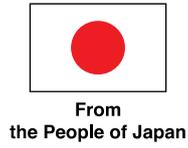




*COMMUNITY-BASED MODEL FOR IMPROVING CHILD  
NUTRITION STATUS - A SUCCESS STORY IN YEN BAI*

*Hanoi, 4-2016*





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# Introduction

In recent years, Vietnam has achieved notable achievements in improving the nutritional status of the people. Most of the objectives of the National Nutrition Strategy for 2001 - 2010 have been met or exceeded; food security has also been enhanced, and people's diets have been improved in quantity and diversified in quality; people's knowledge and practice of nutrition have been improved significantly; the underweight rate in children under 5 has dropped relatively fast and continuously, etc. However, the stunting rate still accounts for 1/4 of a total number of children under 5 and especially this rate remains high in mountainous areas and of ethnic minorities; mothers' knowledge and practice of nutrition in these areas are much limited, and household food security has not been stable.

Van Chan is a mountainous district of Yen Bai province, which is 80 km away from the province center with 66.2% of the population being ethnic minorities, the poverty rate of 39.0%; the proportion of agricultural households above 90%<sup>1</sup>. In this district, although the health sector has made great effort and progress, the malnutrition rate and particularly the stunting rate of the children is very high. An evaluation of Save the Children (SC) in Son Luong commune in October 2011 showed the stunting rate in children under 2 was 55.7%<sup>2</sup>, and another study in children under 5 showed the stunting rate of 52.6%<sup>3</sup>.

With financial support from MOFA, Government of Japan, from March 2013 to June 2016, SC in collaboration with the Provincial Health Department and the Center for Reproductive Health Care of Yen Bai implemented the project "Promoting alternative improvements to child nutrition and food security for the poorest of the poor" at 6 communes including Tu Le, Son Luong, Nam Lanh, Nghia Son, Binh Thuan and Minh An of Van Chan district, Yen Bai province with the aim of "improving food security and nutrition for infant and children under the age of 2 in project area".

This document summarizes the activities of the Project from the steps of Strategy Development, Implementation of Interventions with Specific Models, Achievements, and Lessons learned. We hope that the experiences and results we have had from this project can be of value to other professional organizations and agencies of the same sectors and policy makers at all levels.

This document was developed based on periodic reports, results of the initial survey and final assessment of the project. It is also incorporates information from the in-depth interviews, group discussions with beneficiaries and partners of all levels. The author group wishes to express gratitude to Yen Bai Provincial Health Department, Center for Reproductive Health Care of Yen Bai province, Health Center and Agricultural Extension Center in Van Chan district and local leaders, relevant departments and all the people in 6 project communes who have supported and enthusiastically cooperated during the document completion.

In the process of compiling, shortcomings are inevitable. The authors would like to receive comments, suggestions for the document. We would like to thank all the stakeholders.

*Hanoi, May 19, 2016*

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**MA. Tran Xuan Canh<sup>6</sup>**

1 Report of the Health Center in Van Chan district in 2012.

2 Term-end evaluation report of the "Improvements to child nutrition through better child care behaviors in Yen Bai province" project. SC-2012.

3 Nguyen Thi Hoai Thuong, Le Hong Phuong, Le Thi Huong. Knowledge and practice of child care by mothers and nutrition status of children under 5 in Van Chan district, Yen Bai province in 2013. YHP Journal, Volume XXV, Issue 6 (166) 2015

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## List of abbreviations

ANC	Antenatal Care
BF	Breastfeeding
CGM	Child Growth Monitoring
CHC	Commune Health Center
DOH	Department of Health
EBF	Exclusive Breastfeeding
H&N	Health and Nutrition
HFS	Household Food Security
NERP	Nutrition Education and Rehabilitation Program
NIN	National Institute of Nutrition
PC	People's Committee
PSC	Project Steering Committee
RHC	Reproductive Health Center
SC	Save the Children
T5G	Center for Health Communication and Education
UNICEF	United Nations Children's Fund
VHW	Village Health Worker
WB	World Bank
WHO	World Health Organization
WU Collaborator	Women's Union Collaborator
WU	Women's Union





*PART 1*  
*BACKGROUND*

# 1. Child malnutrition situation

## 1.1 Child malnutrition situation in the world

In 2016, according to estimation from World Health Organization (WHO), United Nations Children’s Fund (UNICEF) and World Bank (WB), in a quarter of the century, from 1990 to 2014, malnutrition rate among children under 5 decreased significantly: stunting rate decreased from 39.6% to 23.8% (from 255 million to 159 million children); underweight rate decreased from 25.0% to 14.3% (from 160.5 million to 95.5 million children). In 2014, there were 50 million children with wasting status (acute malnutrition) worldwide (7.5%), and 16 million of those children had severe wasting, 67% of this group lives in Asia and 28% in Africa.

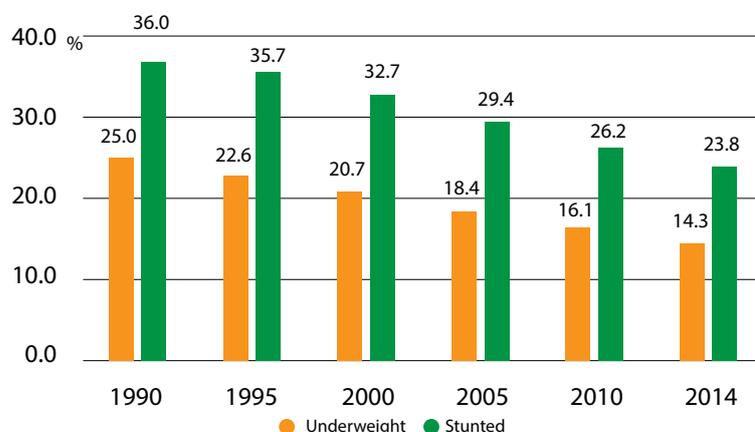


Chart 1. Decrease trend of malnutrition rate worldwide in the period 1990-2014

In Southeast Asia, the nutritional status of children under 5 is similar: stunting rate was 58.6% in 1990 (104.3 million children) and decreased to 33.9% (60.8 million children) in 2014; underweight rate decreased from 46.9% in 1990 (83.5 million children) to 24.8% (44.6 million children) in 2014

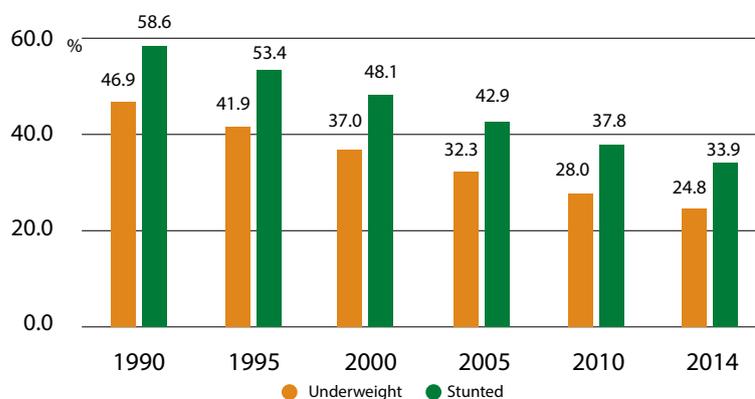


Chart 2. Decrease trend of malnutrition rate in Southeast Asia in the period 1990-2014

Currently, stunting is a more serious problem than being underweight. In developing countries, children in rural areas are at risk of stunting 1.5 times higher than those in urban ones and in many countries, the underweight rate is low, while the stunting rate is very high. For example, in Liberia, Malawi, Mozambique, Rwanda, Tanzania and Zambia, the proportion of underweighted children is less than 20% but the stunting rate 40%. In particular, 90% of children with stunting in the world are located mostly in 36 countries, including Vietnam.

## 1.2. Child malnutrition situation in Vietnam

In recent years, Vietnam has experienced a rapid economic growth and poverty reduction, followed by a significant improvement in quality of life. GDP growth rate in the last 5 years has become stable and reached 6.68% in 2015. Poor household rate has continued to fall sharply from 11.76% (2011) to 5.97% (2014), and accounted for only about 4.5% (2015) while the rate was 29.0% more than 10 years ago (2002). Food security was also been strengthened and people's diets have been diversified in quality and quantity. Average education levels have also improved and the literacy rate has remained high.

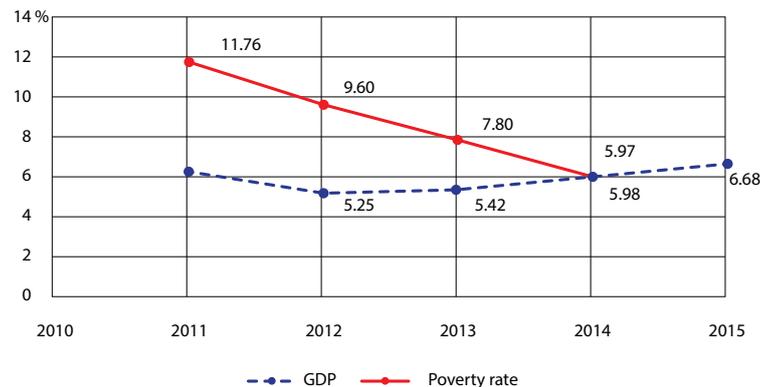


Chart 3. Increased GDP growth rate and decreased poverty rate in recent years.

In the health sector, Vietnam has made remarkable achievements in improving the health and nutrition status of people. Most of goals in National Nutrition Strategy in the period 2001 - 2010 have been reached or exceeded. People's knowledge and practices regarding nutrition have been improved significantly; the malnutrition rate (underweight) of children under 5 has fallen relatively quickly and continuously. According to a survey on child nutrition by National Institute of Nutrition (NIN): in 1985 the underweight rate and stunting was 51.5% and 59.7% respectively, in 2000 it was 33.8 and 36.5% (respectively), decreasing by 1.5 - 2%/year, 14.5% and 24.9% (respectively) in 2014;

this was a relatively faster decline than that in some other countries in the region. As early as 2008, at the 35th annual session of United Nations Standing Committee on Nutrition held in Hanoi (March 2008), UNICEF and WHO rated Vietnam as one of few countries that achieve the child malnutrition reduction rate close to the Millennium Goal.

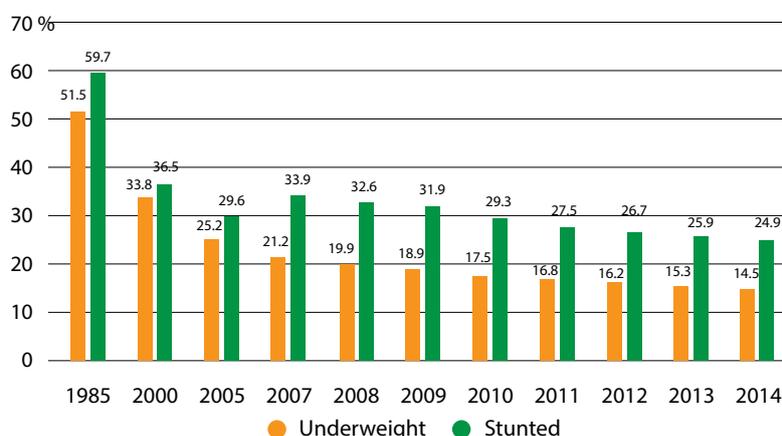


Chart 4. Rate of malnourished children under 5 from 1985 to 2014 in Vietnam

Along with the rapid growth in the development of society and economy, Vietnam continues to face many challenges. There is still a big gap between cities and rural areas, especially remote areas. Rapid population growth also puts more pressure on the development of society and economy. Urban development has resulted in decreased agricultural land, farming area and food supply. Each year, Vietnam faces natural disasters and drought, leading to increased risk of severe diseases and food insecurity. The diet of urban people has significantly changed from traditional diet to a diet rich in fat, starch and processed products while there is a proportion of hungry people in rural, difficult, remote, and mountainous areas. Funding sources and ODA for nutrition programs from international organizations continue to decline.

Currently, in Vietnam, malnutrition remains a problem of public health significance. Although the underweight rate has decreased significantly over the past decade, stunting is still seen in 1/4 of children in Vietnam and remains especially high in rural areas and among ethnic minorities. Malnutrition rate is unevenly allocated across geographic regions in Vietnam. According to figures reported in 2014, in Midlands and Northern Mountain Region, North Central Coast and Central Coast and Central Highlands, the proportion of malnourished children under 5 was much higher than that in other areas, In the delta region, the proportion of malnourished children in rural areas was higher than in urban areas.

**Table 1. Rate of malnourished children under 5 by region in Vietnam in 2014.**

Area	Underweight (%)	Stunting (%)	Wasting (%)
Nationwide	14.5	24.9	6.8
Red River Delta	10.2	20.3	5.2
Midlands and Northern Mountain Region	19.8	30.7	8.2
North Central & Central Coast	17.0	28.1	6.7
Central Highlands	22.6	34.9	7.8
South East	8.4	18.3	5.4
Mekong Delta	13.0	24.0	6.8

**Table 2. Rate of malnourished children under 5 in 2014 in some provinces**

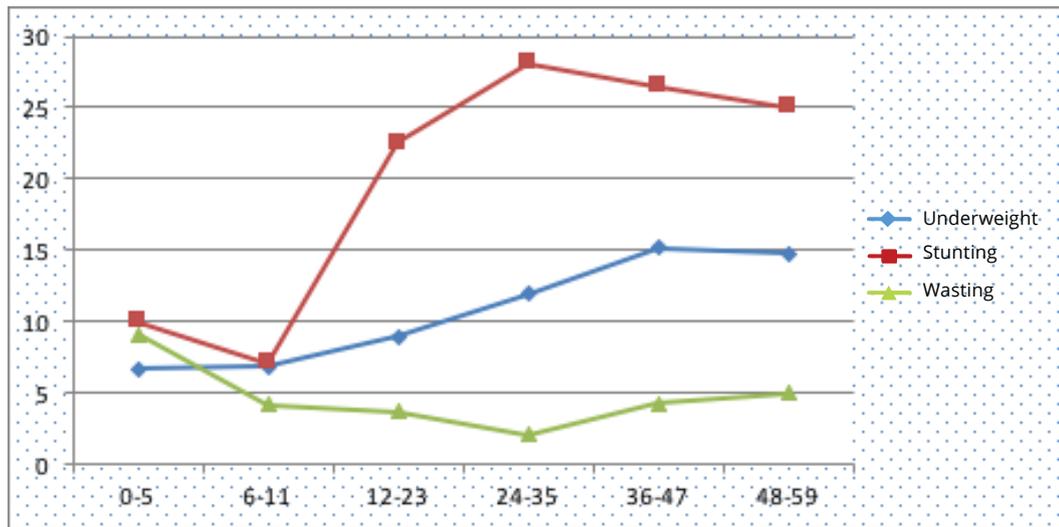
Region/Province	Underweight (%)	Stunting rate (%)
<b>Midlands and Northern Mountain Region</b>		
Ha Giang	23.1	35.2
Cao Bang	18.9	32.4
Lao Cai	20.0	35.2
Yen Bai	18.4	28.6
Son La	21.7	34.4
Dien Bien	19.2	32.0
Lai Chau	23.2	36.7
<b>Central Highlands</b>		
Kon Tum	23.9	39.7
Gia Lai	24.3	35.4
Dak Lak	22.5	32.8
Dak Nong	22.1	33.3

*(Source: Nutrition Monitoring 2014 - National Nutrition Institute)*

By age group: The malnutrition rate of children under 6 months is the lowest for all three statuses (underweight, stunting, and wasting); after this period, malnutrition gradually increases. Children aged 11-35 months are at the highest risk of malnutrition. Underweight rate increases rapidly in the first year, continues to rise in the 2nd year and reaches highest record when the child is at 36 to 47 months old. Stunting appears as early as the first 6 months, increases rapidly from 11-35 months and remains its progress until the child reaches 59 months.



Source: General Statistics Office, UNICEF, UNFPA (2011)



**Chart 5. Rate of malnourished children by age group in 2011 in Vietnam**

The percentage of exclusively breastfeeding children remains low with 29.3% and 19.6% for first 4 months and 6 months respectively, though 93% of the children are breastfed.

Micronutrient deficiency remains common, especially in mothers and children, including anemia among pregnant women (36.5%) and among children under 5 (29.2%). Serum vitamin A and iodine deficiency is still of public health significance, especially in the Central Highlands, North West and Central Coast.

## 2. Household food security with the goal of improving nutrition

At the World Food Summit of 1996, Food and Agriculture Organization (FAO) of the United Nations defined food security as existing “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life”. Commonly, the concept of food security is defined as including both physical and economic access to food that meets people’s dietary needs as well as their food preferences for a healthy and active life”<sup>7</sup>.

Currently, food hunger and lack of vital food, so-called food insecurity has been also a major challenge for all mankind. The world economy has been improving and currently the food supply is available to partially satisfy the world’s food demand. However, a large part of the population in developing countries, such as Africa, Asia and Latin

<sup>7</sup> FAO. 1996. Rome Declaration on World Food Security and World Food Summit Plan of Action. World Food Summit 13-17 November 1996. Rome

America still lacks sufficient food to ensure their demands for energy and protein, leading to protein-energy malnutrition (PEM) and lacks vital micronutrients for growth and development. Therefore, the goal of improving food is of concern at local, national and international levels. As early as the 1980s, food security at the individual and household level and access to sufficient and safe food for all members of all families to ensure good nutrition and health was a subject of national analysis and concern. Currently, our country has high levels of food security nationally, but the food security-particularly nutritional security- of individuals and households is not assured<sup>8</sup>. Nutritional monitoring data in 2010 by the National Institute of Nutrition showed that: Midlands and Northern Mountain Regions, North Central Coast, Central Coast and Central Highlands are the 3 areas with the highest malnutrition rate of children under 5 and the highest poverty rate in Vietnam<sup>9</sup> as well. Ensuring food security, especially household food security is will be important for nutrition improvement. One of the important contents of the “Program to improve nutrition security, household food and nutrition response in emergencies” under 7 main programs, schemes and projects to implement “National nutrition strategy for 2011 - 2020 with a vision toward 2030”, is “Building an economic development model and creating local food sources to ensure food security for each region”<sup>10</sup>.

Measures to ensure food security include implementing agricultural extension and increasing food production (development of Garden-Pond-Pigsty ecosystem, intensification and diversification of food production)<sup>11</sup>. The integrated Garden-Pond-Pigsty model has been carried out and promoted by the Vietnam Gardening Association since 1986. Over the past decades, household-based Garden-Pond-Pigsty ecosystem has created more local food sources, contributing to and ensuring household food security and improving nutrition. Garden-Pond-Pigsty model also helps to improve nutrition in households by diversifying products and supplying vegetables and fruits or eggs, fish, meat for daily meals. The Garden-Pond-Pigsty model has also helped to address hunger problems experienced during “lay-off” periods between harvests.

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8 Journal of Nutrition and Food Sciences, (3 + 4), 12/2008

9 Nutrition in Vietnam in 2009-2010, National Institute of Nutrition - Unicef, Medical Publishing House, 4/2011

10 National Nutrition Strategy for 2011-2020 with a vision toward 2030

11 Nutrition and Food safety – Medical Publication 2004





*PART 2*

*OVERVIEW OF "CHILD NUTRITION"  
PROJECT MODEL*

## 1. Child nutrition programs and projects implemented in Yen Bai province with the support of SC

Since 2000, Save the Children (SC) in cooperation with Yen Bai partner has implemented Integrated Child Nutrition Program in 5 communes in Yen Binh and Tran Yen districts. In later years this program has been expanded to 15 communes in Luc Yen and Yen Binh districts. The purpose of the Integrated Child Nutrition Program is to improve the quality of health care for community members, especially for children under 3 years of age and women of childbearing age in a sustainable way. This program was designed to improve the nutritional status of children under 3 years of age through the integration of four components: Ante-natal Care, Child Nutrition, Household Food Security and Microfinance. In the period from 2005 to 2008, the Early Child Development component was added to the Integrated Child Nutrition Program which was referred to as the Integrated Development Program.

Based on the results and experiences from the above programs, since 2009, SC has been cooperating with Yen Bai partner to implement projects aimed at improving the nutritional status of children under 24 months of age in the poor mountainous communes where many ethnic groups live. In the period from 2009 to 2011, the project was implemented in 6 communes in Van Chan district and expanded to 6 new communes in the period from 2012 to 2016 under the project name "Promoting alternative improvements to child nutrition and food security for the poorest of the poor"- hereinafter referred to as Child Nutrition project. The difference between this project and the above programs is that the target group of this project is children under 24 months of age. Health and Nutrition and Household Food Security are still the key components of the project. However, the Household Food Security was given more emphasis than before, and these interventions were more frequently fulfilled.



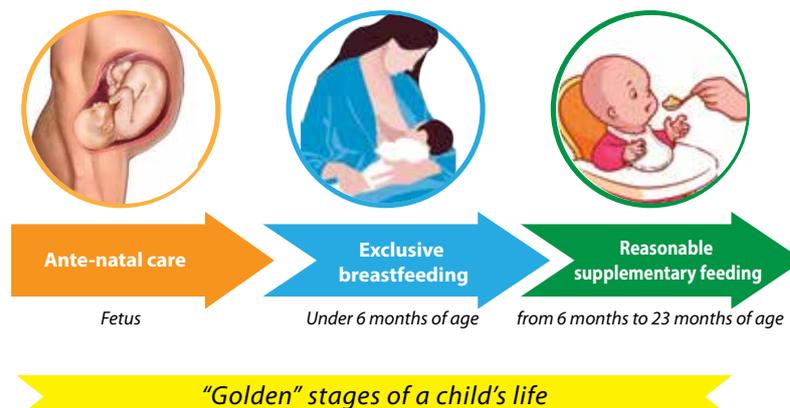
## 2. Child Nutrition project

### 2.1 Purpose, subject and intervention site

The project focused on children under 24 months of age, pregnant women, mothers of children under 24 months of age and women of childbearing age in 6 poor mountainous communes under the Government's Program 135 in Van Chan district. In 2012, the percentage of ethnic groups in these 6 communes was 80%; the poverty rate<sup>12</sup> was 57%. The underweight rate was 22.3% and the stunting rate was 34.3%.

To achieve the goal of reducing malnutrition rate in the project area, the project aimed at reducing both underweight rate and stunting rate.

With children under 24 months of age as its target group, the project resources were concentrated on interventions in the 3 most important stages of a child's life: pregnancy, exclusive breastfeeding for the 6 first months and complementary feeding of the child from 6-24 months. These are the "golden" stages which affect the later growth, height and development of the child.



**Figure 1: Intervention stages to improve child nutrition**

Project partners in the health sector have confirmed the appropriateness of and rationale for focusing interventions on children under 24 months of age.

"Focusing on children under 24 months of age is appropriate because this stage is very important. If the child is taken good care of in this stage, he/she will be healthy and free from malnutrition. If the mothers have good knowledge and skills of child nourishment when the child is under 24 months of age, they will know how to nourish the child



<sup>12</sup> According to the standard of the Ministry of Labour, Invalids and Social Affairs: The per capita income is < VND400,000 per month

during the period of 3-5 years of age" (*Tran Ngoc Thach – Director of Commune Health Center, Son Luong Commune*)

"The target group of the project is appropriate because if the interventions are focused on children under 5 years of age, the resources will be spread out and the implementation will be superficial" (*Hoang Van Hai – Director of District Health Center, Van Chan district*)



SC's strategic direction for these intervention programs was to improve child nutrition, reduce the malnutrition rate, and decrease the proportion of children with stunting in ethnic minority groups living in the poor mountainous areas. This is evidenced by the determination of the project area and the choice of target group.

## 2.2 Intervention strategy



In order to achieve its objectives, the project integrated two components: Child Nutrition and Household Food Security. The interventions of the Child Nutrition component included: i) Improving the knowledge, skills and practice of ante-natal care, breastfeeding, and child nutrition at home and in the community; ii) Increasing the availability, accessibility, and quality of a community-based child nutrition improvement program and ante-natal care for women. The interventions of the Household Food Security component were done to ensure food security for children in poor families through farming and animal raising activities to increase food supplies in households. In addition, one of the aspirations of the project was that the agricultural production models applied by farmer households with the project's support could help increase household income through the sale of their own products.

In recent years, Vietnam's economy has made significant developments, but the gap between the mountainous and rural areas and the urban areas has increased. A new poverty line has been generated including problems with health care, household income and the ability to provide sufficient nutritious food to families, all of which are interrelated

To help solve these problems and improve the nutritional status of vulnerable groups such as ethnic minority women and children, there needs to be a new and comprehensive approach. The approach needs to

address the integrated, multifaceted problems and provide interventions to improve health, nutrition and food security. Focusing solely on nutrition, as has been done in the past will no longer be sufficient to address these complex issues.

The experiences of the child nutrition programs that have been previously implemented by SC to improve the nutritional status of children have shown that interventions to raise awareness, knowledge, and skills regarding nutrition are not enough. Many of the poor households, including the ethnic minorities who live in the mountainous areas have a good understanding of appropriate nutritional care for mothers and children, but lack the economic conditions to practice what they have learned. Therefore, helping the poor households to increase their food supply and improve the quality and quantity of nutritious meals given to mothers and children is essential and critical for improving the nutritional status of children.

The intervention strategy of the Household Food Security component of the program focused on introducing, guiding, supporting and encouraging the farmer households in our selected area of focus to apply models of low-cost agricultural production. These models combined farming, animal raising, activities and the utilization of agricultural residue and by-products and natural materials. These models support the sustainable development of organic agriculture that will ensure a clean food supply and help to protect the environment. The models introduced by the project are consistent with the environmental conditions, farmers' production practices, and development orientation of the local agricultural sector, and also respect and preserve the value of traditional agricultural production. The project did not focus on supporting agricultural supplies but instead focused on the transfer of production techniques to the farmers through training courses and practical guides. This training enhanced their ability to develop and utilize these models in a sustainable way.

Studies done by SC in the project area showed that in addition to the products from farming and animal raising activities in households, the regionally available food was still an important source of nutrition for local people. So, in addition to supporting farming and animal raising activities to increase the household's food supply, the project also encouraged the use of naturally available food in a sustainable way along with education about natural environment protection. With this approach, the poorest households can improve nutrition using natural resources from forests, rivers, streams and fields, in addition to agricultural production activities.

"The project activities to support households in improving Household

Food Security are very important, helping households have more food supply for meals of mothers and children. If you have knowledge but no vegetables and eggs, then how can you cook for your child?" (*Tran Thi Thu Hang – Midwife of commune health center, Tu Le commune*)

"Integrating Household Food Security component in the child nutrition project is appropriate, because it contributes to increasing the food supply for the households to improve the nutritional conditions for children, pregnant women, and breastfeeding mothers. Especially, the project is located in mountainous areas where local people are very poor



and their daily meals are simple and lack nutrients" (*Hoang Van Hai – Director of District Health Center, Van Chan district*)

"Integrating interventions to improve Household Food Security with the child nutrition project as being done by the project is in accordance with the National Nutrition Strategy. In fact, there are not many practices in the combination of agriculture and nutrition. Agriculture just

focuses on supplying enough food and there has been no orientation for nutrition. The project's experience will be very good for making impact, influence and replication" (*Hoang Sy Hien – Director of Provincial Reproductive Health Center, Yen Bai province*)

Many mothers said that the project's support activities regarding Household Food Security were very practical with many benefits to improve the meals for children and families. They enjoyed these activities very much beside the activities which helped improve knowledge and skills of child feeding.

"Before the project implementation, my family planted very little vegetable. Now we plant more vegetables so we always have vegetables and more dishes. In this meal children have this type of vegetable; in other meals they have other types of vegetable. The project also supports us to raise hens so we have eggs to cook soup and porridge for our children. Otherwise, we have no money to buy eggs for our children"

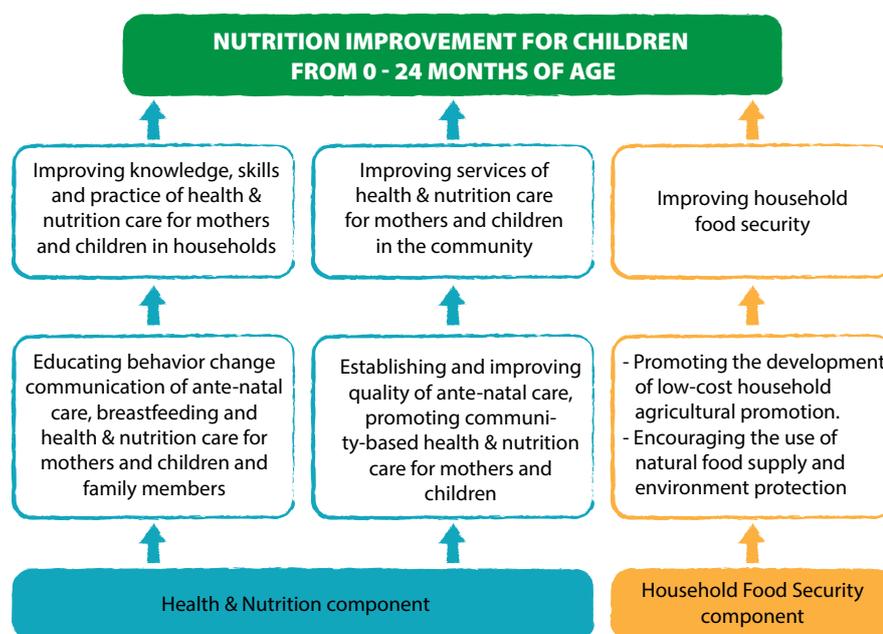
(*Duong Thi Hai – A Dao mother with a child under 24 months of age, Dong Thap village, Minh An commune*)

"I do like the project activity which instructs me to plant vegetables and raise hens. My child has more food"

(*Ly Thi May – A Dao mother with a child under 24 months of age, Tac Te village, Nam Lanh commune*)

For the Child Nutrition component of the project, a behavior change communication (BCC) intervention was implemented through Child Growth Monitoring (CGM) Day, NERP center, ante-natal care and breastfeeding support group meetings, ante-natal care days at the commune health station, home visits and counseling, information sharing at community meetings, and through communication materials such as posters, flashcards, and flyers. These interventions gave the local communities the knowledge and skills to apply best practices in nutrition for pregnant women, breastfeeding mothers and children in their homes. The BCC interventions were implemented through cooperation between community systems including Village Authorities, VHWs and WU staff.

In order to the availability, accessibility, and quality of the community-based child nutrition improvement program, the project held CGM Day on a monthly basis to weigh, measure, and determine the nutritional status of children under 24 months of age and to communicate with and educate mothers about nutrition. NERP Centers for malnourished children under 24 months of age were established in the villages to improve and rehabilitate nutrition for malnourished children under 24 months of age. Ante-natal care services were improved by enhancing the quality of pregnancy examinations and counseling provided to women at the commune health station. At the village level, the ante-natal care and breastfeeding support groups were established and to meet on a monthly basis to support and promote ante-natal care and breastfeeding activities.



**Figure 2: The project's intervention strategy**

## 2.3. Project implementation arrangements

### 2.3.1 Project implementation

The Department of Health acted as the main partner of SC and authorized the Reproductive Health Center to act as the agency that directly implemented the project. Project steering committees were established at the province, district and commune levels. At the province level, project steering committee members included staffs from the Department of Health and Reproductive Health Center, at district and commune level, in addition to the health sector, members were included from the agricultural sector, WU, and Youth Union. At the commune level, the representative of the local authority acts as the head of project steering committee. At the village level, where the majority of project activities are implemented that directly impact the beneficiaries - VHW and WU collaborator are the key activity organizers and operators with the support of village authority. As is usual for a community-based project, the project steering committees at the commune and village levels play a very important role in directly implementing the project activities. The ability to organize and implement most of the project interventions at the village level is one of the key advantages of the project and allows local people to easily access nutrition care for mothers and children.

“Organizing the project activities at the village level, especially the group model, has created favorable conditions for mothers to participate in, exchange and learn from each other” (*Vu Thi Minh Thu – Midwife of commune health center, Son Luong commune*)

The project steering committees at the district and provincial levels provide the training and technical assistance activities to support those at village and commune levels, monitor the project implementation process and achievements and share the project experiences and results with other communes and districts in the province.

The involvement of authorities, agriculture sector, WU, and Youth Union in the project steering committees shows that improving the health and nutrition of mothers and children is not only the responsibility of the health sector, but also requires the participation and involvement of the authorities and other relevant sectors. In particular, coordination and cooperation between the agriculture and health sectors is essential and important for the effective implementation of the program. In addition, the support and active participation of local people in this project shows that improving the health and nutrition of mothers and children is considered a priority by authorities, relevant sectors and the community. However,



while the health sector has had strong participation and commitment at the provincial level, the agriculture sector does not participate at this level. This may limit our ability to expand the project results and learned lessons to other districts of Yen Bai province.

SC provided overall project management and technical support by organizing training courses and offering supervision and support in the project area. During implementation, the awareness of beneficiaries, local people and project partners at all levels about their role in ownership and sustainability of project results is reinforced repeatedly. The opinions of the stakeholders at all levels are respected and incorporated from the stage of project proposal and initial action plan creation through the implementation, monitoring and evaluation of the project.

At the Central level, the project cooperates with National Institute of Nutrition and National Center for Health Communication and Education to develop training, communication and education materials on nutrition care for mothers and children. Utilization of these materials is not limited to this project as they can also be used on a national scale.

## **2.3.2 Capacity building for local partners and develop IEC materials**

### **2.3.2.1 Capacity building for local partners**

To improve the quality of project intervention and strengthen the efficiency and sustainability of project management, many efforts have been made to build and enhance the capabilities of local partners at all levels through training, supportive monitoring, monthly meetings, and project assessment.



Before implementing interventions in the community, in the initial stage, the project focused on providing training courses to enhance the capability of staff involved in the project at all levels. For the Child Nutrition component, a group of trainers including health staff at provincial and district levels was established. This group was responsible

for providing training courses in Antenatal Care, Breastfeeding, Child Nutrition, and Behavior Change communication skills for health staff at the commune and village levels. Similarly, a group of trainers from the agricultural extension staff of the project at the district and commune

levels was established for the Household Food Security component. This group was in charge of providing training on low-cost agricultural techniques for households and assisting them in applying such models. The Training-of-Trainers (TOT) courses for the health staff members was done by lecturers from the National Institute of Nutrition and Hanoi Medical University. TOT courses for the agricultural extension staff members were performed by lecturers from Vietnam National University of Agriculture. The most important aspect of the content of child nutrition training was to focus on improving the stunting status of children. For the training courses on agricultural techniques, the focus was on low-cost agricultural techniques that poor households could easily apply. Constructive and practical teaching methods were applied throughout all training sessions, especially the training sessions for Village Health Workers (VHW), Women's Union (WU) who were collaborators in the Child Nutrition Component and beneficiaries of the Household Food Security Component.

In addition to training staff directly involved in project implementation, an effort was made to extend the project's model to other non-project districts and provinces. In 2015 and 2016, the project carried out TOT trainings on Antenatal Care, Breastfeeding, Child Nutrition, counseling skills and behavior change communication for 71 village health workers from 6 non-project districts in Yen Bai province. Six training courses covering the same content were provided for 223 VHWs and WU Collaborators from 25 non-project communes in Van Chan district. As a result of these training courses, the project expects that the knowledge and skills, of health care providers about maternal and child nutrition care and their ability to improve stunting status will be improved in Yen Bai province. Information about the Household Food Security component of the project were also shared with non-project districts. Two TOT trainings for 25 agricultural extension staffs of 25 non-project communes in Van Chan district were implemented to extend the model of low-cost agricultural production to these communes.

"Previously, I was trained on cooking demonstration for children, but just in brief. The project has trained me in details and step by step by with practice. Therefore, I know how to do it correctly. Furthermore, doing it regularly every month, I am quite proficient now"

*(Lo Thi Loan – VHW in Ban Xe village, Son Luong commune)*



“For each content, the project has trained its theory, then being practiced at the training, so I have understood and been able to do it. The most useful one is the communication skills. Previously, I did not know how to speak in public. Now I can implement communication sessions for mothers”. (*Hoang Thi Dien – WU Collaborator in Quan 1 village, Binh Thuan commune*)

“The project has provided the trainings systematically, efficiently, and with updated new knowledge. After attending the trainings, I have known that stunting is very important and needs improving. Previously, health staff including me mainly focused on underweight. Thanks to the project, now I know how to analyze and record reports on specific types and level of malnutrition”. (*Vu Thi Minh Thu – Midwife of commune health center Son Luong commune*)

“I have participated in many projects, but no project provided as careful training as this, from TOT trainings to trainings for commune and village health staffs. Its quality is good; the output is good, which have to build a strong team of the districts, communes and villages health staff strong on maternal and child nutrition care” (*Hoang Van Hai – Director of District Health Center, Van Chan district*)



“One of the most important achievements of the project is that it has helped to train a strong group of trainers at provincial and district levels on maternal and child nutrition care. This group provides training courses for not only health staffs in the project area but also other health staffs in the non-project districts and communes in Yen Bai province”.

(*Luong Kim Duc – Deputy Director of Yen Bai Province Department of Health*)

“After attending the trainings held by the project, I have known more about techniques to develop nutrition garden, SRI rice cultivation, raising fish on the rice field model, mushroom planting, rabbit raising. I was limited in these techniques before, of which details I did not know much. Therefore, I can instruct and advise households better”. (*Pham Viet Hung – Agricultural extension staff, Tu Le commune*)

“Before the project come, not all the agricultural extension staffs have deep and professional knowledge and understanding on the techniques of low-cost agricultural models which was introduced by

the project to guide the farmer households to apply. After trained by the project and directly implementing and guiding the households to apply these production techniques, the knowledge and experience of the agricultural extension staff have been improved much more" *(Nguyen Tien Lam - Head of District Agricultural Extension Center, Van Chan district)*

For health staff at provincial, district and commune levels, apart from training courses in maternal and child nutrition care and communication and counseling skills, they have been trained in supportive monitoring skills. Supportive monitoring is considered as a tool of improving the service quality by the project, simultaneously plays an important role in supporting and enhancing the capacities for the team of health staffs at communes and villages. Regularly every month, health staff at provincial and district levels performs supportive monitoring of activities of Antenatal Care at Commune Health Stations, and coordinates with commune health staff in supportively monitoring Child Growth Monitoring, Nutrition Education and Rehabilitation and meets with the Antenatal Care and Breastfeeding support groups at the villages. Through these monitoring activities, commune health staff and the teams of Village Health Workers have been supported, instructed to perform activities efficiently and enhance their capacities in their work. It is seen as a form of "hands-on training" which is effective and suitable to such subjects as Village Health Workers and WU Collaborators in mountainous communes.

"Every month, when we perform Child Growth Monitoring, NERP activities, meet with the Antenatal Care and Breastfeeding support groups at the villages, district and commune staff often attends and instructs, contributes their comments for our better deeds. So our skills are more and more proficient". *(Ha Thi Huong - VHW in Na La village, Son Luong commune)*

"After being trained, Health staff at district and commune has support me and provide comments for some skills that I didn't do well while I conducted activities during the project implementation. Now I feel more confident and know how to do". *(Me Thi Oanh - VHW in Nam Toc 3 village, Nghia Son commune)*

Monthly meetings at commune and district levels are considered as a form of exchanging and learning experience among the project staffs. Every month, at the communes, the project holds regular meetings with



participation of commune Project Steering Committee, Village Health Workers, WU Collaborators, Village Heads and representatives of district Project Steering Committee. At district level, monthly meetings will be attended by district and commune Project Steering Committees. The purposes of monthly meetings at the communes and districts are to review and evaluate the situation and results of performing project activities during the month, share the lessons learned, identify the strengths, limitations, difficulties, and challenges while implementing the project, which leads to discussions for solutions as well as planning for the next month. Through monthly meetings, the project villages and communes can exchange and learn experience from each other (Le Thi Hong Mai – Midwife of commune health center, Binh Thuan commune)

### 2.3.2.2 Developing communication materials

Behavior change education and communication activities are the main interventions of the Nutritional Health component. To strengthen the efficiency of education and communication activities to stimulate behavior changes in mothers, family members and communities, the project cooperated with the National Center for Health Communication and Education to develop the communication materials to support these activities. In addition to the National Center for Health Communication and Education, experts from National Institute of Nutrition (NIN) and Maternal and Child Health Department also participate in developing



these materials. The content of communication materials focuses on Antenatal Care, Breastfeeding, guidelines on complementary child feeding, with a focus on improving stunting status. The materials comprise leaflets and handbooks. "Guidelines on nurturing children at 0-5 years old" was a leaflet distributed to mothers and households; posters were used as communication materials on Child Growth Monitoring Day, and were displayed in NERP Centers and Commune Health Centers; flip-charts were used by commune health staffs, VHW and WU Collaborators for communication and counseling at NERP Centers, ANC and EBF support groups, ANC Day at commune Health Center and home visit and counseling services in households. Besides, there are also two DVDs on "Breastfeeding" and "Guidelines on complementary child feeding".

In general, the project's IEC materials are diverse, attractive, well-informed, simple, and easy to understand. The project implementation has shown that the IEC materials have been very useful and have contributed to enhancing knowledge and changing behaviors of mothers and households in the project areas. The IEC materials have been posted on the website of the National Center for Health Communication and Education for all the provinces and cities in the country to be able to access and use.

"The materials are beautiful and their content is easy to understand and useful. The flip-chart are very good for VHWS' communication, both having pictures for mothers to look at and containing instructions for communicators. Posters are easy to understand for mothers; handbooks are quite full of words but well-informed and detailed. The materials make communication much easier". (*Ha Dinh Duyen - VHW in Ban Muoi village, Son Luong commune*)



“The contents of communication materials of the project are very useful, complete and specific. The forms are attractive with many images and many kinds as leaflet, handbooks, flip chart, posters. The designs are appropriate to the local conditions because mothers and partners were involved to provide comments during designing the materials”. *(Le Thi Hong Mai – Midwife of commune health center, Binh Thuan commune)*

For the HFS component, in order to assist the households in applying the low-cost agricultural production techniques effectively, the project has developed a sets of leaflet with the topics: nutrition garden, SRI rice cultivation, chicken raising, rabbit raising and organic composting. The contents of these leaflets consist of detail guideline on techniques accompanied by vivid drawings and illustrations, so they are suitable for farmer households. The district Agricultural Extension Center has highly appreciated these leaflet.

“This set of leaflet is so good. Its content is very useful, brief, and easy to understand, with attractive illustrations. Up to now, Agricultural Extension has not had such folding leaflets”. *(Hoang Thi Hai Yen – Deputy Head of District Agricultural Extension Center, Van Chan district)*

“The people just need to look at the leaflets then can learn how to do. For example, guidelines on SRI rice cultivation or composting have clear steps. The words are simple so the people can understand. The pictures are very vivid, beautiful colors. When distributed, the people like them a lot and feel easy to follow”. *(Nguyen Van Hung – Agriculture Extension Staff, Binh Thuan commune)*



*PART 3  
INTERVENTION  
MODELS*



## 3.1 Community-based Child Nutrition Improvement models

### 3.1.1 Child Growth Monitoring (CGM) Day

“CGM Day” is organized in conjunction with local malnutrition prevention activities; and there are differences in the frequency and level of these interventions. Malnourished children under 2 are weighed monthly; malnourished children under 5 are weighed quarterly and all children under 5 are weighed and measured once per year, on June 1st. Prior to the project, nutrition communication and education in Van Chan was limited. In 2015, the targeted nutrition communication and education activities held for each commune that included a cooking demonstration for malnourished children under 5 was 2 classes with a total expenditure of VND 240,000/commune, VND 4,000/child. This only allowed about 60 mothers and malnourished children to attend these activities in a year.

Since the project was implemented, CGM is organized on a fixed day every month in all villages of the project commune. All children under 2 in the villages are brought to CGM sites by their mother or another family member. Every month, the total number of children participating in “CGM Day” in six project communes averages about 1,100. Village Health Workers and Women’s Union Collaborator are key organizers and administrators of the CGM Day. The venue for “CGM Day” is a central and convenient place for mothers and children: sometimes the village cultural house or the house of Village Health Workers, Women Union Collaborator, village officers, or the house of another person in the village that is large enough. “CGM Day” is usually scheduled in the morning, and it usually lasts about two hours depending on the number of children in the village. The purpose of “CGM Day” is to help mothers and family members as along with village and commune health staff to monitor children’s weight, height and growth, thereby determining their nutrition status. Particularly, “CGM Day” aims at helping mothers and family members gain the knowledge and skills they need to take better taking care of feeding their children

The main contents of “CGM Day” include:

- i. iGrowth monitoring: Weighing (monthly) and measuring the height (quarterly) of children under 2 years of age;
- ii. Recording growth on growth chart, determining nutrition status; recording developmental milestones such as knowing how to crawl, walk, talk, etc. and events related to nutrition, health and life of the children; providing information and advice to mothers and family members;

- iii. Recording data in the child's weighing and measuring diary;
- iv. Imparting nutrition communication and education to mothers on how to feed and care for their children. Guiding the practice of cooking for children from 7 - 23 months of age.

Mothers, village and commune health staffs and WU staff agreed that "CGM Day" was very much needed. First of all, it helped mothers and families know the nutrition status of their children and to provide more nutritious feeding for children with malnutrition or risk of malnutrition. One of the positive aspects of "CGM Day" is that in addition to the evaluation of whether a child is underweight (low weight for age) which has been monitored previously, evaluation of stunting (height by age) was also a focus. In addition, monitoring achievement of developmental milestones (crawling, walking, talking, etc.) and events related to the nutrition health and well being of the children was also given attention. This helped mothers, families and health workers to more fully understand the nutritional status and health of children beyond

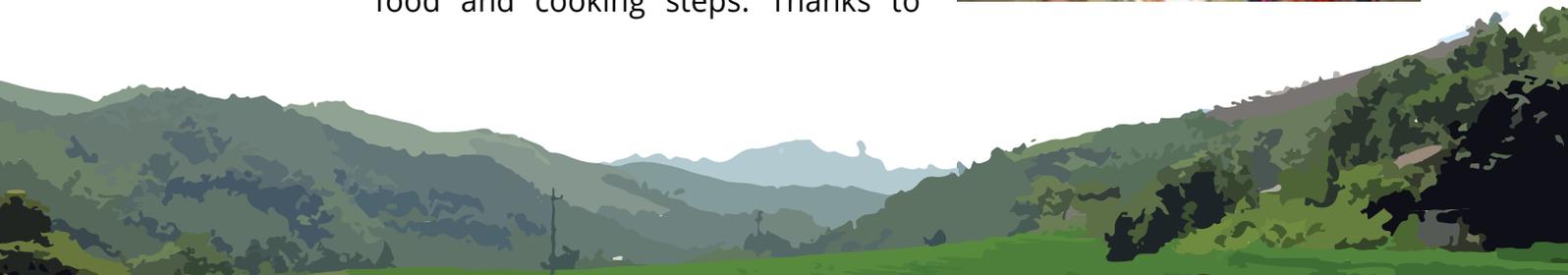


the weight by age measurement that was previously done. Combining weight and height measurements also helped identify children through analysis of both underweight and stunting status for inclusion in the list of malnourished children to be treated at the Nutrition Education Rehabilitation Program Centers (NERP Centers) which will be

discussed below. In addition, mothers and local partners appreciated the role of "CGM Day" in improving nutrition knowledge and skills for mothers and child caregivers in the preparation of good-quality meals for children at home.

"Every month, I take my child to weigh and measure to see if he gains weight, increases height, or is suffered from malnutrition or not, then I will know how to take care of him better". (Ly Thi Hue - A Dao mother whose child is under 24 months of age, Dong Thap village, Minh An commune)

"On CGM day, VHW instructed me on how to breastfeed my child during the first 6 months. When my child was older than 6 months, I was instructed on how to cook all 4 groups of nutrition food and cooking steps. Thanks to





that, my second child was not suffered from malnourishment and was healthier than my first child". (Lo Thi Thao – A Thai mother whose child was under 24 months of age, Pha Tren village, Tu Le commune)

"Thanks to "CGM Day", mothers know if their child is malnourished or not and how the child's health is. Previously, some mothers

thought that their child was not malnourished because he or she was fat, but they knew that their child was malnourished through height by age when measuring height. For malnourished children, VHW will inform and advise mother to participate in NERP Center to improve the child's nutrition status" (Lo Thi Loan – VHW of Ban Se village, Son Luong commune)

"CGM helps evaluate the child's exact nutritional status through both weight and height. Previously, only the child's weight was monitored. After the project was implemented, all villages have been equipped with adequate scale and ruler and VHW and WU collaborator are well trained in weighing, measuring, scoring and recording skills to record in the child's growth chart. Previously, child health monitoring was implemented periodically every six months; after the project is implemented, it has been done frequently every month, helping identify children with malnutrition and risk of malnutrition to have timely intervention. Moreover, "CGM Day" helped mothers know four groups of food necessary for the child's meals and how to cook properly for the child". (Tran Thi Thu Hang – Midwife of commune health center, Tu Le commune)

According to VHWs, WU collaborators and health officers at all levels, there are many advantages when implementing "CGM Day" in the villages, namely: i) Mothers and families are aware of the roles and benefits of child growth monitoring so they have participated enthusiastically. Monthly percentage of mothers' and children's participation in "CGM Day" is 98%; ii) VHW and WU collaborators are carefully trained in weighing, measuring, book-keeping, and recording in child growth chart skills as well as communication skills. Moreover, these activities are carried out regularly on monthly basis and supported and supervised by commune and district health officers so their skills are increasingly proficient; iii) The venues for "CGM Day" are fully equipped with scales, rulers, books, child growth charts, communication materials (posters, flipcharts), and utensils to practice cooking for children; vi) Many families are willing to allow the use of their houses as venues for "CGM Day"; vii) This activity is supported and assisted by local authorities and other relevant departments as well as the community.

"Now it has become a habit that mothers voluntarily take their children to the venue on scheduled date. If they cannot, the father or grandmother or grandfather will do it." (*Lo Thi Vinh - VHW of Ban Lam village, Son Luong commune*)

"After attending the trainings provided by the project, the nutrition knowledge and skills of VHWs and WU collaborators have changed a lot, especially measuring, chart scoring, chart recording, and communication skills. So they implement "CGM Day" much better than before."

(*Ngo Thu Huong - Head of Reproductive Health Department, Van Chan District Health Center*)

Besides advantages, they also raise some difficulties and challenges for "CGM Day", namely: i) Usually, mothers whose child is under one month of age do not participate in "CGM Day" because those mothers and families prefer not taking their child outdoor and do not want to weigh or measure the child; ii) In some place, there is a large number of children, and some children tend to cry so the mothers' attention and participation are limited; iii) In some villages, due to the mountainous terrain and the far distance to "CGM Day" venue, mothers find it time-consuming and difficult to travel, especially on rainy days; iv) During the busy planting and harvesting seasons, it is also difficult for mothers to take the time to participate in "CGM Day"; v) For some households when the mother is busy, the father, grandmother or older brothers and sisters must take the child to the CGM venue. These people pay less attention than the mother, especially in cooking practice section. However, on the other hand, it is also good for engaging other family members in taking care of the child. Through this activity, their awareness, knowledge and skills in child feeding are improved. Hence, the mothers will receive the support and assistance in child care at home.



"If the grandmother takes the child to "CGM Day" venue when the mother is busy, then it is good because the grandmother will get knowledge and she is also the person who usually cooks for the child when the mother is away." (*Ha Thi Vinh - A Thai mother, Son Luong commune*)

"I am his/her grandmother. Sometimes when my daughter-in-law is busy, I take him/her to NERP Center to weigh and measure. So I also know how to cook at home as I learned at the center". (*Ly Thi Tan - A paternal grandmother of a child, Giang Cai village, Nam Lanh commune*)

When the project ends, local partners plan to maintain this activity in the integration with the National Nutrition Program (NNP) based on the advantages gained with the support of the project after 3 years: knowledge, proficient skills in weighing, measuring, scoring, recording in growth chart, and communication skills of VHW and WU staff; awareness and understanding of mothers and families as well as the attention and support of the local authorities, related departments, mass organizations and the community.

*“This activity will be maintained with NNP and other health programs. (Luong Kim Duc – Deputy Director of Yen Bai Province Department of Health – Chairman of Provincial Project Steering Committee)*

### *CGM day in Giang Cai Village, Nam Lanh commune*

Giang Cai village located in Nam Lanh commune, with a total number of 157 households and a number of 808 people, including 209 women of reproductive age (15-49) and 39 children under 24 months of age. 100% of the village population is of Dao ethnic group



“CGM Day” is fixed on the 17th of every month, from 8:00 a.m. to 10:00 a.m. The venue for this activity is the house of VHW, Mr. Ban Ton Senh. Mr. Senh and Ms. Trieu Thi Luu, the village WU collaborator, are two key people responsible for implementing “CGM Day” activities in the village. All children under 24 months of age are taken by

mothers to CGM sites. The first activity of the “CGM day” is weighing and measuring children. Weighing and measuring results are recorded in the “Child’s Weight and Height Monitoring Book”, then VHW uses scoring table and child growth monitoring form to determine the child’s nutrition status. Depending on the child’s age, VHW and WU collaborator also ask the mother if the child already knows how to tumble, crawl, or say; how many words the child can say; whether the child got sick during the month; how the child’s supplemental meals were, etc. The information indicating that the child gains weight or increases height; the child does not gain weight or loses weight; the child does not increase height; and all other information and events related to the child’s nutrition status and health is shared by VHW and WU collaborator with the mother along with reasonable advice for the mother, especially for children who do not gain or lose weight. Next, VHW

and WU collaborator implement nutrition communication and education activity for mothers, including a demonstration of cooking a nutritious meal for the child. Then mothers will jointly practice cooking for their child. The meal menu on the “CGM Day” emphasizes on ensuring adequate nutrient and encouraging the use of local available food and the food is changed regularly.

Mr. Senh said that mothers were very enthusiastic to take their children to participate in this activity. Sometimes when the mother is busy, the father or grandmother will take the child to the venue. Some mothers in Ngon Cai village which is 5km far from the center also encounter with difficulty in traveling, especially on rainy days. After VHW and WU collaborators have been trained by the project and have directly implemented this activity for a time, now they are familiar with and proficient in weighing, measuring, scoring, recording in chart, determining nutritional status, communicating and guiding cooking for mothers. Because the village culture house’s kitchen and water are not adequate, the “CGM Day” activity and Nutrition Rehabilitation Education (NRE) activity are held at Mr. Senh’s house. He and his wife do not mind but feel happy to contribute to child health care and nutrition care in the village. Sometimes when his wife is not busy, she also supports cooking for children. According to Mr. Senh, CGM activity and other activities of the project have changed mothers’ and villagers’ perception and knowledge about child nutrition care a lot.

*Recorded at Giang Cai village, Nam Lanh commune, January 29, 2016*

### *The husband's support and assistance in child care*



Ly Ton Ken living in Giang Cai village whose son is malnourished has been participating in NERP Center of the village. He said that his wife normally took their child to the center. But sometimes when his wife is busy, he will take their child to the center. In his village, there are also some fathers or grandmothers who take the children to NERP Center when the child’s mother is busy. At the center, he observes and learns how to cook for the child as instructed by village VHW and WU staff. He also participates in cooking practice with other mothers or fathers. He said that his wife usually cooks for their child at home. But when

his wife is busy at work in the fields or works away from home, he cooks for the child. Through learning at NERP Center, he knows that when cooking for children, in addition to rice, he also needs enough food such as meat, fish, egg or shellfish, vegetables, fish sauce, oil and grease. Ken said, "Though my family's economy is difficult, we have to try to find food to cook for my child. We plant vegetables, raise hens to lay eggs and sometimes try to buy more meat and fish for my child." Because Ken's child was born underweight, the child usually got sick and refused to eat at first, and lost weight. But for recent months, the child has gained weight regularly and now he weighs 6.7kg; he is still malnourished but he is much better and less ill than before..

*Recorded at Nam Lanh commune, January 29, 2016*

### 3.1.2. Nutrition Education and Rehabilitation Program (NERP center)



Nutritional Education and Rehabilitation Center (NERP Center) is a specific intervention of the projects that improve children's nutritional status implemented by Save the Children (SC). This model is used to improve and rehabilitate the nutritional status of malnourished children in the community. The purpose of NERP session is to provide knowledge about child nutrition and instructions on

how to improve nutritional status of the malnourished child. It also helps to improve the health and nutritional status of other children in the home by using the food available at home and local area. The method used in the NERP centers is following positive role models and learn nourishing healthy children through sharing, exchanging and learning information between the poor families in the villages and communes.. The nutritional education and rehabilitation (NERP) session is associated with and follows the "Child Growth Monitoring Day (CGM Day)" activity. Children under 24 months of age who have been identified as underweight and stunted as a result of their recent weighing and measuring will participate in NERP Centers.



On average, about 310 malnourished children under 24 months of age participate in NERP Centers monthly in the villages of the 6 project communes. The same locations are used for the CGM day and for the



NERP Center. The VHWs, women's union collaborators (WU collaborators) are also key organizers and operators of NERP Centers. Because some villages have a small number of malnourished children, two or three villages are sometimes combined into one NERP Center located at a central village. The period of time for each NERP session is 5 fixed days in a month. Every day, usually in

the morning, mothers take children to NERP center for 1 and a half to 2 hours. The main activities NERP centers focus on are educating mothers and guiding mothers on how to cook a good-quality meal (porridge or soup) for children using nutritious food that is available in the local area. The mothers practice cooking together for children and children consume the meal that has been cooked by the mothers at the centers. The menu for children is different for each of the 5 days of the NERP session. However, the main purpose of NERP Centers is to improve awareness, knowledge and skills for mothers and family members that they can apply at home in order to rehabilitate their children's nutrition status. The 5 meals provided at the NERP Centers will not play a significant role in improving the overall nutritional status of the children, and it is important to improve the children's meals at home. The project also provided micronutrient powder to increase the levels of iron, zinc, calcium, vitamins, and amylase to further increase the efficiency of nutrition rehabilitation for children,

All comments of the project beneficiaries and partners agreed that NERP session played an important and significant role in improving the nutrition status for malnourished children. After a period of participation in NERC, mothers' nutrition knowledge and skills to cook supplemental meals for children have changed markedly. Moreover, NERP Center also contributed to raising the awareness and attention of mothers, family members and community in improving the nutrition status for malnourished children.

"My child got rid of malnutrition thanks to my participation in NERP Center that project held in the village. I am very thankful for this project." (*Trieu Thi Khach - A Dao mother whose child was once malnourished, Giang Cai village, Nam Lanh commune*)

"I am thankful for the project because it brought NERP Center here; when NERP Center is here, there is a place to treat malnourished children. Coming to the center, I learned how to cook for my child. My child was once malnourished; after a period of participation in NERC, my child now gains weight and his malnourishment has almost gone." (*Ly Thi Liu - A Dao mother whose child under 24 months of age was malnourished, Tac Te village, Nam Lanh commune*)

“Mothers participated fully and enthusiastically; they cooked for their children on their own and contributed more food such as vegetables, crabs, eggs, fish, and fruits. NERP Center provides deeper knowledge and mothers can practice more because the number of children are fewer than that of “CGM Day” and the implementation time of the NERP session is 5 days. With more times to practice, mothers remember well and are very proficient in cooking skills for children. *(Tran Ngoc Thach – Head of Commune Health Center, Son Luong Commune)*

“NERP model is very effective to improve mothers’ cooking skills for children and nutrition rehabilitation of malnourished children”. *(Le Thi Hong Mai – Midwife of Commune Health Center, Binh Thuan commune)*

“NERP model is appropriate. The most obvious proof is that mothers and their families have participated enthusiastically and fully. They see the benefits of this activity for their children. The monthly average percentage of participation in NERP center of mothers and children is 95%. Mothers have the opportunity to exchange and learn experience caring their children. NERP centers provide knowledge and skills so that they can apply



them to improve their feeding practices at home”. *(Hoang Van Hai – Director of District Health Center, Van Chan district, Chairman District’s Project Steering Committee)*

“NERP center is necessary to treat malnourished children in the community”. *(Luong Kim Duc – Deputy Director of Yen Bai Province*

*Department of Health, Chairman of Provincial Project Steering Committee)*

The operation of NERP center has advantages, disadvantages, and difficulties similar to those of CGM Day mentioned above. However, there are some notable points from the actual operation of NERP centers in the mountainous areas where is supported by the SC: i) Because the number of malnourished children in some villages are small, for these villages, one NERP center is established for malnourished children of 2 or 3 villages. There are 64 villages in 6 project communes of Van Chan district; the number of NERP centers in villages are 31. In the mountainous areas, the population distribution is scattered and the roads are difficult for travelling, so this is a considerable obstacle for mothers when taking their children to NERP center; ii) Another significant obstacle for poor families is to have adequate food to cook for their children at home.

Because the project is located in the mountainous area with very high poverty rate, though the project has implemented activities to support beneficiary households to improve household food security through cultivation and animal husbandry activities, in fact some households still encounter with difficulties in having a regular source of nutritious food for children daily; iii) The implementation of NERP session for 5 days per month somewhat affects the working time of mothers and VHWs, WU collaborators, especially during the busy planting and harvesting seasons. Some suggested that NERP session should be reduced to 3 days per month, or the number of days can be flexible from time to time; during the busy planting and harvesting seasons, the number of days may be reduced, or during the early stage of project implementation, the number of days can be 5. However, after a certain period of time, when mothers are more proficient, the number of days can be reduced; iv) Currently, NERP centers have not classified and had treatment specific regimen for children with acute malnutrition. Focused interventions to treat children with acute malnutrition are urgently needed, especially when NERP model is available in the community; v) Maintaining the operation of NERCs after the project being transferred to the local partner is a relatively difficult problem. In the phase with direct support from the project, funds to buy food to cook for children for five days at NERP centers are provided by the project. Mothers partially contribute vegetables, eggs, crabs, fish, fruits, and firewood. However, this contribution from mothers is irregular and inadequate.

“Every family with malnourished children must try; it’s easier for families with better conditions, but poor families encounter with difficulties in having food to cook good meals for children like those in NERP centers”.

*(Ban Thi Ghen – A mother of malnourished child in Giang Cai village, Nam Lanh commune)*

“Maintaining NERP centers is necessary but it’s difficult because it requires financial resources, contribution not only from local people but also from the community, local authorities, mass organizations, and other sources”.

*(Hoang Sy Hien – Director of Provincial Reproductive Health Center – Vice Chairman of Provincial Project Steering Committee)*



## *NERP Center in Ngon Lanh village, Nam Lanh commune*

Ngon Lanh is one of the poor and difficult villages of Nam Lanh commune with 98 households of Dao ethnic people. As of March 2016, the number of children under 2 years of age was 18. Meanwhile, the number of malnourished



children from 7-23 months of age participating in NERP Center was 10. Because the number of malnourished children in the village was high, a NERP Center was established specifically for this village and located in Ly Huu Trinh's house, who is a VHW. The center operates from the 12th to the 16th of every month, from 6:00 to 7:30 in Summer and from 6:30 to 8:00 in Winter; during the planting

and harvesting seasons, the operating time of NERP Center may be shorter. All children under 2 years of age in the village will be weighed on the 17th to assess nutrition status and identify malnourished children to participate in NERP Center in the next month. Ban Thi Dan who is a village WU collaborator will support Mr. Trinh to organize and operate activities of NERP Center on a monthly basis. The main activities during a rehabilitation session include: i) Nutrition education and communication; 2) Guiding mothers how to cook a meal (soup or porridge) for children, then 1 or 2 mothers will practice; iii) The mothers will cook soup or porridge for children together; iv) Children eat soup or porridge cooked at the center by mother.

Mr. Trinh said that mothers and children participated enthusiastically and fully because they found it interesting and beneficial. Mothers prefer practice, so he and the WU collaborator focused more on practice. After participating in NERP center, most mothers apply things they learned from the center to cook for the children at home. Previously, mothers often cooked soup or porridge with rice only, or even let children eat rice together with family, but now they cook soup or porridge with vegetables, eggs or meat, fish. If they work hard, it would not take much time and cost. However, there are mothers who do not often cook at home for children as instructed, because they do not really care, or they are busy, or their families are too poor. When participating in NERC, about 70% of children gain weight. The children who do not gain weight often have respiratory infection or anorexia.



Mr. Trinh did not see any difficulties in organizing and operating NERP Center as he said: "I was trained by the project so I can master the knowledge about nutrition; now if any mother asks, I can answer the question well. Because I'm a Dao ethnic person, I can communicate and educate mothers in Dao language easily. Instruments for weighing, measuring and cooking are adequate so it is very convenient." Mr. Trinh did not find it wasting time and his family did not feel troublesome when doing monthly NER activities at his house. Sometimes when the WU collaborator was busy and absent, his wife also supported mothers in cooking soup or porridge for children. Mr. Trinh and his wife said that they "find it happy to see mothers happy."

*"...our family is so poor that we don't have enough conditions for our child to eat the same as other families' children"*



Ms. Hoang Thi Huong and her husband live in Dong Thap village, Minh An commune. Dong Thap village is about 8 km far from the center of the commune, and the road is difficult to travel. They have a daughter named Quynh, born on November 23, 2014. Her family is under poor households, has 500 m<sup>2</sup> as a 2-crop rice field. The rice harvested is about 5 quintals, which is not enough to eat so her family has to buy more. In

addition to farming, Ms. Huong's husband works for a wood workshop in the commune with an income of approximately 3 million dongs/ month. Such income, besides covering the spending of the family, is used to pay the loan for house construction gradually by Ms. Huong and her husband. The loan is about 30 million dongs. At present, 7 million dongs are unpaid.

Quynh weighed only 2 kg at birth due to preterm birth (8 months). Ms. Huong said during her pregnancy, although she knew that she needed to eat adequately, her family was so poor that her meals couldn't provide enough nutrition. In addition, Ms. Huong was often ill when pregnant. As born prematurely and underweighted, Quynh often had coughs, fever, diarrhea and anorexia. When she was 7 months of age, Quynh took part in Nutrition Education and Rehabilitation Program (NERP) Center held in the village by the project. Ms. Huong was enthusiastic to bring her child to the center to learn how to cook and hoped to treat her child's malnutrition. But because her house was far from the center, and on many rainy days, she had to walk for nearly 1 hour, they couldn't get to the center. Another important thing

is due to her difficult economic situation, although she knows her child's meals should have 4 groups of food and how to cook, she cannot prepare nutritious meals regularly for her child. Many meals have only vegetables. Ms. Huong shared, "Because our family is so poor that we don't have enough conditions for our child to eat the same as other families' children". They just have a small land area, so activities of animal raising and farming of Ms. Huong's family are limited. She raises chickens for eggs for her child but they often die of epidemic, so eggs are not available all the time.

At present, Quynh is not out of malnutrition yet, but "Growth Monitoring Sheet" shows Quynh has been gaining weight continuously from birth. According to Ms. Huong, although Quynh is not completely out of malnutrition, this is a good result for Quynh as a prematurely-born and underweighted baby. Obtaining this outcome, she expresses her gratitude to the project for its contribution to her nurturing Quynh.

*Recorded in Minh An commune on January 31, 2016*

### 3.1.3. ANC and EBF support group

The model of Antenatal Care (ANC) and Breastfeeding (EBF) support groups – or "Motherhood Class", includes pregnant women and breastfeeding mothers with child under six months of age. A total number of 350 target mothers join the ANC and EBF support groups in six project communes.



The purpose of ANC and EBF support groups is to support child health care from the first stages of pregnancy and promote the practice of Exclusive Breastfeeding for the first 6 months of life. These support groups are established in villages and hold a meeting on a fixed date each month. In the meeting, the VHW provides knowledge and guidance to mothers on: i) Antenatal care including nutrition, working and resting conditions

during pregnancy, abnormal and dangerous signs during pregnancy, the importance of regular antenatal check-ups, tetanus vaccination, taking iron supplements during pregnancy and preparing for delivery ii) Breastfeeding including colostrum breastfeeding, breastfeeding at birth, Exclusive Breastfeeding for the first 6 months, breastfeeding up to 2 years, proper breastfeeding, and maternal nutrition during breastfeeding. During these meetings, in addition to the knowledge and guidance provided by the VHW, a lot of time is spent on sharing, exchanging experience and mutual learning among mothers. Although pregnant mothers receive information and advice on ANC and EBF at the health center on ANC day,

and breastfeeding mothers nursing children under six months old are communicated with on Child Growth Monitoring (CGM) day, both mothers



and project partners have indicated that holding additional group meetings for ANC and EBF support groups was both necessary and effective. The communication and consultation regarding ANC and EBF that can be delivered at the health center on CGM day is neither as specific nor as informative as the information that is conveyed at the ANC and EBF support group meetings. Moreover, these meetings provide an important

and very useful time and opportunity for mothers to exchange and share experiences with each other. Mothers gain a deeper understanding of ANC and EBF from their participation in these support groups. In addition, the activities of these groups support and promote the mothers' practice of optimal child care and feeding. VHWs at project communes said that after the project had been implemented, the mothers' Pregnancy Care and Breastfeeding behaviors changed remarkably. In particular, more attention was paid to nutrition for pregnant women; the mothers did not discard colostrum and tried to breastfeed right after birth; and exclusive breastfeeding for the first six months has increased significantly.

"After attending the group meeting, I know much more about breastfeeding, so I don't discard colostrum and breastfeed my baby right after birth. I know that I should start feeding all of one breast before moving to the other. And I also breastfeed exclusively for the first 6 months". (*Ha Thi Thuy - a Thai mother of a 7-month baby, Son Luong commune*)

"Group meetings provide more specific information. If I don't understand anything, I can ask VHWs. For example, I asked VHWs about the nutrition to have more milk for breastfeeding" (*Lo Thi Nho - a Thai pregnant mother, Son Luong commune*)

"Since joining the ANC and EBF group meetings, mothers can know more about the benefit of breast milk and practice breastfeeding better than before" (*Do thi Ngoc - WU collaborator in Khe Bon Village, Binh Thuan Commune*)

"It's necessary and useful to join ANC and EBF group meetings. Because on ANC day at health commune, we are quite busy so we cannot consult mothers in a careful and sufficient way. But in the group meeting in the villages, VHWs have a lot of time to guide mothers in details and the mothers also have time to exchange and ask for more information. Attending group meeting also encourages mothers to take antenatal checking and vaccination in a more complete and timely way. Through group meeting, mothers can get better understanding and knowledge of Pregnancy Care; many mothers have bought iron supplements by themselves. That is very

different from the past". (*Tran Thi Thu Hang – Midwife of commune health center, Tu Le commune*)

"Consulting on ANC at health station is not as good as in group meeting. In the group meeting, mothers also have more opportunities to exchange experience and knowledge with each other". (*Nguyen Minh Ban, Head of commune health center, Nghia Son commune*)

Similar to the operation of the Nutrition Education Rehabilitation Program (NERP) Centers, because the number of pregnant women and mothers with child under six months of age in some villages are small, the ANC and EBF support group meeting has gathered mothers from 2 to 3 villages. This made mothers take more time for traveling. Poor economic conditions are also a significant obstacle to the mothers' practice of what they have learned about ANC and EBF. Nutrition for pregnant women and breastfeeding mothers in poor households is limited. Some pregnant women still have to do a lot of hard work during pregnancy due to huge amount of work, poverty condition, lack of man power, etc. The practice of exclusive breastfeeding for the first 6 months encounters a lot of difficulties because the mother has to go to the field for farming work.

"There are many poor households here, so pregnant women still have to do a lot of work and their nutrition is low. Thus, the children are small and underweighted at birth." (*Trieu Thi Senh – a Dao mother, Tac Te village, Nam Lanh commune*)

To support and promote ANC and EBF, within the framework of the project to improve nutrition for children under 24 months of age - funded by MOFA – Government of Japan, and implemented in 6 other communes of Van Chan district during 2010-2011, the model of community group meeting has been piloted at the village level. This meeting gets the attendance of husbands, grandparents and other family members as well as interested members of the community to call for support for ANC and EBF activities and it is held twice a month. After a period of piloting, this model shows ineffectiveness due to the limited participation of the target groups. Therefore, the community group meeting model is not implemented in 6 current project communes. The biggest obstacle to the participation of husbands is that about 60-70% of them often work far away from home in other local areas to earn extra income for the family. Even in some villages, the percentage of men from 18 to 40 years old working far away from home is 80%. On the other hand, according to the local traditional customs, women are responsible for caring for the children. Men hesitate to go to group meeting. Grandparents also hesitate to go to the meeting.

"Organizing group meetings with the participation of husbands is really difficult. As many as 70-80% of husbands work far away from home in Hanoi, Lao Cai or other provinces, and they only come home on the

occasion of harvesting seasons or holidays" (*Luong Van Tan - Agriculture extension staff, Luong Son commune*)

"Organizing group meetings for husbands is difficult because men are busy working far away from home. Even if they are at home, they will not participate in the meetings because they hesitate to hear about antenatal



care for pregnant women and health care for infants" (*Lo Van Truong - a Thai father of a child under 24 months of age, Pha Tren village, Tu Le commune*)

"60-70% of men here work far away from home to earn extra income, because income from farming is low and not in cash. Therefore, it is impossible to organize group meetings for them. It is also difficult for grandparents because they are unlikely to attend

meetings. The best way is to integrate educational contents of health care and nutrition for mothers and children in the village community meetings" (*Le Thi Hong Mai - Midwife of commune health center, Binh Thuan commune*)

Though direct activities for the target subjects including husbands, grandparents and other child caregivers in the family cannot be organized, the project activities taking place in the village community are known by most people. The government and mass organizations in communes and villages have cooperated and supported communication and promoted the project activities in the community. Moreover, as mentioned above, because mothers are sometimes busy, fathers, grandparents, brothers, sisters, or other child caregivers directly take the children to CGM venues or NERP Centers and participate in these activities. In addition, the project communication materials given to households such as "Handbook for nourishing children from 0-5 years of age," leaflet about health care and nutrition for mothers and children are also an effective communication channel for the target subjects. Thereby, their awareness, knowledge and skills about child nourishment have changed remarkably, and they have supported and assisted mothers in nourishing children.



"In the village, most people know about the project, including the elderly. They know that the project is about health care and nutrition for children. Fathers take more care of their children. Some even catch crabs at night to provide more food for their children" (*Ha Thi The - VHW of Tanh Hanh village, Luong Son commune*)

"The project helps everyone in my family understand more about and support me in taking care of my child at home" (*Ha Thi Quyet - a Thai mother of a child under 24 months of age, Ban Tu village, Luong Son commune*)



*Working far away from home to earn extra income is now common in rural areas*



The family of Lo Van Truong consists of 4 people: Truong, his wife and two young children, living in Pha Tren village, Tu Le commune. They are classified as poor household in the village. Truong's family has 700m<sup>2</sup> of agricultural land to grow rice in 2 crops. Every year, his family harvests nearly 1 ton of paddy rice. With this amount of paddy rice, his family has enough foodstuff. They also raise 1-2 pigs and about 10-20 chickens and ducks. Although they have enough foodstuff, they lack cash for food, clothes, electricity, medical care, school fees, etc. So, like many other men in the village, Truong often does extra work in other local areas to earn extra income for his family (Truong's village has about 30 men from 20-40 years old; 20 of them work far away from home). Truong often works in Hanoi, Lao Cai, and Lai Chau. The total time he stays at home with his family is 3 months per year, on the occasion of the harvesting seasons and holidays. His average wage is nearly 3 million dongs per month (excluding money for meals) from his work as a maison. If he does other common jobs which do not require techniques, his income is about more than 2 million dongs. After two years of doing extra work, excluding household spending, he has save an amount of money from his income which is enough to purchase a buffalo and a television set. His next plan is to save money to rebuild his house. He said, "Doing extra work gives me cash. I cannot do anything to make cash at home. But I have to do it far away from home and my family. The extra work is hard, and living conditions are worse than at home. My wife has to do all the housework and take care of the children. I have to send my second child to my mother's house nearby. Honestly I don't want to work far away from home, but due to the situation, I have to. I don't know if I have to work far away from home in the future".

*Recorded in Pha Tren village, Tu Le Commune on January 30, 2016*

### 3.1.4. Ante-natal care day at commune health center

Before the project implementation, pregnant women were encouraged to visit health facilities for pregnancy check-ups, vaccinations and counseling under the reproductive care programs administered by the health sector. A few years ago, when the iron supplementation program



was implemented, pregnant women received iron supplements for free. Now that program is over and iron pills need to be purchased. The timing of visits to health facilities varied per person and they visited arbitrarily on different days of the month. Since the project started, "ANC day" has been held on a fixed date every month

at the commune health centers. Conducting "ANC day" on a fixed date helps mothers remember to get regular and timely pregnancy check-ups. Moreover, since the work is more concentrated, it has become easier and more convenient for the health workers to provide pregnancy check-ups and counseling services to pregnant women; especially the counseling and communication aspect of the visit. When the project was implemented, in addition to the counseling activity carried out by staff of the commune health commune, there is an additional communication activity that entails showing mothers a "nutrition plate", to provide them with knowledge and guidance about optimal nutrition for mothers during pregnancy.

Communication and counseling about breastfeeding is also emphasized to encourage mothers to breastfeed soon after birth, not to discard colostrum, and breastfeed exclusively for the first 6 months. For pregnant women who can not go to the clinic on on "ANC day", it is still possible to do this on any other day of the month

To improve the quality of pregnancy check-ups at the health center, the project organized training to increase pregnancy check-up knowledge and skills and communication and counseling skills for commune health staff workers. It also provided some tools for the standard 9-step pregnancy check-up activity, including a urinalysis machine. As a result of the communication and counseling at pregnancy check-ups and breastfeeding support group meetings, the mothers more fully understand the necessity and benefits of pregnancy monitoring. Therefore, pregnancy checkups activity at health centers since the project was implemented take place more smoothly without any significant obstacles and the quality of is the visits have significantly improved. This service has contributed to



promoting maternal and fetal health care and child nutrition beginning during pregnancy, promoting exclusive breastfeeding (EBF) and increasing the healthy birth rate at health facilities. "Ante-natal care day" will be easy to maintain after the project ends.

"During my pregnancy I take pregnancy check-up at health station fully. I know my health conditions and the fetal development. Commune health staff advises me to take rest properly, not to work hard, eat enough for the fetus to develop well. I have also been advised to breastfeed soon after birth, and should not discard colostrum. I find that taking pregnancy check-up is very beneficial" (*Lo Thi Nho - Thai ethnic pregnant woman, Son Luong commune*)

"I find that conducting "ANC day" on a fixed date is good because mothers remember to take pregnancy checkup more fully and regularly. For health staffs, it is also convenient for their examination, vaccination, and counseling because they concentrate more on work" (*Tran Thi Thu Hang - Midwife of commune health center, Tu Le commune*)

"Conducting pregnancy check-up on a fixed date is to have deeper communication and counseling for mothers. Mothers also have chance to exchange experience with each other. This way is also convenient for mothers, they will visit health station to take pregnancy checking on a scheduled date. If anyone cannot take it on schedule, they can take pregnancy checking on another day" (*Vu thi Minh Thu - Midwife of health center in Son Luong commune*)

"Cán bộ y tế xã được dự án tổ chức tập huấn kỹ về khám thai 9 bước và kỹ năng tư vấn cho bà mẹ nên chất lượng cung cấp dịch vụ khám thai và tư vấn cho bà mẹ tốt hơn. Máy thử nước tiểu do dự án cung cấp giúp việc thực hiện khám thai 9 bước được thuận lợi. Việc tổ chức khám thai theo ngày cố định làm cho bà mẹ nhớ và đến đều đặn hơn. Công tác quản lý thai sản của trạm vì thế cũng tốt hơn" (*Hoang Thi Minh - Head of commune health center, Binh Thuan commune*)

### 3.1.5. Home visit and counseling



Home visit and counseling is an intervention applied by the project to reinforce the other interventions. Home visits significantly increase the effectiveness of communication and counseling about health and nutrition care for mothers and children in the project area. Before the project was initiated, home visits were already being done by the VHWs. When the project was implemented, WU collaborators in the village also began to participate in the implementation in the home visits in addition to VHWs. This allows home visits to occur more frequently than before, wider coverage of homes in the target group and enhanced counseling content.. In addition to the counseling they provide on health and nutrition for mothers and children, the VHWs and WU collaborators also provide counsel families on the HFS, with a special focus on the nutrition garden

Home visits and counseling focuses on the target group of households with pregnant women, new mothers, mothers with child under 6 months of age and mothers with malnourished children under 24 months of age. The purposes of home visit and counseling are to: i) Provide guidance and support to mothers on the importance of pregnancy checkups, health care for mother and child after birth, breastfeeding within and hour after birth, EBF for the first 6 months and proper nutrition care for young child at home, care and timely treatment of sick children; ii) Mobilize family members to support the implementation of health and nutrition care for mothers and children as mentioned; iii) Find out the difficulties that may be hindering the implementation of health and nutrition care for mothers and children and provide appropriate advice; iv) Mobilize family members to apply the household low-cost agricultural production models to increase domestic food supply, and developing nutrition garden

Home visit and counseling activity has several advantages: i) Focusing on a specific target group, using the direct counseling method, understanding the specific circumstances that impose obstacles in the implementation process for individual households, having more time to counsel families more carefully and closely; ii) Home counseling is not only for the mother, it is also an opportunity to meet and exchange information with family members such as husbands, grandparents, etc. thereby getting support and assistance for mothers on health and nutrition for mothers and children, iii) Meeting those who may not come to the activities held at the village level such as child growth monitoring (CGM) day, NERP center, ANC and EBF support group meetings, especially new mothers.



Home counseling activity has many outstanding advantages as mentioned above, but it takes the counselors more time and requires them to have good communication skills and knowledge and experience of the subjects on which they are providing counsel to the families. VHWs and collaborators of project communes said that, in general, when visiting households, they were welcomed into the homes and the families listened to their advice. Moreover, families appreciate the attention and enthusiasm of the health worker who visits them and so they are eager to understand and follow their advice and guidance. However, some cases are more difficult when grandparents are conservative and would prefer to follow ancient traditions, and some husbands distrust and resent the young VHWs who visit their homes to provide counsel and guidance. In these cases, VHWs and collaborators try to take more time and use persistence and skill to gain the families trust and acceptance.

“Through home visit and counseling, both mother and other family members can be met, so the whole family will be communicated and counseled, while through CGM day, NERP center and ANC and EBF support groups only mothers are communicated. If the family members know and understand, they will support and assist the mother. But sometimes there are also difficulties, in some families, grandparents are often conservative, and in some families, the husbands despise us because we are young, they think that how can we communicate when we have less knowledge.”

*(Ha Thi Thuy – VHW of Ban Tu village, Son Luong commune)*

“Visiting households directly helps us know the circumstance, customs, habits, and thoughts of each household, each subject. Thereby the counseling will be closer and more relevant. The communication activities with group of mothers do not have this advantage. However, home visit takes more time and requires us to be enthusiastic, clever and persistent”

*(Tran Ngoc Thach – Head of commune health center, Son Luong commune)*

“Home counseling will be deeper and more relevant with target group, we know if they apply it and what difficulties they have. This may be the best way to impact target group, encourage them to practice good behaviors”

*(Ngo Thi Thu Huong – Head of Reproductive Health Department, District Health Center, Van Chan district)*

*Participating in the project work is busier but Thuy - a VHW still feels happy for her meaningful work*



Ha Thi Thuy, born in 1990, has been a VHW of Ban Tu village, Son Luong commune since 2009. She graduated Grade 9 of 12-year educational system and participated in the training course for VHWs organized by Yen Bai province Department of Health at District Health Center for 9 months before becoming a VHW. By January 2016, Ban Tu village has 67 households with 323 people, including 98.5% of Thai ethnic people. The total number of children under 2 years of age is 18, including 9 malnourished

children, 6 of them have underweight problem and 3 have both underweight and stunting problems.

Since the SC's project was implemented in the village in June 2013, every month, in addition to the work assigned to VHW as prescribed by health sector, Thuy has cooperated with village WU collaborators to organize and implement the following activities:

- Nutrition rehabilitation education for children under 2 years of age, from 12th to 16th of every month (about 15-18 children, from time to time);
- CGM for mothers and children under 2 years of age, on 17th of every month (about less than 20 children);
- ANC and EBF support group meetings for pregnant women and breastfeeding mothers, on 18th of every month (about 6-8 mothers);
- Participating in monthly briefings in the village on 20th of every month;
- Home visit and counseling for pregnant women, new mothers, breastfeeding mothers of child under 6 months of age, mothers of malnourished children, (visit almost household, deeply counsel about 2-3 households).

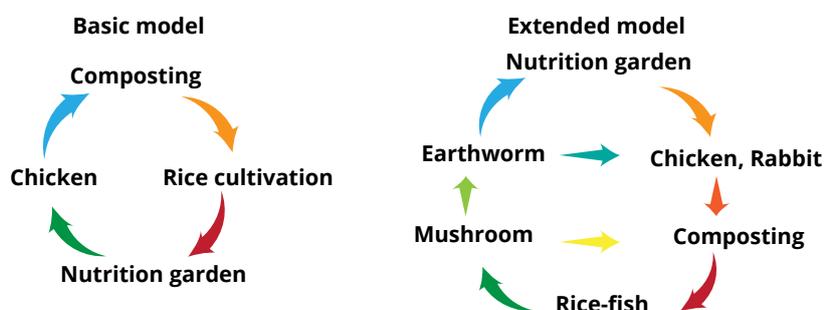
Thuy said that, though participating in the project work takes her more time, but she is still very happy because it is relevant with the work and responsibilities of a VHW. On the other hand, since joining the project, her knowledge and skills have changed a lot through participation in training courses of the project and through practical work. Previously, she did not know much about stunting, now she can identify and monitor the stunting status of children in the village. In particular, her communication skills have been improved a lot. Another important thing is that she is very happy and proud of her contribution to bringing in positive changes to the health and nutrition care for mothers and children in the village. After the project is implemented, mothers take pregnancy checking more fully. The birth rate

at home in 2013 was about 50%, now all mothers in the village visit the health facilities for delivery. Breastfeeding practice has changed markedly, all mothers breastfeed soon after birth and do not discard colostrum. Previously, children are often fed complementary meals as early as 4-5 months of age, now the majority of mothers have practiced EBF in the first 6 months. Children's daily meals are significantly improved because mothers and families pay more attention and know how to cook a nutritious meal for children.

*Recorded at Son Luong commune on January 18, 2016*

### 3.2. Low cost agriculture models

With an aim to be suitable with the household's conditions and affordability, low cost agriculture models introduced by the project are divided by two levels. The lower level – called basic model – includes basic and necessary low cost agriculture models which every household can be able to apply such as nutrition garden, SRI rice cultivations, chicken raising and composting. Higher level – called extend model – includes models that need higher techniques and production conditions when apply. With those models, households will decide to apply by themselves.



#### 3.2.1 Nutrition garden

In rural Vietnam, home gardens play an important role in providing food for daily family consumption. In the project areas of Van Chan district, thanks to favorable soil, climate and water sources conditions, most of the families have their own gardens to supply a quite diverse variety of green vegetables for the families. However, findings from the project in 2011 and 2013 showed many constraints in household gardening: i) Only 78.7%

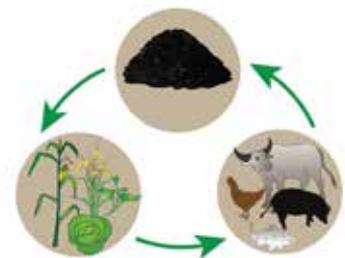
of the households in the 6 project communes had a vegetable garden; ii) home-grown vegetables are not enough to meet all-year-round family demand, with as few as 28.7% of the household having enough vegetable supply at any time of the year. February to April is usually when vegetable supply falls short of family consumption; iii) Lack of diversity of home-grown vegetables, with 49.1% of the households in Nam Lanh commune only growing 1-2 types of vegetables, and iv) 20.6% of the household still used manure and 19.2% chemical fertilizers for their vegetables. A limited number of households still used pesticides and growth stimulants. In this context, and with the aim to improve health and nutrition for family members especially mothers and children, the project has conducted training, instruction and support activities to help the households develop a home-based nutrition garden..

A nutrition garden is defined as a garden with at least 4-5 types of vegetables simultaneously grown at any point in time, in order to ensure diversity of nutrients and provide sufficient and safe food for daily family meals. The project encourages families to achieve four criteria for their home-based nutrition garden, i.e

- **Diversity of nutrients and sufficient quantity.** to meet the family's need for vegetables. This means a nutrition garden should ensure sufficient supply of vegetable for daily consumption of the family all year round with a rich diversity of nutrients.
- **Enhanced synergies and mutual support.** Sự kết hợp, hỗ trợ được thể hiện thông qua qSynergies and mutual support can be achieved through garden planning and selection of a combination of plants to grow in order to maximize the use of space and nutrients of the different soil layers while allowing for synergies and mutual support among the different types of plants. The principle is based on the biological diversity of plants (photophilic vs. shade tolerant, root depth, shrubs vs. liana...). In addition, selection and combination of perennial and annual plants combined with reasonable succession planting will help close the gaps of shortages in between harvests.



Synergies and mutual support is not only possible in plantation. Development of nutrition garden should be closely linked with household-based livestock production in an end-to-end process to create synergies and leverage resources (waste and byproducts) and produce food sources full of nutrients.

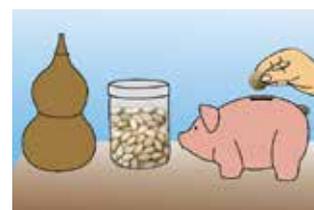


- **Organic farming**, in order to produce clean, safe and healthy food and protect the environment sustainably. Organic farming has been promoted for nutrition gardens, i.e.: using organic manure and not chemicals (e.g. crops protection chemicals and/or chemical fertilizers). Biological measure e.g. alternate row planting of legumes to increase soil fertility, crops rotation, soil processing before seeding (soil solarization, deweeding for combustion), selection of quality pathogen-free varieties, use of botanical pesticides, manual worm-catching, and moth trap lights, among others, are advisable.



- **Prioritized using local seeds that can be reserved for next for seasons**, helping households to save on the cost of seed procurement and increase their control over crop seasons. Local seeds are suitable for local soil and climate conditions, and also help preserve local varieties.

In addition to promote households to develop nutrition garden meeting the above criteria, the project also focuses on guiding the planning, design selection and arrangement of vegetables/crops suitable for local conditions to improve the quality of the gardens. In the project areas, many households are used to planting vegetables in hills or fields that are far from their houses. However, the project encourages them to allocate a plot of land near their homes to plant vegetables so that they can easily and conveniently plant and harvest on a daily basis. Moreover, households are guided to build trellises over pond surfaces or overhead spaces at their house gates or along alleys for loofahs, gourds, squashes, chayote, or use pond edges for sweet leaf, water spinach, taros, limes, and herbs, fences for climbing spinach, yard-long beans, beans, gourds, bitter gourds, squashes, chayote, and pond surfaces for water spinach and water mimosa. Households are typically used to the natural grazing of livestock (chicken, ducks, geese...) and cattle (buffalos, cows, goats...), therefore it is necessary to build fences to protect the vegetable gardens. Fences can also be used for liana plants as previously mentioned. In the project areas, fence materials such as bamboos and neohouzeaua are readily available to help households to save on fence costs.



Selection and arrangement of plants are important to ensure a diversity of nutrients and adequate supply for family consumption throughout the year. Households are encouraged to plant vegetables that:

- Are able to adapt to local soil and climate conditions, especially local

varieties.

- Are highly nutritious with a variety of nutrients.
- Offer diversity of vegetables e.g. loofahs, pumpkins, chayote (leaves, tops, flowers and fruit); sweet potatoes (leaves, tops, tubers), ...
- Are diverse in terms of use: as food but also as medical herbs e.g. perilla, stinkvine, garlic, ginger; as food for man but also as animal feed e.g. water spinach, sweet potatoes, taros.
- Offer long harvest duration: sweet leaf, water spinach, sweet potato leaves...
- Offer food reserves in between crops: sweet potatoes, potatoes, taros,
- Can be preserved for long durations: squashes, pumpkins, potatoes of different types...
- Allow for alternate planting to address shortage of vegetables in between crops.
- Include some types of flowers and herbs that keep damaging pests away.



Van Chan offers some basic advantages for developing the nutrition garden. The local climate is hot and humid, with lot of rain enabling various types of vegetables to grow. Water supply is from clean, unpolluted sources, especially from the mountains and rivers, streams and ponds of different sizes. The soil is quite fertile. The majority of the households have land for gardening or can at least grow vegetables up in the hills. There are however also some challenges and disadvantages that are mainly driven by local residents' habits: they typically grow their gardens following natural methods and don't pay much attention to garden planning and appropriate arrangement of different types of vegetables. They also don't take much care of the vegetables once they've planted them. There is a lack of diversity, and at any point in time there are only 1-2 types of vegetables grown in a garden, especially during the winter-spring season when they mostly grow vegetables of the mustard family. People are more used to growing vegetables during the right season and don't pay much attention to alternative crops and succession planting, therefore when the season is over households usually don't have enough vegetables for domestic consumption. This is especially true during February to April and August to October. The habit of growing vegetables up in the hills and depending on natural sources of vegetables also decreases people's

interest in growing vegetables at home. This habit puts households in a situation where they do not have control over their daily vegetable supply. Moreover, although Van Chan's climate is quite enabling for agricultural production, from time to time deep and damaging cold and rime still happen during winter time and heavy rains during summer time, which is not good for growing vegetables.

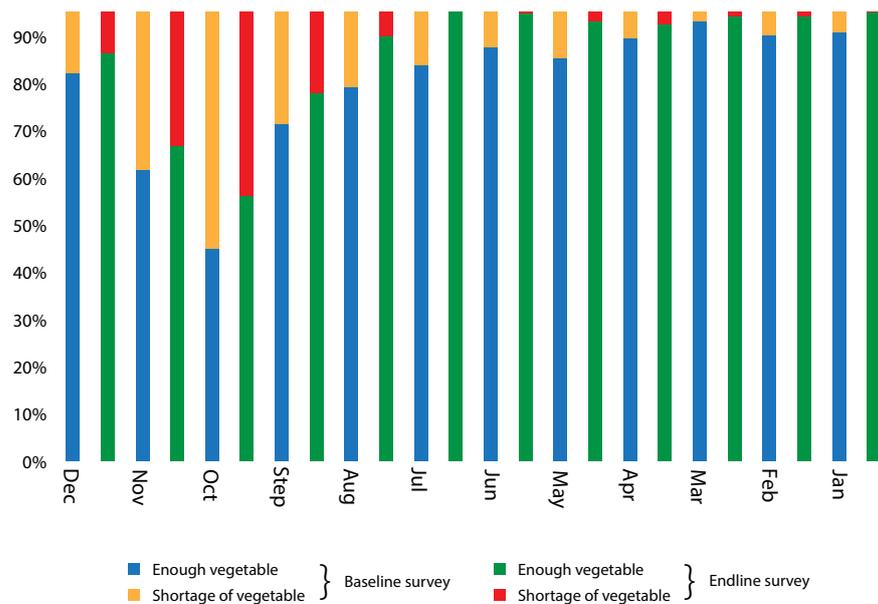
"Nutrition garden are suitable for rural Vietnam and with farmers' customs and practices. Van Chan has hot and humid climate and lot of rain with two distinct hot and cold seasons therefore it is suitable to grow two different types of vegetables accordingly. There is a quite good variety of vegetables that can be grown. Some naturally-grown types of vegetables e.g. Indian lettuce or baloon cherries can be grown in households' gardens. However, there are also some challenges e.g. some households don't have land to grow vegetables while others are still used to seasonal vegetable planting or are mainly dependent on growing vegetables up in the hills". (*Nguyen Tien Lam, Head of District Agriculture Extension Center, Van Chan district*)

To facilitate household in the project areas to grow a good nutrition garden, the project has worked in collaboration with Van Chan District Agriculture Extension Center to provide training courses for them. Apart from delivering the training courses, agriculture extension staffs at district and commune levels also pay site visits to the households to guide them on gardening. In addition, the project also provides some initial support in terms of seeds and seedlings to encourage households to develop nutrition gardens.

After three years of implementation, results and outcomes have been impressive with a lot of big changes vs. prior to the project. The most outstanding outcome of all is the project has managed to change the mindset of people and staff of relevant local departments about the benefits that home-based gardening can generate and provide them with knowledge and techniques they need to grow a nutrition garden. Mr. Nguyen Tien Lam, head of Van Chan agriculture extension station, mentioned, "The biggest achievement when the project ends is it's changed locals' mindset and improved their technical skills for nutrition garden."

A comparison between baseline assessment and assessment at the end of the project showed that the percentage of households with a home-based vegetable garden increased from 78.7% to 91.8%. More importantly, the quality of nutrition gardens has improved significantly. Households have paid attention to planting a larger diversity of vegetables. Some vegetables are highly nutritious, e.g. sauropus androgynous, water spinach, amaranth, jute and Ceylon spinach but due to dietary habits they are not commonly

grown in home gardens. Another finding is that some naturally-grown types of vegetables e.g. Indian lettuce or physalis angulate were increasingly grown in home gardens. The percentage of households having 4 different types of vegetables at any point in time increased from 40.1% to 84.8%. 71.5% of the households practiced alternate and succession planting vs. 24.4% prior to the project. 76.9% do not fall short of vegetables for domestic consumption at any point in time vs. 28.7%. Graph 1 below shows that the percentage of households who are able to meet their own daily vegetable needs has grown, especially in between crops i.e. during February to April. Households also paid better attention to planting types of vegetables that can serve as seedlings for the next seasons in order to increase their control and reduce costs from procurement of seeds. 66.0% vs. 31.4% of the households were now able to preserve at least 3 types of seedlings. Home-based vegetable gardens were also better planned and arranged for, with protective fences and alternate planning combining perennial and annual types of plants and leveraging land and space. Households' habits were also changed towards row planting for better sowing, fertilizing, care-taking and harvesting. Training to raise locals' awareness of clean vegetable planting and guidance on how to compost and use organic manure helped households to get rid of the habit of using fresh manure and to limit the use of chemical fertilizers and chemical pesticides. The percentage of households using fresh manure declined from 21.3% to 1.4%, chemical fertilizers from 20.1% to 1.7%, and chemical pesticide from 2.1% to 0% in planting vegetables. According to the project's quarterly statistics, by April 2016, 67.5% of the households have met the four criteria of a good nutrition garden



**Chart 6: Supply of vegetables for domestic consumption, by month**



The majority of local people and government and relevant departments think that the model of nutrition garden is very suitable and meaningful in increasing food sources and improving nutrition for mothers, children and other family members. They acknowledge that this is the most suitable and meaningful low cost agricultural production model within the household-based food security component of the project, as it meets real local needs by addressing shortage of vegetables in between crop seasons and increasing the diversity of vegetable choices and therefore the diversity of nutrients. On the other hands, as an organic production-led method, nutrition garden help create a clean and safe source of vegetables for households.

“Nutrition garden bring a lot of benefits, providing sufficient vegetables of more diverse types for daily children’s and households’ meals. The vegetables are fresher, safer and more delicious than bought ones”  
*(Trieu Thi Dung – a Dao ethnic mother, Minh An commune)*

“Thanks to the project, my family is now growing many types of vegetables that we did not in the past, e.g. sauropus androgynous, amaranth, jute and Ceylon spinach. Now we don’t have to buy vegetables anymore.”  
*(Ha Thi Sen – a Thai ethnic mother, Son Luong commune)*

“We used to lack vegetables during February to April, but now we have sufficient supply for daily use because right now we are growing pumpkin leaves, chayote, water spinach, Ceylon spinach, kohlrabi and cabbage.”  
*(Sa Thi Linh – a Thai ethnic mother, Son Luong commune)*

“In the past, some households in the village used fresh manure for the vegetables or even sprayed chemical pesticides. Now they don’t do that anymore, instead they now use composted manure and spend time catching worms manually. They also pay attention to growing many different types of vegetables that can serve as seedling e.g. squash, bean, melon, Indian lettuce or physalis angulate, auropus androgynus and Miao mustard green.”  
*(Ly Thi Luong – a Dao ethnic mother, Minh An commune)*

“Vegetable gardening has been a local tradition, but recently due to the impacts of the market economy, locals are not interested in vegetable gardening any more. With the training activities from the project, locals now have better understanding of the benefits of a home-based vegetable garden, and many of them have developed one at home. Moreover, with guidance from the project, nutrition garden yield better quality than before.”  
*(Sa Viet Thuyen – Secretary of the Youth Union, Son Luong commune)*

“Promotion of nutrition garden works well with local conditions. Local people and especially local mothers have better awareness of

nutrition and daily meals for their children and households. Thanks to the project, households are using more green vegetables. Not to a commercialized commodity extent, but this has helped ensuring better nutrition for households at lower costs." *(Nguyen Dang Hiet – Vice Chairman of People's Committee, Minh An Commune)*

"In the past, local people often grew vegetables up in the hills with a poor diversity of vegetables. Now they have their home-based vegetable gardens with fences to prevent damages from cattle and livestock and they are growing more types of vegetables." *(Ban Ton Khe – Secretary of the Youth Union, Nam Lanh commune)*

"In the past, home-based vegetable gardens were spare with typically only 1-2 types of vegetables and households did not pay attention to building fences. Thanks to the project, locals now have a better understanding of the benefits of green vegetables, of different types of vegetables and of how to do gardening. Gardens now have fences and vegetables are planted in rows to enable better care and harvest. People are planting more types of vegetables and know how to do alternate planting by season." *(Luong Van Tan – Agriculture extension staff, Son Luong commune)*

"Apart from diversifying types of vegetables and addressing shortage of vegetables in between crop seasons, nutrition gardens are also important in creating a clean source of food for local people right from their homes, as vegetables sold in the market carry a high risk of food safety due to the use of chemical fertilizers, pesticides and growth stimulants." *(Do Chi Thanh – District Agriculture extension staff, Van Chan district)*

Despite the very encouraging results, there are still obstacles to overcome to improve the quality of nutrition garden in the project areas. Diversifying vegetables and addressing shortage in between crop seasons, i.e. from February to April, is the biggest challenge. The main reason is some households haven't really paid attention and tried to develop nutrition gardens. In addition, some poorer households with fewer family members who are busy making ends meet or with both spouses working away from home cannot focus on their vegetable gardens. Some households are still largely reliant on natural sources of vegetables and therefore don't pay attention to improve the quality of their home-based vegetable gardens. Unfavorable weather conditions are also a significant challenge to growing vegetables in between crop seasons especially in mountainous communes.

Overall, it is very likely that local people will sustain and develop nutrition



gardens because of the need of such gardens and the benefits they bring about and because they are not costly and technically difficult. Moreover, nutrition gardens as a model are not only limited to direct beneficiaries of the project but can also expand to other households in the community. The model will be replicated by the district agriculture extension station to non-project communes within Van Chan district.

“Nutrition gardens shall sustain after the project ends, because local people are now aware of the necessity of nutrition garden for daily food supply and to improve nutrition for their families, especially now that they are very afraid of buy vegetables from the market for fear of use of chemicals during cultivation.” *(Tran Ngoc Thach – Head of Commune Health Center, Son Luong commune)*

“Once local people see the benefits and have developed it into a habit, they will sustain and develop nutrition gardens to serve their own demand. The model of nutrition garden will also be replicated by the agriculture extension station to other communes in the district of Van Chan through the system of agriculture extension workers.” *(Nguyen Tien Lam – Head of District Agriculture Extension Center, Van Chan district)*

### *Nutrition garden – safety vegetables all year round.*

Ms. Ha Thi Hien is a young mother from Thai ethnic group in Ban Muoi village, Son Luong commune. She has two children, the older one 3 years old and the younger one 3 months old. Although she’s always busy with her small children and she is quite young herself, she only has a vegetable garden of 100m<sup>2</sup> which is evergreen all year round.



Ms. Hien told us that before the project her family only had a small back-yard garden to grow a limited number of common vegetables e.g. mustard greens, onions, sweet potatoes, and water spinach. But thanks to the project and the training it offered, she moved the buffalo barn to the

back yard and changed the front yard into a truly nutrition garden.

Having received thorough training, Hien understands very clearly the

four requirements/ criteria in designing a nutrition garden: diversity, synergies, ability to keep seedling for subsequent seasons, and increased use of organic manure. For that reason, even in between crop seasons i.e. March and April, her garden still yields more than 10 types of vegetables: leafy vegetables e.g. sweet leaf, sweet potato leaves, Indian lettuce, baloon cherry, pumpkin leaves, and amaranth, fruity vegetables e.g. beans, chayote, and bitter gourds, herbal vegetables e.g. coriander, parsley, onions, piper lolots, and lemongrass. Her garden also has fruity trees at the corner including mango, jack fruit, banana, and papaya.

Hien said it was a result of using composted manure twice every crop season and watering twice a day in the morning and afternoon. She also uses nutrients from fish extracts to increase nutrition for her vegetables once a week. To deal with pest, she sprays garlic and hot chili pepper twice or three times every time she detects pests, and catches moths during night time when her kids are in bed.

The nutritious garden has offered her kids and family a diversity of nutritious and clean vegetables. In the past she had to secure vegetables from outside, but now she has more than enough vegetables for her family's consumption that she can even sell some of them from time to time.

Hien also shared that as her kids are small, she needs to optimize her time spent on the garden to catch up with the seasons, but she receives enthusiastic support from the commune agriculture extension workers and support from her family. For varieties that she does not have seeds or seedlings, she buys local seeds and seedlings to grow and preserve seedlings for the next seasons. Every month she successively plants an additional new type of vegetables based on the crop schedule provided by the project.

Hien is very happy with her small garden that yields a rich source of clean, highly nutritious vegetables for her family and helps her nurture a dream for an even more diverse garden with not only vegetables and fruits but also combining aquaculture.

*Recorded from Ban Muoi, 15/4/2016*



### 3.2.2 SRI rice cultivation

SRI (System of Rice Intensification) is an advanced rice intensification system which helps increase farming productivity while reducing input cost such as seeds, fertilizer, pesticide, and water. Developed in Madagascar by Fr. Henri de Laulané from 1961 to 1995, SRI enabled farmers to double their farming productivity and secure their livelihood. SRI was introduced in the Northern provinces of Vietnam in 2003 and was recognized as technological advancement applicable to rice farming in the North of Vietnam under Decision Number 3062/QD-BNN-KHCN dated 15 October 2007 by the Ministry of Agriculture and Rural Development. Today SRI is considered to be well-adapted to climate change in Vietnam. So far, over 20 provinces and cities applying SRI

have achieved outstanding results as compared to conventional cultivation method, for example, seed amount decreased by 40-60%, nitrogenous fertilizer went down by 20-25%, average crop yield rose by 9-15%, profits increased by VND2-5 million/ha, production cost/kilogram of rice dropped by VND342-520 and 1/3



*SRI cultivation*



*Traditional cultivation*

**SRI: More seedlings. Number of productive seedlings increased by 10%**

of irrigation costs were saved. There was about a 30% reduction in watering demand for rice fields compared to regular farming methods which becomes more meaningful amid the current scarcity of watering resources. Furthermore, regular drainage at rice fields helps bring down methane emission created by anaerobic bacteria in waterlogged soil with oxygen loss. SRI farming also aerates rice field ecosystem, limiting pest development such as sheath blight, and root obstruction decrease, contributing to the reduction of pesticide usage.

The basic technical principles of this method include: transplanting of young seedlings, single seedlings, sparse transplanting, proper water



*SRI cultivation*



*Traditional cultivation*

**SRI: Fuller panicles with more grains**

management, weeding, mud scouring and enhanced use of organic fertilizer.

With limited land for rice cultivation in the project area, many poor households still struggle to obtain food during the months between harvests and with



*Traditional cultivation*



*SRI cultivation*

unsustainable paddy cultivation methods that use excessive amounts of chemical fertilizers and plant protection products. Given the benefits of the SRI method, the project collaborated with the district's agricultural promotion center to encourage farmers to apply this method primarily in 6 communal project areas. The plan is for the district's agricultural promotion center to scale up the model to other communes through the communal agriculture extension workers who have been guided and trained on SRI technique by the project. In fact, the SRI method has been introduced in the Van Chan district since 2011 by the district's Plant Protection Station through a pilot model that was done in the Thanh Luong and Son A communes. However, as a pilot program, the scalability of this method in Van Chan district remained limited. Only when Save the Children's project started did the district's agricultural promotion center implement this program and communicate it to households.

Along with the promotion of SRI application, the targeted households are also encouraged to use quality rice seeds to increase the product value and food quality. SRI and the nutrition garden models are easily applied without technical complexity and help reduce costs, increase yields and have almost no risk. These features make them suitable for all targeted households, including the poor. Therefore, they are considered to be the key models that the project wants to disseminate



to more targeted households. Furthermore, the SRI model lays the foundation for the development of fish farming model in the rice fields which is supported by the project in the targeted areas.

To support and encourage farmers to apply the SRI method, the project organized training

courses on its benefits, paddy cultivation techniques and direct instruction in the paddy fields. Folded pictures on SRI guidance were developed and provided to farmers to help them master the technique. For households applying the technique for the first time, the project supports them with rice seeds, and they make their own investment in the next crops. During the implementation, agriculture extension workers at district and commune levels always closely monitor and provide proactive technical support to the households.



The first SRI pilot phase was implemented in 2013 summer season with the participation of 29 households (including 13 poor households) on an area of 3.5 ha at Son Luong, Nghia Son and Nam Lanh communes. After harvesting, the agriculture extension workers at district and commune levels, farmers, village leaders and Save the Children's staff conducted a field day workshop to evaluate the program's effectiveness, draw lessons and share experience. Financial accounting results for the pilot SRI models indicated that the average yield rose by 8.7%, the cost of seeds, labor, fertilizer and plant protection products fell nearly VND 2 million/ha. Participating farmers were very happy with the success of the new cultivation method, which reinforced their confidence to apply this approach in the next season. This success was used as evidence to persuade and encourage other farmers in the village/commune to apply the method. At the same time, the agriculture extension workers at the district and commune levels have learned more lessons that will allow them to continue implementing this model in other communes.

After piloting SRI model in 3 communes, the project disseminated this model to the remaining communes in the next season. By the spring season in 2015 - 2016, there have been 1,460 households applying SRI method in 6 project communes with a total area of 119.8 hectares. In Van Chan district, the exchange of transplanting labors are relatively common, facilitating the experience exchange on SRI model among households. In Nam Lanh commune, a project commune with over 90% of the Dao ethnic group, where previously no households applied SRI, the new method has now been applied for over 40% of the total area of 90 hectares. In Luong Son commune, a project commune with more than 90% of the Thai ethnic group, over 50% of households have adopted this approach. More TOT training courses were conducted

for all agriculture extension workers at the commune level, including non-project communes, to provide guidance and support for farmers. Statistics on number of households applying SRI throughout the district are not available, but the model was adopted in about 1,600 hectares of paddy area in the district during the spring season in 2015-2016

The application of the SRI model is generally favorable, but there are some significant obstacles.. The first one was the large number of channeled apple snails living in the paddy fields of Van Chan district. They multiply very fast and are difficult to fully exterminate, despite the use of both manual catching and chemical sprays. They are harmful to the newly transplanted young seedlings and the singly spaced transplanting technique provided by SRI is riskier because it allows the snails to bite the rice plant horizontally. During spring crops, the occasional appearance of extreme cold weather in the Van Chan district kills the newly transplanted seedlings which are not fully rooted. For this reason, farmers often transplant 1-2 units rather than single transplanting in accordance with SRI technique. Another obstacle is that water regulation approach of the SRI technique is difficult to implement in the terraced terrain in the Van Chan district. In addition, the enhancement of organic fertilizer recommended by this method faces challenges due to fewer sources of livestock manure. Due to these obstacles, the adoption of every element SRI was not possible, and some aspects of the method needed to be adapted to the local field context.

In general, SRI is a practical model for farmers, contributing to increased food supply for poor households. It is actively applied by farmers, appreciated and supported by all levels of the local government, local agricultural centers and related agencies. This model along with the nutritious garden are considered appropriate and effective for improving food and nutrition for mothers, children and household members. They are also among the most successful cost-efficient models that have been supported by the project in the targeted area. As with the nutritious garden model, the sustainability and scalability of this model remains high.

“SRI application helps reduce cost for seedlings, fertilizers, pesticides, and labors, while bringing about fuller panicles and higher rice yield.”

*(Sa Thi Linh – a Thai mother, Co Ly village, Son Luong commune)*

“Non-project households also apply SRI because they learn from early adopters who have better results. Farmers learn from each other easily



because of regular exchange of transplanting labors.”

*(Ly Thi Luong – a Dao mother, Dong Que village, Minh An commune)*

“SRI model is well-adopted in Son Luong commune. Most households have been trained on SRI techniques. The model is currently applied by all villages because farmers find it easy to adopt, simple techniques, reduced labor, reduced pesticide while generating higher yield. Local government support this method and communicate it during meetings.”

*(Luong Van Tan – Agriculture extension staff, Luong Song commune)*

“SRI model is adaptable to the local context, in line with the green, clean and organic agricultural development orientation. The model is highly appreciated and supported by the provincial and district government and agriculture sector. People enthusiastically piloted the model and found significant benefits. SRI model is easy to be maintained by just attending one training and applying it for one crop. There is no risk but only benefits to farmers. The replication of the model is also easy because farmers can learn from each other even when they are non-project households.”

*(Nguyen Tien Lam – Head of District Agricultural Extension Center – Van Chan district)*

### *“SRI helps my family produce more rice with lower cost”*

Ms. Lo Thi Hanh is a Tay ethnic woman living in Quan 2 village of Binh Thuan commune. She has a six-month child and is living with her parents in law. In 2014, Save the Children started supporting some households in the commune to apply SRI. Ms. Hanh’s family was among households registering for the training on this technique. Supported by her parents, she applied SRI for 2.800m<sup>2</sup> of their family’s paddy field. At first, she was nervous for several reasons, whether rice yield would be lower than before due to lower transplanting density, whether young seedlings would die of cold weather, and whether rice panicles would



have many floater grains. Surprisingly, after adopting this method, the amount of seeds, labors, chemical fertilizers, and pesticides drop while crop yield remarkably rose:

Items	Conventional cultivation method	SRI
Transplanting density	40 - 45 clumps/m <sup>2</sup>	30 - 35 clumps/m <sup>2</sup>
Transplanting space	10 - 15 cm	18 - 25 cm
Number of seedling units for transplanting	4-5 seedlings	1-2 seedlings
Types of seeds	Chiêm Hương seed-rice	High quality Vietnamese original seeds
Amount of seeds	14 kgs	8.5 kgs
Number of transplanting labors	10 people/time	5 people/time
Fertilizers	Fresh livestock manure	Compost + biogas 10 kg nitrogenous fertilizer + 50kg NPK
Pesticides	Fresh livestock manure 30kg nitrogenous fertilizer + 100kg NPK (5:10:3)	1-2 or even 0 times/crop
Water	Always flooded by 5cm	Water drainage when maximizing tillers
Yield	1,8 tons	2,07 tons

After their success in the first season, her family continues to adopt SRI method up to now (for additional 3 crops). From her experience in applying SRI, she found that transplanting of young seedlings at wider space help rice plants maximize tillers earlier and grow stronger due to adequate lights, therefore it's unnecessary to spray pesticides because of fewer pathogen. She finds SRI very adaptable to her village, so every time exchanging labors for transplanting at the beginning of the crop, she convinces and guides other households to apply SRI. Currently, nearly 100% of households in her village have adopted SRI in paddy cultivation. She happily thanked the project for introducing this model to her village, including her family, which helped her family produce more rice at lower cost.

*Recorded in Quan 2 village, Binh Thuan commune on 17 April 2016*





## Monitoring and comparison results between SRI and traditional cultivation methods

Household information: Vu Thi Lan, living in Quan 3 village, Binh Thuan commune, has a less than 2-year-old child. Total area

applying SRI: 700m<sup>2</sup>, total area applying traditional cultivation method: 400 m<sup>2</sup>, observed during 2015 summer season.

Sources: Conducted by the district's agriculture extension staffs in coordination with the family

Items	Fields with conventional cultivation method (4 unit transplanting)	Fields with SRI method (Single transplanting)	Comparison between fields with SRI method and conventional method
Specific expenses	Thien uu 8	Thien uu 8	
- Cost for Seeds	50 kg x VND100,000/kg = VND5,000,000	30 kg x VND100,000/kg = VND3,000,000đ	Down by VND2,000,000
-Transplanting labors	60 man-day x VND60,000/man-day = VND3,600,000	40 man-day x VND60,000/man-day = VND2,400,000	Down by VND1,200,000
<b>General expenses</b>	<b>VND13,210,000</b>	<b>VND12,870,000</b>	
- Soil leveling	VND3,000,000	VND3,000,000	
- Fertilizers	VND5,310,000	VND5,310,000	
- Caring	VND1,500,000	VND1,700,000	Up by VND200,000
- Harvesting	VND2,500,000	VND2,500,000	
- Plant protection drug	VND900,000	VND360,000	Down by VND540,000
<b>-Yield (ton/ha)</b>	<b>69</b>	<b>75</b>	<b>Up by 0.6 ton/ha</b>
<b>Total cost</b>	<b>VND21,810,000</b>	<b>VND18,270,000</b>	<b>Down by VND3,540,000</b>
<b>Total revenue</b>	<b>VND51,750,000</b>	<b>VND56,250,000</b>	<b>Up by VND4,500,000</b>
<b>Profit</b>	<b>VND29,940,000</b>	<b>VND37,980,000</b>	<b>Up by VND8,040,000</b>

### 3.2.3 Composting model



In the past, in rural areas when chemical fertilizers were not available, animal manure and green manure were very important fertilizers for crops and plants. Everyone was aware of collecting and processing these types of manure for field fertilization. As part of the green revolution in the 1960s, a series of chemical fertilizers were invented. Due to their rapid effects on crops and plants, chemical fertilizers represented a big

mindset shift in farmers. Over-use of chemical fertilizers has led to environmental pollution and an excessive amount of chemical residue on agricultural products and in agricultural soil which is increasingly degraded. Although Van Chan is a mountainous district, chemical fertilizers are widely used in planting while fewer and fewer organic fertilizers are being used. In addition, there are a certain number of families that still use fresh animal manure directly from pens as fertilizers for plants including vegetables.

In this context, and with the objective of supporting households to produce safe and quality agricultural produce especially for pregnant women, women with small children, and children, the project implemented activities to raise awareness and to promote and support households in composting and use of organically composted fertilizers. In addition to helping to produce safe sources of food, the use of composted organic manure is an important part of the chain for a complete end-to-end model of plantation and livestock production, leveraging natural resources, reducing spending on chemical fertilizers, helping to improve soil quality and protecting the environment. The district agriculture extension workers also see it as critical to promote composting and use of organic fertilizers to develop sustainable agriculture in the Van Chan district.



*Animal manure and green manure*



*Composting process*



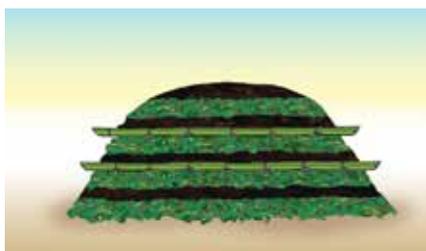
*Organic fertilizer*

“Composting is necessary models to generate a source of quality fertilizers and reduce environmental pollution, improve people’s health and reduce spending on chemical fertilizers. This is also the way to go for agriculture sector.”



*(Nguyen Tien Lam – Head of District Agriculture Extension Center, Van Chan District)*

In fact, composting is not something that is new to the rural Vietnamese including those in Van Chan, and in fact it has been a long-standing practice. However, as mentioned above, the over-use of chemical fertilizers has led to much less use of organic fertilizers. Sometimes when organic fertilizers are used, they are not composted before used, or are not composted correctly. In this context, since 2013, the project has organized training courses to provide guidance on the correct composting techniques, including when the main materials e.g. cattle and livestock manure should be combined with plantation byproducts e.g. straw, corn plants, bean plants and other green plants readily available around houses and from hills and forests e.g. banana trees, chamber bitter, bidens pilosa, ageratum conyzoides, melia azedarach linn leaves. According to the condition of the households, the project introduced to them two composting methods, i.e. with and without biologicals. The former one allows for fast decomposing with high percentage of composts, reduced unpleasant odor and shortened composting duration. However, this method also requires households to spend money on biologicals, which are not readily available in many rural areas. In fact, after the training from the project, very few families bought and used biologicals to compost manure.



After some duration of implementation, the most visible result has been a significant change in farmers' mindset regarding the benefits of using composted organic fertilizers, which has led to their increased use. Most families have now stopped using fresh manure as fertilizers for planting. Some of them have been successfully composting fertilizers according to the guidance of the project. Composting and using organic fertilizers have contributed to good nutritious gardens and improved SRI practice. As mentioned under Section 2.1 Nutritious Garden model, the use of fresh manure as fertilizers for vegetables before and after the project was 21.3% vs. 1.4%, and the use of chemical fertilizers has dropped from 20.1% to 1.7%.

“After the training from the project, many families have composted banana trees, chamber bitter, bidens pilosa, and melia azedarach linn leaves together with manure from buffalos, cows and pigs.”

*(Lo Thi Lam – a mother, Co Ly village, Son Luong commune)*

“Before the project comes, many families just used fresh manure straight from cattle pens for fertilization. Now they don't do that anymore. They understand that composted manure is better.”

*(Ban Thi Nay – Vice Chairwoman Peoples' Committee, Nam Lanh commune)*

Despite the positive results and impacts, the actual volume of composted organic fertilizers that have been used is still much lower than plantation needs, and not all families have composted their fertilizers correctly as guided by the project. There is still limited use of green manure and agricultural waste and byproducts to increase output, as was previously the practice of many families. Some major obstacles include:



- Reduced cattle raising (buffalos, cows and pigs) combined with natural grazing leading to limited volumes of manure collected.
- High developed market for chemical fertilizers, especially FDPs, with many choices that offer convenience and quick wins, resulting in large scale use by many families.
- Some families do not pay much attention or give much effort to the composting process, i.e. collecting green plants and agricultural waste and byproducts to correct piling. Instead, manure is often left to decompose naturally. When done in this way, the quality of composted fertilizer is not as good.
- In the project area, high proportions of men are working away from home, up to 60-70% in some villages, leaving behind mainly women, children and elderly people to do the hard work of composting and turning piles..

“In the commune, there are many green plants available, but people were not bothered to collect them for composting. Many did not following instructions from the project. All they did was pile the manure up and leave it to decompose for several months before using it as fertilizer.”

*“Ly Ton Senh – Agriculture extension staff, Nam Lanh commune)*

“In our commune, the use of FDPs is still very popular because they are convenient to use and are effortless.”

*(Hoang Xuan Tinh – Vice Chairman of Peoples' Committee, Binh Thuan Commune)*

“Thanks to the project, families have changed their mindset and they no longer use fresh manure. But they have not completely adhered to technical guidance when composting.”

*(Nguyen Tien Lam – Head of District Agriculture extension Center, Van Chan District)*

To solve this and to further promote the composting and use of organic fertilizers, the district agriculture extension team has a plan to continue communication, training and guidance to the producing families and also to encourage them to increase livestock production, collect more manure and use more green plant and agricultural waste and byproducts in order to increase the quantity and quality of composted fertilizers. This will be done in integration with nutritious gardens, SRI practice and rice-fish model.

### *"Benefits from using composts are obvious"*



Pham Thi Mai, aged 39, lives in Khe Bit village, Minh An commune. At home, she usually composts manure as she needs fertilizers for her vegetable and orange gardens.

Before the project, all that Mai did was pile manure up and add lime. But thanks to the training provided by the project, she now

understands the importance of proper composing combining manure with cultivation byproducts to improve the quality of composts. She uses cassava pulp to compost with cattle manure. In addition, she also buys Emina as an additive to accelerate fermentation. She followed exactly with the project had instructed, i.e.: add manure, cassava pulp and Emina in consecutive layers, pile them up and cover them so that decomposing can happen faster. She uses the composts as fertilizers for her orange and vegetable gardens up the hills. Currently, she has many types of vegetables in her garden: Amaranth, water spinach, auropus androgynous, moringa, Phaseolus vulgaris, Physalis angulata, pumpkins, indian lettuce, Ceylon spinach, cucumbers and spices e.g. parsley, Eryngium foetidum, lemongrass, and ginger. Mai said when she used composts, her vegetables grew very well, and that it was cleaner and safer than using chemical fertilizers. With composts, her orange trees grew strong and were free from pests, diseases and/or mycosis, which was in contrast with families who used chemical fertilizers and whose orange trees did not grow every well due to lack of nutrients. She also found the soil in her garden up the hills was more fertile and moist and had a lot of worms in it therefore it required less watering which could otherwise be quite hard work. Her orange fruits tasted much better and

she could sell them at a premium. She also informed that composts helped her save from spending on chemical fertilizers and pesticides.

With her hands-on experience, she saw the benefits of composting therefore together with her husband she'd make plan for composting every year. She also encouraged other families to do the same..

*Recorded in Khe Bit village, Minh An commune, on 17/4/2016*

### **3.2.4 Black chicken raising model**

Similar to home garden, chicken raising has become a regular and popular activity of households in rural Vietnam. This activity is of low cost and farmers can do the breeding themselves without having to purchase chicken breeds for the next batches. Moreover, it requires little labor, is easy to carry out and provides high-nutrition sources of food (meat and egg). For young children, eggs are a nutritious food and easy to prepare. In addition, chicken raising can bring income to households – a small amount for daily spending or for ad-hoc occasions. The biggest obstacle for households in chicken raising is epidemics which can kill the entire flock of chickens of a household or of the whole community. Chicken epidemics are easily spread, making it very risky to raise free-range chickens. In the Van Chan district, except for some households with good economic conditions who can raise chickens using an industrial farming method with farms and a barn for the chickens, most people raise chickens that range partially, i.e. chickens live outdoors during the day time and stay in coops at night time. This poultry husbandry practice is appropriate for the habits and conditions of local households given their large gardens and hills, helps reduce the costs of food for chickens and produces high-quality meat and eggs. However, it is also prone to spread epidemics and can affect the vegetable gardening activities of households. In fact, since chickens often have epidemics, a number of households no longer raise chickens, or raise them less frequently.

In order to support households and promote chickens raising for the objective of improving nutrition and increasing family income, the project organized technical training courses on chicken raising techniques for households through the agricultural extension system. Communal extension workers provided intensive guidance and help with veterinary services for households at their homes. Folded brochures providing instructions on free-range chicken raising were developed by the project and provided to households. Contents of the training and the brochure focus on traditional raising methods which are in line with chicken raising

practices of most households - especially the poor. The prevention of epidemics for chicken is emphasized through recommendations on how to make chicken coops, ensuring hygiene for disease prevention, caring for and nurturing chickens. Traditional preventive and curative methods for chicken diseases are also mentioned.

Along with the improvement of chicken raising knowledge and techniques, the project also introduced black H'mong chickens to households through



the provision of five breeding stocks (both roosters and hens) for beneficiary households. This is a chicken breed with good quality of meat and eggs, being prolific, resistant to diseases, easy to raise and suitable to the characteristics of the project site. 6,675 breeding stocks were distributed to 1,279 beneficiary households in May and July 2013. The breeding stocks were supplied by the Center for Livestock Experiment and Preservation in Hanoi. Due to

the long distance and large quantity of breeding stocks to be transported, 1-month-old breeding stocks were selected to be distributed to beneficiary households. This created some difficulties for households in the early stage of chicken raising: the breeding stocks were too young to change the living environment from a good one in the Center to the natural breeding environment in households (when they were in the Center, they were raised in appropriate temperature and given bran as the main food). Apart from the young age of breeding stocks, the small number of (5) chickens distributed to each household was a risk factor that led to death of some of the stocks of chickens. Once these matters were recognized, district and communal extension staffs provided more guidance and support to families in caring and nourishing chickens, including brooding chickens, giving food and drink to chickens properly. However, due to the risk factors described above plus inadequate care for and nourishing of chickens by some households (they had limited understanding of chicken raising and did not pay sufficient attention to additional instructions), after 2 months 34% of breeding stocks died.

In spite of the deaths of some of the breeding stock, the remaining ones grew rapidly. At the same time, households also raised local chicken breeds so the introduction of the black chicken breed by the project created a generation of hybrid chickens not only in beneficiary households but also in the community. According to the people and local officers, hybrid chickens are more resistant to diseases. Households in the project site like the black chicken breed very much because it produces delicious meat and many eggs. A local hen often produces 15 - 20 eggs/brood, meanwhile a black one produces 25-35 eggs/brood; some even



produces 40 eggs, even though they stop some days they then continue laying eggs. The selling price of black chickens is higher than that of local ones (local chickens are usually valued at VND 95,000 - 100,000/ kg, black ones are valued at VND 110,000-120,000/ kg). The model of black chicken raising has helped to improve the meals of households markedly, the eggs improve the nutritional status of children,

which is consistent with the project's objectives. It also helps to increase the income of many households. Ms. Luong Thi Hoi in Muoi village, Son Luong commune has gained more than VND 15 million from selling chickens and eggs. Ms. Nguyen Thi Thuy in Quan 3 village, Binh Thuan commune has gained about VND 9 million from selling chickens and eggs since early 2015 to present. Therefore, the model of black chicken raising has been evaluated by local people in the project site as one of models of the project that has been effective and that they benefit from. According to statistics of households, at the end of March 2016 the number of black chickens and hybrid chickens of over 1,000 beneficiary households in 6 project communes is approximately 12,000, and this number does not include the number of hybrid chickens of non-beneficiary households. Baseline and end point data of the project also show that the average number of poultry per beneficiary household has increased significantly as a result of the interventions of the project: number of chickens has increased from 14.6 to 25.7, number of ducks is increased from 1.5 to 6.5.

"The model of black chicken raising is very suitable with local conditions. This chicken breed is adaptable, easy to raise, prolific with high value of meat and eggs. All local people like it. After the project distributed breeding stocks to beneficiary households, non-beneficiary households also started to buy the stocks for raising". (*Luong Van Tan – Agriculture extension staff, Son Luong commune*)

"Previously many households raised chickens on range completely, now they make coops for chickens and raise them on range partially, they also take better preventive care for their chickens. Although parts of the black chickens distributed to households died, the remaining ones grow very fast and proliferate a lot, spreading to the whole village. They produce many eggs, which is very good for children's diet". (*Luu Thi Hong Kiem – Head of commune health center, Minh An commune*)

"The introduction of the black chicken raising model by the project is relevant and effective. Black chickens are strong, suitable with local conditions, prolific with good quality of meat and egg. It is very relevant for improving children's nutritional status". (*Hoang Van Hai – Director of district health center – Head of district project steering committee*)

## *Black chickens help Ms. Thuy's family not only improve nutritional status but also increase income*



Nguyen Thi Thuy's family is one of the poor ones in Quan 3 village, Binh Thuan commune. She has two children, a 9-year-old son and a 2-year-old daughter. After attending the training on chicken raising techniques organized by the project in her village, she was provided with five black H'mong breeding stocks. Being aware that this breed is precious, her family took good care of the 5 chickens, but 2 died and there remained 3 chickens (1 rooster and 2 hens). After a while, these stocks produced the first batch of chicks. She and her husband decided not to sell chickens and eggs; they kept the chicken so that they can develop into a big flock, and the eggs were for their children's daily meals. Their plan has become successful. After a year, she has a flock of over 100 big and small chickens, of which about 30 are hens. Every day she gets 15 eggs.

Ms. Thuy says her children can freely enjoy the eggs, as well as the chicken meat. When the number of chickens and eggs is bigger, she and her husband starts selling them. She does not remember how much she earned from selling chickens and eggs in 2014, but since early 2015 to present her family has gained about VND 9 million from selling chickens and eggs. She says black chicken and eggs are easy to be sold, people prefer them and they often come to her house to buy, hence she does not have to take them to market. During Tet period, they are of high demand. Before the project, her family also raised about 20 local chickens but they could not sell these chickens due to small quantity. According to Ms. Thuy, black chickens has many more advantages: strong, prolific, good-quality meat and eggs, delicious, easy to be sold. Some of them can produce 40 eggs. The breeding stocks which were distributed to her by the project laid for 2-3 consecutive months without hatching, sometimes it stopped for several days. In 2014 when there was a bird flu epidemic, all her local chickens died while the black ones survived. Currently, she still has a male and a female stock. According to her experience, it is necessary to clean chicken coops regularly.

In addition to successful black chicken raising, Ms. Thuy is also very successful in the model of rabbit raising supported by the project. She and her husband are very happy and thankful for the initial support of the project, including technical training and provision of chicken and rabbit stocks. This support has helped improve her family's economic situation remarkably

*Recorded in Quan 3 village, Binh Thuan commune, 15 March 2016*

## *I like this black chicken because it produces so many eggs*

Ms. Phung Thi Quy, 24 years old, is living in Khe Bit village with 2 small children, a 2-year-old son and a 12-month-old daughter. Previously her family raised 20 local chickens. In 2013 the project provided her with 5 black chickens, in 2014 due to epidemics some of them died and she only had 1 rooster and 1 hen left. Currently, her flock of black chickens has been multiplied to 60 chickens, including both black ones and hybrid ones, of which 10 are hens. She also has 50 local chickens.

Every morning, she frees the chickens so that they can find food and drink by themselves, at night time she puts them in coops. Apart from the food that the chicken find in the nature, she also feeds them with corn bran, rice



bran, green vegetables and cassava pulp incubated with banana trees

She likes to raise black chickens very much because they suit the climatic conditions in her community, are easy to raise, grow fast and can reach 1.2-1.5 kg/chicken after 12 months. If well raised, black hens will start laying eggs after 7-8 months and they produces a lot of eggs. On average, each black hen lays 30-40 eggs. Black cocks are very strong, therefore the number of hybrid chickens has increased sharply.

This breed has a very high nutritional value, with big eggs yolks and delicious meat. Since she participated in the project, her children can enjoy eggs in 3 meals/week with 2 eggs/meal, and enjoy chicken meat (1 chicken/week), thereby she spends less on buying foods. Moreover, she can sell eggs at VND 4,000/egg and sell chickens at VND 100,000/kg. Each year she sells about 60kg of chicken and 60 eggs. The eggs of black chickens are mainly sold to other households for hatching. In that way the income of her family has been increased.

Ms. Quy says that she has attended the training on chicken raising techniques organized by the project. She also has some experience in raising chickens, so she shares some lessons as follows: when the weather gets hot and during the white cedar blooming season, chickens will be prone to diseases. During this period, chickens should be kept in coops for prevention and treatment of diseases. In treating chickens, we should firstly apply herbal remedies such as garlic juice, then if they do not recover we will give them medicines and/or injection. She wants to get more coops built to expand the scale of farming.

Ms. Quy says currently every household in her village raises black chicken.

She is very happy because the project has introduced not only to her but also to the entire village, commune and district a new generation of chickens with better fertility and good quality of egg and meat.

*Recorded in Khe Bit village, Minh An commune on 17 April 2016*

### 3.2.5 Rice-fish model

Intensified rice-fish culture is considered by scientists and development experts as an integrated pro-poor solution thanks to low capital expenditure with fish culture being a component of the cultivation system. Rice-fish culture has the advantages of: reduced use of chemicals (pesticides, fertilizers...), increased biological reserves for aquatic species, increased farmers' food security, and increased and stabilized rice yield. It helps diversify production, re-use byproducts, and increase economic returns and is good for the ecological environment, and can be considered as a good opportunity for sustainable agricultural production.

In the past, a small number of households in Van Chan had had fish entered in their paddy fields in an uncontrolled manner without technical knowledge, e.g. with no trenches for the fish. Moreover, they had usually cultured fish during the winter season following a successive model i.e. rice – fish – rice to take advantage of idle fields in between 2 crops. With the increasing trend of pesticide use, however, very few farmers had continued with the model.



Recognizing the obvious benefits from the Rice-fish model and taking into consideration the suitable natural conditions in the project area, the project has provided households with implementation support. In Van Chan, many of the households' rice fields have good access to clean water source, which is channeled from the mountains with regular flows which allow households to manage water inflows into their fields. However, not every household has this control over water access, which is a big challenge. Many have their fields located in the middle of others', meaning water flowing into their fields has to pass through others' fields. If the other households use pesticides or herbicides, that would affect the water inflows that these households eventually get. Therefore, unless all households with fields in the same plot that share the same water sources implement the Rice-fish model, only the ones with fields located at the

watershed. For households whose fields are small, Rice-fish culture can also be a challenge, because it requires a certain part of the area for fish trenches. The project also identified the Rice-fish culture is an advanced model rather than a basic one that can be applicable to all households.

"It's very good to raise fishes in rice fields, but not every household can do it because massive use of pesticides means many households who do not have control over water inflows will be affected." (*Ha Thi Sen – a Thai ethnic mother, Co Ly village, Son Luong commune*)

"Households with small rice fields will find it difficult to follow the Rice-fish model because fish trenches are needed." (*Hoang Thi Tien – Chairwoman of Women Union, Tu Le Commune*)

In December 2015, the project started a pilot effort to implement 3 Rice-fish models in Son Luong and Binh Thuan communes 2,600m<sup>2</sup> of rice fields. Since then, the households who participated in the pilot have been applying SRI rice cultivation practices. Similar with other models, apart from initial fish seeds support, the project has focused on providing thorough training and technical instruction of raising fish in rice fields to farmers before they started implementation. During the process, agricultural extension workers also provided technical support to the households, from digging trenches to disinfecting fields using limes to moderating water levels required for productive fish and rice culture. The types of fish that are cultured by the households are carp and tilapia, because they are suitable with field environment. Initially, the pilot households were also concerned as fish culture would take a



certain part of the area for fish trenches. But after they harvested their rice, they saw that paddy yield were almost unchanged, and that the model brought many economic gains and helped protect the environment without costing a lot of money or labor or requiring very high techniques. Therefore they were very happy and chose to continue with the model during the

subsequent rice season.

After pilot implementation, seeing the suitability of the model, in February 2016, the project expanded to 36 additional sites in 6 project communes with a total area of 12,900m<sup>2</sup>. Currently, the 39 Rice-fish sites are maintained with very good development and are highly valued by farmers and local officials because:



- The fishes raised in rice fields grow faster and don't require feeds as they can feed themselves with insects, worms, planktons, lost paddy, weed seeds...
- Rice-fish model combined with SRI practices and increased use of organic fertilizers have reduced significantly the use of chemical pesticides and fertilizers.
- As the fishes look for food, they plunge deep into the muddy bottom of the fields, helping to increase air and oxygen for the rice plants to grow and to save on labor that is otherwise needed for weeding and mud tilling.
- This model contributes to significantly improve food sources for families, mothers and children.

"Raising fish in rice fields will provide more fish for food, reduce worms and pests, manure from the fish is good for the rice plants. The fishes also help till the muddy bottom which is good for rice cultivation." *(Lo Thi Thien – a Thai ethnic mother, Co Ly village, Son Luong commune)*

"Fishes raised in rice fields consume less food than farmed fishes because they eat worms and pests in the fields and therefore they require less supplementary feed. Fish culture in rice fields also helps limit spraying pesticides." *(Vu Thi Lan – a Tay ethnic mother, Quan 3 village, Binh Thuan commune)*



"This is a very suitable and meaningful model together with SRI practice to increase paddy yield and reduce costs. The fishes grow fast and help improve family meals. This model can be maintained expanded easily. Households will apply it if they see the benefit from it. Agriculture extension staff is willing to support household even after the project ended" *(Luong Van Tan - Agriculture extension staff, Son Luong commune)*

"In the past, fishes were entered massively in rice fields in an uncontrolled manner without trenches and only once every year because access to water was difficult during spring time and also because plant protection chemicals were massively used. Thanks to the project, officials teach us how to dig trenches and ponds to accumulate water and keep the fishes in captivity so we can have control. The fishes grow fast with the first harvest possible after 3 months." *(Hoang Van Soan – Vice Chairman of*

*People's Committee, Tu Le commune)*

"This is the first year of implementation but we have had many families buy-in with plans to dig trenches and ponds to culture fish." *(Nguyen Dang Hiet - Vice Chairman of People's Committee, Minh An commune)*

"Rice - fish model is very suitable for the poor, it is highly organic and can help deliver many objectives in line with local agriculture development direction." *(Nguyen Tien Lam - Head of District Agriculture Extension Center, Van Chan Distric*

### *Rice fields don't just yield rice!*

Vu Thi Lan's family is one of the poorer Tay ethnic families living in Quan 3 village, Binh Thuan commune. Lan is 30 years old and has two children, 9 and almost 2.



In the past, the families applied conventional cultivation practices in their rice fields. But since 2014 with the SC project, she has joined the SRI model and has seen many benefits. She will continue to maintain this model in subsequent seasons.

In July 2015, when the project went on to introduce the rice+fish model, she registered and became one of the three families to pilot it in Binh Thuan and Son Luong. Her 300 m<sup>2</sup> rice field is located near the watershed so she can proactively control water sources. Initially she was very worried that fish culture in rice fields would take away land for rice cultivation and that rice yield would decline. But after she received training from agriculture extension workers, she felt much relieved. The agriculture extension worker guided her and worked with her to dig trenches and ponds and disinfect her field with lime. It did not take her much time or effort to culture the fish, because it mainly required water moderation for the rice plants and the fish, which agriculture extension worker guided her on how to do. Sometimes she visited her rice field to observe the fish looking for food around the rice plants and she felt very happy. She saw that fish cultured in rice fields can grow faster than farmed fish in ponds. When the rice was near to harvest, she could catch big fish for the family's daily meals. After rice was harvested, she channeled more

water into her field to culture fish while waiting for the next rice season. She usually caught bigger fishes and enter them into a pond, while the smaller ones would be kept in the rice fields, as by this time the amount of food available in the fields would start to decline. According to her, the systems of trenches and ponds were very useful. After the first rice+fish season, she found the rice+fish model combined with SRI would bring more benefits than the conventional practice without fish culture. The benefits she saw include significant cost reduction from paddy seeds and chemical fertilizers and pesticides. She got higher rice yield and more fish for food and even for sales. Her lesson learnt was next season she would only enter 300-400 fishes vs. 600 like during the last season as that would allow more food and therefore faster growth for the fish.

Lan was thankful to the project for introducing to her and providing guidance and support to her family in launching a nutritious garden, composting manure, raising chicken, and apply SRI and rice+fish model. Her family would continue to maintain the model.

*Recorded in Quan 3 village, on 15 March 2016*



### *"Together with SRI, rice - fish bring many benefits"*



Lo Thi Thien lives with her family in Co Ly village, Son Luong commune. They were one of the first 29 families joining the SRI pilot during the spring season in 2013, and were one of the first 4 to pilot rice -fish model in July 2015 with support from the project in 6 project communes. Her family has 1,100m<sup>2</sup> of rice fields with two crops annually. She provided some basic information

to compare the two cultivation practice in the same field that the family possess:

	Conventional practice	SRI practice
Rice variety	Chiem Huong	Chiem Huong
# of rice seedling transplanted	4-5 seedling	1-2 seedling
Distance from plant to plant	12 – 15 cm	18 - 20 cm
Quantity of seedling used	5 kg	3 kg
Man days for trans-planting	10 men for 1 time	5 men for 1 time
FDP	30 kg	15 kg
Organic fertilizers	10 hangers	15 hangers
Pesticides	Sprayed from 5-7 times.	Sprayed 1-3 times using biological pesticides
Paddy yield	16 bags x 45kg	18 bags x 45kg

Thien and her family are now very familiar with SRI practice, and they will keep applying this method now that they've seen the benefits from it over the past 6 rice crop seasons.

From the first rice+fish season, apart from the fish they caught from time to time along the process for family consumption, after rice was harvested, they also harvested 38kg of fish. Of this, she sold 10kg and got 350,000 VND, and moved the remaining 28kg to a pond to continue culturing. According to Thien, fish cultured in rice fields do not require as much feed as pond fish but could still grow fast as they caught worms and insects in the rice field for food. She saw no difficulty in implementing this model and she would definitely buy fish seeds and continue to culture fish in her rice fields thanks to the many benefits the model brings in combination with SRI. Lesson learnt was that she would need to dig deeper trenches to give bigger fishes more water to survive hot days. Some neighbors who are not project beneficiaries already asked her about her experience so that they could follow. Thien had also shared SRI-related experience with many other women in her village and now many of them have applied SRI practice successful



### 3.2.6 Rabbit raising

Rabbits are low-maintenance, highly reproductive and fast to grow. From a nutrition point of view, rabbit meat contains a very high level of protein. Rabbit raising is highly productive economically helping to increase household income. Costs to raise rabbits are especially low as rabbit cages can be made from bamboo and wood readily available locally. Food for rabbit mainly contains green plants that can easily be found and/or planted all year round and possibly agricultural byproducts. Raising rabbits is not labor-intensive and can be done leveraging subordinate labor forces during free time. Due to all of this, rabbits are said to be “pigs of the poor” and the Project has selected rabbit raising model for beneficiary households in Van Chan district. In fact, many households in Van Chan have been very successful raising rabbits. It was also confirmed by agricultural extension workers and district and commune levels and local governments that the rabbit raising model is indeed suitable for Van Chan’s conditions and for poorer families.

“Rabbit raising is suitable for Van Chan district to leverage readily available materials for building pens and natural and nutritious garden sources for food.” *(Nguyen Tien Lam – Head of District Agriculture Extension Center, Van Chan district)*



“Rabbits are suitable for the poor as they require little care and can be harvested faster than chicken. Leftover vegetables and green plants can be used as food.” *(Nguyen Van Hung – Agriculture Extension staffs, Binh Thuan commune)*

“Rabbit meat can be sold easily to generate income for poorer households. Enabling conditions are also in place for cuniculture to develop.” *(Hoang Xuan Vuong – Vice Chairman of People’s Committee, Binh Thuan commune)*

Since rabbit raising is more technically challenging than nutritious gardens or chicken farming, rabbit raising was implemented following a household group-based model to enable members to share, learn and support one another during the process. Moreover, the group-based model also allowed for rotation of rabbits among the members after kindling in order to increase the responsibility of rabbit-raising households and reduce capital expenditure. The household groups discussed with their district and commune agriculture extension staffs two options of rotating either dams and sires or kits and decided to

rotate the later, as rotating dams and sires is not good because when they have to change their living environment from one family to another it will affect their reproduction. Each group of families were supported with four breed rabbits, i.e. 3 does and 1 buck. The breed rabbits were of a variety from New Zealand now they are now quite popular in the local areas thanks to distinct features e.g. high weight, delicious meat, fast growth, high reproduction, and high economic benefits. Providing local breed varieties was also considered, especially given the high mortality level after the first round of support. However, local varieties were becoming increasingly rare therefore the project could not secure a sufficient supply for the beneficiary households.

Before receiving the breed rabbits, group members were provided with technical training on rabbit raising by district and commune agriculture extension workers. As cuniculture was new to most of the beneficiary families and required a certain level of knowledge and experience, agriculture extension workers were always available along the journey to provide hands-on guidance and support to the families whenever there was any technical situation. Leaflets were developed and distributed to families with very detailed and adequate information, e.g. how to make pens and food and water troughs, cautions on food for the rabbits, how to take care of rabbits which are raised for breeding vs. meat production. The families who had the privilege of receiving the first breed rabbits took advantage of the available materials to build pens and troughs and nests for kindling very carefully following the instructions of commune agriculture extension workers before they received the breed rabbits from the project.

In August and November 2014, the project provided seed rabbits for the first and second pilot to 128 groups of families in 64 project villages (2 per village) with a total number of 512 rabbits. Seed rabbits were provided by local breeders in Van Chan district. At the time of distribution, the seed rabbits were in good health conditions as required by the project.

The families receiving the seed rabbits from the project were very happy and delighted. With a lot of enthusiasm and commitment, the seed rabbits were well taken care of and some families started to see the first litters of kits after some months. However, mycosis and diarrhea started to develop. Despite much support from commune agriculture extension staff, treatment was not effective. Some rabbits were killed by diarrhea, while rabbits with mycosis relapsed after treatment and began wasting gradually. Some kits also got mycosis from their dams. In addition, it was observed that in some of the families the rabbits did



not die but did not reproduce either. These situations happened a lot in Nam Lanh, Tu Le, Son Luong and Nghia Son communes but not as much in Binh Thuan and Minh An. Due to the contradictory results from pilot implementation in the two different regions, district and commune agriculture extension staffs tried to collect information from the families to find the causes. The problems were also discussed during check-in meeting among different levels to discuss solutions. Some of the identified reasons include:

- Poor care was given to the rabbits by some families. Despite the thorough training on rabbit raising, during the process of raising rabbits, some families did not adhere to the technical instructions while others were too busy to spend time and take care of the rabbits. Moreover, most of the families were not experienced in rabbit raising. Although agriculture extensions workers were always available with hands-on guidance and support, day-to-day caretaking must be the responsibility of the families.
- Another problem was although the agriculture extension staffs were knowledgeable of rabbit raising in theory, they did not really have practical experience to support the families. Though rabbits are low maintenance, they are prone to diseases without care and experience.



Of the 6 project communes, the families in Minh An and Binh Thuan did a better job in taking care of and raising the rabbits. In fact, local people in these two communes have better experience and pay better attention to developing non-conventional agricultural production models apart from rice cultivation.

***Some problems regarding rabbit care-taking:***

- Some families did not build pens and troughs very carefully and the rabbits would gnaw and nibble especially their water troughs leading to shortage of drinking water. This had negative effects on the rabbits, especially pregnant and kindling dams. Sometimes when there were not enough water, dams could eat their kits. Some of the pens were not sufficiently ventilated and hard to be cleaned, or placed in poorly ventilated places. Some families did not clean their rabbit pens and troughs on a daily basis. These were the factors leading to rabbits being prone to intestinal diseases, scabies and/or mycosis.

- Care-taking and feeding were not done with care and did not follow technical guidance. Sometimes the rabbits were fed with unparched high water content vegetables e.g. cabbage and sweet potato leaves or pubescent leaves causing stomach upset. Others did not feed their rabbits with sufficient rough and refined food, and the rabbits were sometimes left hungry and thirsty. Malnutrition led to wasting rabbits which were prone to diseases and reproductive problems.
- No reproduction: some families were not experienced in identifying oestrus moments to allow for timely mating, or were unknowledgeable of how to make sure mating was effective. In some other cases, bucks were kept in cages which were close to dams'. Some families were also not experienced in taking care of their rabbits after kindling, resulting in kits dying.
- Other important reasons leading to underperformance during waves 1 and 2 also included the fact that breed rabbits had been fed by breeders with industrial bran before given to the families. Once the families received the rabbits, they fed them with leaves and rice/corn brans or corn seeds or cassava that was readily available at home. Sudden food change led the rabbits to eat less and became wasting with declining immunity. In families who paid attention to take care of the rabbits and feed them carefully, they could survive this transition and gradually adapt. Otherwise, they became prone to diseases and death.

"The reason why many rabbits died during the first and second wave was because cage were not built technically properly or adequately cleaned, and because of poor care-taking and feeding practice by the farmers. At the same time, there was limited technical assistance from agriculture extension workers." (*Nguyen Tien Lam - Head of District Agriculture Extension Center, Van Chan District*)



"Most of the families were keen to raise rabbits. However, they did not do a good job raising the rabbits due to lack of experience and/or genuine care. For example, they fed their rabbits with wet leaves and did not provide enough water. They did not clean the pens appropriately. Therefore the rabbits became wasting and prone to diseases and eventually died." (*Luong Van Tan - Agriculture Extension staff, Son Luong commune*)



“Raising rabbits was difficult because of the sudden food and habitat changes from a breeder to a family. Moreover, rabbit raising only worked when you were careful and hard-working.” *(Nguyen Dang Hiet – Vice Chairman, People’s committee, Minh An commune)*

After analyzing reasons and drawing lessons from the first and second wave of pilot, the project continued to provide 120 seed rabbits in three other waves to 30 producer-groups in December 2015. The first families to have received the rabbits were carefully selected based on criteria including enthusiasm and commitment and also condition to ensure good raising. Agriculture extension staffs guided the families on how to prepare cages properly and followed-up carefully as the families progressed with their cuniculture, especially to guide them on how to help the rabbits get used gradually to the new environment and ensure proper and adequate feeding and pen cleaning. As a result, the performance of wave 3 was significantly different from that of waves 1 and 2, with no rabbits found dead.

“After the failure of waves 1 and 2 especially in Tu Le and Nam Lanh communes, we drew some lessons learnt. During wave 3, we were more careful in selecting the first producer families and provided good technical assistance from agriculture extension workers. The families also took better care of the rabbits. Therefore we succeeded with wave 3 when no rabbit was dead and instead the litters have been maintained and developed.” *(Nguyen Tien Lam – Head of District Agriculture Extension Center, Van Chan District)*

While some families were not, many have been very successful in raising and have rotated the rabbits to other families following the group-based mechanism. Rabbits have since used as family food and also for sales. The next generations of rabbits kindled by rabbits of the first families have been transferred to other families because they are used to household-based raising from when they were born. Families who succeeded in rabbit raising were those who worked hard to take care of the rabbits, cleaned pens regularly, and cleaned leftover food and rabbit manure to create a clean environment. They also paid attention to learn from others’ experience and share theirs with other producers. They thought that rabbit raising was not difficult and in fact was very productive. Local officials where producers have been successful also spoke highly of the model.

“For me rabbit raising is very easy. I can use my free time to raise rabbits. They grow very fast with extensive reproduction every 28-30 days and I

can sell rabbits every 60-90 days." (Nguyen Thi Thuy – a mother with small kid, Quan 3 village, Binh Thuan commune)

"Rabbit raising is suitable for families as it is economically productive. Some families have enjoyed extensive rabbit reproduction."

(Hoang Xuan Vuong – Vice Chairman of People's Committee, Binh Thuan commune)

**Table 3: Below are some updates of the cuniculture model as of March 2016:**

Rabbit's status	Unit	Number
# of rabbits already provided	count	632
# of rabbits that died	count	204
# of kits kindled	count	435
# of rabbits sold	count	112
# of rabbits consumed	count	41
# of remaining rabbits	count	710
# of rabbits transferred to new families	count	106
<b>Proceeds from rabbit sales</b>	<b>VND</b>	<b>15,700,000</b>

### *"For me raising rabbit is very easy"*

When the project started the rabbit raising model in Binh Thuan commune, Nguyen Thi Thuy and four other mothers in Quan 3 village decided to form a group. On 17th January 2015, Thuy was the first one in the group to receive 3 does and 1 buck to raise. By March 2015, all



the three does gave birth to their first kits, and they continued to kindle every 2 months. Thuy herself could not remember how many kindlings had happened and how many kits had been kindled. According to the group's rotation/transfer mechanism, Thuy transferred 4 rabbits to each of the four other families in her group. Apart from the

rabbits transferred to the other families, so far her family have earned over 9 million VND from selling rabbits and have consumed ~ 10 rabbits. Currently they still have 26 rabbits, big and small, including the original four seed rabbits. The couple plans to receive two more seed does to increase the number of seed does.

According to Thuy, although many said rabbits were hard to raise, but she found it very easy. Every day she'd feed the rabbits mainly

with cassava leaves taken from the forest, corn leaves, banana leaves, cabbage leave etc. In addition, she'd also feed them with corn and bran. Thuy found raising rabbits easier than raising pigs or buffalos and also more profitable within a shorter period. Rabbits can be sold very easily with many buyers, and the couple could sell rabbits right from home. She shared her experience: sanitation was required, as was adequate feeding. At the initial stage, her rabbits also got mycosis due to insanitary conditions and she needed to seek help from the commune agriculture extension team. After that, she understood that she needed to keep the cage clean to prevent her rabbits from disease. She shared the experience with other household in her village. Many families came visit Thuy to learn from her. Not only is she successful in raising rabbits, but she is also very successful in raising black chicken and SRI-based rice cultivation. These models have helped improve the family's daily meals and increase cash income for the family. She could use proceeds from selling rabbits and chicken to pay for her children's schooling, invest more in her production and pay daily expenditures.



*(Recorded in Quan 3 village, Binh Thuan commune on 15 March 2016)*

### *Vuong and her husband did not know why their rabbit died although they had taken good care of them*

When the project launched the pilot rabbit raising model with family groups in Nam Lanh commune, Ban Thi Vuong and three other Dao ethnic mothers in Ta Lanh village formed a group. Vuong was trusted by the group to become the first to receive breed rabbits. Before that, all of the four families attended technical training for cuniculture provided by the project. Vuong's husband also attended the training. He used available bamboo, wood and palm leaves to build nice and strong pens for the rabbits.

In August 2014, Vuong and her family received 4 seed rabbits including

3 does and 1 buck. The family as well as the others were very happy with the beautiful strong breed rabbits and were hopeful that they would kindle many kits so that they could transfer them to the other



three families. Every day the couple would take care of the rabbits carefully. They got grass and forest leaves to feed the rabbits twice every day. In addition, they fed the rabbits with corn and cassava, and also provided adequate water as guided. But after a couple of months, the litter began to suffer from diarrhea. The couple sought help from commune agriculture

extension workers, but after a few days all the four breed rabbits died. They could not figure out why the rabbits died given they've taken very good care of them. They just could blame local conditions for not being suitable to raise rabbits. According to commune agriculture extension workers though, the rabbits had been fed by industrial bran before given to the family, therefore it could have been difficult for the rabbits to adjust to grass, leaves, corns and cassava feeding. After the rabbits died, the whole group felt discouraged and thought they'd never raise rabbits again. Now she is using the rabbit pens to raise chicken. .

*(Recorded in Ta Lanh village, Nam Lanh commune, on 8/4/2016)*

### 3.2.7 Mushroom growing model

Mushroom is a highly nutritious type of food containing high levels of amino acids and vitamins B1, B2, B6 and PP... Mushroom also has high proportion of protein comparable to animal meat. Therefore, since 2014, the project has been piloting a model to grow straw mushroom and oyster mushroom using straws as the substrate, with the expectation that the model can be expanded in the subsequent years. This model has been seen to be suitable with the conditions of poorer families in the project areas thanks to available materials i.e. straws left behind after rice harvests, cool climate conditions, no high tech and not much time required, ability to leverage idle labor, and speed to harvest. The products are clean and highly nutritious, helping to improve and change nutrition for families' daily meals and

easily marketable to increase family income. Discussions with families growing mushrooms showed that the model requires low level of investment: with VND 250,000 for 15kg of mushroom spawns and another VND 500,000 for 300 kg of readily available dry straws, lime and sacking, production yields 100kg mushroom which is estimated to worth VND3,000,000 to 3,500,000. The byproducts generated from growing mushroom can be used as fertilizers. The most significant obstacle however is lack of on-site supply of spawns therefore spawns must be procured and transported from Hanoi.

"Mushroom is easy to grow, quick to harvest and easy to sell. You sell it as you grow it." (*Ha Thi Nhan, Agriculture extension staff, Binh Thuan Commune*)



"The model of mushroom growing can be applicable to poorer families thanks to available straws which does not cost anything. It is highly productive economically." (*Nguyen Van Hung - Agriculture extension staff, Binh Thuan Commune*)

"The model of mushroom growing is suitable for Van Chan in terms of the climate, available materials and ease of implementation. It is also aligned with the project's objective i.e. providing clean and highly nutritious products for children and families." (*Nguyen Tien Lam - Head of District Agriculture extension Center, Van Chan district*)

Similar to raising rabbits, growing mushroom is organized by groups of families to enable mutual support and sharing among the member families as well as technical guidance and support from agriculture extension. Steps of material preparation, molding for straw mushroom, and packaging for oyster mushroom are quite hard work and labor-consuming, therefore organizing them by groups should be more effective. Moreover, although straws are readily available in every family, growing mushroom requires a large quantity of straws, therefore working in groups will make it easier to collect sufficient straws. The size of a group was up to its members to decide: some have 3-4 people while others have 4-6. Support from the project includes training and technical guidance and support throughout the process and initial support in terms of spawns and some other materials e.g.

plastic bags.

Between August 2014 and December 2015, the project organized training and direct guidance to 41 groups of mushroom-growing families, with 215 beneficiary families participating. The first wave included 16 groups of families growing straw mushroom. The subsequent waves included groups growing oyster mushroom.

Pilot results of the first wave i.e. growing straw mushroom were not up to expectations. As many as 9 out of 16 groups failed to harvest or could harvest very little mushroom, while the rest of the groups also had limited positive results meaning limited possibility to expand the model in subsequent years.

After the first wave of pilot growing of straw mushroom, agriculture extension workers at district and commune levels and SC staff sat down to review the results and analyze the challenges and obstacles and the reasons for failure and lessons learned. Some of the main reasons for underperformance included:

- Technical reasons: this was the main reason. While growing mushrooms is not technically demanding or complicated, it does require strict compliance with the technical process. In fact, members of some of the groups did not follow the technical guidelines along the process, especially in preparation of premises and preparation and processing of materials. They were not fully aware and experienced in growing mushroom therefore they did not do a thorough job preparing and ensuring sanitation and pasteurization of the premises and solarizing and processing straws and therefore the mushroom got infected. Not only beneficiary families but some agriculture extension workers were also not experienced in this field and therefore were unable to guide the groups to comply with technical requirements.
- Low straw quality: straw preparatory work was not planned upfront when harvesting time, straw was not stored and preserved well therefore the quality was not ensured (rotten, too moist, and moldy.)



- Lack of control over spawns including quality in some instances. Because spawns were procured from Hanoi and transported by coaches to Van Chan, there were times when they were not transported in due course after the groups of families had completed all preparatory work for sowing leading straw to be rotten. In some other instances, spawns were received when they were quite mature, which affected productivity

Following the analytic exceed and provided further guidance to the groups of families. In December 2014, all 7 groups in two waves chose to grow oyster mushroom because the weather was more suitable for this type of mushroom. The results were quite positive. All 7 groups yielded some harvests including some very good ones. During the following two waves in 2015, the groups continued to grow oyster mushroom and only one out of 18 groups was not successful. After the failure of the first wave, no family wanted to grow straw mushroom anymore. According to Mr. Lam, Head of Agriculture Extension Station in Van Chan district, his staff had already successfully guided mushroom growing in some communes within the district, however the model was focused on some more developed communes where families were better off. On the contrary, the project was focused on more difficult communes and poorer families. Beneficiary families have limited technical capabilities, experience and economic/ labor conditions to grow mushroom, leading to some challenges during implementation. Successful groups of families wanted to continue with the model, while groups who failed did not. But, the agriculture extension workers in Van Chan district are still confident that this low-cost organic agricultural model is suitable for local farmers and very much aligned with the objective of increasing clean and highly nutritious food and income for poorer families. In addition, it is also a model that creates synergies and mutual support along an end-to-end process of agricultural activities, contributing to monetizing waste and byproducts and protecting the environment. The biggest challenge for this model to be further developed across groups of family is supply of spawns – which is something out of control and quite complicated given the fact the spawns must be ordered and transported from Hanoi.

## *Success - joy and encouragement for mushroom-growing women*

Trieu Thi Ngan, age 26, Phung Thi Vinh, age 28, Trieu Thi Quy, age 27 and Ly Thi Lanh age 23 are mothers with small kids from the Dao ethnic group in Dong Que Village, Minh An commune. They attended a training course on mushroom growing delivered by commune and district agriculture extension workers. Understanding the benefits of growing mushroom and seeing that it is not very difficult or costly, they decided to form a group to grow oyster mushroom in the winter-spring season of 2015-2016. They feel very happy because they can share the workload of many hard steps e.g. cutting, fermenting and turning straw, filling and compressing so that they can use their free time to do.



According to Ngan, initial support from the project included 25kg of mushroom spawns and substrate bags. The only thing that the families needed to invest in was straw which was readily available at home from the last harvest, plus lime for straw treatment and bags. In total, the group was able to fill 400 bags, which were then distributed equally to the four families to take care and harvest. They each felt it was very fast – they were able to harvest in less than 1 month (straw fermentation took 7 days, plus around 20 days from filling and spawning to first harvest). The joy was so big when their first harvest yielded as much as 100 kg, followed by subsequent harvests at 30kg/ harvest time. The mushroom was easily sold, at VND 40,000/kg at the beginning of the harvest season and then VND 30,000 right in the middle of the harvest season. Most of them knew how to cook the mushroom into delicious, highly nutritious dishes including soup, stir fried mushroom and/or putting it into hot pots. The home-grown mushroom was very fresh, clean and delicious. Not only did they consume the mushroom domestically, they also shared some with their relatives and friends and also sold some (e.g. Ngan got VND 800,000 from the mushroom she sold).

Ms Lanh in the same group also added that Minh An had suitable conditions to grow mushrooms e.g. available materials, cool climate, and committed agriculture extension workers. Also thanks to the training they found growing mushroom quite easy. They especially felt delighted when working in the group because they could share the otherwise hard work.

The whole group agreed that next year they would continue to grow

mushroom during the winter-spring time of 2016-17 because they would be very busy with their small kids and the rice field and then tea field work during summertime.

They also shared some successful lessons e.g. when filling straw into bags, the higher compression was the more mushroom would grow. Also, when it was cold, mushroom should be watered with warm water. There could be multiple harvest times until the substrate deflated.



Quy also added that thanks to the knowledge they obtained from the project, the women now knew how to use used substrates to compost fertilizers for their home-based vegetable gardens.

They all felt very happy and proud because they could harvest the mushroom that they grew themselves every day and cook it into good dishes for better nutrition for their kids and families

*Recorded in Dong Que village, Minh An, on 15.3.2016*

### *Failure due to lack of experience*

In November 2014 when the project supported some families in Na Lon village, Tu Le commune to pilot growing mushroom, 7 Thai ethnic mothers with young children including Vãn, Mai, Lan, Chiên, Thưởng, Xuyên, and Phong decided to form a group. The members in the group attended



training on mushroom growing delivered by the project and then were provided with technical guidance by commune agriculture extension workers throughout the process. In addition, the project also provided them with support in terms of mushroom spawns, lime and plastic sacking for straw fermentation and stacks to cultivate mushroom. They contributed straw themselves. They were very committed and

followed the instruction from agriculture extension workers from straw processing, fermenting and turning, to filling, spawning and taking care of the mushroom. They were also faced with some challenges e.g.: due to lack of planning, they had to collect and ask for straw therefore the quality of the

straw were not satisfactory. After fermenting the straw, when it was time to do the filling, mushroom spawn arrived three days in delay therefore the spawn were too old. Despite the hard work, they were very excited to wait for the mushroom to grow. However, after a while, all they saw was wild small black mushroom. The group was very disappointed. After the failure experience, they sat down with the commune agriculture extension workers to figure out the reasons, which were identified as: i) Under-qualified straw; ii) Lack of pasteurization of stacks before growing the mushroom (a lot of chicken mites jumpers were found as they grew the mushroom); and iii) delay in spawn supply with under-qualified spawn.

Mai said, "It was such hard work for everyone, which was why we were so frustrated when all we got was wild mushroom. Some of us wanted to quit. But I would still want to give it another try. If I did it again, this time I would have better experience in preparing straw and lime and room to grow mushroom and ensuring good pasteurization and timely spawning."

Hung, a commune agriculture extension worker, also said, "Failure was mainly driven by not complying to technical guidance and lack of experience in both us agriculture extension workers and the women themselves. Lack of quality spawn is also an important factor."

*Recorded from Tu Le commune, on 7/4/2016*

### **3.2.8. Earthworm (Redworm) raising**

Earthworms (Redworm or *Perionyx excavates*) are a kind of worm that consumes manure as food and usually live in environments with large amounts of decaying organic compounds. Raising earthworms is beneficial in many ways: it helps handle organic waste and manure from chicken, pigs and cows with massive digestion capacity to generate high quality organic fertilizers and therefore improve the rural ecological environment. Earthworms are a clean, high quality source of food for chicken, geese and pigs... because the dry form can contain up to 70% protein.

Earthworms require simple types of food and they are very speedily reproductive. From 1-2m<sup>2</sup> original load, after 1.5 – 2 months one could gain 2- 4m<sup>2</sup> of earthworms to supply food for livestock and aquaculture. After 3-5 months of growing, one can collect vermicast



as a fertilizer for plants. Vermicast has high nutritious contents and is good for improving soil conditions due to its ability to retain water and prevent soil erosion.

Raising earthworms is part of the chain of an end-to-end organic circulation cycle with steps including gardening, plantation, livestock and cattle production, aquaculture, production of animal feeds, and processing of microbial fertilizers. Single cycles turn into multi-cycles; with waste and byproduct of a step used as major input for the next. This helps improve total energy efficiency and generate higher economic yields in planting and livestock production. Vermicast is also helpful in restoring and improving soil. Therefore, earthworms can be considered a natural fertilizer factory. Raising techniques are quite simple and earthworms have hardly any cost except for breed costs. The best food for earthworms is composted cow and buffalo manure.

With such benefits, raising earthworms is a low-investment model that generates many benefits. For that reason, the project selected this to be piloted based on local strengths i.e. available buffalo manure sources and plantation and livestock production activities by every family. Raising earthworms also generates an additional source of clean, highly nutritious food for livestock production and field/garden fertilization.

“This is a very meaningful model – earthworms can be used both as food for livestock production and as fertilizers.”

*(Do Chi Thanh – District Agriculture extension staff, Van Chan district)*

“Earthworms can be raised to generate food for chicken and ducks and therefore help reduce the cost for animal feed.”

*(Lu Thi Tao – village health worker, Pom Ban village, Tu Le commune)*

“Earthworms can be raised easily and reproduce quickly. They are quite low-maintenance. You just need to feed them once every 2 days during summer and once every 4-5 days during winter.”

*(Vi Thi Keo – WU collaborator, Nghia Son commune)*

In October 2013, the project held training courses about raising earthworms and provided support in terms of breed earthworms to beneficiary families in 6 project communes. After attending the training

on the benefits and techniques of raising earthworms, many families were excited to implement it, so much so that demand outweighed planned supply. 663kg of breed earthworms were provided to 221 family groups. Each of the groups had a representing family to receive the breed earthworms first



and share with the other families in the group once the earthworms reproduced. About 6 months into implementation, the model was well maintained and developed by the family groups. There were times when as many as 300 families implemented this model. But after that, families gradually dropped out. The other families in the same groups did not want to receive breed earthworms. At the time of this report, there is only a handful of families staying with this model.

Based on discussion with earthworm producing families and project staff at different levels, below are some of the main reasons for families to drop out of this model:

- Many people were hesitant of the dirt when they had to collect cow and buffalo manure and compost it for good for the earthworms, and when they collected the worms themselves.
- Some people were vermiphobic.
- There were limited sources of cow and buffalo manure to be used as food for the earthworms. Recently, cattle raising has also declined, therefore many families do not have cows and/or buffalos and they had to ask for it and collect it which was time consuming and something they were reluctant to do.
- Lack of adherence to technical guidelines: food for the earthworms was too damp, moisture was not supervised regularly and substrates became too dry and the earthworms died or reproduced very little, therefore the families were frustrated and dropped out.
- Families did not pay attention to feeding the earthworms regularly and they died.
- Location for worm farming was not proper, or lack of covers leading to damages by animals.



- Chicken were raised naturally, and in some cases were fed full with paddy and corn so in some families the chicken refused the earthworms.

“Raising earthworms is not costly, but families are hesitant and did not like the dirt that’s why they dropped out.”

*(Dinh Thi Khiem, a Thai ethnic mother, Co Ly village, Son Luong commune)*

“Other families in the village also stopped raising earthworms, mainly because of lack of cow and buffalo manure as food for the earthworms and also because people were hesitant of the dirt.”

*(Phung Thi Quy, a Tay ethnic mother, Khe Bit village, Minh An commune)*

“At first people were very keen to raise earthworms, but after a while they just abandoned it. Now nobody in the commune continues, although this model is very suitable for poorer families. Mainly because they are hesitant of the dirt.”

*(Nguyen Van Hung – Agriculture extension staff, Binh Thuan commune)*

“Limited food sources for the earthworms because cattle are mainly raised up in the hills so it’s quite difficult to collect their manure.”

*(Luong Thi Toan – Chairwoman of Women’s Union, Son Luong commune)*

“Food for chicken are readily available including bran, paddy, corn... chicken are also free-ranged to seek their own food so the families were not very interested in raising earthworms.”

*(Lo Hung Cuong – Head of commune health center, Tu Le commune)*

Despite the many good things about raising earthworms, especially including the low cost which is suitable for poorer families and generating end-to-end cycle of plantation and livestock production towards sustainable organic agriculture, the model could not be maintained and expanded due to the above-mentioned obstacles.

## *Raising earthworms was not maintained and developed for many reasons.*

### **Case study 1:**



When the project provided support to families to raise earthworms, Luong Thi Thuong's family was among the first to implement in in Ban Xe village, Son Luong commune. After receiving the breed earthworms, her family paid attention to raising them and they reproduced very fast. After about 3 months, they had enough earthworms to share to the other families in the same group and started to use earthworms as supplementary feed for some 60 chicken and 30 ducks and geese. Thanks to the earthworms, they could reduce ca. 50% of corn/bran used to feed their chicken and duck. But after about 1 year, the family no longer paid attention to raising earthworms like they had done before. The earthworms were not fed regularly, and watering to ensure appropriate levels of moisture was also not done. The reason was because her father in law, who was directly raising the earthworms, was busy with some other business and her husband was often away from home while Thuong herself was vermiphobial. Without proper covers, the earthworms were not protected from chicken and they gradually died. Eventually, the family stopped. So did the other families in the group whom she shared her earthworms with. Currently she is raising some 30 chicken, 20 ducks and 20 geese, but they are only fed with corns and bran as supplementary food.

Thuong said it was a shame because raising earthworms was not difficult and did not cost anything except labor, while chicken and ducks fed with earthworms grow very fast and earthworm could also be used as very good fertilizers for vegetables.

*Recorded in Ban Xe, Son Luong, 13/3/201*

### **Case study 2:**

Phung Thi Quy, aged 24, lives in Khe Bit village, Minh An commune.

Her family was very successful with raising black chicken with over 100 chicken, mainly black and hybrid chicken at the time of the report. In addition, the family also has a pond to farm fish.

In 2013, she attended a training course on raising earthworms organized by the project. Seeing the benefits from raising earthworms in the relations between plantation and livestock production, she formed an earthworm producer group together with three other women in her village. She was the first one



to receive 3kg of breed earthworms as supported by the project. Her aspiration was to generate highly nutritious food for her chicken and fish. Quy arranged to raise earthworms near her chicken and pig pens at the back of the house. The earthworms were raised on composted chicken manure as the substrate. Every day she would go ask for buffalo manure and compost it for food for the earthworms. With their rapid reproduction, after a short while she was able to collect earthworms as food for her chicken and fish. She recognized that chicken and fish fed with earthworms grew faster and stronger, and that she could save a lot on chicken feed. She shared some earthworms to the other three women in the group. After about 1 year, the earthworms were attacked and eaten by ants and cockroaches and also by chicken due to lack of covers. Moreover, the family was hesitant to go around asking for buffalo manure so they gradually lost their interest. According to Quy, other families in her village also dropped from raising earthworms, mainly because there were not enough buffalos and cows to generate enough food for earthworms and also because people were hesitant of the dirt.

Currently, Quy was keen to continue raising earthworms, but she did not know where to buy breeds as no other family in her village is still raising earthworms.

*Recorded in Khe Bit village, Minh An commune, on 17/4/2016*

## *Hoa's family is one of the few who still raise earthworms*

In 2013, the project organized technical training and provided support to family groups in Son Luong commune to implement the earthworm raising model. Hoang Thi Hoa from Co Ly village was the first in a group of three to receive 3kg of breed earthworms.

According to Hoa, raising earthworms did not cost anything or take much time. Her family has a buffalo, and every day she'd collect the buffalo's



manure as food for her earthworms. The earthworms in turns are used by her family to raise chicken and ducks. She usually raises some 20-30 chicken and 20 ducks at any point in time. The chicken and ducks are raised mainly to supply meat and eggs for family consumption. Since she started raising earthworms, she has been able to save 50% of the feed for her chicken and

ducks, and they have also grown faster too. She uses the byproducts from raising earthworms as fertilizers for her vegetables. She said, when earthworms were used to plant vegetables, the soil itself became more fertile and the vegetables grew faster. Food safety was also guaranteed. Hoa and her family found raising earthworms to be very beneficial and have maintained this activity for nearly 3 years. At the same time, she also has plan to expand the scale of earthworm raising so that she can raise more chicken and ducks. Also raising earthworm is seen to be beneficial, the other families in her group and her village did not want to do so because some were hesitant of the dirt while others did not have access to buffalo manure supply.

*Recorded in Ban Xe, Son Luong, on 13/3/2016*

During the final evaluation of the project, four groups of beneficiaries were invited to jointly discuss, consider, compare and rank 8 low-cost agricultural models on the basis of 8 criteria: relevance, applicability, low investment costs, low labor costs, economic efficiency, environmental protection, low risk, and easy maintenance. The models are compared with each other and ranked from highest to lowest orders for each criterion. The top rated model gets 8 points and the bottom rated model gets 1 point. The ranking results are reflected in Table 4. Top three overall rated models include nutrition garden, SRI and raising black chicken respectively. These models also have the highest score in the following criteria: relevance, applicability and easy maintenance. Composting model - one of the four basic models - is ranked at 5th position overall, following the model of raising in rice fields. These results reflect the project's rational selection of four basic models to encourage all beneficiary households to apply. Three models at the bottom of the rankings with the lowest total score include raising mushroom, raising earthworm, and cuniculture respectively. These models are rated low in most of criteria, especially: relevance, applicability, low risk and easy maintenance. The rating results made by beneficial households are also consistent with the aforementioned analysis of each model.

**Table 4: Comparative ranking of low-cost agricultural models made by four beneficial groups**

Model	Relevance	Applicability	Low investment cost	Low labor cost	Economic efficiency	Environment protection	Risk	Maintenance	Total score	Rank
Nutrition garden	27	27	27	22	17	23	16	29	188	1
SRI	26	24	21	24	28	24	11	29	187	2
Fish raising	22	23	13	22	22	19	8	17	146	4
composting	14	20	29	16	7	26	13	17	142	5
Raising black chicken	27	23	11	20	28	10	3	25	147	3
Raising earthworm	7	9	22	14	7	18	11	8	96	7
Rabbit raising	11	11	13	19	20	10	3	10	97	6
Mushroom planting	10	7	8	7	15	14	7	9	77	8

Notes: Only 2 groups rated on risk criterion



*PART 4*

*PROJECT OUTCOMES AND IMPACTS*

*The findings from the final evaluation, information gathered through in-depth interviews, group discussions with beneficiary groups, and periodic and annual reports of the project show that the project has made positive changes and impacts on the subjects who, directly and indirectly, benefit from the project, and the community, especially it contributes to the reduction of malnutrition rate among children under the age of 2 years. These outcomes and impacts have been specifically mentioned partially in Part 3 above. Below is a summary of the primary outcomes and impacts of the project:*

#### 4.1. Overall outcomes

- The project has contributed significantly to changing the awareness of mothers, family members, authorities, relevant departments, mass organizations and the community about the issue of health and nutrition care for mothers and children. This issue has been given more attention by the families. Mothers have received necessary support and assistance from the family members during pregnancy and while breastfeeding their children. Nutrition improvement for children is now not only the task and work of the health sector but also paid more attention by the authorities, relevant departments, mass organizations, and the entire community.
- Integrating HFS component into the child nutrition improvement project has contributed to raising awareness of local people, community, authorities, local departments and mass organizations about the role of HFS in improving nutrition for mothers, children and family members. This component has also made the connection and coordination between the local agriculture and health sectors in implementing the goals of improving nutrition for local people in general and children in particular. In other words, it has contributed to promoting the nutrition-oriented agriculture.
- The project has helped to build capacity of local staff at all levels, especially staff in the health and agriculture sectors for the professional and technical aspects as well as the management and implementation aspects of child nutrition improvement programs in the community. This is critical for helping localities maintain the project outcomes, while expanding these outcomes to other local areas in Yen Bai province.
- After three years, there have been many lessons learned from the



project which can be shared with other local areas and organizations about how to bring about child nutrition improvement and stunting improvement in mountainous areas focusing on children of ethnic minorities. HFS improvement is considered to be the key factor for attaining the goal of sustainable nutrition improvement.

## 4.2. Outcomes of HFS component

The HFS component has obtained some significant specific outcomes which are as follows:

- Enhancing knowledge and experience of local people about some low-cost agricultural production techniques such as nutrition garden, growing rice by SRI method, making organic compost, raising black chickens and rabbits, farming fish in rice fields, growing mushrooms.
- Most of the low-cost agricultural production models introduced by the project are suitable for the actual conditions of the project area and households including poor households, as well as the local agriculture development orientation. These models have been implemented effectively by many households.
- Application of low-cost agricultural production models has really improved the household food supplies in both quantity and quality. Thus, it helps improve nutrition for mothers, children and family members. Among the above models, nutrition garden and raising black chicken directly improve nutrition for mothers and children most significantly. Some models such as raising chickens, raising rabbits, farming fish in rice fields, and growing mushrooms also help increase cash income for households.
- In addition to selecting low-cost agricultural production models for the easier application of poor households, the implementation of the HFS component also aims at a stable organic agriculture. This is very appropriate and necessary approach in the context where the trend of using chemical fertilizers, chemical pesticides, herbicides, and growth stimulants has been increasing recently. This approach contributes to protecting and improving human health and natural environment (land resources, water resources) and ecological systems (useful animals and insects). The organic approach has promoted the closer connection and support between farming and animal husbandry activities, which utilizes the residues and by-products in agricultural production, reduces production costs for households, and avoids waste of resources.
- When guiding and supporting farmer households to apply low-cost agricultural production models, the project always respects and



encourages local people to preserve and promote their good agricultural practices following the cultural identity of local people. Those practices include using indigenous vegetables which can be grown from seeds, using purebred paddy varieties of good quality and using indigenous chicken breed raised in the form of semi-free range conditions, using the prevention and treatment methods for poultry by using traditional herbs, growing vegetables on hills along with home gardening, using natural food combined with the products made by farming, animal husbandry, etc.

- The implementation of low-cost agricultural production models has helped draw lessons for the stakeholders, especially the agricultural extension sector. These will be valuable lessons to help them organize and implement well the technology transfer and support activities for poor households to develop agricultural production models to improve food security and increase income for the households.

Followings are some comments on the positive outcomes and impacts of the project for beneficiaries and partners at all levels:

"Thanks to the project, I know how to cook nutritious meals for my child. The project also instructed how to build a nutrition garden and raise the chicken to have food for my kid, instead of buying food. Since the project was implemented, children in the village have been paid better care."

*(PhungThi Lieu – Dao ethnic mother, Dong Thap village, Minh An commune)*

"Thanks to the participation in NERP center established by the project in the village, my child has escaped from malnutrition. I am so grateful to the project for this. Participating in NERP center, I have knowledge about nutrition and know how to cook nutritious meals for my child at home. However, because my family is poor and doesn't have money to buy meat and fish frequently, I tried to make a nutrition garden, raise hens to lay eggs and my husband usually catches frog and fish in the fields and streams to have more food for my child."

*(Trieu Thi Khach – Dao ethnic mother, Giang Cai, Nam Lanh commune)*

"Now H'Mong ethnic men care for their wives and children more. Mothers breastfeed soon after birth and do not discard colostrum after giving birth. All H'Mong mothers visit CHS to give birth, only mothers who do not have enough time to go to CHS give birth at home. Pregnant women have time to rest and prepare to give birth. They also have time to rest after giving birth. The nutrition, however, depends on the living conditions of each family, but it's better than before in general."



*(Ly A Trang, H'Mong ethnic, VHW of Khau Tau village, Tu Le commune).*

"In the past, mothers always gave birth at home because they waited for the labor pain to visit CHS thus sometimes they had not enough time to; now very few mothers give birth at home; and if so, they will call for the midwife to help them. In the past, they felt ashamed to take ante-natal care, now they all take it during pregnancy. In the past, mothers who nearly gave birth still had to carry heavy bundles of cassava or firewood. Now, it's much different. Many children have escaped from malnutrition; mothers know how to cook porridge for their children, and they add many things in it, such as meat, green beans, eggs, vegetables, etc."

*(Phung Sinh Suong, Dao ethnic, head of Giang Cai village, Nam Lanh commune)*

"In the past, mothers usually discarded colostrum after giving birth, now no one discards it but breastfeed their children right after birth, they do not pour water, lemonade or honey into the child's mouth before the first breastfeeding. When applying complementary feeding for children, now mothers follow my instructions, they do not feed their children soon anymore, now they usually feed after six months of age."

*(Pham Thi Huong, midwife of commune health center, Nghia Son commune).*

"When the project has not been implemented, mothers did not know much about four groups of food, they only thought that feeding their children fully was enough, and they did not care much about how to cook for their children either. The weighing and measuring activities were not frequent, so mothers did not know much about their children nutritional status. Some mothers thought that their children were small and underweighted due to hereditary. After the project has been implemented, mothers and family members know how to care and nourish their children much better. The whole community shares a mutual interest."

*(Le Thi Hong Mai – midwife of commune health center, Binh Thuan commune)*

"The greatest impact of the project is to change the awareness and knowledge of local people. The project also attaches great importance to enhancing the capacity of local partners. Those impacts are considered stable."

*(Luu Thi Hong Kiem – Head of commune health center, Minh An commune)*



“Since the project was implemented, all family members have paid more attention to pregnant women and new mothers. The nutrition of mothers has been paid more attention; they eat more and better food. They often do not work after 3-4 months of birth. Now people know much.”

*(Vi Thi Thang, Kho Mu ethnic, Vice Chairwoman of Women Union, Nghia Son commune).*

“The project has significantly altered the local people’s awareness and attention to child care. People also pay more attention to such activities as family’s nutrition garden, raising chickens to increase the food supply for the household. In 2015, people had more vegetables, more chickens and eggs to eat and more chickens to sell. People also pay much attention to vegetables in family meals than before.”

*(Hoang Van Xoan – Vice Chairman of People’s committee, Tu Le commune)*

“The SC’s project has equipped mothers a lot of knowledge in agriculture, especially taking advantage of the available local conditions such as indigenous varieties, using agricultural residues as fertilizer, combining farming with animal husbandry to ensure HFS. With these products mothers have improved the nutritional value of the family meals.”

*(Nguyen Dang Hiet – Vice Chairman of People’s Committee, Minh An commune)*

“Attaching nutritional goals to HFS is highly stable because this strategy helps solve the root problems. The project has changed the awareness of local people, authorities of villages and communes and sectors about food security and household nutrition. People know how to apply low-cost agricultural production models to generate clean and diversified agricultural products of high quality to improve the nutrition for mothers, children, and their families. The project also helps increase knowledge, skills and experience for agricultural extension workers about the low-cost agricultural production models.”

*(Nguyen Tien Lam – Head of District Agricultural extension center, Van Chan District)*

“There has been no project that alters the thinking and awareness of the poor households and reduces the rate of malnourished children like SC’s project. This is expressed through the dominant agreement and active participation of the community, and the positive changes of the households, as well as the community in making nutrition garden, raising backyard chicken, growing SRI paddy, farming fish in paddy fields, etc. The district steering committees regularly report the progress and results of project implementation to the district authorities. They highly evaluate the project interventions and the achieved project results.”

*(Hoang Van Hai – Director of District Health Center, Van Chan District)*

“This project is appropriate with Yen Bai province; it meets the real and practical needs of local people. Their knowledge and practice about young children feeding are limited. Despite the good conditions of land and manpower, households have not generated enough food for their needs. The advantage of the project is to instruct local people how to organize agricultural activities based on their potential. The low-cost agricultural production models are very suitable for local residents, because in this way the poor households can apply. Moreover, this project creates the integration and coordination between food security and child nutrition improvement. In fact, this has not been implemented locally.”

*(Luong Kim Duc – Deputy Director of Yen Bai Province Department of Health)*

In addition to the positive outcomes and impacts mentioned above, the project implementation also has undesired outcomes and impacts. However, these results and effects are negligible compared to the positive outcomes and impacts that this module has achieved. Moreover, some of the undesired outcomes and impacts of the HFS component are also valuable lessons for the households, agricultural extension sector, other relevant departments and the project to set the direction for and improve their activities in the future. The undesired outcomes and impacts include:

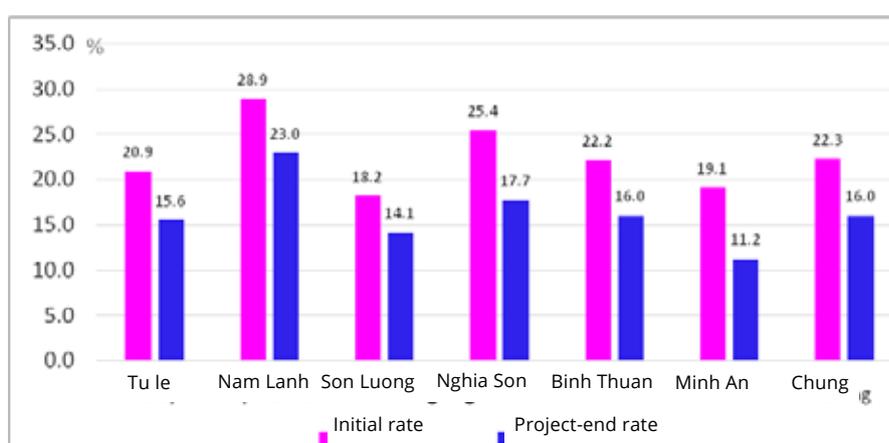
- The project has increased the amount of time worked by staff who directly involved in the implementation of project activities, especially VHWs and WU collaborators.
- In the busy days of the harvesting season, the participation in CGM day, NERP center, ANC and BF support group meetings somewhat affects the working time of mothers, especially those of households with few members.
- The implementation of rabbit production model of some households failed. This wasted efforts and partial expenditures of the households in making rabbit hutch, fostering and caring rabbits. Likewise with the failed mushroom growing model of some households. After a period of implementation, most households could not maintain the earthworm raising model.
- For agricultural extension sector, when supporting farmer households to apply some ineffective models such as mushroom growing model, earthworm raising model, the agricultural extension workers also wasted their efforts. For the project, part of the budget has not been used effectively.



### 4.3. Outcomes and impacts on the nutritional status of children under the age of 2 years and the mothers' knowledge and practice of nutrition

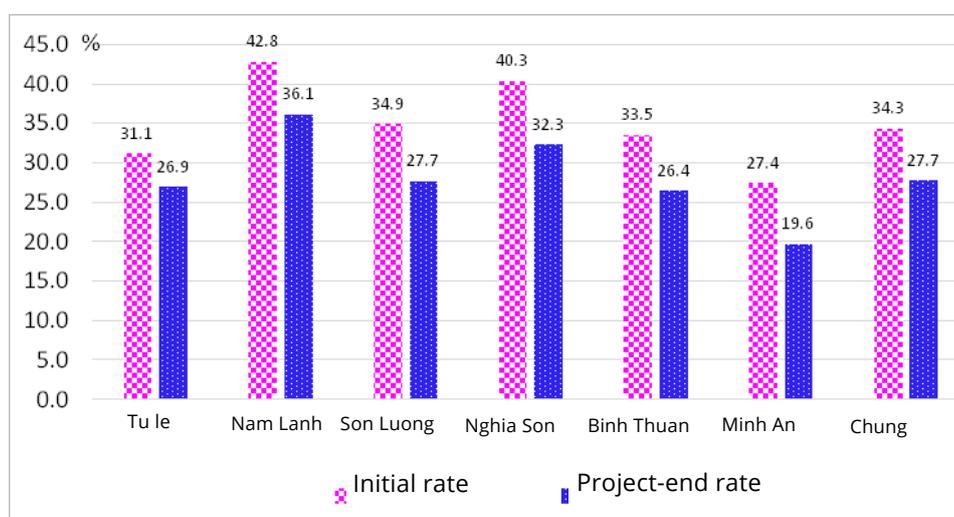
All project activities are to achieve the most important goal of reducing the malnutrition rate of children under the age of 2 years and changing the knowledge and practice of child nourishment of mothers, families and community

The findings from the final project evaluation show that the malnutrition rate of children under the age of 2 years in both underweight and stunting in the target communes has been significantly reduced after three years of intervention:



**Chart 2: Reduction of underweight rate of children under the age of 2 years in individual commune and six communes collectively at the project end**

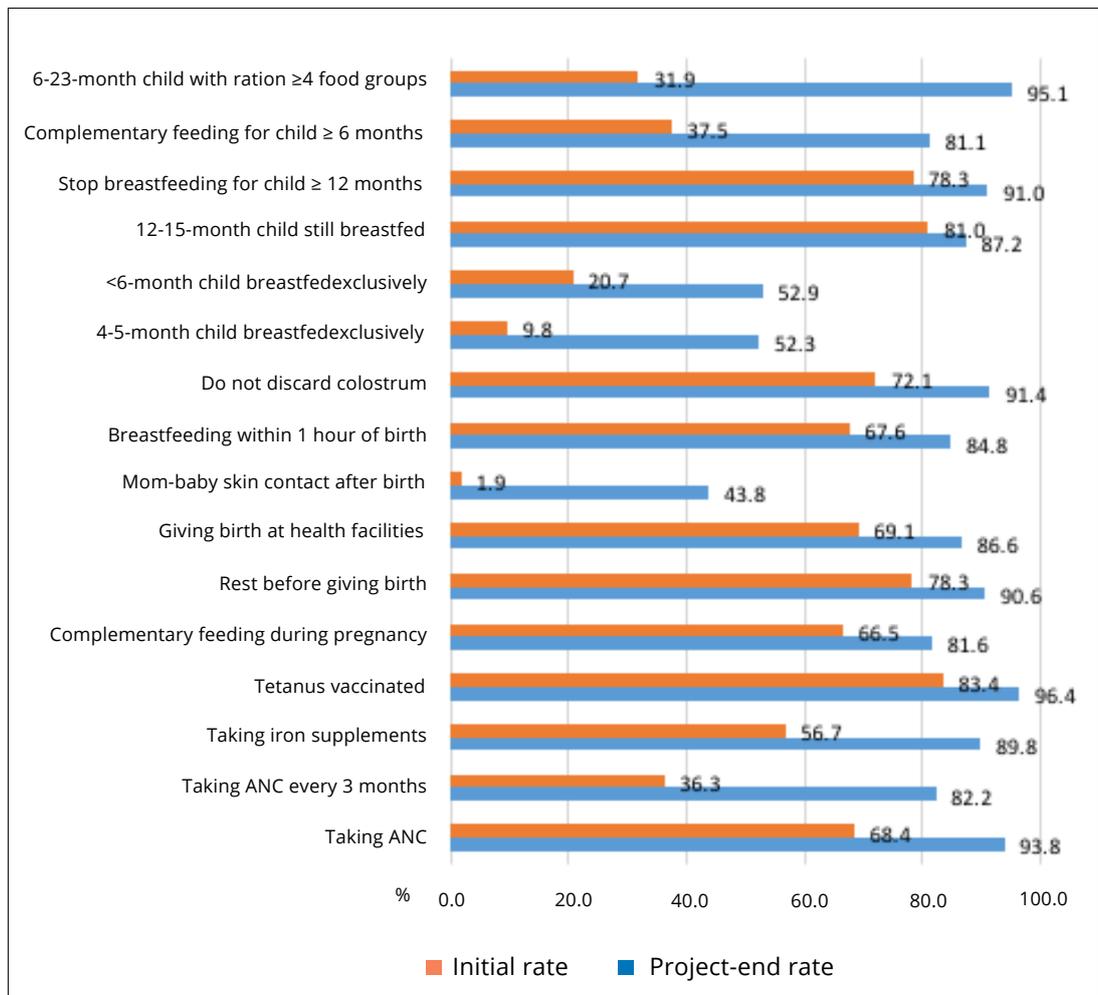
The underweight rate in these six communes has reduced by 6.3% (initial rate was 22.3%; the rate at the project end was 16.0%; statistical significance was  $p=0.001$ ).



**Chart 3: Reduction of stunting rate of children under the age of 2 years in individual commune and six communes collectively at the project end**

The stunting rate in 6 communes collectively has reduced by 6.6% after three years of intervention (from initial rate of 34.3% to 27.7%; statistical significance was  $p=0.003$ ).

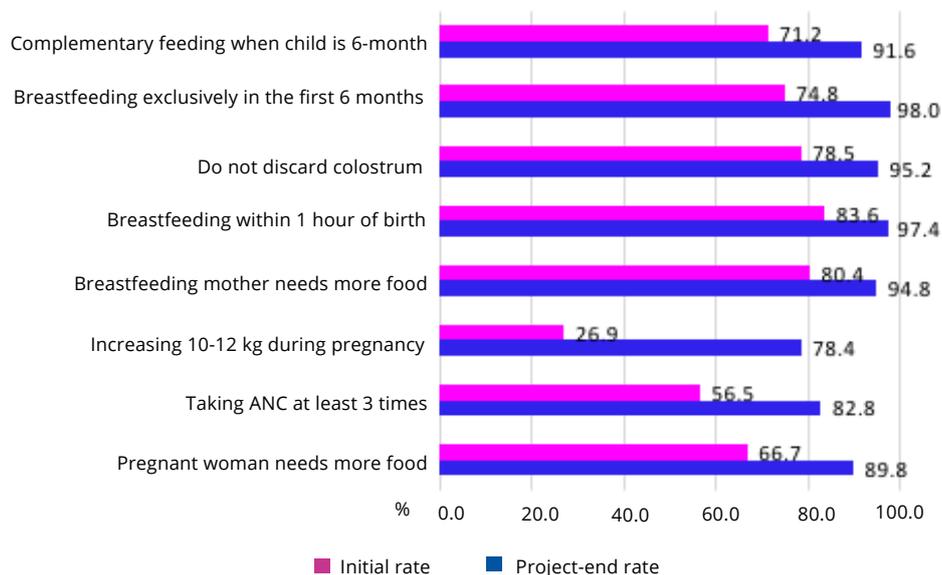
Along with the reduction of malnutrition in children under the age of 2 years, the knowledge and practice of nutrition of mothers and families have also changed positively:



**Chart 4: Improved practice of nutrition of mothers at the project end**

Chart 4 shows that the mothers' and families' practice of ANC, childbirth, BF and complementary feeding for children has changed a lot after the project intervention, especially some IYCF – 2010-based indicators such as: the rate of complementary feeding at the right time increased from 37.5% to 81.1%; the rate of children (6-23 months old) with ration of 4 food groups increased from 31.9% to 95.1%; the rate of children breastfed within one hour of birth increased from 67.7% to 84.8%; the rate of children from 4-5 months of age breastfed exclusively increased

from 9.8% to 52.3%; and the rate of children under the age of 6 months breastfed exclusively increased from 20.7% to 52.9% (all changes have statistical significance,  $p = 0.000$  for all comparisons).



**Chart 5: Improved knowledge of nutrition of mothers at the project end**

The rate of mothers having proper knowledge of ANC, BF and complementary feeding for children has changed significantly after the project intervention (all changes have statistical significance;  $p = 0.001$  or  $p = 0.000$  for all comparisons).

*The greatest benefit that the project has brought about is to help our family nurture My in a healthy and non-malnourished manner.*



Ms. Lo Thi Thao's family lives in Pha Tren village, Tu Le commune. She and her husband have two children: a son named Huy, born in 2001 and a daughter named My, born in July 2014. They live with the husband's parents.

Ms. Thao has participated in the following activities held with the support

of SC project in Tu Le commune:

- Activities of supportive groups of Antenatal Care and Breastfeeding every month in the commune and Antenatal Care Day at the commune health station when Ms. Thao was pregnant with My.
- Together with My, taking part in Child Growth Monitoring (CGM) Day held in the commune for mothers whose child is under 24 months of age.
- Attending training sessions on farming and animal raising techniques held by the project: nutrition gardening, chicken raising, organic composting, earthworm raising.

According to Ms. Thao, the greatest benefit from the project is to help her family nurture My in a healthy and non-malnourished manner. After attending the project, her knowledge and skills of An-natal Care, Breastfeeding and complementary child feeding have been changed a lot compared with the previous time when she got the first pregnancy and nurtured the first child. In addition, the activities of training and supporting the development of agricultural production have contributed to her family's food sources to improve her nutrition during pregnancy and breastfeeding and ensured nutritious meals for My during My's complementary feeding. Previously, her family had a vegetable garden,



but with few vegetables; in the winter-spring crops, there was almost only cabbage grown, which were sometimes fertilized with fresh night-soil and chemical fertilizers. But after instructed by the project, her family has planted many kinds of vegetables in the garden to diversify nutritional ingredients and used only organic compost to fertilize vegetables. Currently, her family has 20 chickens, including 4 egg-laying hens.

The following detailed information regarding nurturing Huy and My shared by Ms. Thao below is the specific evidence of the benefits from the project

<b>Nurturing Huy - before the project</b>	<b>Nurturing My - after the project</b>
<p><b>Antenatal Care</b></p> <ul style="list-style-type: none"> <li>- Pregnancy checking 2 times</li> <li>- Not taking iron tablets</li> <li>- Abstaining from some kinds of food</li> </ul> <p><b>Breastfeeding</b></p> <ul style="list-style-type: none"> <li>- Discarding colostrum as advised by her husband's mother and uncles and aunts. Breastfeeding 3-4 hours after birth</li> <li>- Complementary feeding from 4 months of age</li> <li>- Weaning at 16 months of age</li> </ul> <p><b>Complementary Feeding</b></p> <ul style="list-style-type: none"> <li>- Cooking porridge with meat, eggs without vegetables, oil, and fish sauce.</li> </ul> <p><b>Nutritional and health conditions</b></p> <ul style="list-style-type: none"> <li>- Gaining little weight</li> <li>- Often having coughs, fever, runny nose</li> </ul>	<ul style="list-style-type: none"> <li>- Pregnancy checking 3 times</li> <li>- Taking iron tablets</li> <li>- Not being on a diet</li> </ul> <ul style="list-style-type: none"> <li>- Breastfeeding with colostrum and immediately after birth</li> <li>- Exclusively breastfeeding for the first 6 months</li> <li>- At present, still breastfeeding (18 months of age)</li> </ul> <ul style="list-style-type: none"> <li>- Having enough food groups: rice, meat, fish, eggs, vegetables of all kinds, fish sauce, oil, fat.</li> </ul> <ul style="list-style-type: none"> <li>- Gaining more weight</li> <li>- No minor sickness and being easy to bring up</li> </ul>

Recorded in Tu Le commune on January 20, 2016

## *NERP Centers in villages are necessary to treat malnutrition of children*



Vi Thi Nhat is a Kho Mu mother. Her family lives in Nam Toc village, Nghia Son commune which is a very poor mountainous commune of Van Chan district. Her family consists of 5 people: paternal grandmother, she and her husband and two sons. Her first son was born in April 2009 and the second son named Duong was born in

November 2014. Her family is listed as poor family in the village (with per capita income below VND 400,000 per month). The main income of the family comes from farming with 2,000m<sup>2</sup> of double-cropping paddy rice. Although this area of paddy rice supplies enough food for her family, her family is short of cash to cover the family's expenses. Sometimes, her husband has to work in other local areas to earn extra income for their family.

Nhat has participated in Child Nutrition Program sponsored by SC since June 2014, when she was pregnant with Duong. In the course of pregnancy, she practiced pregnancy care as instructed by the project, so Nhat was born very healthily, weighing 3.7kg. She practiced complete breastfeeding immediately after giving birth and during the first 6 months. But when Duong was 5 months of age, he had tonsillitis, cough, fever, and lost weight and was undernourished. Nhat knew that her child was undernourished after weighing and measuring him on CGM day held periodically on the 17th of every month in the village. After suffering malnutrition, Duong was eligible to participate in the village NERC. Every month, Nhat regularly took her child to the center for 5 days from 12th to 16th. At the center, Nhat and five other mothers who had malnourished children in the village were instructed by VHWs and village WU staff to cook a meal with adequate nutrition for children and practiced cooking together. Duong and other malnourished children had the meals of soup or porridge cooked by their mothers at the center. All mothers know that the main purpose of NERP CENTER is to provide knowledge and cooking skills to them so that they can cook nutritious meals for children at home and help children rehabilitate their nutritional status.

Because Nhat's family was poor and had no money to buy food, her family tried to create additional sources of food in the household through farming and animal raising. Nhat participated in training courses to make a nutritional vegetable garden and poultry production organized by the project. Her family had a vegetable garden at the house backyard and planted different vegetables like spinach, amaranth, pumpkin, kohlrabi, cabbage, etc. depending on the season. In addition to planting vegetables, her family frequently raised around 20-30 chickens, including hens to lay eggs for her children and farmed fish in pond. Sometimes her husband caught frogs, crabs in streams and fields. Thanks to the mother's cooking knowledge and diversified food sources created by the family, Duong had meals with good quality at home. After 5 months participating in NERC, Duong's nutritional status has been improved significantly and he has currently escaped from malnutrition.



According to Nhat, "NERCs in villages are necessary to treat malnutrition of children." She was very grateful to the project and hoped that the project would keep helping other young mothers in the commune to have child nourishing knowledge so that children in the villages and communes are healthy and free from malnutrition.

*Recorded in Nghia Son commune on December 4, 2015*



*PART 5:  
LESSON LEARNT*

## 5.1. General lessons

### 5.1.1. Towards group of ethnic-minority children living in poor mountainous areas



Ethnic-minority children are the group which suffers from many disadvantages, with more difficult living conditions than Kinh children regarding the economy, education, information, traffic, etc. Moreover, although the national rate of child malnutrition has fallen significantly over the past decades, the malnutrition rate is still high, and the declining rate is slow in ethnic-minority children, especially stunting malnutrition. Therefore, aiming towards and setting priority for the resources to implement programs to improve nutrition for this group of children are the right direction in line with the real situation of child malnutrition in Vietnam.

### 5.1.2. Focus on improving stunting malnutrition

Stunting malnutrition causes adverse effects to the child. The impact on the height of children of stunting malnutrition is permanent. Children of stunting malnutrition often have more likelihood to have mortality risk, are more susceptible to diseases than normal children, and can easily suffer from chronic diseases later. Girls of stunting malnutrition grow up and become stunted women, and their child's risk of suffering from stunting malnutrition increases. In other words, stunting malnutrition affects future generations.

In the past period, the nutrition programs have just focused primarily on the goal of reducing underweight malnutrition. The goal of reducing underweight malnutrition is integrated into the social and economic development objectives of local areas, but there is no goal of reducing stunting malnutrition. With this situation, during the implementation, programs and projects to improve child nutrition status should focus on reducing the stunting rate.

### 5.1.3. Focusing interventions for children under 24 months

Nutrition for the first 1000 days in the life of the child from pregnant time to the child's second birthday plays a decisive role in the child's later development. This period consists of 3 important periods: the period of the child in the womb, the period of exclusive breastfeeding and complementary feeding period. Most cases of stunting malnutrition in children occur before age 3. Therefore, interventions for children to be nourished well when the children are under 24 months are suitable in

terms of time and the most valuable to help children develop, prevent the children from malnutrition; this is also the golden period to improve stunting malnutrition. For each above period, it is required to have appropriate interventions aimed at specific groups: pregnant women, mothers nursing children under six months and feeding children aged 7-23 months

## **5.2. Specific lessons learned from the project operation**

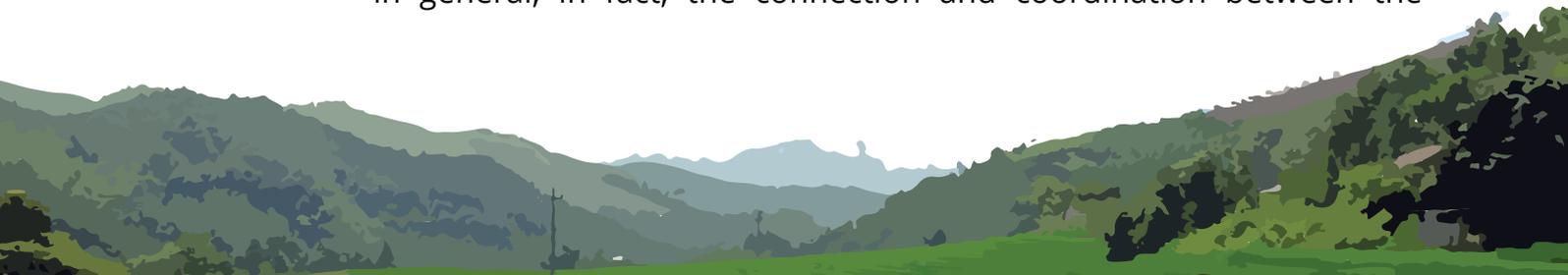
### **5.2.1. Specific interventions for malnourished children**

In the child nutrition improvement program, it is required to have specific interventions for malnourished children to help these children improve nutritional status. In this project, “NERP Model” is an initiative for improving the nutritional status of malnourished children in the community. Held at the village level for malnourished children under 24 months, this model has contributed to raising much awareness and interest of the family and the community in nutritional rehabilitation for malnourished children, while creating opportunities for mothers to exchange and learn experience mutually. Despite being held at the village level, including quality meals for malnourished children, the ultimate goal of the NERP center is still to guide mothers and child caregivers in the family to have knowledge and skills of nutrition rehabilitation for children at home in a sustainable way.

When applying the model NERP, experience from the project shows that it is necessary to consider the suitability of this model for mountainous areas with sparse population and hard traveling and remote ways which would be a major obstacle for the mothers and children. Time to implement NERP per month should be determined suitably not to take much time of the mothers, VHWs, Collaborators, but enough to be effective. In addition, it is necessary to have specific interventions for the treatment of acute malnutrition cases.

### **5.2.2. Integrating household food security improvements into child nutrition improvement program**

If household food security is not guaranteed, mothers and children cannot have a quality meal which makes child nutrition improvement impossible. This problem is more evident in the poor mountainous areas where the daily diet of the people is very poor and monotonous with insufficient nutrients. Although the goal of improving household food security is defined clearly in the National Nutrition Strategy, in general, in fact, the connection and coordination between the



agriculture and health sectors for improving nutrition for people, especially for children have not been close. So, it can be said that the project model is a lesson for reference for child nutrition improvement programs in the mountainous areas with tight combination between interventions of the health sector in order to improve knowledge and change behavior in feeding children, and agricultural interventions to promote household food security improvement, facilitating economic conditions for mothers and families to apply the attained child feeding knowledge and skills.

***Lessons from household food security component:***

- Selection of appropriate intervention models for poor households to help them improve food security through low-cost agricultural production activities, utilization of family resources of land, labor and materials from nature, agricultural byproducts, a combination of farming and animal raising to develop organic agriculture production towards sustainability, ensuring hygiene, food safety and good living environment for health and nutrition of people.
- When selecting agricultural production models to introduce, guide and assist farmers in the application, in addition to the low cost for easy application, other factors such as techniques, the level of risk, ability to maintain to decide on model selection or training content development, and detailed instructions to farmers to avoid failure also need careful consideration.
- When supporting farmers to apply low-cost agricultural production models, support and provision of materials is not an important factor leading to the success and sustainability of the model but the agriculture technique transfer, capacity building for farmers which help them develop by themselves based on household capacity, are required to be paid attention.
- With each model, it is required to have a pilot place to learn lessons before expansion. The real tests of new households are evidence of suitability of the model; at the same time, it's needed to offer lessons for expansion.
- Learning, sharing experiences and following among farmers is a very common form of agricultural activities, especially with new production techniques and models. This form is also very effective for model expansion. Some agricultural production models should also consider applying the organization based on the household group because of the advantages of this model, especially experience

sharing and mutual support among group members.

- In addition to agricultural production promotion activities to develop household food source, survey implementation and encouragement and promotion of people to use natural food sources are also an initiative of the project, in line with the actual circumstances of people living in mountainous areas. However, within the framework of this project, in-depth research has not been done, especially for analyzing ingredients of foods from nature to develop instruction, education and communication documents for the people of using natural food. This issue should receive further attention and research.

### 5.2.3. Focusing on environmental hygiene and treatment of sick children in Child Nutrition Program in mountainous area



It has been revealed from the implementation of child nutrition program in Van Chan district which is a mountainous area with a high rate of ethnic people that diseases are one of the popular reasons leading to child malnutrition. Diarrhea and respiratory diseases are two common kinds of diseases in mountainous areas. It has been reported from NERP centers in

6 project communes that children under 24 months mainly suffer from malnutrition after getting diarrhea and respiratory diseases. In mountainous areas, the lack of hygienic toilets and the raising of cattle and poultry in the semi-confined method are quite common. The water for living activities of many households is not guaranteed to be clean. In addition, in the cold season, some children, especially poor children are not kept warm enough, so they often develop respiratory diseases. These factors are directly related to child malnutrition. Therefore, to increase the efficiency of child nutrition intervention programs in mountainous areas, it is essential to pay special attention to interventions to assist mothers and families to prevent diarrhea and respiratory diseases for children as well as increase the quality of health examination and treatment at local health facilities. Improving environmental hygiene and promoting hygienic practices in daily life, especially when caring for children and cooking for them, are integral contents of educational and communication activities for mothers and community.

#### **5.2.4. Diverse, flexible, and appropriate communication activities with a focus on practical results**

The project uses both direct and indirect communication methods to enhance the awareness, knowledge and to change the attitudes and behaviors of mothers and family members in raising children; however, direct communication method remains the principal one because this method is appropriate for mountainous area. With direct communication, the project uses many different ways to organize activities to supplement and support each other and target at specific subjects: pregnant women, breastfeeding mothers of children under six months, mothers of 6-23 month children who are in complementary feeding period, mothers of malnourished children and other family members. Moreover, behavior-changing communication activities focus a great deal on instruction and construction of specific skills for mothers and the encouraging and motivating them to apply them in raising their children at home. The project also reveals that for the group of ethnic-minority people in the mountainous area, communication activities need to be repeated many times over a long enough period to help construct, reinforce and maintain the habits and behaviors of mothers and other family members. In addition, apart from mothers, it is also important to influence other family members so that they can understand, share and support mothers in raising children. With these subjects, it is advisable to have flexible and appropriate communication methods, such as home visits and consultations which are very effective. Moreover, communication activities can be incorporated in community meetings or used in indirect communication material such as flashcards and notebooks to be distributed to the household.

#### **5.2.5. Capacity building for village and commune officers**

It can be said that the village is the most important level in a child nutrition intervention program in communities because most intervention activities occur at the village level. VHWs and WU collaborators are closest people to mothers and children. Therefore, their capacity has a key impact on the quality and success of intervention activities. In mountainous communes, VHWs usually finish just the 9th or 12th grade, then receive nurse training for 9 or 12 months. During their work, they have few chances to join training courses of national nutrition program about nutrition for mothers and children; even if they do, such courses are usually not specific and in-depth. WU staff even has less knowledge and fewer skills to implement child nutrition program. In addition to village level, the staff of commune health



stations also plays a very important role in caring for pregnant women and after-birth mothers, promoting breastfeeding, examining and treating sick children, managing and monitoring child nutrition. Moreover, they are those who give instruction and technical assistance for village staff in the process of implementing intervention activities at the village.

On this factual basis, the project has had adequate investment in training village and commune staff in basic knowledge and skills in caring for mothers and children, as well as communication and consultation skills. Regarding training method, it focuses on practice and specific instruction, and at the same time using monitoring activities as an effective on-site training method. These can be useful lessons for community-based nutrition programs implemented in mountainous areas.

#### **5.2.6. Socialization of nutrition cares in the communities**

Nutrition care in the community requires the participation of not only health staff and each family but also the local government, relevant departments, and the entire community.

In the project model, the implementation of intervention activities for child nutrition improvement is not only the responsibility of health sector, but also requires the participation of the local government, agriculture sector, Women's Union, Youth Union, Farmers' Association, and other relevant local departments and mass organizations. In mass organizations, the Women's Union plays a prominent role and has very active and effective activities. The Women's Union possesses an advantage in implementing nutrition program, which is they are very close to mothers and children; moreover, they are enthusiastic and actively participate in social activities in the community. With the participation of the Women's Union, it will be easier to maintain the results of nutrition programs.

At the family level, with appropriate interventions, the project has encouraged the support and sharing from husbands and other family members in raising children; and they are aware that raising children is not the sole responsibility and task of mothers.

At the village and commune levels, the project has organized activities to promote and attract the community so that they understand, pay attention and support.







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