varieties of foods.

- Factors that limit and promote healthy diets were also identified in the research. Limitations are constraints in crop and animal production, including land degradation, weather extremes, inadequate production techniques, crop diseases, lack of capital for cattle, and degrading resources that lower the yield, leading to a reduction in production for home consumption.. Constraints in accessibility to market of remote communities also indirectly influence diet quality. However the availability of local resources, for example, pumpkin and goat milk of H'mong people, maize of local communities, is considered a factor directly and indirectly enhancing the diet quality.
- Potential solutions include: enhancement of efficiency in rice production by test of lower density model of paddy rice, improvement of efficiency in chicken raising and some solutions on nutrition, including assistance of a canteen for the nursery school and promotion of processing skills and use of pumpkins for H'mong people.

Figure 2: Map of Yen Chau district by commune for data collection, Son La, Vietnam, 2013



A Luoi district in Vietnam: In A Luoi district of Thua Thien – Hue (Vietnam), data collection in the field including household survey, focus group discussions, key informant interviews, and in-depth interviews were conducted during November and December 2013. Data entry and analysis were completed in January and February 2014 with contribution from each of the researchers in the team.

- Results of the baseline agricultural research show that: In the studied commune, nutrient-rich crops are still not given much consideration during crop selection. People use simple farming techniques with minimal consideration for breed selection and soil fertility improvement. There is slow growth of pigs due to the pasturing style and low survival rates due to poor veterinary service, with one result being low manure availability for farming. Poultry production is small-scale and there is lack of appropriate attention to disease prevention and lack of methods for processing feed from agricultural products to increase the growth rate of poultry. Egg incubation is not practiced well and so few of the eggs hatch to yield live young.
- Nutrition practices are poor. Many families having ponds and water sources, but these are not being used effectively to create food sources for improving nutrition. The mothers' knowledge about health care during pregnancy and after birth is still very limited, especially for poor families and households with early-age marriages. Mothers do not have adequate knowledge of how to preserve and process foods to ensure and enhance the nutritional level, and there is lack of diversity of foods in each meal and throughout the week.
- Potential interventions include: a) Improving small scale poultry production of households; b) Improving fishpond; c) Improving home garden with nutrient rich vegetables; c) Improving bean production and inter-cropping systems; d) Improving soil fertility in upland; and c) Improving infant feeding practices.

Figure 3: Map of A Luoi by commune for data collection, Thua Thien Hue, Vietnam, 2013



4. Project implementation and management

(i) Financial and administration challenges:

There are no financial or administrative challenges to report. Project expenses are slightly lower than initial projections, however, it is expected that this will be reconciled in Year 2 of the project during which implementation of the solutions will begin.

(ii) How are the identified risks in the proposal being managed?

As mentioned in the first interim technical report, the agricultural solutions that will be tested are not fail-proof, which could negatively impact food availability for the participating households. To reduce this risk, the research teams conducted an in-depth situational assessment and, from this, identified agricultural solutions that are locally relevant and have the best potential to address nutrition gaps found in the situational assessment. These solutions will be discussed amongst the teams at the second project meeting in March 2014 and vetted with the local communities before implementation.

(iii) Workplan for the next reporting period: The three sites will implement the Stage 2 of the project to develop and test nutrition-sensitive agriculture solutions based on suggestions identified from baseline assessment. The activities include:

Table 2: Main Activities and Timeline for Stage 2 of the Research

Main activities	Timeline	Responsible
Submit ethic application for stage 2	March 2014	HBV and 3 team leaders
Conduct workshop on testing nutrition-sensitive agriculture solutions and making pilot plan	March 2014	HB and leaders/ researchers from three teams
Train on nutrition and agriculture solutions for local people	April - June 2014	Three teams at sites HB as technical support
Test and pilot interventions	June 2014 – December 2015	Three teams at sites

(iv) Problems and Challenges

While the two Vietnam’s team had no problems and challenges during this reporting period, the Thai team has been experienced a difficulty in communicating with the distant communities using internet and phones due to weak signals in the remote areas. As it happened during data collection process, it sometimes caused the concerns for planning and arranging schedule for meeting with respondents. To prevent the delays, the team coordinators and researchers tried

their best to plan ahead of time all the activities, and regularly checked with field coordinators/ collaborators to ensure everything was conducted as planned.

(v) Recommendations

There are no recommendations to modify the research plan. As described above, each of the research times have recommended potential solutions to pilot test, however, these will be discussed amongst the research teams and vetted with the local communities before the final solutions to test are selected.

(vi) Annexes:

Annex 1 – Monitoring AFS Expected Outcomes

Annex 2 - AFS Research Output Title and Abstract Pages

2 a. Agricultural production, food security and Nutrition in Yen Chau district, Son La province

2 b. Farm productivity and conditioning factors of the Thailand site

2 c. Local nutrition status of the Thailand site

Annex 3 – IDRC second interim report – CARES

Annex 4 – IDRC second interim report – CARD

Annex 5 – IDRC second interim report – CMU

Annex 6 – Research report from CARES: Agricultural production, food security and Nutrition in Yen Chau district, Son La province