PROJECT

"Reconstruction and sustainable management of degraded forest based on the combination of inter-planting nitrogen fixation rare tree species and thinning"

REPORT OF LIVELIOOD SURVEY

Bos Thom village, Knapor commune, Sotrnikum District,

Siem Reap Province

30 June 2022

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I. Introduction

This report presents key findings from a Household Livelihood Survey to determine the contributions of the project to local people's livelihood improvement. The survey was carried out in *Bos Thom village* at the end of each year from 2019 to 2021. It was designed, implemented and analyzed by project team members.

This report is divided into five sections. They are 1) project background and objectives of survey; 2) data and methodology; 3) demographic and socio-economic status; 4) impacts of the project; 5) summary and recommendation for the further implementation.

1.1 Context and Project Background

Bos Thom village is located in Khna Por commune, Sorth Nikum district of Siem Reap province. 30 km away from Siem Reap, the village has a relatively backward economic society (Figure 1). With a population of about 300, the residents are living by planting rice. The main sources of income are beans, cucumber and other crops. In addition to food consumption, the rest will be sold to the market to meet their daily living expenses. Since total area of crops per household is less than 1 hectare, average annual income for each household is lower than $300/year, indicating a very poor economic condition. Therefore, it is necessary to improve living standards of the local people through our project activities.

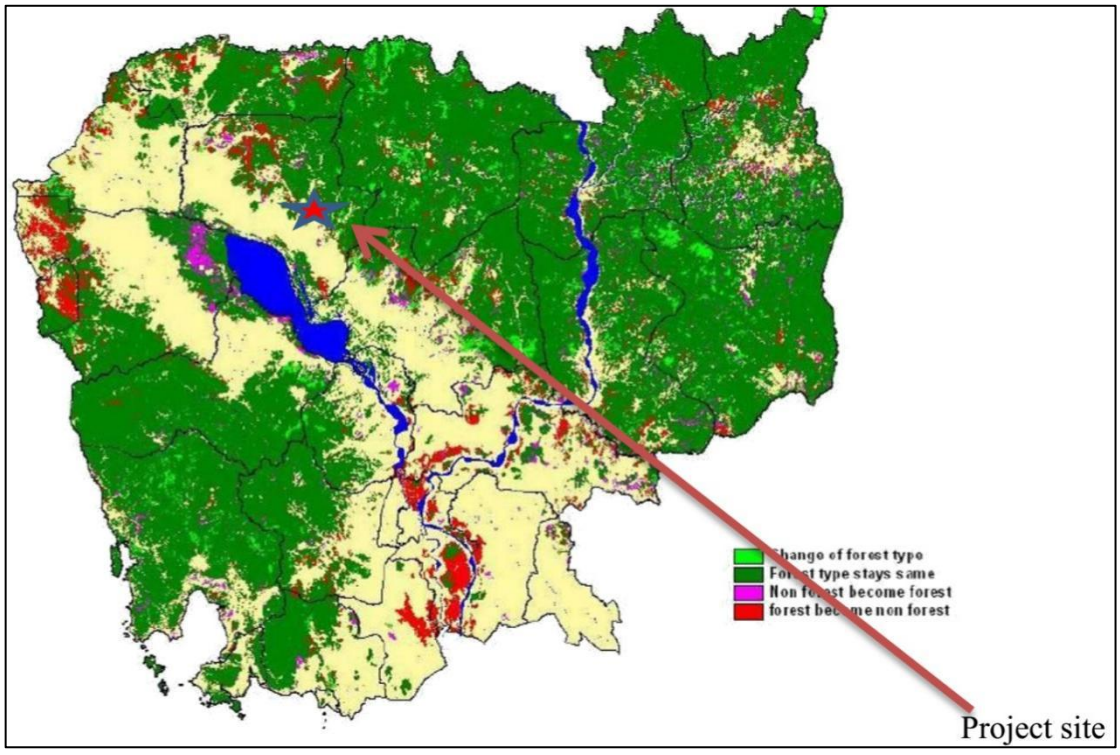

Figure 1. Location of Bos Thom Village

Cambodian forestry is seriously degraded and it is imminent to restore and reconstruct the forest ecosystem. Through adopting scientific and reasonable reforestation measures, we would like to enhance the biodiversity and other forest ecosystem services, and improve the livelihood of disadvantaged rural populations in Cambodia. Therefore, this project follows the principle of "feed long-term on short-term, combine long-term with short-term, and integrate economic and ecological benefits". Obviously, this project can promote and improve sustainable forest management and rehabilitation in Cambodia, by optimizing the utillization of light, water, soil, nutrient, and other resources in degraded woodlands.

The project takes three main approaches. The first is to inter-plant some target local tree species with nitrogen-fixing tree species in order to increase the survival and numbers of target tree species, improve forest structure, and promote a positive succession of forest ecosystem. The overall purpose is to gradually develop a resilient uneven-aged mixed forest, meanwhile to enhance forest productivity, stand quality and stability, and forest ecological functions. The second approach is to change the direction of forest succession, and to shorten the period of forest cultivation through thinning non-target tree species. The third approach is to enhance the livelihoods of rural people through increasing economic source, providing living facilities, and motivating local people involving in reforestation programs. During the project, we also improve local people's awareness through holding capacity-building trainings and a information-sharing seminar, and conducting some demonstration activities.

1.2 Objectives of the Survey

The goal of the project is to increase the level of forest resource restoration and promote forest sustainable management in Cambodia through the establishment of demonstration forests and technical personnel training. To improve the livelihoods of local people through non-forestry livelihood activities.

The specific objectives of the livelihood Survey are as follows:

1. To understand the situation, living standard, social economic of the selected households in the target area with respect to livelihood activities, annual income and expand, and the support of the project,
2. To assist the project and stakeholders in determining whether verifiable indicators and related targets, stated at the beginning of the project and encapsulated in Outcomes 2 is being achieved over time,
3. Examine the current situation of the project beneficiaries in terms of their economic and social aspects and the issues affecting their lives.

2. Data & Methodology

The survey was conducted in 37 households in Bos Thom village. Data was collected in 2019, 2020 and 2021 to generate a livelihood report as 'Restoration and Livelihood Enhancement Project'. Proportional sample size was considered to determine the actual sample needs of each of data collection in the project areas.

2.1 Sample Selection and Sampling Technique

Thirty seven direct beneficiaries from the project were selected for interview. Gender factor is not considered in this study. Whether a female or male responds to the interview depends on the person in the family being found at home at the time of the survey.

A structured questionnaire, including both open and closed-ended questions, was initially developed by the assigned team members. Questions derived from a review of the project log frame for identification of bench-marking indicators. These questions were further examined and finalized by project advisors through communicating with the team members to ensure that the questionnaire was sufficiently comprehensive (Annex 1).

Before conducting the survey, a pretest was undertaken by four enumerators for several villagers to ensure the quality and comprehensiveness of the survey, and the expected answers drawn out by the interviewers. Noting that the same people were excluded in the actual survey. The pretest results revealed that some of the questions were not clearly understood by the respondents and some gaps were in the questionnaire. According to feedbacks of the pretest, the enumerators revised the questionnaire.

2.2 Training of Enumerators

Four enumerators from the project team who have suitable qualifications and experience in socio-economic data collection undertook this survey. In addition, the project coordinator was responsible to train the enumerators, supervise their work and organize the entire activity. The enumeration team had a one-day classroom training to understand definitions of some peculiar technical terms and get some skills of interviewing during the survey.

2.3 Field operation, Data Entry and Analysis

Data was collected over a 5-day period each year and compiled together. The team leader provided clarification and instruction on concepts, definitions to the enumeration team in the field, and resolved problems in carrying out the field work. Interviewed questions were checked one by one to filter the unclear information or errors. The leader identified the strengths and weaknesses of individuals within the team and arranged team members accordingly.

Each questionnaire was submitted by enumerators to the leader. All survey data from each location was entered to Microsoft Excel software for the subsequent analysis.

3. Results and Discussions

3.1 Demographic and Socio-economic Characteristics

According to the valid responses, 81.08% of the respondents are male while the rest are females. The reason why we get such an unbalanced sex ratio (more male respondents) is that the survey is house to house, and males are likely head of the family and more involved in the project. Coming to the age distribution, most of the respondents are in the range of 36-45 age. This shows they are at a productive age, which is important for the income of the pastoral people (Figure 2).

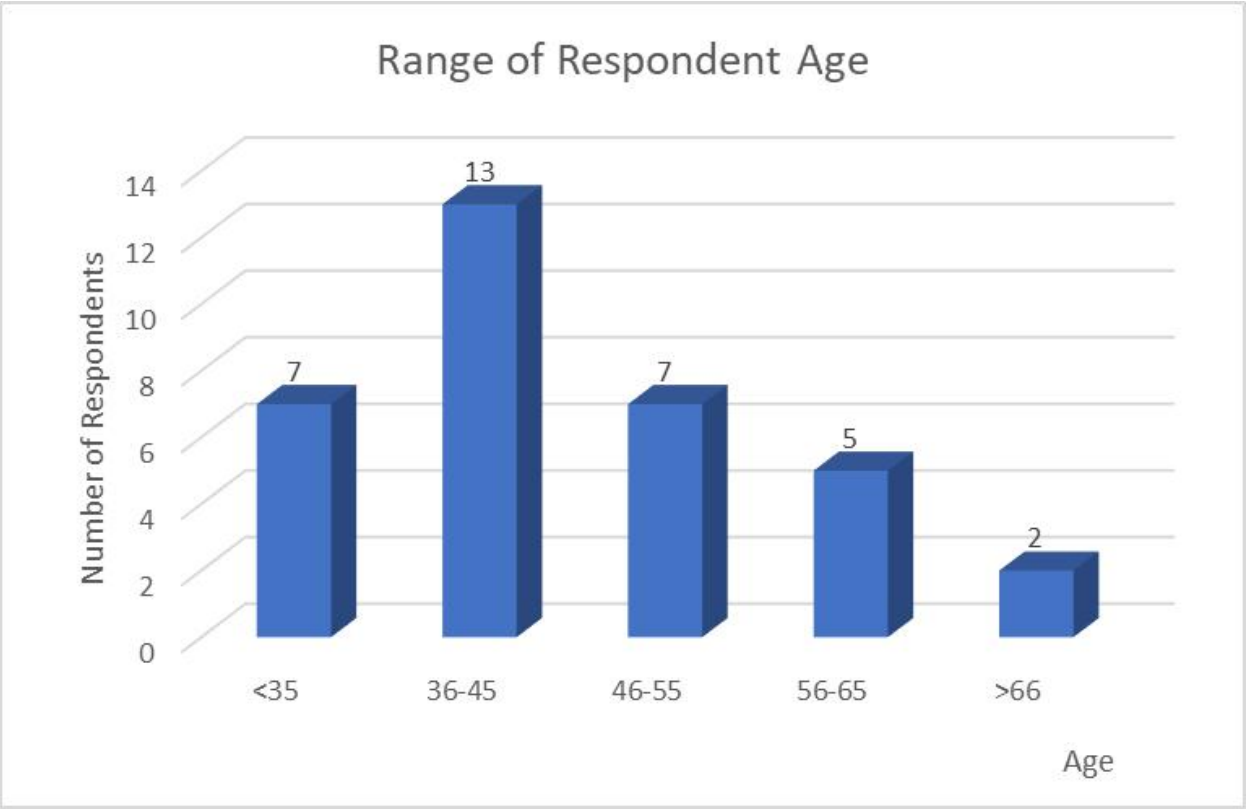

Figure 2. *The age distribution of respondents*

Table 1 shows that majority (51.35%) of the respondents are illiterate. Most of them are middle-age and there was a civil war during their childhoods, which will affect labor production and productivity.

Table 1 Educational status of respondents

Education	Frequency	Percentage %
None	19	51.35
Primary	12	32.43
Secondary	5	13.51
High	1	2.70

Majority of the respondents (81.08%) are working on farming for their livelihoods. A 8.11% of respondents have extra livelihood activities (such as village chief, house constructor and a soldier), while the rest is vendor, teacher and bike repairer (Figure 3).

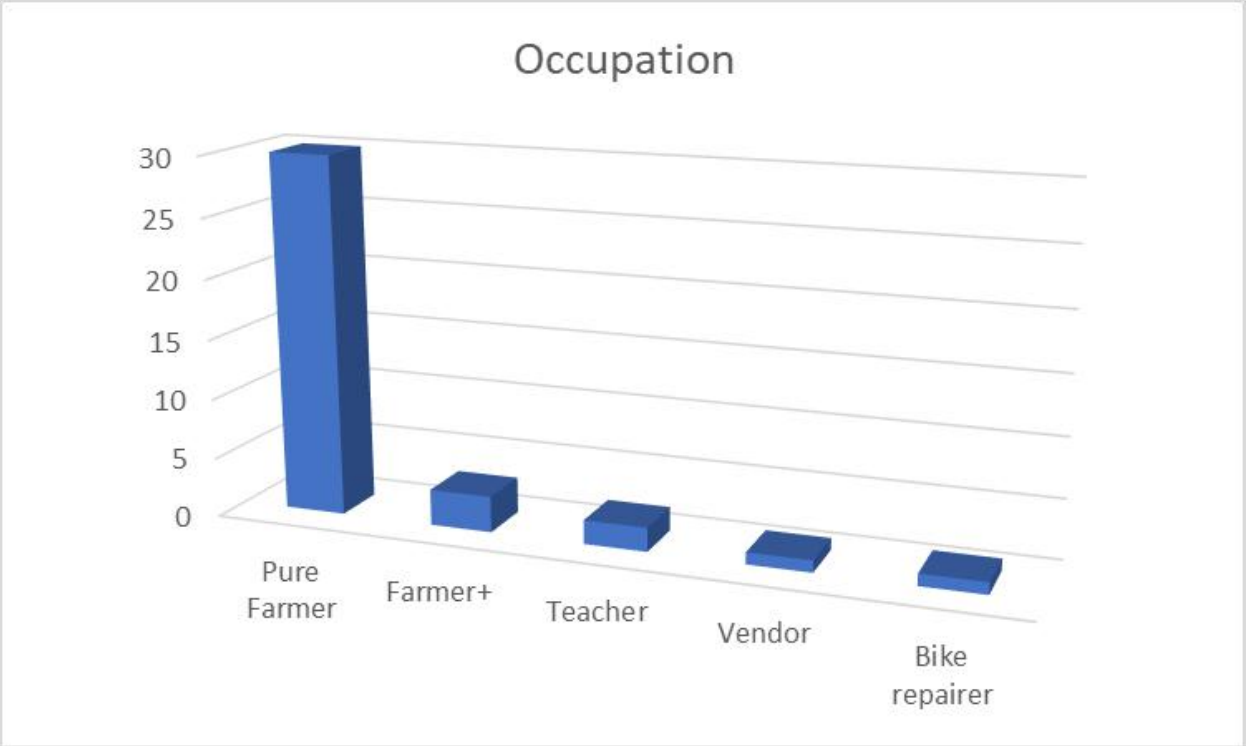

Figure 3. Occupations of Respondents

All respondents are married. Their family contain two to eight members. The largest family has 8 members, and smallest family has two members. Most of households have 4 members, and followed by 7, 6 and 5 members(Table 2).

Table 2 Number of members in respondent families

Family's Member	No. of Families
1	0
2	1
3	2
4	9
5	7
6	7
7	8
8	3
9	0
10	0

3.2 Social Economic Status

The section is to see social and economic status through investigating the land ownership, annual income from various activities, annual expenditure, and benefit from the project in each household.

The land types are significantly different among respondents. Majority of the respondents (86.49%) have a residential land less than one hectare. In average, more than 54.05% of respondents own the farmland less than one hectare, while 8.11% are larger farm land owners (5 ha), followed by 2.70% (4 ha), 13.51% (2 ha) and 5.41% have no farm land (Figure 4).

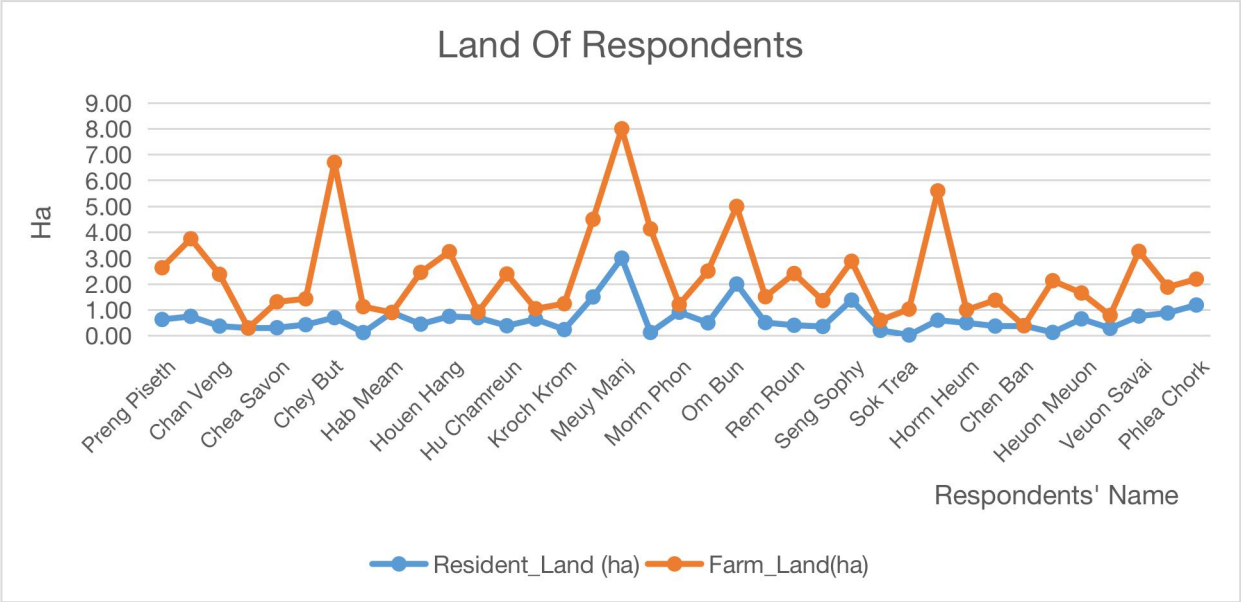

Figure 4. Landownership of respondents

The largest income source was labor, which contributed 62.9% of total income in 2019, and followed by 41.18% and 26.86% in 2020 and 2021, respectively. All respondents and their family members worked as part time, such as cassava cultivation, mango farm, house construction, migrating to neighbour countries, and involving in the field work of the project. The labor income was going down from 2019 to 2021 because of the limitation of work and travelling due to pandemic of COVID-19. The second income source was rice production. There were 19.02%, 13.73% and 15.09% of selling rice in 2019, 2020, and 2021. The third income source generated from vegetable cultivation, which increased from 2019 (6.50%) to 2020 (18.50%), and then dropped down to 2021 (4.91%). This was because most of villagers were at home working on vegetable cultivation during the pandemic of Covid-19. The rest income was from livestock, NTFP (charcoal, wild fruits, mushroom) and others (Table 3 and Figure 5).

Table 3 Sources of Incomes

Year	Major Income Source (USD)							Total
	Rice	Fruit tree	Vegetable	Livestock	Labor	NTFP	Other	
2019	15,120	150	5,170	3,650	49,996	1,800	3,600	79,486
2020	18,475	3,210	24,955	9,365	55,500	2,895	20,375	134,775
2021	17,350	1,085	5,650	30,875	30,875	680	28,450	114,965

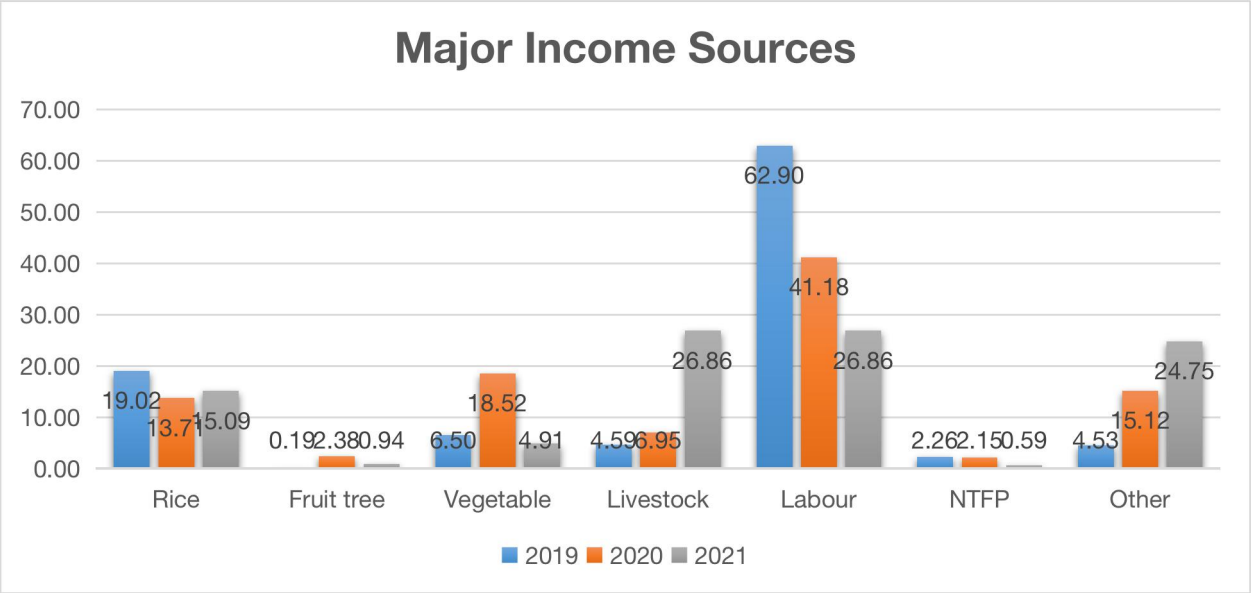

Figure 5 Percentage of income sources in 2019, 2020 and 2021

According to the survey, the largest expenditure was food (meet, fish, vegetable and ingredient), and 32.08%, 34.76% and 27.68% of total expenditure in 2019, 2020 and 2021, respectively. The second expenditure was farming activities (soil preparation, cultivation, fertilizer, maintenance and harvesting), and 22.73%, 26.24% and 28.22% in 2019, 2020 and 2021, separately. The third one was education at the secondary school and university. The health was also a major part of expenditure. The rest include gasoline for transportation, medicine, and electricity. Other expenditures such as clothing, social event (married, religion ceremony) was not included in the survey table because the respondent could not calculate them (Table 4 and Figure 6).

Table 4 List of Expenditures

Expenditure (USD)							
Year	Farming	Food	Health	Education	Electricity	Gasoline	Total
2019	12,180	17,190	5,735	11,084	1,270	6,122	53,581
2020	21,400	28,350	8,600	11,880	2,364	8,971	81,565
2021	18,275	17,925	9,435	9,835	2,275	7,020	64,765

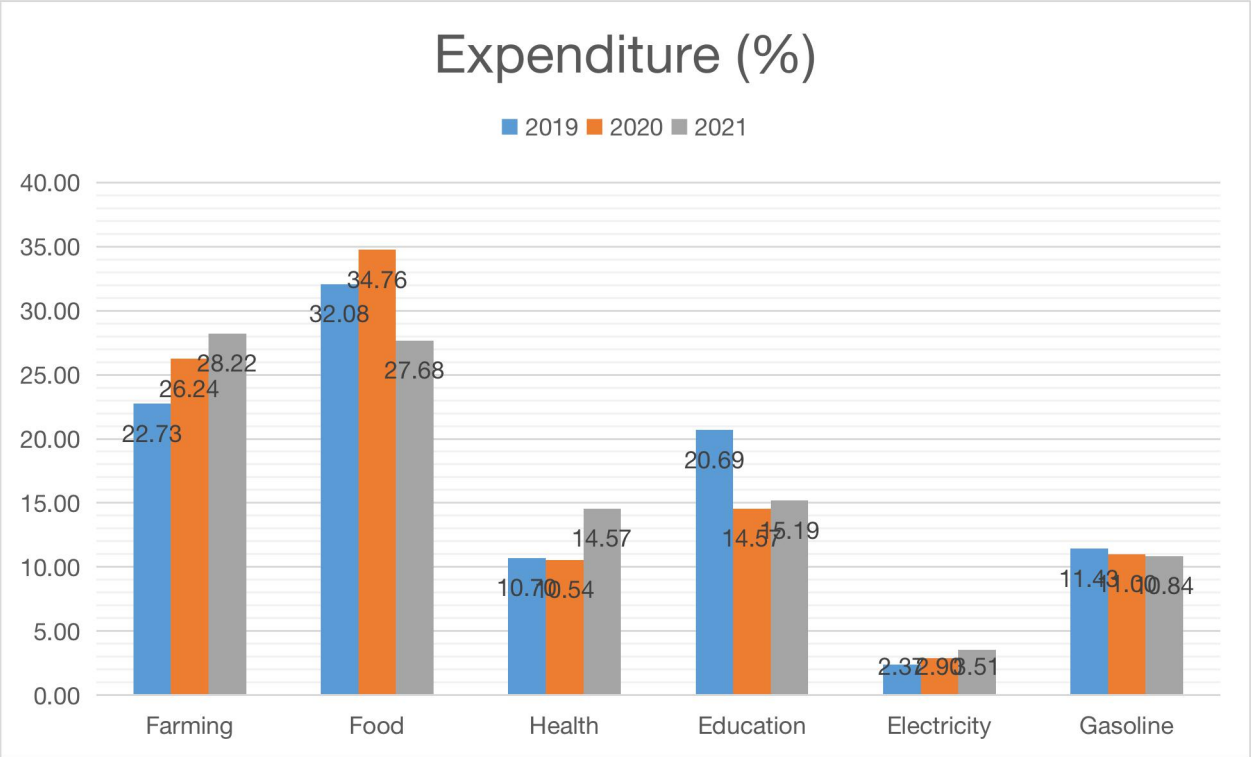

Figure 6 Percentages of Expenditures

In average, each household had higher income than expenditure. There were 2,839$ income and 1,914$ expenditure in 2019, 3,643$ income and 2,204$ expenditure in 2020, and 3,107$ income and 1,750$ expenditure In 2021. Each household could save around 925$, 1438$ and 1357$ as an asset in 2019, 2020 and 2021, respectively.

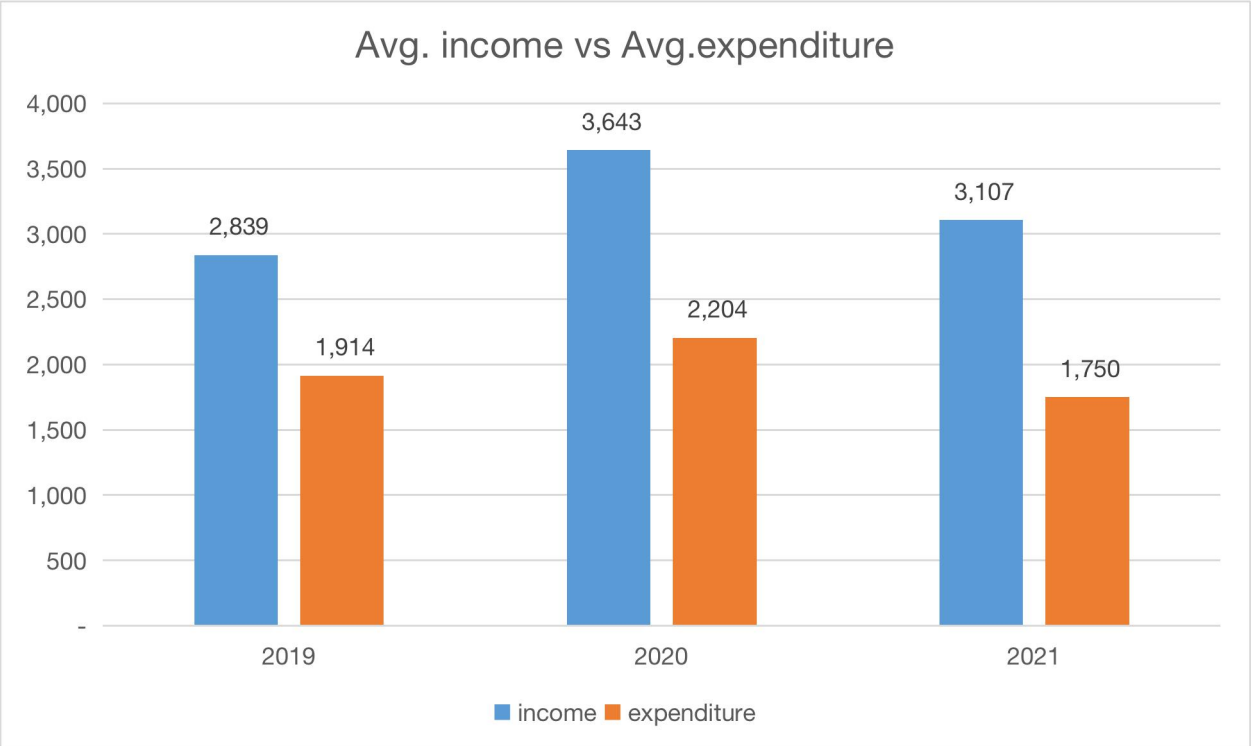

Figure 7. Annual Income and Expenses of Respondents

The asset of each household in 2019 was used as the baseline of livelihood improvement. The increased assets in 2020 and 2021 compared to that in 2019 showed the positive impacts of the project implementation. The villagers gained extra labor incomes by participating in the project

activities, especially in both 2020 and 2021 (Figure 8). A slight decline in the asset of 2021compared to that of 2020 is mainly due to the pandemic of COVID-19, which reduced the labor services, farming and others.

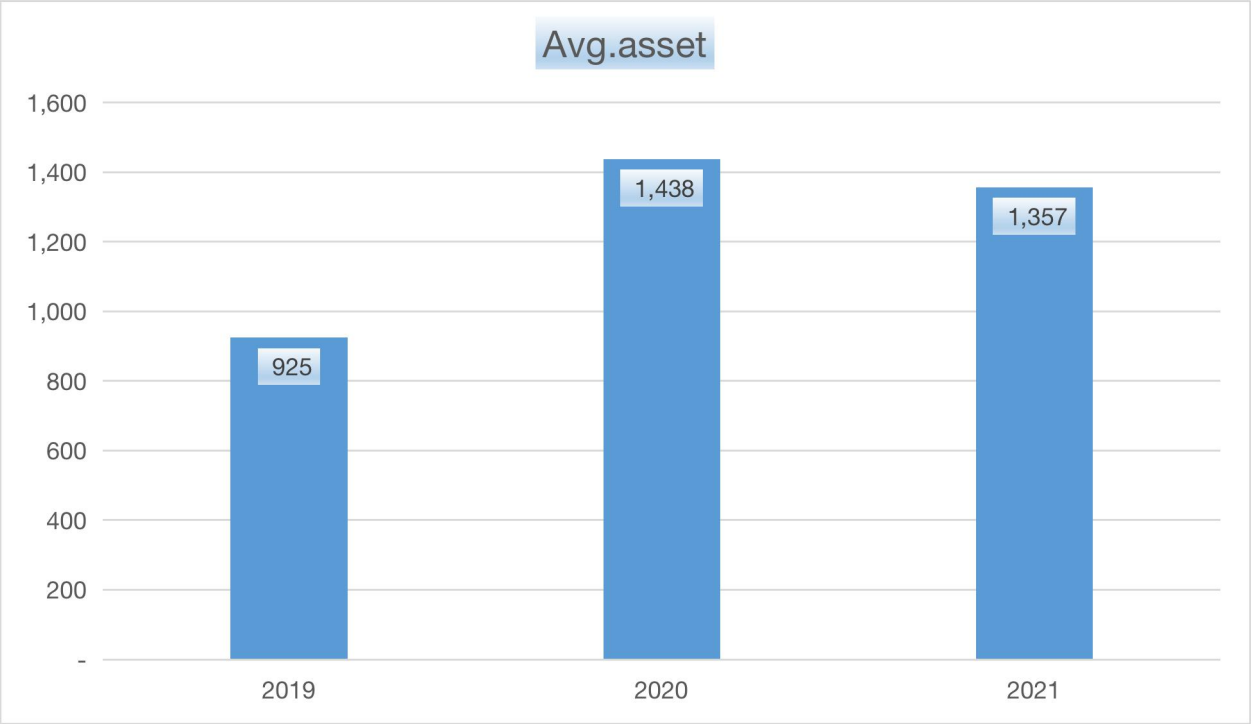

Figure 8. Comparison assets among 2019,2020 and 2021

4. Impact of the Project

The households receive some supports from our project, such as fruit trees, crop, and solar energy, a loan, and labour fee. There are 14 of 37 respondents received loans from the project to improve their livelihood activities, including farming, livestock, and extent business. All respondents receive free fruit trees from the project. Although planting fruit trees can not generate incomes at present, but it will increase incomes by selling the fruits in the future. Eight of them receive the solar panels. In average, each household save 57$ annually for the electricity bill. There are 30 of them receiving free crop seeds from the project. During three years of the project, each household will generate an income of 337$ annually from vegetable cultivation, which really contributes to their livelihood improvements. Addtionally, some of respondents participate directly in project activities, such as marking tree selection, pruning, thinning, planting, and so on. They can also earn some labor fees to increase their annual incomes.

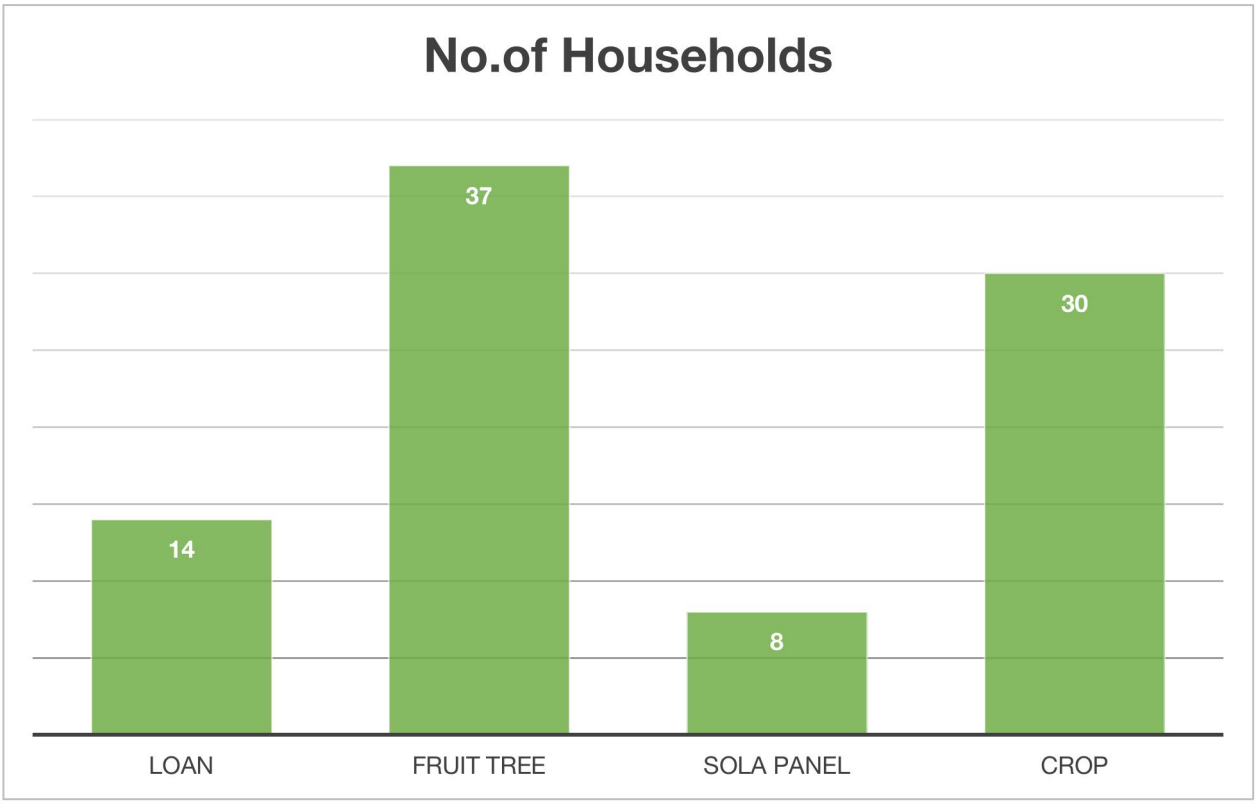

Figure 9 Number of households received support from the project

5. Conclusions

A 81.08% of respondents are males, and they are heads of household who know more informations about family status and our project. Majority of them are aged under 45 years old, which is a productive age. A 51.35 % of respondents are illiterate, since they were born in rural areas during the civil war when education was not widely distributed at that time. This has a great impact on the labor productivity. About 81% are pure farmer who live on rice and crop production. Some others have extra jobs, such as house constructor, vendor, village chief, and high school teacher.

A 86% of households have less than one hectare of residential lands including home-garden. Moreover, the majority own agricultural lands from one to five hectares, which generates their incomes depending on different areas of lands.

The largest income is from labor, followed by rice production and vegetable cultivation. The rest income are from livestock, NTFP (charcoal, wild fruits, mushroom) and others. The largest expenditure is food, followed by farming activities and education. Each household has higher income than expenditure from 2019 to 2021. They can save around 925$, 1438$, and 1357$ as an asset in 2019, 2020 and 2021, respectively.

Our project significantly improved the local people's livelihood by providing fruit tree, crop, solar energy, loan and labour fee. According to the survey results, fourteen households received loan to invest in farming, livestock, and extent business. All respondents received the fruit trees from the project, which will generate extra incomes in the future by selling the fruits. Eight of them received the solar systems and each household could saved 57$ annually for the electricity bill. Thirty households received the crop seeds from the project and each household generated 337$ annually from vegetable cultivation. Some of respondents participated directly in project activities, which also earn some labor fees.

ANNEX

Annex I. Questionnaire

Tool 1: Interview Questionnaire

IDQ: _____

Date: _____

District	Commune	Village

1.0 General Information

1.1 Socioeconomic Profile

1.1.1 Name: _____ 1.1.2 Age _____

1.1.3 Sex _____ 1.1.4 Marital Status: _____ 1.1.5 Level of Education:

_____1.1.6 Occupation _____1.1.7 Members of Household:

_____

No.	Family Members	Sex	Age (yrs)	Relation in Family	Education	Marital Status	Occupation

1.2 Economic Resources and Equipment (Nos. and Date of Acquisition)

1.2.1 Land Resources (Area, Date, Kind What Are Planted, Tenure)

Type	**Total Area**	**Ownership**	**Date Acquired/Bought**
Residential			
Farming			

1.2.2 Equipment and Facilities

Equipment and Facilities	Quantity	Status/Condition	Source
House			
Solar Power System			
Water Tank			
TV			
Radio			
Car			
Motorcycle			
Bike cycle			
Tractors			
Walking tractor			
Animal			
Others			

1.2.3 What is your electricity source?

_____

1.3 Main Livelihood and Level of Income

Livelihood/Incoming sources	Option		Daily/Monthly/yearly incomes
	Yes	**No**	
Farming			
▪ Rice			
▪ Fruit Trees and Palms			
▪ Vegetables			
Poultry and Livestock			
▪ Piggery			
▪ Chicken			
▪ Ducks			
▪ Eggs			
▪ Cattle			
Employment/labours			
Fishing			
Forestry			
▪ NTFPs			
▪ Fuelwood/Charcoal			
▪ Wood			
▪ Hunting/Selling Wildlife			
Others			

1.4 Main Health Problems Commonly Experienced by the Household Last Month

Main Illness	Causes

1.5 Major Expenses

Items	Monthly Expenditure (Riles/month)
Farming and Livestock	
Food	
Health and Medication	
Education of Children	
Fuelwood	
Electricity	
Gasoline	

2.0 Support Received from the Project

2.1 Material Support Received from the Project (please be specific):

_____

2.2 Trainings

_____

3.0 Practice of the Technology

Farming Technology Being Practiced	Contribution of the Technology to Farm Production 1 = Limited 2 = Slightly Signiant 3 = Moderately Significant 4 = Highly Significant	Contribution of the Technology to HH Income 1 = Limited 2 = Slightly Signiant 3 = Moderately Significant 4 = Highly Significant

4.0 Trend of Production

	Production Trend: **1= Decreasing** **2= The Same** **3= Increasing**
Farming	
▪ Rice	
▪ Fruit Trees and Palms	
▪ Fruits from Annuals	
▪ Vegetables	
Poultry and Livestock	
▪ Piggery	
▪ Chicken	
▪ Ducks	
▪ Eggs	
▪ Cattle	

5.0 Impacts

5.1 What farming technology/skills have changed after you join the project?

_____

5.2 What did you learn from the project about forest conservation and restoration?

_____

5.3 In your opinion, since you participated in the project, what is the most significant change that happen to your family?

5.4 In your opinion, since the project was implemented, what is the most significant change that happened in your village/community.

Annex II. Data set of Respondents