

## **Chapter 4. Rural Socio-analysis**

### **4.1 Introduction to and purpose of rural socio-analysis**

Rural socio-analysis is seen as an important part of many types of works in various fields. Theoretically and practically, the purpose of rural socio-analysis varies depending on the requirements of specific work. For the purpose of this manual, such socio-analysis aims to identify socio-economic potential and ensure sustainable operation of the project by understanding the socio-economic environment in the project area. It is intended to analyze and perform the following tasks:

- 1) To grasp the socio-economic conditions of people and the project area, and to identify constraints and potentials with analysis of the reasons behind them;
- 2) To identify the major stakeholders of the project and establish an appropriate framework for their participation in the project's preparation and implementation;
- 3) To ensure that the project design is acceptable to the target beneficiary and other major stakeholders;
- 4) To assess the social impact of the project and determine how any adverse impact can be mitigated.

### **4.2 Use of rural socio-analysis outputs in the F/S report**

Analysis contributes to the feasibility study in terms of describing socio-economic conditions in Part 1 (project background), design for the participation of local people in the organization of project management and implementation in Part 2 (project contents), evaluation of social impact and project risks and mitigating measures in Part 3 (project justification). Some specific uses of rural socio-analysis outputs in the F/S report are described below.

#### Part 1: Project background

##### Sub-chapter 2.2 Socio-economic conditions

- Basic information on the socio-economic conditions in the project area is studied first. The information is then assessed from the viewpoint of whether a particular condition poses constraints to the project, serves as potential to promote the project implementation and enhance its effectiveness and sustainability, or at least serves as a non-limiting factor. The feedback of the survey results is used to develop counter-measures or acceleration measures as part of the project's activities.

- Through analysis of the socio-economic conditions, the causes of problems to be solved under the project are identified and verified.

## Part 2: Project contents

### Section 3.2.8 Training plan

#### Sub-chapter 6 Organization of project management and implementation

- The reaction of local people to the project is assessed in terms of whether their attitudes are positive or negative toward the implementation.
- What is the role of the beneficiaries, including the target beneficiary in undertaking the project?

## Part 3: Project justification

### Chapter 3 Evaluation of social impact

#### Chapter 5: Project risks and mitigating measures

- Positive or negative impact expected from the project on people living in the project area and surrounding areas is examined.
- Counter-measures are designed for any negative impact expected from the project.

## **4.3 Analytical perspectives**

Rural socio-analysis is undertaken in consideration of the draft project plan. In preparing the project design, the target beneficiary<sup>11</sup> and other major stakeholders of the project are identified. The analysis examines the socio-economic conditions concerning: (1) people and organizations; (2) local economic conditions; (3) access to infrastructure; (4) land use. In particular, it is important to understand the specific characteristics of local people and the project area by looking at how it differs from other areas in terms of potential and constraints. For the purpose of the analysis, comparison between the project area and other neighboring regions or areas with the same characteristics as the project area is helpful. Trend analysis of specific statistical data gives meaningful results, and analysis of the basic socio-economic conditions helps the planner to identify and verify the causes

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<sup>11</sup> The target beneficiary is the principal group for which positive changes are intended as a result of the project implementation.

of the problems to be solved by the project, design the activities of the project to address constraints or promote factors that may accelerate achievement of the project objective, examine the expected reaction of people to the project, and assess the impact expected from its implementation.

The tables below show examples of analytical perspectives that can be applied for the study of socio-economic conditions in the project area. These perspectives can be used for confirmation of information relevant to the project, cause-and-effect analysis (problems analysis) and/or analysis of the impact expected from the project. As described in (1) – (4) below, it is important to grasp the characteristics of the project area and identify problems there within the framework of the possible development intervention. For the purpose of the project design, it is helpful to analyze constraining (or limiting), non-constraining (or non-limiting) and accelerating factors for the project.

**(1) People and organization**

Example of analytical perspectives	Use for the analysis		
	Confirmation of information	Problems analysis	Impact analysis
What are the differences in the characteristics of the people who utilize the forest land in terms of human resources, organization and social conditions?	X	X	
What are the reactions of the local people to the project?		X	X
What is the impact of the project on the people and their organization?			X

The outputs of the analysis on people and organizations can be utilized, for example, in the following part of the F/S report:

Part of the F/S report where the analysis outputs could be utilized
<b>Part 1: Project background</b>
2.2.1 Population, ethnicity and labor This description may also include other aspects of the people, which are deemed relevant to the project’s design, such as literacy, education, gender and health issues.
2.2.2 Household economy
<b>Part 2: Project contents</b>

3.2.8 Training plan
6 Organization of project management and implementation
Participation of the target beneficiary in the project and their roles and responsibilities
<b>Part 3: Project justification</b>
3. Evaluation of social impact
5. Project risks and mitigating measures
Positive and negative impact expected from the project, and mitigation measures

**(2) Economic conditions**

Example of analytical perspectives	Use for the analysis		
	Confirmation of information	Problems analysis	Impact analysis
What are the differences in the characteristics of the people who utilize the forest land in terms of their economic conditions?	X	X	
How do the economic conditions of the project area and surrounding areas affect the project?	X	X	
What impact does the project have on the economic conditions in the project area?			X

The outputs of the analysis on economic conditions can be utilized, for example, in the following part of the F/S report:

Part of the F/S report where the analysis outputs could be utilized
<b>Part 1: Project background</b>
2.2.3 Major economic activities
2.2.4 Financial sources

**(3) Access to infrastructure**

Example of analytical perspectives	Use for the analysis		
	Confirmation of information	Problems analysis	Impact analysis
How do the conditions of the infrastructure affect the project?	X	X	
What impact does the project have on the infrastructure of the project area?			X

The outputs of analysis on access to infrastructure can be utilized, for example, in the following part of the F/S report:

Part of the F/S report where the analysis outputs could be utilized
<b>Part 1: Project background</b>
2.2.5 Infrastructure Emphasis of the description is placed on the infrastructure relevant to the project implementation such as communication (transportation system and telecommunication services), power, and water supply.

#### (4) Land use

Example of analytical perspectives	Use for the analysis		
	Confirmation of information	Problems analysis	Impact analysis
How is the forest land being utilized?	X		
Is the forest land effectively utilized?		X	
What impact does the project have on the utilization of the forest land?			X

The outputs of analysis on land use can be utilized, for example, in the following part of the F/S report:

Part of the F/S report where the analysis outputs could be utilized
<b>Part 1: Project background</b>
2.3 Status of land and forest resource use 2.3.1 Current situation of forest land

#### 4.4 Methodology

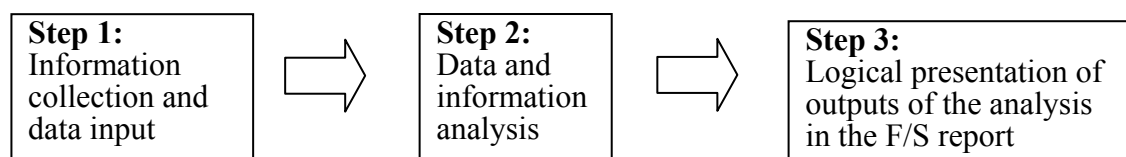
Rural socio-analysis can be conducted in a number of ways. Depending on the type of project to be designed, the scope and level of the analysis will differ. Practically, the analyst has to clarify the study objectives and select methods to meet them. For the purpose of conducting the F/S, the following analytical tools (methodologies) are described in this manual:

- 1) Socio-economic survey
- 2) Household socio-economic survey
- 3) Communal consultation meeting

4) Stakeholders analysis

5) Social impact survey

The three-step method below is also proposed in this manual.



Step 1 involves the collection of relevant data and information to input. In Step 2, analysis is conducted on the data and information collected. The outputs of the analysis are presented in the F/S report. This three-step method is applicable to the different methodologies of rural socio-analysis described above.






The following table summarizes the possible application of methodologies to the preparation of relevant parts of the F/S report:

Relevant part/chapter in F/S report and method	Methodology						
	(1) Socio-economic survey		(2) Household socio-economic survey		(3) CCM	(4) Stakeholder analysis	(5) Social impact survey
	(1.1) Secondary data survey	(1.2) Questionnaire survey	(2.1) Questionnaire survey	(2.2) Interview survey			
Part 1 : 2.2 Socio-economic conditions	X	X	X	X	X	X	X
2.3 Status of land and forest resource use	X	X	X	X	X	X	X
Part 2: 3.2.8 Training plan		X (Note)	X (Note)	X (Note)	X	X	
Part 2: 6. Organization of project management and implementation		X (Note)	X (Note)	X (Note)	X	X	
Part 3: 3. Evaluation of social impact	X	X	X	X	X	X	X
5. Project risks and mitigating measures	X	X	X	X	X	X	X

Note: If a project is to be undertaken not through mobilization of local people but through labor contracts, the questionnaire and interview surveys (if used to examine ways of mobilizing local people in the project implementation) may not be conducted.

#### **4.4.1 Socio-economic survey**

The socio-economic survey aims to provide an overview of the socio-economic conditions of local people and the project area based on secondary data, the information collected from interviews with key personnel and visits to selected villages. The relevant part of the F/S highlights similarities and/or differences in the socio-economic conditions of the project area by comparing with those in the district, province, region and the whole country. Various forms of tables and figures are utilized to illustrate conditions such as demographic features, e.g. population, ethnic groups and workforce, as well as economic and organizational structure, including administrative structure.

-  **Technical Note 4.1 - Socio-economic survey**
-  **Technical Note 4.2 - Handbook for socio-economic survey**
-  **Technical Note 4.3 - Farm income**
-  **Technical Note 4.4 - Loan schedule**
-  **Technical Note 4.5 - Socio-economic analysis**

The Technical Notes 4.1 to 4.17 provide more detailed explanations on particular topics at the end of this chapter on rural socio-analysis.

In the case of the F/S in Thai Nguyen Province, the following items are described as outputs of the socio-economic survey:

<b>Part 1 Project background</b>
<b>2.2 Socio-economic conditions</b>
<b>2.2.1 Population, ethnicity and labor</b>
(1) Population
(2) Literacy and Education Level
(3) Ethnic Minority Group
(4) Labor Force
(5) Gender
(6) Health
<b>2.2.2 Household economy</b>
(1) Household income
(2) Off-farm activities
(3) Poverty
<b>2.2.3 Major economic activities</b>
(1) Agriculture
(2) Forestry
<b>2.2.4 Financial sources</b>
<b>2.2.5 Infrastructure</b>
(1) Transport
(2) Power and water supply

#### **4.4.2 Household socio-economic survey**

The household socio-economic survey is conducted through a questionnaire to individual households in the project area. The survey provides information to highlight the socio-economic conditions of households in the project area, including income and spending, poverty level, means of production etc. The household socio-economic survey may take the following steps:

- Step 1: Identification and confirmation of the focus of the study
- Step 2: Confirmation of the research schedule and budget
- Step 3: Establishment of an information base



Step 4: The sampling frame

Step 5: Determination of sample size and sample selection procedures

Step 6: Design of the survey instrument

Step 7: Pre-testing of the survey instrument

Step 8: Selection and training of interviewers

Step 9: Implementation of the survey

Step 10: Editing, coding and data entry

Step 11: Data analysis

 **Technical Note 4.6 - Household socio-economic survey**

 **Technical Note 4.7 - Descriptive statistics (mean-median-mode and standard deviation) and inferential statistics**

 **Technical Note 4.8 - Instructions to interviewer**

 **Technical Note 4.9 - Sampling method**

 **Technical Note 4.10 - Data input and analysis of quantitative data**

 **Technical Note 4.11 - Data worksheet**

In the case of the F/S in Thai Nguyen Province, the following items are described as outputs of the household socio-economic survey:

### **Annex 3: 2.2 Household economy**

- (1) Household socio-economic survey (survey method and profile of respondents)
- (2) Ethnicity and its influence on household economy
- (3) Household income and structure
- (4) Poverty
- (5) Living conditions
- (6) Livestock raising
- (7) Spending
- (8) Production
- (9) Financial sources
- (10) Land-use rights
- (11) Land-use purpose

#### **4.4.3 Communal Consultation Meeting (CCM)**

The Communal Consultation Meeting (CCM) is held with local people in the project area at the project formulation stage. It aims to provide local people with a general description of the project and identify their needs, within the framework of the project, in order to reflect them into the project design. During the first phase of the JICA study in Thai Nguyen Province, the CCM was conducted as part of the Project Option Evaluation.

The CCM is undertaken through the following steps:

Step 1: Pre-meeting preparations

Step 2: Implementation of the CCM

Step 3: Analysis of the results

##### **4.4.3.1 Step 1: Pre-meeting preparations**

At the preparation stage of the CCM, organizational issues such as decision letters from the relevant authorities, issuance of invitation letters, meeting schedules, members to be invited and the training of facilitators are decided. In Thai Nguyen Province, answers to the questionnaires for the household socio-economic survey were collected at the CCM, so the selection of CCM participants was made in accordance with the design of the questionnaire survey.

##### **4.4.3.2 Step 2: Implementation of the CCM**

The CCM begins with a brief introduction to the meeting, to be followed by a presentation of the project options, preference ranking by participants, group discussion and so on. In Thai Nguyen Province, erroneous entries on questionnaires were examined upon the arrival of participants.


##### **4.4.3.3 Step 3: Analysis of the results**

The results of the CCM are analyzed to identify people's needs, incentives for participating in the project, possible forms and structure of project implementation etc.

#### **4.4.4 Stakeholders analysis**

The stakeholders analysis is performed as part of the CCM. It can be undertaken separately at village, commune and district levels. The analysis aims to identify the issues, problems and current conditions of the project area through analyzing the area and local people targeted for assistance, related groups, related organizations and agencies.<sup>12</sup> The implementation of the project will bring about positive and/or negative impact, and direct and/or indirect impact to the people in the project area and its surrounding areas. It is therefore essential to identify the groups of people who will be affected by the project, as well as the type and extent of the impact that the project is expected to bring about.

 **Technical Note 4.15 - Stakeholders analysis (1): Steps to carry out**

 **Technical Note 4.16 - Stakeholders analysis (2): Experience from Thai Nguyen Province**

#### **4.4.5 Social impact analysis**

Social impact analysis aims to evaluate the social impact, be it positive or negative, expected from the project. For instance, the sensitiveness of project activities to the livelihood of local people is assessed to reaffirm whether such activities may cause any land-use changes negative to local people, widen the socio-economic gap between landholders and landless farmers and/or raise gender inequity. The loss of traditional tree species is another expected consequence when they are replaced with fast-growing or foreign species. If a negative impact is expected, possible mitigation measures will be proposed.

Social impact may be expected in areas such as economic and financial considerations, society and culture, organization and institutions etc. The results of the socio-economic survey, stakeholders analysis and the household survey can be utilized to assess the potential impact.

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<sup>12</sup> FASID [2004], *Project Cycle Management – management tool for development assistance – Participatory Planning*.

In Thai Nguyen Province, the following aspects were examined under the social impact analysis:

**Part 3 Project justification**

**3. Evaluations on social impacts**

- (1) Impact on ethnic minorities
- (2) Short-and medium-term impact on the household economy
- (3) Special consideration for women's participation in training programs

**5. Project risks and mitigating measures**

## Technical Note 4.1 - Socio-economic survey

### Question: Why do we have to check the socio-economic setting of the project area?

The socio-economic survey aims to provide an overview of the socio-economic conditions of local people and the project area. At the beginning of the study, the F/S team may not know much about the socio-economic setting of the project area. The survey will help to quickly familiarize themselves with it and plan for the necessary activities. After gathering the information available on the project area, the F/S team can confirm what kind of information is missing and plan for further socio-economic surveying.

### Question: How do we grasp an overall picture of the socio-economic setting?

#### ✓ Collect and check the available documentation

##### (1) National level

- Statistical year-book
- Socio-economic statistical data by province
- National 5-year Socio-economic Development Plan
- MARD's 5-year Socio-economic Development Plan
- 5 Million Hectare Reforestation Plan (5MHRP)
- Comprehensive Poverty Reduction and Growth Strategy Paper (CPRGSP)
- National Poverty Reduction Programs (such as Program 135)
- etc.

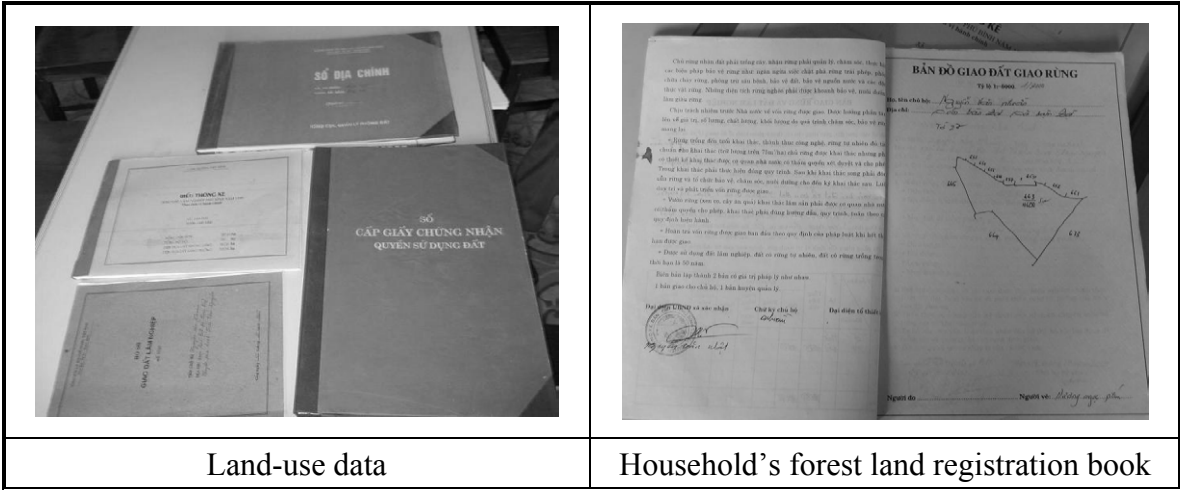


##### (2) Provincial level

- Thai Nguyen Province Statistical Yearbook
- Thai Nguyen Province 5-year Socio-Economic Development Plan
- Maps
- etc.

##### (3) District level

- Phu Binh District Statistical Yearbook
- District 5-year Socio-economic Development Yearbook
- Land-use data from the land administration department and maps



(4) Commune level

- Household data and information available from the Commune People's Committee
- Sample Red Book and other relevant documents
- etc.

✓ **Interview and discuss with key informants**

Visit the following key people to collect relevant information:

(1) Central government level

- Department of Forestry, MARD (e.g. policy relating to 661, MARD's 5-year socio-economic plan---mainly policy issues)
- MONRE (e.g. land allocation and land-use policy)

(2) Provincial level

- Sub-Department of Forestry, DARD
- DONRE (e.g. provincial land allocation and land-use situation. In particular, DONRE has information on land allocation for enterprises.)
- People's Committee, DPI etc. (for policy issues)

(3) District level

- Agriculture and Rural Development Division, District People's Committee ---this division has detailed on-site information. Major statistics, information on past similar projects, afforestation efforts and lots of other relevant information can be obtained here. In order to collect the necessary data, make a list of the required points and request the information to be entered.

[Example: Data request form]

Indicators	Unit	District	Commune1	Commune2	Commune3	Commune4	Commune5
Number of Village							
Total Land Area (ha)	Ha						
Forestry land	Ha						
Natural Forest	Ha						
Plantation	Ha						
Agricultural land	Ha						
Residential land	Ha						
Special land	Ha						
Open land	Ha						
Population							
Male							
Female							
Growth rate of population	%						
Population density	people/Ha						
Number of Household							
No. of male-head household							
No. of female-head household							
Number of poor household							
Population in labor							
Infant death rate							
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.	.	.	.	.	.	.	.

- ❑ Office of Land Allocation and Land-Use Administration, District People’s Committee---the district-level PC is in charge of allocating land at household level, although the provincial DONRE is in charge of allocating to enterprises. This office keeps a record of land allocation.

(3) Commune level

- ❑ Commune People’s Committee --- the lowest-level formal administrative unit. The Commune PC keeps detailed household information including each household’s forestry land area and purpose (e.g. forestry land for PAM, 327, private investment etc.), and also PC keeps statistics at village level. The Commune People’s Committee is the right place to ask for local information such as the characteristics of people’s living and issues concerning ethnic minorities, gender and poverty.

✓ **Visit several households in the village**

With the information collected through the above process, visit several households randomly to understand their livelihood. The following are useful tools that may be applied during village visits:

- Drawing of village historical lines
- Village sketch mapping
- Creation of transects
- Building a village profile
- Creation of a seasonal calendar
- etc.



(Note: for detailed steps on implementing the tools above, please refer to the “**Handbook for the socio-economic survey**” in Annex 1 of the F/S Manual (Volume IV))

✓ **Summarize the collected local information by each commune**



## [Example: Summary sheet of socio-economic situation by communes]

<b>Tan Hoa Commune</b>														
Number of village: 14		Population: 4364		Number of Household (HH): 1728		Area of natural land (ha): 1405.11								
<b>Special characteristics:</b>														
+ Hilly site, Good soil, high potentials of cultivation and reforestation														
+ new economic zone by spontaneous immigrants who from adjacent province as Cao Bang and Lang Son come. Recent resettlement not be original indigenous ethnic group as Tay and Nung, different customer with original local Tay-Nung in Phu Binh district														
+ suitable conditions for rural development, Good infrastructures														
+ Traditional experiences and knowledge on land use, agroforestry models and mixed aquaculture products and cultivation on slop lands														
+ Approaching market high value products														
+ high potentials soils, lands, manpower and indigenous knowledge on rural development														
<b>Ethnic Minority:</b>														
4 ethnic groups (Tay, Nung, Kinh and Hoa)				<b>Forestry land available (ha):</b> 670										
Over 70% of Tay, Nung are new spontaneous immigrants resettlement				Pam: 438.14 (672 HHs)										
				*372 and 773*: 49.1 (37 HHs)										
				Agroforestry models: 206.55 (664 HHs)										
				(From official commune PC statistic/integrated document)										
No. Village	Name of villages	HH/ population (if available)	HHs under poor level (135 criteria)	Forestry areas (ha)	Existing areas of PAM reforestation			Existing areas of "327", "773" programs of reforestation			Existing area of private agro-forestry models as farm complex			Notice
					Areas (ha)	HH owner	Comments + Evaluation	Areas (ha)	HH owner	Comments + Evaluation	Areas (ha)	HH owner	Comments + Evaluation	
1	Xom Ca	92/442	6	44.68	28.96	61	Eucalyptus-good and medium quality, high price of wood for sale	2	3	Indigenous species of trees: canarium, bracontocelum, bamboo, palm...	13.72	19	Successful agroforestry models, high income, diversify products as long term and short term	Almost market products from agroforestry models
2	Xom Han	155/739	0	12.25	5.94	25	As above	2	4	As above	4.31	7	As above	As above
3	Xom Ngo	127/605	0	27.79	16.93	47	As above	0.8	3	As above	10.06	11	As above	As above and high potential for
4	Dong Ca	90/425	0	33.1	20.75	40	As above				19.35	21	As above	As above
5	Xom Vau	168/705	0	27.75	19.25	42	As above	1	3	As above	8.5	9	As above	As above and high potential for
6	Xom U	90/424	0	25.04	22.34	49	As above				2.65	5	As above	As above and high potential for
7	Trai Giua	102/430	0	52.05	43.61	61	As above				8.44	10	As above	Medium rate of products, not the same
8	Vac Quang	102/430	0	50.55	35.58	60	As above	4.7	7	As above	10.27	12	As above	As above, difficult area
9	Xom Gian	121/556	3	86.42	65.63	68	As above	16.9	17	As above	3.89	5	As above	As above, difficult area
10	Xom Te	110/490	5	25.34	19.97	36	Eucalyptus bad forests				5.37	6	As above	As above
11	Vang Ngoai	144/668	4	103.14	87.89	73	Eucalyptus medium forests	2.5	3	As above	12.75	9	As above	As above
12	Gieng Mat	101/449	7	94.8	48.16	52	Eucalyptus medium forests	8.9	11	As above	37.74	46	As above	Remote and difficult area low value
13	Tru So	104/458	0	102.93	23.13	58	Eucalyptus good forests	10.3	9	As above and plus Acacia	69.5	71	As above	High value products
14	Thanh Luong	200/980	0	0	0	0								Almost paddy lowland cultivation

### Technical Note 4.2 - Handbook for socio-economic survey

Refer to Annex 2 of the F/S Manual (Volume IV).

### Technical Note 4.3 - Farm income

#### 1 Household agricultural income

Net income is obtained by deducting the amount of gross expenditure for inputs from the amount of gross receipts (or gross income) from production. Gross receipts (or gross income) consist of cash as well as non-cash receipts, including the amount of production domestically consumed.

(1) Gross receipts (or gross income) (ABCD in the figure below)

= production volume per area x area size x unit price

(2) Operating expenditure for household (the non-shaded area of the figure below)

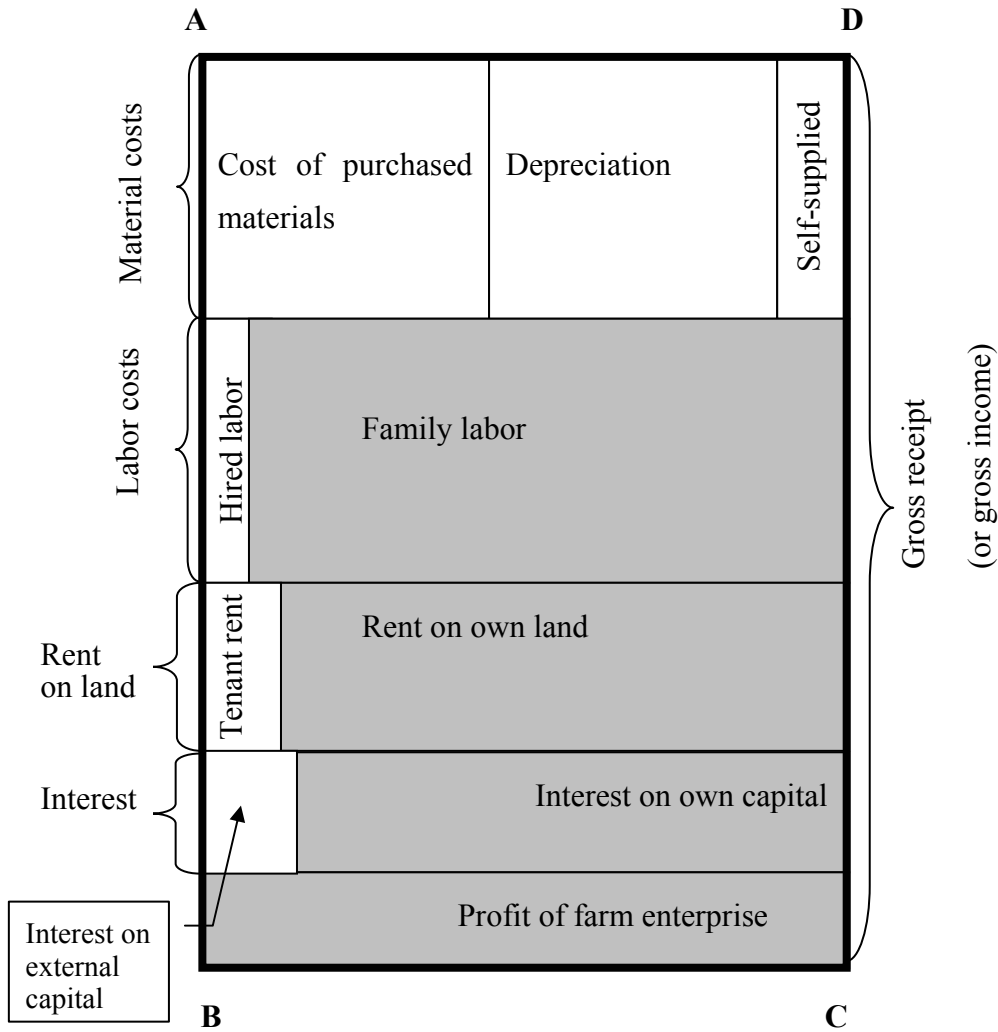
= material costs + hired labor + tenant rent + interest on external capital

(3) Household agricultural income (the shaded area in the figure below)

= (1) gross receipts (or gross income) – (2) Operating expenditure for household

= family labor +rent on own land + interest on own capital + enterprise profits

Household agricultural income (3) includes family labor costs, rent on own land, interest on own capital, and enterprise profits. It is shown in the shaded area in the figure below.



Source: Gomi [1994] *Agriculture Management*. Tokyo: Jikko Shuppan

## 2 Home consumption

Since home-consumed production contributes to project objectives in the same way as marketed production, it clearly forms part of the project benefits in both financial and economic analysis. Gittinger [1982] points out the hypothetical case of a farmer selling his output and then buying it back.

### **3 Intermediate inputs**

An intermediate good is an item produced primarily as an input in the production of another good. By emphasizing the point of first sale as a starting point for valuing the output of a project, Gittinger [1982] implies that imputed prices should be avoided in the analysis for intermediate goods produced in the production process of the final output. If an intermediate good is not freely traded in a competitive market, it is not possible to obtain a price established by a range of competitive transactions. Fodder produced on a farm and then fed to the dairy animals on the farm is an example of such an intermediate product. If increased fodder production is an element in the proposed agricultural product, the analyst would avoid valuing it. Instead, the analyst would treat the whole farm as a unit and value the milk produced at its point of first sale or value the calves sold as feeder cattle.

## Technical Note 4.4 - Loan schedule

### 1. Loan amount and outstanding balance

To construct a loan schedule, several terminologies need to be recalled. As an example, if a total loan amount of 100 million VND is disbursed, the outstanding balance of the loan is 100 million VND. If a portion of the loan (e.g. 70 million VND of the 100 million VND) is repaid, the outstanding balance, which is uncollected or not repaid, will become 30 million VND ( $30 = 100 - 70$ ). The interest is charged against the outstanding balance of the loan.

$$\text{Total Loan Amount} - \text{Repaid Amount} = \text{Outstanding Balance}$$

Total Loan Amount 100 Million VND
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70 Mil VND	30 Mil VND
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Repaid amount

Outstanding balance

In order to calculate the loan disbursement and repayment schedule, the following table may be used.

Item	Item	Year 0	Year 1	Year 2
Outstanding balance at beginning of year	(a)	0	100	30
Disbursement (at end of year)	(b)	100	0	0
Repayment (at end of year)				
Interest (10% p.a.)	(c)=(a) x annual interest rate	0	10	3
Principal	(d)	0	70	30
Outstanding balance at end of year	(e)=(a) + (b) – (d)	100	30	0

The following information compares the outstanding balance of loans between different periods at one of the banks operating in a district and a province. The loan balance at the district branch office is classified by the loan repayment period.

## Outstanding balance of loans

*Unit: Mil VND*

Loan type	End of 2004		End of June 2005		Change [(b)/(a)-1] x 100
	Amount (a)	Proportion	Amount (b)	Proportion	
Short term (1 yr or less)	21,800	32%	26,700	35%	22.4%
Medium (1 to 5 years)	46,700	68%	48,600	65%	4.0%
Long (5 to 7-8 years)					
Total in district (A)	68,500	100%	75,300	100%	9.9%
Province (B)		985,000		1,090,000	
(A)/(B) x 100		6.9%		6.9%	

### 2. Fixed interest rate vs. variable interest rate

When examining the interest rate, it is necessary to obtain information on whether it is fixed or variable. A variable interest rate is one that varies as inter-bank interest rates change, while a fixed rate will remain unchanged throughout the agreed period.

### 3. Nominal interest rate vs. real interest rate<sup>13</sup>

The market interest rates referred to by financial institutions are expressed in nominal terms. The nominal interest rate (i) determined in financial markets is made up of at least three components:

(r) is an element reflecting the real-time value of money that lenders require in order to be willing to forego consumption or other investment opportunities;

(R) is a risk element measuring the compensation that lenders demand to cover the possibility of the borrower defaulting on the loan;

$(1+r+R) \cdot {}_gP^e$  is an element representing compensation for the expected loss in the real purchasing power of the loan principal still outstanding because of the expected future rate of inflation  ${}_gP^e$ .

The nominal or market rate of interest (i) can be expressed as:

$$i = r + R + (1+r+R) \cdot {}_gP^e$$

For the sake of simplicity, let us put the risk element (R) together with element (r). Then, the following formula is presented:

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<sup>13</sup> Reference was made to the following: Glenn P. Jenkins and Arnold C. Harberger, Program on Investment Appraisal and Management, 1991, HIID.

$$i = r + (1 + r) * gP^e$$

If  $r$  is 5% p.a. and  $gP^e$  is 3% under the conditions above, the nominal interest rate ( $i$ ) is calculated as:

$$\begin{aligned} i &= r + (1 + r) * gP^e \\ &= 5\% + (1 + 5\%) * 3\% \\ &= 8.15\% \text{ p.a.} \end{aligned}$$

Likewise, if the nominal interest rate is 8.15%, the real interest rate is calculated as 5% using the following formula:

$$r = (i - gP^e) / (1 + gP^e) = (8.15\% - 3\%) / (1 + 3\%) = 5\%$$

## Technical Note 4.5 - Socio-economic analysis

Based on secondary data, interviews and visits to the project area, the analysis aims to overview the socio-economic conditions of local people and the project area, and look at their specific characteristics in comparison with other areas. As the main text of the feasibility study report is prepared in a concise manner, the details of the analysis are placed in the annexes of the report.

### 1 Demographic features

The following table of project-targeted communes can be used to summarize population, households, labor forces and villages. After presenting the table, the section highlights the demographic features of the district such as population, ethnic groups and workforce.

**Table: Demographic characteristics of communes in the project area (Year 20\_\_)**

Item	Province	District	Commune in the project area				
Area (ha)							
Population							
Households							
Households with forestry land							
Poor households (*)							
Labor force							
Villages							

Source: Statistical yearbook of \_\_\_\_ Province and \_\_\_\_ of \_\_\_\_ District, 20\_\_

Note: Households' living conditions are classified by a set of criteria and indicators defined by Ministry of Labor, Invalids and Social Affairs, issued in \_\_\_\_ 20\_\_, as follows:  
 Poor households in the countryside: Average income per capita is \_\_\_\_ million VND per year.  
 Poor households in urban area: Average income per capita is \_\_\_\_ million VND per year

### 2 Information on the economy

This section looks at economic information such as Gross Domestic Product (GDP), Regional GDP, poverty, markets and enterprises, the availability and accessibility of credit, and the condition of the infrastructure in the province.

(1) Industry

**Table: Selected economic indicators (Year \_\_\_\_\_)**

*(Mil. VND)*

Item	Nation-wide	%	Province	%
GDP (or RGDP)				
GDP per capita				
GDP by sector				
Agriculture				
Forestry				
Fishery				
Mining & Construction				
Service				

Source: Statistical Yearbook 20\_\_\_, General Statistic Office

(2) Poverty

**Table: General poverty rate (%)**

Location	1998	2002	2004
Whole of Vietnam			
Red River Delta			
North-East			
North-West			
North Central Coast			
South Central Coast			
Central Highlands			
South East			
Mekong Delta			

Source:

Note:

1) The project is located in the region of \_\_\_\_\_.

2) The general poverty rate is defined as follows: \_\_\_\_\_

The following shows the general poverty rate in the project area.

Year	2001	2002	2003	2004	2005
Rate of poor households (%)					

Source:

Note: The general poverty rate is defined as follows: \_\_\_\_\_



(3) Markets and enterprises

**Table: Wood and/or agro-forestry products in the national economy**

Product	Unit	Total	Domestic	Export	Import	Province
Paper	Ton					
Pulp	Ton					
Logs	M <sup>3</sup>					
Furniture						
Chip wood						
Particle board	M <sup>3</sup>					
MDF	M <sup>3</sup>					
Ply wood	M <sup>3</sup>					

Source: Statistical Yearbook, 20\_\_

The number of wood processing enterprises in 20\_\_ by ownership is recorded in the table below.

**Table: Number of wood processing enterprises by ownership**

*Unit: No. of enterprises*

Order	Ownership	Nation-wide	Potential market (1) +(2)	Province A (1)	Province B (2)
1	Total				
2	State-owned				
3	Private				
4	Joint-venture				
6	Co-operatives and stocks				

Source: Vietnamese Timber Association Year \_\_\_\_

The major wood processors operating in \_\_\_\_\_ province in 20\_\_ were as described below.

**Table : Wood processing entities in \_\_\_\_\_ provinces**

Name and location	Wood product	Production capacity (m3/year)	Wood materials (species)	Consumption of wood materials (m3/year)
Xxx factory	Particle board	16,500 m3	Acacia	35,000 m3

Wood materials and the wood-products industry in the province of \_\_\_\_\_ is active/not active, compared with other neighboring provinces.

#### (4) Financial sources

This section describes the availability and accessibility of loans to implementing agencies and farmers, who are potential participants in the project. In order to assess the availability of loans, public statistical data at provincial and district level can be used. Aside from public documents, data and information can be collected from major financial institutions operating in the area. In the case of Phu Binh District, data was collected from the Vietnam Bank for Agriculture and Rural Development (VBARD) and the Vietnam Bank for Social Policies (VBSP).

The table formats below can be used to examine the increase or decrease in loan availability from a financial institution over the previous year by loan type.

**Table: Outstanding loans at the Provincial Branch Office**

Loan type	Unit	As of 12/20__ (a)	%	As of 12/20__ (b)	%	Change [(b)/(a)-1]*100
Total outstanding balance of loans (x)	Mil. VND					%
Short-term loans	Mil. VND					%
Medium-term loans	Mil. VND					%
Long-term loans	Mil. VND					%
No. of customers (y)	Mil VND					%
Average amount of loan (x)/(y)	VND					%

Source:

**Table: Sectoral distribution of loans in \_\_\_\_\_ province**

Item	Outstanding loans as of end of year 20__ (c) (Mil. VND)	%	Outstanding loans as of end of year 20__ (d) (Mil. VND)	%	Change [(d)/(c)-1]*100
Total outstanding loans					%
Of which					%
Agriculture					%
Forestry					%
Commerce					%
Processing industry					%
Private & cooperatives					%
Other sources					%

Source:

Loan accessibility may be determined by factors such as documentary requirements, collateral requirements, minimum loan size, loan interest rates, geographic locations of branch offices etc. Several questions relevant to the accessibility of loans can be incorporated in the questionnaire for the household survey if the accessibility of loans to farmers is to be examined. Interviews with bank officers, selected clients of banks and

leaders of farmers' associations may also provide important information on their access to loans. For a description of the lending rate of loans, the table below can be used.

**Interest rate applied by \_\_\_\_\_ bank: (by 12/20 \_\_)**

Loan repayment period	Interest (%/month)	Fixed or variable
Short term ( shorter than 12 months)		
Medium term (from 12 to 60 months)		
Long-term (longer than 60 months )		

In order to summarize the purpose and terms and conditions of a loan that a client farmer receives from a bank, the following table can be used.

Details	
Name of bank	
Purpose of loan	
Amount of loan	
Loan interest rate	
Repayment period	including grace period of _____
Frequency of repayments	
Collateral requirements	
Date of first disbursement	
Other conditions	

Factors that need to be taken into consideration in designing a project plan are analyzed in terms of the financial sources.

(5) Access to infrastructure

The development status of the infrastructure in the project area is an important point to consider. For the transportation of logs, the current condition of transport networks, the availability of transportation and the distance to major buyers are important concerns.

(a) Communication (transportation system and telecommunication services)

Data and information on the road network can be obtained at the transport department of the provincial government.

**Table : Road network in \_\_\_\_\_ Province**

Road type	Length (Km)	Status of road surface			
		Asphalted	Gravel	Gravel & earth	Earth
National roads					
Provincial roads					
District roads					
Communal roads					

Source: Road Management Office, Transport Department, 20\_\_

Aside from the road network, river and railway networks as well as telecommunication service networks can be considered depending on the project area.

(b) Availability of other services such as power and water supply, irrigation networks etc.

The availability of other services such as power/water supply facilities and irrigation networks can also be described in this section.

#### (6) Land use

According to the Land Law, land is classified into three groups - agriculture, non-agriculture and un-used land; forest land is part of agricultural land under the current classification. The table below can be used to summarize the findings of the survey.

**Table : Land Classification by Administrative Unit**

*Unit: hectares*

Administrative unit	Province	District	Project area
Land classification			
Total area			
1. Agricultural land			
(Of which: forest land)	( )	( )	( )
2. Non-agricultural land			
3. Un-used land			

Source:

The proportion of forest land issued with certificates may vary across participating communes. A table such as Table I -13: *Area of the forest land by land ownership (land-use rights), administrative unit (commune), and current land use situation in the project area* in Volume 3 of the F/S Manual can be used to describe land use by holder type in the project area.

**Table: Area of the forest land by land ownership (land-use right), administrative unit (commune), and current land-use situation in the project area (Example)**

*Unit: ha*

Holders of land-use rights by commune		Current land use situation of forested land in the forest land						
		Plantation					Natural forest	Subtotal (1)
		Eucalyptus	Acacia	Pine	Others	Total		
Commune xx	Farmer							
	SFE							
	Conflict							
	Others							
	total							
Total in the project area	Farmer							
	SFE							
	Conflict							
	Others							
	Total							

Source:

Holders of land-use rights by commune		Current land use situation of un-forested land in the forest land					Total (1) +(2)
		Bare land	Crop	Fruit	Others	Sub-total (2)	
xxx	Farmer						
	SFE						
	Conflict						
	Other						
	Total						
Total	Farmer						
	SFE						
	Conflict						
	Other						
	Total						

Source:

## Technical Note 4.6 - Household socio-economic survey

### Question: Why do we need to conduct the household socio-economic survey?

(1) The household socio-economic survey is conducted in order to consider and possibly incorporate socio-economic issues into the design of the project. The survey is used to verify the underlying assumptions of the project, as well as any perceived problems, priorities and areas of convergence or divergence between government/implementing agency and the beneficiaries/participants (local farmers, for example) of the project. The survey should assist in assessing the farmers' or beneficiaries' perceptions and likely responses to the opportunities and needs of the project.

(2) In order to identify cause-and effect-relationships between the project and its impact, it is desirable to collect, at the planning stage of the project, baseline data to evaluate the achievement of the project objective and the overall goal (or higher-level objectives). The results of the household socio-economic survey conducted at the project preparation stage can be used as the baseline data for the project, and can be compared to the situation during or after project implementation.

### Question: How do we conduct the household socio-economic survey in a concise manner?

Survey-based research such as the household socio-economic survey is one among several alternative methods associated with the process of data collection, including direct measurement, observation and secondary research. As it is not necessarily efficient to conduct the survey for the entire population, it takes the form of a sample survey. Information can be collected by means of face-to-face surveying,<sup>14</sup> delivery and collection of questionnaires through surveyors and/or village leaders, a questionnaire survey at meetings (e.g. Communal Consultation Meetings) in the project area and so on.

The household socio-economic survey, be it a questionnaire survey or an interview survey, will take a series of systematic procedures. The following steps from 1 to 11 show an example of such procedures:

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<sup>14</sup> Advantages of the face-to-face interview survey lie in, among others, its flexibility, the ability to administer complex questions, the ability to contact hard-to-reach populations, its high response rate, etc. On the other hand, disadvantages are found in its high cost, the existence of possible interviewer bias, reluctance to cooperate, decreased anonymity etc.

- Step 1: Identification and confirmation of the focus of the survey
- Step 2: Confirmation of the survey schedule and budget
- Step 3: Establishment of an information base
- Step 4: The sampling frame
- Step 5: Determination of sample size and sample selection procedures
- Step 6: Design of the survey instrument
- Step 7: Pre-testing of the survey instrument
- Step 8: Selection and training of interviewers
- Step 9: Implementation of the survey
- Step 10: Editing, coding and data entry
- Step 11: Data analysis

✓ **Step 1: Identification and confirmation of the focus of the survey**

The first step of the household socio-economic survey is to confirm its focus. While the socio-economic survey based on secondary data is to be conducted as part of the rural socio-analysis, the focus of the household socio-economic survey needs to be elaborated on in terms of its objectives and relevant research questions.

✓ **Step 2: Confirmation of the survey schedule and budget**

Prepare a timetable for the survey, including the issuance schedule of a decision letter by the relevant authorities. Budgets are prepared in conjunction with these timetables.

✓ **Step 3: Establishment of an information base**

Before the development of a questionnaire, collect information about the questions in the survey. Prior data collection through face-to-face interviews with relevant personnel and focus group discussions will help identify potential key issues of the target beneficiary and other beneficiaries. It will also serve to improve the survey questions in the questionnaire.

✓ **Step 4: The sampling frame**

The population for the questionnaire survey is identified in the rural socio-analysis. After the population or universe is defined, a list of identifiable household members of this population will be obtained for sampling.

✓ **Step 5: Determination of sample size and sample selection procedures**

As it is not necessarily efficient to conduct the questionnaire survey for the entire population of the project area, the household socio-economic survey will be conducted with the selected personnel living in the project area. In order to generalize the results of the questionnaire survey for the entire population of the project area, it is preferable to make the selection through **random sampling**.<sup>15</sup> The sample size will be determined by weighing the time and cost involved in the survey against the accuracy of the data.

✓ **Step 6: Design of the survey instrument**

The survey questionnaire is developed to systematically obtain unbiased information and achieve the objectives of the study.

✓ **Step 7: Pre-testing of the survey instrument**

Once a draft questionnaire has been prepared, it is pre-tested to improve the quality of the survey instrument.

✓ **Step 8: Selection and training of interviewers**

The interview survey, be it with questionnaires or not, will require trained interviewers. If the questionnaire survey is not conducted on a face-to-face basis but through the collection of responses at meetings such as CCMs, training of interviewers may not be required. However, if face-to-face interviews are intended, it is necessary to train interviewers in advance. The rural socio-analyst selects interviewers according to the nature of the study and the characteristics of the sample respondents. It is good to provide them with specific instructions on conducting their interviews.

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<sup>15</sup> Refer to Technical Note No.4.9 of this chapter for the sampling method.



✓ **Step 9: Implementation of the survey**

During the implementation of the survey, care must be taken that the established random sampling procedure is adhered to if the sample selection procedure is based on the random sampling method. Ensuring privacy and minimizing the inconvenience of potential respondents are prime concerns, and ethical standards must be followed in this process.

✓ **Step 10: Editing, coding and data entry**

Questionnaire responses are edited to ensure accuracy and consistency, and are formatted to enable computer input for data processing. The appropriate number of entries should be marked for each question, and all open-ended answers need to be categorized and coded on the form for computer entry. Because of the wider availability of the software in Vietnam, Micro-soft Excel was used for the analysis in preparing the Model F/S in Thai Nguyen Province. However, other types of software can also be used for data processing.

✓ **Step 11: Data analysis**

The recorded data input is summarized, placed in tabular form and prepared for statistical analysis. Graphic presentation of data will be used, and descriptive statistics will be presented.

Reference: Rea, Louis M., and Parker, Richard A. [1992], *Designing and Conducting Survey Research*. San Francisco, California: Jossey-Bass Inc.

## **Technical Note 4.7 - Descriptive statistics (mean-median-mode and standard deviation) and inferential statistics**

### **1 Measures of central tendency and measures of dispersion**

In order to describe distributions of data, the two primary types of statistics used are measures of central tendency and measures of dispersion.

#### **1.1 Measures of central tendency**

Measures of central tendency provide summary numbers that characterize what is “typical” or “average” for a particular set of data. The mean (arithmetic mean), mode and median are the three measures of central tendency. They are defined as follows:

##### **(1) Mean**

The mathematical center of the data, taking into account not only the location of the data (above or below the center) but also its relative distance from the center.

##### **(2) Median**

The value of the variable that represents the midpoint of the data. Half the data will have values below the median, and the other half will have values above it.

##### **(3) Mode**

The category or value of the data that is characterized by possessing the greatest frequency of response. It conveys that category which is most typical of the population surveyed.

(Example data)

100, 95, 94, 90, 85, 82, 79, 79, 76, 70, 53

Mean =  $(100+95+94+90+85+82+79+79+76+70+53)/11=82.1$

Median = 82

Mode = 79

#### **1.2 Measures of dispersion**

Standard deviation measures the spread around the average. Calculation of the true population standard deviation ( $\sigma$ ) is shown as follows:

$$\sigma = \sqrt{\frac{\sum (x - \mu)^2}{N}}$$

where  $\sigma$  = true population standard deviation,

$\mu$  = true population mean,

$N$  = population size.

The standard deviation ( $s$ ) of a single sample for the population standard deviation ( $\sigma$ ) can be expressed as follows:

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

where  $s$  = standard deviation of a single sample,

$\bar{x}$  = sample mean,

$n$  = sample size of the single sample.



TN-AvgStdHistogram.xls

**Excel functions for average, median, mode, standard deviation (of a sample), skew and kurt**

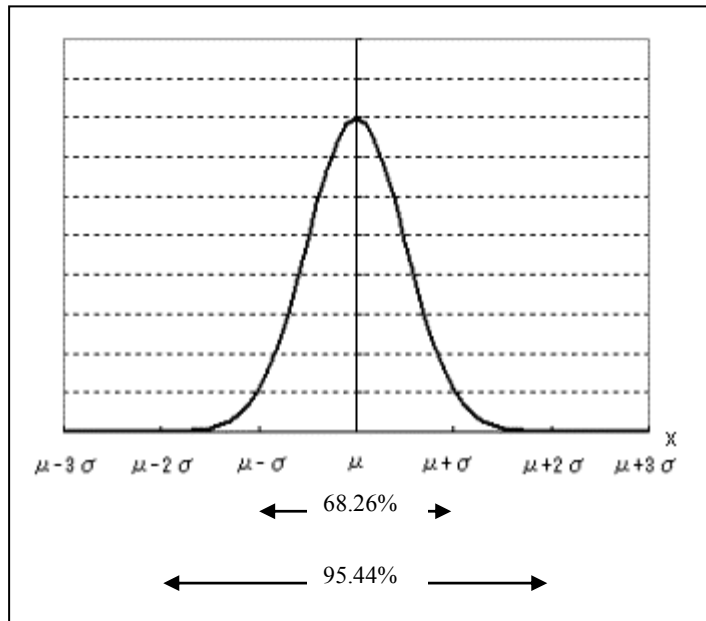
A	B	C	D	E
4	Code	Excel function	Case A	Case B
5	1		20	15
6	2		20	10
7	3		20	5
8	4		20	30
9	5		20	45
10	6		20	20
11	7		20	15
12	8		20	25
13	9		20	15
14	10		20	20
15	Average	=AVERAGE(C5:C14)	<b>20</b>	<b>20</b>
16	Median	=MEDIAN(C5:C14)	20	18
17	Mode	=MODE(C5:C14)	20	15
18	SD	=STDEV(C5:C14)	0.0	11.3
19	CV	=C18/C15	0.00	0.57
20	Max	=MAX(C5:C14)	20	45
21	Min	=MIN(C5:C14)	20	5
22	Skew	=SKEW(C5:C14)	#DIV/0!	1.2
23	Kurt	=KURT(C5:C14)	#DIV/0!	1.9

Note: If the function is placed in cell D15, the function of “Average” is entered as “=average (D5:D14).”

## 2 Normal distribution

Most features or characteristics (variables) of a population tend to be distributed in accordance with the commonly understood concept of a bell-shaped curve (normal distribution or normal curve). In normal distribution, the mean is located at the exact center and peak of the curve, dividing it into two symmetrical halves, each the mirror image of the other. In both directions, the curve moves closer and closer to the x-axis but, in theory, never touches it.

There are certain standard properties of the normal curve that convey how values of the variable are distributed around the mean. The measurement of distance from the mean is calculated in terms of the standard deviation, which is a measurement of dispersion around the mean in standardized units. Consequently, no matter what the variable is, a constant proportion of the total area under the normal curve will



lie between the mean and any given distance from it as measured in units of standard deviation ( $\sigma$ ).

For any particular normal distribution, regardless of the mean or the calculated standard deviation, the number of cases between the mean ( $\mu$ ) and one standard deviation ( $1\sigma$ ) turns out to include 34.13% of the total cases. Since the normal distribution is symmetrical, an identical proportion of cases will lie below the mean. Hence 68.26% of all cases in the entire population will be found within one standard deviation of the mean in either distribution. Similarly, 95.44 % of all cases are to be found within two standard deviations and 99.74 % within three standard deviations from the mean. If the height of the people in Country A follows the normal distribution with a mean height of 160 cm and an associated standard deviation of 15 cm, it can be expected that 68.26% of the population would have a height of between 145 cm and 175 cm.

### 3 Sampling and properties of sample means

Complete information on every case in a population is rarely available because the collection of data from all members of a population is, in most cases, either logistically impossible or economically unfeasible. In light of this, it has become practical for samples of the population to be selected so that generalizations can be inferred from the sample to the total population. These generalizations find their statistical basis in the characteristics of the normal distribution.

Under this condition, it is suggested that 100 separate, mutually exclusive samples be taken from the same population, and that the mean of each of the 100 sample mean weights be calculated in order to estimate the total population's mean weight. The first selection of 100 samples will follow the principles described in **Technical Note 4.9 for Sampling Method**.

The distribution of sample means has the following properties that give it a critical role in the sampling process:

**Property 1:** The distribution of sample means will approximate a normal curve as long as the size of each individual sample is reasonably large (generally over 30). This remains true whether or not the raw data are normally distributed.

**Property 2:** The value of the mean of sample means ("the mean of means") approaches the true population mean. The larger the number of samples, the closer the approximation to the population mean. This property is referred to as **the central limit theorem**.

**Property 3:** The standard deviation of the distribution of sample means (called the standard error) is smaller than the standard deviation of the total population. The standard error is estimated to be:

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} * \sqrt{\frac{N-n}{N-1}}$$

where  $\sigma_{\bar{x}}$  = standard error,  
 $\sigma$  = population standard deviation  
 $n$  = number of sample means (sample size of sampling distribution)  
 $N$  = true population size

For large populations,  $\sqrt{(N-n)/(N-1)}$  approaches 1 so that the standard error approaches

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$$

The assumption of normality (Property 1) allows probabilistic judgments to be made about a population based on one sample. It does so by making use of the standard area proportions under the normal curve as they apply to the distribution of sample means (Property 2) and the standard error for this distribution (Property 3).

While we rarely possess information on population parameters such as  $\sigma$  and  $\mu$ , the standard deviation of a single sample ( $s$ ) can be substituted for the population standard deviation ( $\sigma$ ). The best estimate of  $s$  contains the finite population correction, and can be expressed as

$$s = \sqrt{(n-1)/n} * \sigma, \text{ where } n = \text{the size of the single sample. As } n \text{ grows large, the}$$

factor  $\sqrt{(n-1)/n}$  approaches 1. Hence, for large samples (generally  $n \geq 30$ ),  $s$  approximates  $\sigma$ . Furthermore, the population mean ( $\mu$ ) is estimated by using the mean ( $\bar{x}$ ) and the sample size of the single sample. The standard error  $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$  can be expressed in its single-sample form as

$$s_{\bar{x}} = \frac{s}{\sqrt{n}}$$

where  $n$  = sample size (number of cases in a single sample),  $s_{\bar{x}}$  = standard error of the mean for the single sample, and  $s$  = the sample standard deviation.

#### 4 Confidence interval

Because the probability of conformity of the normally distributed sample to the true population is known, adjustments to account for any potential differences between the sample and the true population are possible. For such adjustments, the three properties of sample means explained in Section 3 above (Sampling and properties of sample means) should be taken into account. The results of a single sample can be used to draw conclusions about the larger population of which it is a part, by recognizing the nature of sampling errors<sup>16</sup> and determining their extent through the use of confidence intervals derived from the properties of sample means.

---

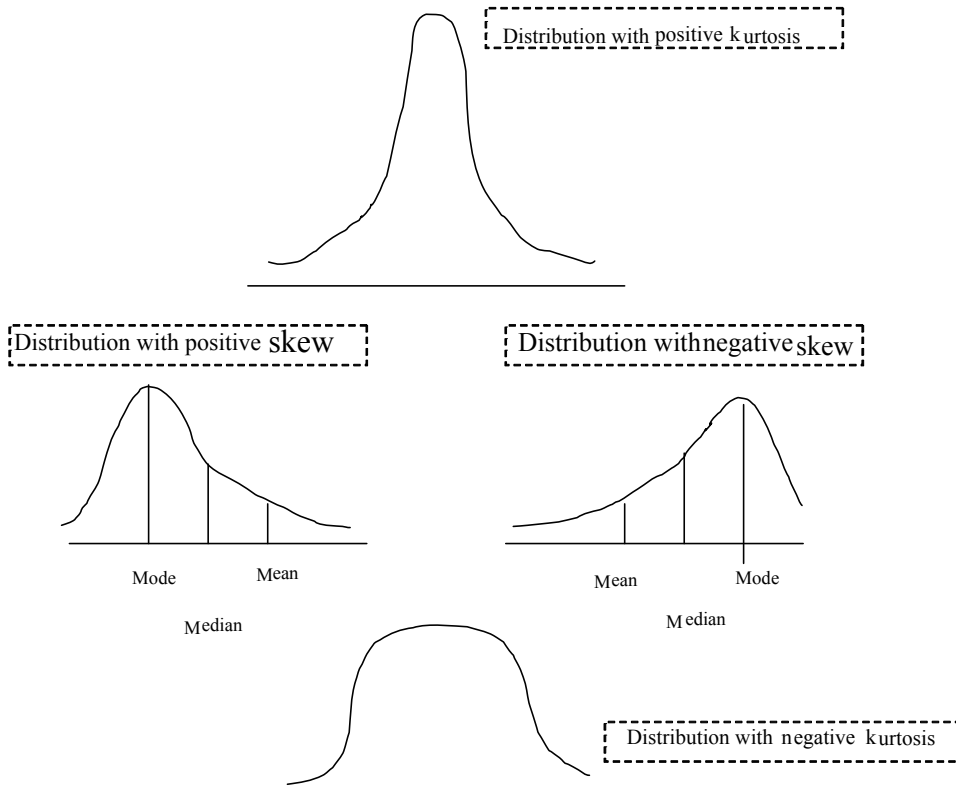
<sup>16</sup> The population mean and population standard deviation are not the same as the sample mean and the sample standard deviation respectively. These differences are known as sampling error.

Suppose that in a single sample of 400 young Vietnamese respondents, it is found that the mean sample height ( $\bar{x}$ ) is 176 cm with a standard deviation ( $s$ ) of 25. The standard error is calculated as follows:

$$S_{\bar{x}} = \frac{s}{\sqrt{n}} = \frac{25}{\sqrt{400}} = 25/20 = 1.25$$

It is known that there is a 68.26% probability that the mean of any sample drawn from a population will be within one standard error of the true mean. Hence, the analyst is 68.26 % confident that the true population means lies between 174.75 and 177.25 from  $\bar{x} = \mu \pm S_{\bar{x}}$ ,  $\mu = \bar{x} \pm S_{\bar{x}}$ , and  $174.75 \leq \mu \leq 177.25$ . There is 68.26% confidence that the analysis has identified the interval within which we will find the true population mean.

## 5 Distribution with skew and kurtosis



In the normal distribution, the mean will be used for normally distributed interval data that indicate the exact values of responses. The median will be the most appropriate for ordinal data (ranked categories of the variable), and the mode is for nominal data, which can be placed into categories and counted with regard to only the frequency of

occurrence. In the normal distribution, the three measures (mean, median, and mode) of central tendency are equal and the distribution of the variable is symmetrical.

However, if the distribution has a few extreme values, the three measures of central tendency will begin to deviate from one another. As an example, a distribution can be skewed. A positive skew has a mean higher than the median and mode, as there are a few high values pulling the mean toward them. Similarly, a negative skew has relatively low values pulling the mean and median toward them. When the analyst determines that the mean is overly affected by the skew and is therefore a poor representation of the central tendency<sup>17</sup> of the distribution, the median becomes the chosen statistic.

To examine the shape of the distribution, a histogram can be drawn using Excel's graphic function. The Excel arithmetic function can also be used to calculate skew and kurtosis. In the case of normal distributions, the values of skew and kurt formulae will be zero (0). If the values of skew or kurt are large, the analyst may have doubts about the normal distributions. As an indicator of skew, the standard deviation is also used to illustrate the nature of dispersion. In a normal distribution, three standard deviation units cover nearly the entire distribution. The analyst can therefore suspect a skewed distribution if the mean plus or minus three standard deviations does not cover the range of the data.

Extreme measurements in the data set are called outliers. If the analyst finds outliers, it is advisable to re-examine them to ascertain whether the data entry was properly performed and to identify specific features and reasons behind such sample data. Outliers can be found by drawing a histogram, calculating skew and kurtosis using Excel functions, comparing the standard deviation with the range of the data, and so on.

## **6 Cross tabulation**

To examine the joint distribution of two or more variables, preparation of a cross tabulation is useful. As an example, below is a sample of a cross tabulation of responses from those who received loans from the Vietnam Bank for Social Policies (VBSP) and the Vietnam Bank for Agriculture and Rural Development (VBARD) in Village B. An Excel pivot table can be used to prepare the cross tabulation.

---

<sup>17</sup> Measures of central tendency provide summary numbers that characterize what is typical for a particular data set.



### Example of cross tabulation

*Unit: Responses*

		Loans from VBARD		
		No	Yes	Total
Loans from VBSP	No	4	14	18
	Yes	30	21	51
	Total	34	35	69

Code	VBSP	VBARD
1	1	0
2	0	0
3	1	0
4	0	1
5	0	1
6	0	1
7	0	1

Loan from VBSP / VBARD =  
 No= 0  
 Yes= 1

	VBARD		
VBSP	0	1	Total
0	4	14	18
1	30	21	51
Total	34	35	69

**Reference:**

Freedman et al. [1991], *Statistics*. Second Edition. USA: W.W. Norton & Company, Inc.

Rea, Louis M., and Parker, Richard A. [1992], *Designing and Conducting Survey Research*. San Francisco, California: Jossey-Bass Inc.

## Technical Note 4.8 - Instructions to interviewer

When interviewers are equipped with the survey instrument, they need to be able to generate and sustain interest in the survey from respondents. It is good to provide them with specific instructions on conducting their interviews.

### 1 Introduction to the questionnaire survey

Interviewers should be trained to provide explanations on the purpose of the socio-economic survey under the study. They should describe the objectives and outline of the study, the study areas, its contents and implementation framework etc. It is important to start interviews only after obtaining informed consent from interviewees.

- (1) Objective and outline of the study
- (2) Study areas
- (3) Contents of the study
- (4) Implementation framework of the study
  - (a) Implementing agency
  - (b) Study team
  - (c) Study schedule

Time table	Plan of activities

- (5) Purpose of the study

### **An example of a format to obtain informed consent from an interviewee**

Informed consent

Hello. My name is \_\_\_\_\_ and I am working with (Name of Organization).

We are conducting a household socio-economic survey on farmers living in this area. We would very much appreciate your participation in this survey. I would like to ask you about the socio-economic conditions of your household. This information will help our organization to plan an agro-forestry development project in this area. The survey usually takes between 30 to 40 minutes to complete. Whatever information you provide will be kept strictly confidential and will not be shown to other persons.

Participation in this survey is voluntary and you can choose not to answer any individual question or all the questions. However, we hope you will participate in this survey since your views are important.

At this time, do you want to ask me anything about the survey?

May I begin the interview now?

Signature of interviewer: \_\_\_\_\_ Date: \_\_\_\_\_

Respondent agrees to be interviewed.....1

Respondent does not agree to be interviewed.....2 (interview ends)

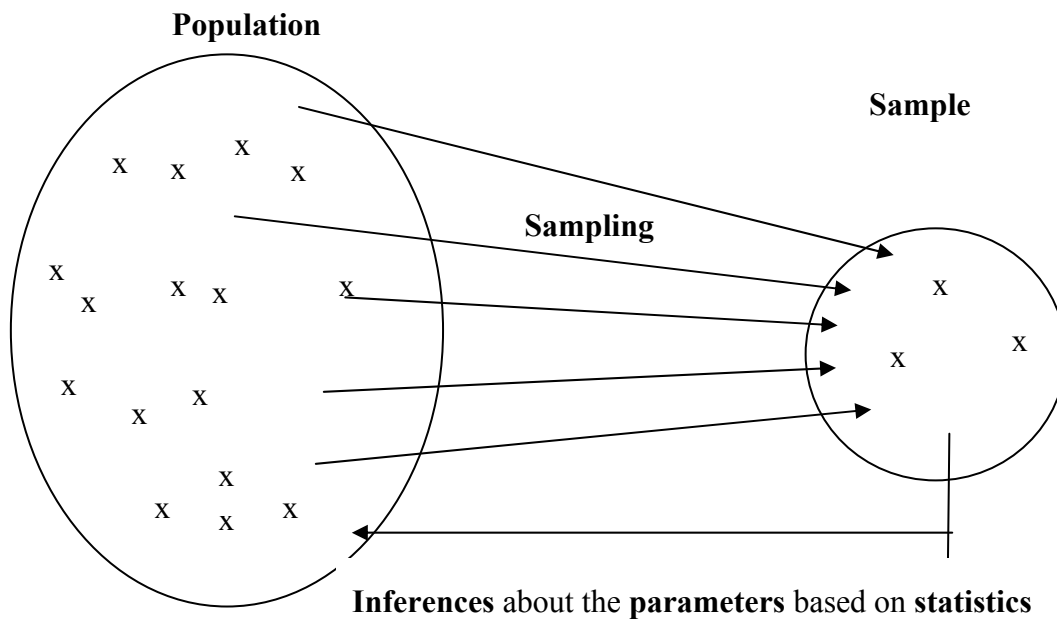
## **2 Guidelines and explanation of the survey and questions**

Specific guidelines and explanations for each question should be provided to clarify possible issues and questions that may arise during the study, including when interviewing respondents. Such guidelines may include appropriate times to conduct interviews, a sample selection process, procedures in case of no responses, household members to interview, household boundaries (i.e. who should be included as household members), methodologies for measurement and its units (the size of paddy fields, weight of agricultural products etc.), examination of the completed questionnaire for missing questions and unclear open-ended responses etc.

## Technical Note 4.9 - Sampling method

### 1 Definition

A rural socio-analyst wishes to generalize about a whole class of individuals, an entire group of observations, or a total of any kind of units under consideration. This whole class or entire group is called the “population” or “universe.” As studying the whole population often requires a larger budget and more time, only one part or portion of the population can be selected for examination. “Sampling” involves the selection of a portion of the population, and the “sample” is the part selected. Based on the sample, the rural socio-analyst makes “inferences” about the population. Numerical facts about the population that the rural socio-analyst wishes to know are called “parameters,” and numerical facts about the sample are called “statistics.”



### Definition

Population: The total of the items under consideration by the rural socio-analyst.	Sample: The portion of the population selected for study
Parameters: Characteristics of a population	Statistics: Characteristics of a sample
Symbol (Greek letters or capitals)	Symbol (lower-case italics)
Population mean = $\mu$	Sample mean = $\bar{x}$
Population standard deviation = $\sigma$	Sample standard deviation = $s$
Population size = $N$	Sample size = $n$

## **2 Sampling and sampling methods**

The goal in sampling is to select a portion of the population that represents its characteristics as closely as possible. However, it would be difficult to obtain a sample with exactly the same values as the corresponding parameters of the population because of the existence of sampling errors. If sampling errors can be objectively examined though, the precision of estimates about the parameters can also be objectively gauged.

Sampling methods can be classified into probability sampling and non-probability sampling. In the former, the probability of any member of the population being selected to be a part of the sample is known. In non-probability sampling, on the other hand, the selection process is not formal and the probability of selecting any given unit of the population cannot be determined. The following part compares examples of the sampling methods.

### **(1) Non-probability sampling**

There are several types of non-probability sampling such as convenience sampling, purposive sampling, snowball sampling and quota sampling. In the case of purposive sampling for example, sample selection is based on the opinions of one or more people who feel qualified to identify samples as being representative of the population. This sampling method is convenient, but it is difficult to assess how closely the sample represents the population as it is not supported by statistical techniques. The primary advantage of non-probability sampling is found at the preliminary stage of the study. As an example, it would be useful when the analyst wishes to have a preliminary understanding of some of the key issues underlying the study.

### **(2) Probability sampling**

In probability sampling, the probability of each element of the population being selected is known prior to sample selection. Two characteristics of probability samples are pointed out (Rea et al. 1992): (a) the probability of selection is equal for all members of the population at all stages of the selection process, and (b) sampling is conducted with elements of the sample selected independently of one another (one at a time). Use of a random sample may make it possible to objectively examine the population characteristics. There are several methods of conducting probability sampling such as simple random sampling, systematic sampling, stratified sampling and cluster sampling.

(i) Simple random sampling

Simple random sampling means drawing at random without replacement (Freedman 1991). A simple random sample is one in which each possible combination has an equal probability of occurrence, and each item in the population has an equal chance of being included in the sample. It is usually conducted by assigning a number to each potential respondent or unit, and then choosing numbers at random by a process that does not tend to favor certain numbers or patterns of numbers. The sampling units selected by this process will become part of the sample itself. To assign numbers, a table of random numbers or a computer function to generate random numbers can be used.

(ii) Stratified random sampling

If a population is classified into relatively homogeneous groups or strata and a sample is drawn from each group or strata to produce an overall sample, this overall sample is a stratified sample. This sampling method is utilized when a large variation exists within the population and the rural socio-analyst has some prior knowledge of the structure of the population for classification of the population into groups or strata. Each stratum needs to be represented by an adequate sample size.

(iii) Cluster sampling

Cluster sampling is also known as “multistage sampling” or “area sampling”. There is a hierarchy of sampling units, and the primary sampling unit is a grouping (or cluster) of the individual elements that are the focus of the study. Such grouping may be based on administrative boundaries, census tracts etc. Secondary sampling units are the individual elements within these clusters from which information is to be requested. These units are selected for study at random during subsequent stages of the process. Cluster sampling can be used for situations in which population lists are incomplete at the individual level but are complete at some more aggregated level.

### **3 Existence of potential bias**

The rural socio-analyst has to be aware that survey results may be distorted through the existence of possible biases, and that such biases should be controlled or minimized. As an example, when the sample represents the population, estimating parameters from the sample is justified. However, if a systematic tendency is found on the part of the sampling procedure to exclude one kind of person or another from the sample, any parameters estimated will not be justified. This systematic tendency for sample selection is called

selection bias. Bias may not be found only in the selection process; if a large number of those selected for the sample do not respond to the questionnaire, this will also create a distortion called non-response bias. Even when the questions are answered, the answers given by a respondent are influenced to some extent by the phrasing of the questions and the tone or attitude of the interviewer. This type of distortion is called response bias.

Reference:

Friedman, David et al.[1991], *Statistics*. 2<sup>nd</sup> ed. New York :W. W. Norton & Company, Inc.

Sanders Donald H. [1990], *Statistics: A Fresh Approach*. 4<sup>th</sup> ed. Singapore:McGraw-Hill, Inc.

Rea, Louis M., and Parker, Richard A. [1992], *Designing and Conducting Survey Research*. San Francisco, California: Jossey-Bass Inc.

## **Technical Note 4.10 - Data input and analysis of quantitative data**

Quantitative data collected through the socio-economic survey will be analyzed through the following steps:

Step 1: Editing

Step 2: Coding

Step 3: Data input

Step 4: Calculation of statistics

Step 5: Graphic presentation of data

### **✓ Step 1: Editing**

Editing is a process to ensure the data collected is accurate, complete and logically consistent. If there is any inaccurate or incomplete data, confirm with interviewers or check with own field notes for correction. Ideally, editing will be performed twice: once during the field survey, and again after it.

### **✓ Step 2: Coding**

Raw data to be entered into a computer spreadsheet may need to be coded in advance. This is done by labeling each data item with an abbreviated code (usually numerical) to make the data processing easier. In order to maintain consistency across those involved in the data coding, coding procedures are prepared. An example of the data coding procedure is shown below. In accordance with the coding procedure, codes will be entered into the questionnaire sheet collected.



## Example of data coding procedure

*Project name*

Sample Coding Procedure

Instructions to assistant researchers: The following is a guide to the Microsoft Excel worksheet aggregate coding sheet for all respondents surveyed under this study. The variable names refer to the columns in the Excel sheet.

<u>Variable name/ Field</u>	<u>Question no.</u>	<u>Variable name</u>
	<i>(in survey sheet)</i>	<i>(in Excel code sheet)</i>

### I. Profile of interviewee

1. Household Control Number (Code)      1                      hcn

2. VILLAGE    2                      village

Village	A	B	C
Code	1	2	3

3. Age of respondent                              3                      age

4. Sex of respondent                              4                      sex

Sex	Male	Female
Code	0	1

5. Number of children                            5                      child

6. Ethnic group of household                6                      ethnic

Ethnic group	X	Y	Z
Code	1	2	3

7. Perception of access to basic services    7                      service

Perception	Bad	Somewhat bad	Neither	Somewhat good	Good
Code	1	2	3	4	5

8. Number of years in commune              8                      year

9. Possession of motor cycle                9                      bike

Bike	No	Yes
Code	0	1

If categorization of responses to questions is made on the questionnaire sheet, the coding can simply follow this categorization. If the categorization is not done, it needs to be done by checking through the responses to the questionnaires.

If there are any missing values, different codes will be given. Missing values can be classified differently depending on the type of response, such as “no answer,” “do not know” and “not applicable”. In the case of multiple answers, each choice for the question can be recorded using binary code (“0” or “1”).

✓ **Step 3: Data input**

The data code in the questionnaire sheet collected is input into the spreadsheet. It is necessary to perform error checking. Ideally, data input will be conducted twice for comparison. The following is an example of a data entry spreadsheet:

1	2	3	4	5	6	7	8	9
hcn	village	age	sex	child	ethnic	services	year	bike
1	1	33	0	2	1	3	25	1
2	1	45	0	3	2	4	15	1
3	1	54	0	1	1	2	20	1
4	1	69	1	2	3	5	18	1
5	2	50	0	2	2	1	22	1
6	2	46	0	4	2	2	1	1

✓ **Step 4: Calculation of statistics**

In order to describe the basic features of the data collected in the study, descriptive statistics are used. In general, descriptive statistics are classified into two types: one shows the central tendency of the data, and the other shows its dispersion. Examples of the former category are average, median and mode, while examples of the latter include variance and standard deviation. **Technical Note 4.7: Descriptive statistics and inferential statistics** describes meanings of these statistics.

Calculate the sum, percentage, average, and other variables depending on the nature of the questions and answers (i.e. carry out statistical analysis).

Try to use following functions:

“AVERAGE”, “MEDIAN”, “MODE”, “STDEV”, “MAX”, “MIN”, “SKEW”, “KURT”, “FREQUENCY”

✓ **Step 5: Graphic presentation of data**

In order to overview the characteristics of the data, the graphic functions of Excel can be used. Graph types useful for the overview include bar-chart, histogram, line graph, scatter plot etc.

### Technical Note 4.11 - Data worksheet

	1	2	3	4	5	6	7	8	9
	hcn	village	age	sex	child	ethnic	services	years	bike
	1	1	33	0	2	1	3	25	1
	2	1	45	0	3	2	4	15	1
	3	1	54	0	1	1	3	20	1
	4	1	69	1	2	3	5	18	0
	5	2	50	0	2	2	1	22	1
	6	2	46	0	4	2	2	1	1
<b>Frequency distribution</b>									
0				5					1
1		4		1	1	2	1		5
2		2			3	3	1		
3					1	1	2		
4					1	0	1		
5					0	0	1		
<b>Statistics</b>									
Average			49.5		2.3			16.8	
Median			48.0		2.0			19.0	
Mode			#N/A		2.0			#N/A	
SD (Standard Deviation)			11.9		1.0			8.5	
CV (Coefficient of Variation)			0.24		0.44			0.50	
Max			69.0		4.0			25.0	
Min			33.0		1.0			1.0	
Skew			0.5		0.7			-1.6	
Kurtosis			1.5		0.6			3.0	

## Technical Note 4.12 - Household data analysis

### 1. Objective and methodology of the analysis

Prior to describing the results of the data analysis, its objective and the methodologies adopted for it are explained, including the sampling method.

### 2. Results of the data analysis<sup>18</sup>

The data analysis may cover the following aspects among others:

#### (1) Household income<sup>19</sup>

Based on the results of the household socio-economic survey, household income is analyzed. Descriptive statistics<sup>20</sup> such as the average, median, mode, and standard deviation are presented. A frequency distribution table or histogram is prepared to show the distribution of household income.

An average household income and its structure are analyzed to identify the income levels of households as well as their main income sources in the project area. As an example, the table below is used to show the average household income (gross receipts or gross income in this case) and distribution by income source in Phu Binh District of Thai Nguyen Province. “*n*” represents the sample size.

**Table : Average income and its sources in the project area (*n*= )**

Item	Gross income (million VND)	Rate (%)
Agriculture		
Forestry (production forest)		
Salary		
Service		
Others		
Total		100%

Source:

Single numbers such as the average are considered to describe the general level of household income (average household income) in the project area, which may also enable comparisons across different groups of people inside and outside the project area and over

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<sup>18</sup> Annex 3 Socio-economic data of the Model FS (Book 4-1) provides concrete examples of the analysis results.

<sup>19</sup> For the definition of farm income, refer to **Technical Note 4.3 - Farm income** of this chapter.

<sup>20</sup> Descriptive statistics are used to describe the basic features of the data in a study by providing simple summaries about the sample and the measures. It is contrasted with inferential statistics, which are used to make inferences from the data to more general conditions.

different periods of time. However, when analysts try to describe a large set of observations with a single indicator, they should be aware that there is a risk of distorting the original data or losing important information. As an example, the average income does not indicate the distribution of income among different households within a group. It does not show whether a farmer has land-use rights to large areas of forest land or not. In some cases, the average value is not considered as good an indicator as the median value to represent the general profile of households in the project area. Even given some limitations, descriptive statistics, with a mixture of different indicators, provide a good summary of the socio-economic conditions of the people and the project area.

### **(2) Household expenditure**

Based on the household socio-economic survey, the level and structure of household expenditures are examined. The level of expenditure is compared with the income level for verification purposes.

### **(3) Production**

Because the economy of the project area in Phu Binh District of Thai Nguyen Province was based on agriculture, the focus of the study was put on production of agricultural commodities and livestock. In the case of the F/S in Phu Binh District, the table below was prepared for livestock raising.

**Table: Average number of cattle and poultry per household ( $n=$  )**

Unit:

No	Animals	Project Area	Commune			
1	Cows					
2	Buffalo					
3	Pigs					
4	Poultry					
5						
6						

Source:

### **(4) Living conditions**

A general description of the living conditions in the project area was given in terms of the conditions of houses, transport access etc.

### (5) Land-use rights and land use

Land is one of the most important assets for farmers. Identification of the status of the land-use rights that a particular farmer holds is necessary information for analysis of their socio-economic conditions and also to prepare the project plan. The purpose of the land use is also analyzed to examine its distribution. The table below may be used to summarize the structure of land use.

**Table: Land designated for different uses ( $n =$  )**

No.	Items	Area (ha) per household	Rate (%)
1	Total		
2	One-crop rice		
3	Double-crop rice		
4	Dry-season crop		
5	Gardening		
6	Forest home-lots		
7	Forestry lands		
8			
9	Others		

Source:

### (6) Financing

The amount and utilization of loans are analyzed. This information will help assess the availability and accessibility of loans to the target beneficiary. As an example, the table below was used for the data summary of loan use in the F/S report in Thai Nguyen Province.

**Table: Loan use ( $n =$  )**

Item	Rate (%)
Total	
Livestock	
Agricultural development	
Forestry development	
Handicraft	
.....	
Other	

Source:

### (7) Poverty

The survey results can be used to estimate the poverty level. The analysis of information collected from households may show the distribution of the population under different income classes. This data will be arranged by administrative unit at the lower

level and compared with the relevant secondary data for verification purposes. For the classification of the data, it is important to clearly specify the classification criteria.

**Table: Classification of households by income level or wealth. ( $n =$  )**

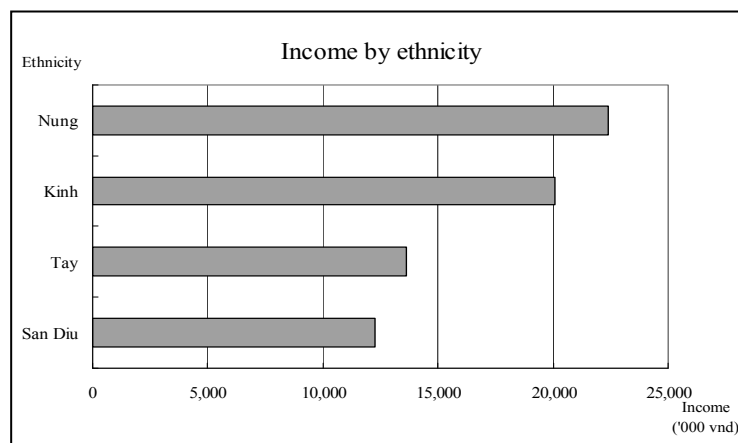
	Percentage
Rich households	
Fairly rich households	
Medium households	
Poor households	
Starving households	
Total	100%

Source:

### (8) Factors that affect the household economy

Analysis will be made of factors that affect the household economy. As an example, the graph below was prepared to show the results of income by ethnic group in the feasibility study report for the project prepared in Phu Binh District.

**(Figure : Income by ethnic group as an example) ( $n =$  )**



Source:



## Technical Note 4.13 - Communal Consultation Meetings (CCMs)

### Question: Why do we need to conduct the CCM?

- This process can be incorporated in the **project option evaluation**, as local people's needs are one of the criteria used to select the most feasible project option.<sup>21</sup>
- Through the CCM, the F/S team can give a general description of the project to farmers in the early stages of project preparation.
- The F/S team can identify people's needs and incentives so that the team can reflect them into project development for their future participation in the project.
- The F/S team can obtain socio-economic information directly from farmers (by questionnaire sheet). The results will be used as part of the socio-economic survey.

### Box: Project Option Evaluation

#### What is the Project Option Evaluation?

It is a process to select the best project from among the possible project options. The selected option should be the strongest in terms of maximizing benefits and minimizing negative impact given the local setting of the project area.

#### What is it for?

It provides an opportunity to compare project options by analyzing a range of aspects. By introducing the procedure of project option evaluation, project planning does not limit the project design to only one possibility; it begins by examining possible project concept alternatives and project options and enables the best one to be chosen, thus allowing development of the most feasible project.

### Question: How do we conduct the CCM?

#### 1 [PRE - MEETING PREPARATIONS]

- Form a meeting organization board (MOB). MOB members may include:  
Project planners: Local province, district and commune representatives, etc.

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<sup>21</sup> Refer to Part 1 Chapter 2 of F/S Manual (Volume IV) for **Method of Project Option Evaluation**.

Local extension officers

Local consultants and/or NGOs (the local NGO can guide the CCM as a third party).

- Share information on the purpose and content of the CCM with the organization board and set a schedule for preparation activities (data collection, participant selection, facilitator selection, building design for the CCM etc.), the CCM date, location, agenda etc.
- The location of the CCM may be a field site such as under the forest canopy, or in a meeting room, or at a communal cultural community house etc. Do not make the CCM's atmosphere serious - try to create an open atmosphere.
- Collect information and understand the local socio-economic situation (refer to and use the results of the socio-economic survey).
- Select the CCM participants.

The participants must comprise a good sample to represent the population of the project area. If probability sampling is possible, the sample size can be decided by referring to the table below as well as to the budget applicable. If it is not possible to conduct probability sampling, efforts need to be made to select a group of personnel who are likely to represent the population of the project area.

- Decide the sample size based on the available budget (if the size of the population is 100,000 for probability sampling).

Approximate sample size	Confidence interval for the population percentage with a confidence level of about 95% (note)
25	±20%
100	±10%
400	±5%
2,500	±2%
10,000	±1%

Note: The analysis is about 95% confident that the population percentage is found inside the interval of plus minus of percentages for the respective sample sizes.

- According to the CCM preparation social form, the population can be divided into several categories based on:

- (a) Administrative unit (by village, commune, or district),
- (b) Past involvement in forestry activities (PAM, 327, 661, etc.),
- (c) Ethnic group (also identify whether indigenous or not if possible)

(d) Sex (male or female)

- Select participants from each category of (a), (b), (c), and (d). In order for the meeting to be effective, key people such as commune PC leaders, farmer's union leaders, women's union leaders and youth union leaders may also be invited.

**Box: Participant selection for the Thai Nguyen CCM**

For the production forestry project, about 70 households participated in the CCM. The following stakeholders were invited:

**Households:** According to the CCM preparation social form, the population is categorized into administrative units (by commune), past involvement in forestry activities (PAM, 327, private fund) and ethnic groups. The selection of participants from each category was made to give a likely representation of the population. Even though an equal number of men and women were invited, more men attended the meeting as most women were too busy, so the men showed up instead.

**Key people:** A commune PC leader, a farmer's union leader, a women's union leader, a youth union leader and a commune forestry officer were also invited to attend the meeting.

## Reference: CCM Social Form

<ul style="list-style-type: none"> <li>▪ Commune Name</li> </ul> <p>.....</p>	<ul style="list-style-type: none"> <li>▪ District</li> </ul> <p>.....</p>	<ul style="list-style-type: none"> <li>▪ Province</li> </ul> <p>.....</p>
<ul style="list-style-type: none"> <li>▪ Number of Village:</li> </ul>		
<ul style="list-style-type: none"> <li>▪ Social-Economic Region Classification:</li> </ul>		
<ul style="list-style-type: none"> <li>- Remote and difficult <input type="checkbox"/></li> <li>- Average development <input type="checkbox"/></li> <li>- Advantage development <input type="checkbox"/></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> </ul>	<ul style="list-style-type: none"> <li>▪ Geo-economic Region National Classification (*1):</li> </ul> <p>.....</p> <p>.....</p>
<ul style="list-style-type: none"> <li>▪ “661” Planning (ha):</li> </ul> <p>.....</p>		

#	Village name (Thon, Ap)	Hamlet name (a group of households) (Xom, Cum, Chom)	Household number		Reforestation status of households (Number household, what ethnic group)			
			Majority ethnic (*2)	Minority ethnic (*3)	PAM	327	661	Private fund
	<i>Example:</i>							
	Thon DA (Local name)	Σ 3 Xom	8 Kinh	4 Nung 7 San Chi	8 Kinh 2 Nung 5 San Chi	0	6 Kinh 4 Nung 7 San Chi	2 Kinh
		▪ Xom Ca	2 Kinh	4 Nung 2 San Chi				
		▪ Xom Doi	5 Kinh	2 San Chi				
		▪ Xom Mo Σ 3 Xom	1 Kinh 9 Kinh	3 San Chi 3 Nung <del>5 San Chi</del>				
	Lang Xoi (Local name)	▪ Xom Nac	3 Kinh	1 Nung				
		▪ Xom Buo	4 Kinh	2 Nung	9 Kinh 2 Nung 3 San Chi	2 Kinh	9 Kinh 3 Nung 3 San Chi	0
		▪ Chom Ru	2 Kinh	5 San Chi				

- Prepare the questionnaire sheet

Review the collected data and information and analyze what kind of information needs to be collected from each household. Prepare the questionnaire sheet to obtain the missing data and information - try to make it as simple as possible. The questionnaire sheet can be distributed before the CCM and collected at the meeting. It should be made based on the local situation, e.g. if people are illiterate or unfamiliar with answering questionnaires, the way the questions are asked should be re-considered. It is advisable for the questionnaire sheet draft to be pre-tested before actually distributing it to farmers (i.e. ask one or two farmers to answer the questionnaire and check which questions are difficult to answer).

### **Box: Asking about the land use situation by questionnaire**

One of the most difficult issues relating to the preparation of afforestation projects is the issue of land. In Vietnam, land-use right certificates for forest land may be issued to each individual household or forest enterprise, or such a land allocation process may be underway depending on the province. It is critical for the analyst/project planner to grasp the area of forest land that can be used for the project; how can the analyst/planner obtain such information if the land is already allocated to each household? Even if the land has not been allocated to people, there is a possibility that local people without land-use rights may have encroached upon the land for economic activities.

To obtain information on the current land-use situation efficiently at the stage of project preparation, the analyst/planner may ask the CCM participants to draw their own land according to the current situation and ask them to specify the areas where they may be willing to carry out afforestation activities. Even though the hand-drawn maps of farmers may not be precise and may not indicate the actual situation, the analyst/planner can later visit the household to confirm the actual situation. By drawing maps of their land, farmers will have a clearer idea of their land area, and at the same time the analyst/planner will be able to identify specific households during the land survey later.

- Distribute the invitation letter with the questionnaire sheet to participants through close coordination with local authorities.

A guidance letter about the CCM may be issued to the lower-level local authority (e.g. in the case of Thai Nguyen, the Phu Binh District People's Committee issued guidance on the CCM to each commune People's Committee to give instruction on the steps involved in detail).

- Select the facilitators and assistants for the CCM

For preparation of the Model F/S in Thai Nguyen Province, young commune-level extension workers and district-level officials were selected to be trained as facilitators for the CCM. They were working closely with local farmers on a daily basis, and people are more relaxed with familiar faces at the CCM.

- Train the facilitators and assistants, and prepare presentation materials

Facilitators need to understand the purpose, contents and procedure of the CCM. To enable them to understand such issues, ask each facilitator and assistant in the group to prepare presentation materials after explaining the purpose and required outcomes of the CCM. After the first presentation materials are drafted, discuss among the facilitators and MOB and make suggestions for further improvement. When the presentation materials are finalized, practice and rehearse for the CCM in advance.



- Prepare the instruments and equipment to be used in the CCM

## 2 [On the day of the CCM]

In the case of the CCM for Thai Nguyen Province, the activities conducted for the meeting can be described as follows:



- Reception--- at the reception, farmers registered for participation in the CCM and submitted their answers to the questionnaire sheets. Facilitators and assistants at the reception checked whether participants had responded to all the questions sufficiently. For any insufficient entries on the sheet or misunderstanding of the questions, facilitators and assistants helped participants to correct their answers. In the case of the CCM in Thai Nguyen Province, participants received 10,000 VND for submission of the completed questionnaire sheet when they registered for the CCM.<sup>22</sup>
- Simple opening talk and brief introduction to the CCM, focused objectives and suggestions for meeting action

<sup>22</sup> The CCM was held in August 2005 in Phu Binh District of Thai Nguyen Province.

- Presentation of project options by the facilitator with an explanation of the advantages, disadvantages, risks and opportunities of each project option
- Preference ranking by participants to understand their needs for each option
- Group discussion on why participants chose or did not choose each option
- Group discussion on suggestions in the case of project implementation for each option
- General discussion on people's needs, incentives, current problems etc.

**CÁC LOẠI HÌNH RỪNG SX VÀ CHÍCH**

1	Hộ nông dân - vốn tư có - không rừng SX		19
2	Hộ nông dân - vốn ngân hàng - không rừng SX		0
3	Nhóm KS - vốn tư có - không rừng SX		13
4	Nhóm KS - vốn vay ngân hàng - không rừng SX		19
5	Hộ nông dân doanh nghiệp KS KS - không rừng SX		22
6	Nhóm KS - doanh nghiệp KS KS - không rừng SX		22



●Reference: Options to be presented at the CCM in Thai Nguyen Province●

**1. Group for production forest**

Based on the study conducted by the local sub-contractor and the Provincial Study Team (PST) of Thai Nguyen under the guidance and supervision of the JICA Study Team (JST), six production forest models have been selected for CCM. The six models include:

Model 1: Farmer + Self capital + Production forest

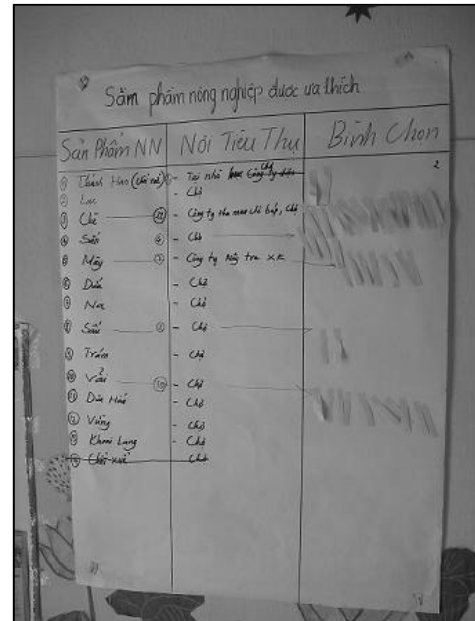
Model 2: Farmer + Bank loan + Production forest

Model 3: Group farmer + Self capital + Production forest

Model 4: Group farmer + Bank loan + Production forest

Model 5: Farmer + Forestry enterprise + Production forest

Model 6: Group farmer + Forestry enterprise + Production forest



**2. Group for agro-forestry**

For agro-forestry models, the local sub-contractor and the PST selected eight models under the guidance and supervision of the JST to present at CCM. The eight models include:

Model 1: Farmer + Self-capital + Agro-forestry (Agriculture and short-term wood species)

Model 2: Farmer + Self-capital + Agro-forestry (Agriculture and long-term wood species)

Model 3: Farmer + Bank loan + Agro-forestry (Agriculture and short-term wood species)

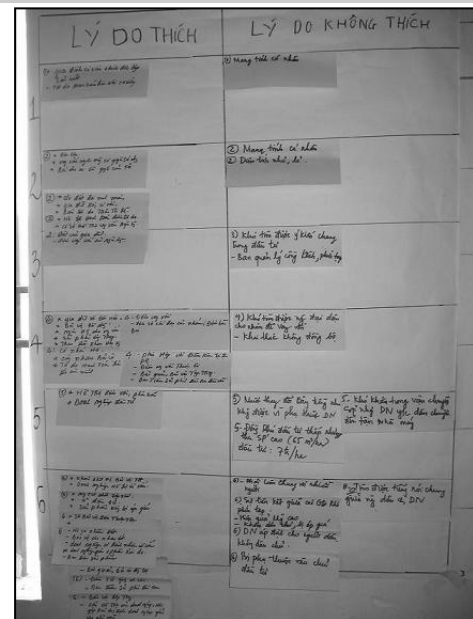
Model 4: Farmer + Bank loan + Agro-forestry (Agriculture and long-term wood species)

Model 5: Group farmer + Self-capital + Agro-forestry (Agriculture and short-term wood species)

Model 6: Group farmer + Self-capital + Agro-forestry (Agriculture and long-term wood species)

Model 7: Group farmer + Bank loan + Agro-forestry (Agriculture and short-term wood species)

Model 8: Group farmer + Bank loan + Agro-forestry (Agriculture and long-term wood species)





### 3 [Analysis of CCM result]

#### 3.1 PRODUCTION FOREST

In the case of Thai Nguyen Province, most land for production forests has already been allocated to individual households with land-use right certificates. Some farm households may be interested in investing in production forests by themselves, or an organization may plan to carry out a production forest project by utilizing the land of such households. That is, forest land for the production of wood materials could be secured through a contract or an agreement to use a household's land, or through a contract to use a number of households' land forming an organization of farmers as the labor force. In any case, as the land is used by local people, it is critical to design the project in such a way that they are interested in participating in it. For this reason, it is important to understand people's needs and incentives at the first stage of project planning, and then reflect their needs in the project implementation plan. The results of the CCM can therefore be utilized to analyze people's needs and incentives and the possible form and structure of project implementation. The points of the analysis and its corresponding activities are described in the table below.

#### ● Reference: Analysis check list ●

Check Points	Detailed check items	Activities in the study
1. Identification of beneficiaries including target beneficiary, and needs assessment	1.1. Have the land owners/users in the project area been identified? 1.2. Has the information on the general socio-economic situation of the project area and people's needs been collected and analyzed? 1.3 Have the people's needs been reflected in the project plans?	1.1. Land owners/users identified before the CCM (data collection stage). 1.2. Data and information collected before and during the CCM. 1.3 Project option evaluation and CCM are methods to reflect people's needs in the project plans.
2. People's acceptance of the project	2.1. Has the influence of the project on current forest resource use/production and people's living system and its social and economic feasibility been examined? 2.2. Do the people accept the project with full understanding of its influence?	2.1 Brief analysis is performed before the CCM, and detailed analysis will be carried out during implementation of the feasibility study. 2.2 During the CCM, the project will be explained to farmers carefully.
3. Mitigation of negative impact	3.1. Might the project have a negative impact on the people? 3.2 Have possible measures to mitigate, reduce or compensate the negative impact been prepared?	3.1. Brief analysis is performed before the CCM, and detailed analysis will be carried out during implementation of the feasibility study (F/S). 3.2 Detailed analysis will be carried out during implementation of the F/S.
4. Participation of people or social/farmers' organizations in the project	4.1. Was there any opportunity for the people to participate in the discussion of project planning? 4.2. Was the way in which people participated appropriate? 4.3. Have existing social/farmers' organizations been researched? Also, are such organizations able to participate in the project? 4.4. If people will obtain a profit from the project, has any monitoring mechanism to check that they actually receive the expected profit being developed in the project planning?	4.1. The CCM is an opportunity for people to participate in project planning. 4.2. The CCM is designed for efficient and effective participation of the people. 4.3. Existing social/farmers' organizations are identified and analyzed before the CCM. The formation of new organizations or the use of existing organizations is analyzed before, during and after the CCM. 4.4. Profit-sharing and its monitoring mechanism are some of the difficulties discussed at the CCM. More detailed analysis will be carried out during implementation of the F/S, and more specifically in implementation planning.

### 3.2 *AGRO-FORESTRY*

Agro-forestry is considered to be the combination of farming systems and forestry components, fruit trees and/or Non-Timber Forest Products (NTFPs) practiced by local households with a view to increasing their livelihood, alleviating poverty, securing food and so on.

When a certain technology is introduced and implemented, there are many ways to extend that technology. As an example, extension officers, FEs, NGOs and/or farmers' groups may be able to implement the extension of the technology. In consideration of such potential, the results of the CCM can be used to analyze potential methods for technology extension.

#### **Technical Note 4.14 - Handbook for the Communal Consultation Meeting**

Refer to Annex 2 of the F/S Manual (Volume IV).

## Technical Note 4.15 - Stakeholders analysis (1): Steps to carry out

### Question: Why do we have to conduct the stakeholder analysis?

- (1) When the F/S team develops a project, the team first needs to identify who will be the target beneficiary and how they are related to or involved in the project.
- (2) In order to maximize the feasibility of the project and introduce it efficiently at the implementation stage, the F/S team must make a detailed plan on the project's activities, including the roles and responsibilities of stakeholders.
- (3) In order to avoid possible risks and maximize the project's effectiveness in social terms, the F/S team needs to identify and analyze potential stakeholders who may oppose the project.

The stakeholders analysis can be carried out through the following six steps

Step 1: Confirmation of the project framework

Step 2: Identification and listing of all stakeholders

Step 3: Classification of the stakeholders

Step 4: Analysis of selected stakeholders in detail

Step 5: Confirmation of the target beneficiary of the project

Step 6: Outline of a stakeholder participation strategy

#### **Step 1: Confirmation of the project framework**

Confirm the expected framework that will serve as the basis for discussions among participants of the workshop. “The implementation of the production forest development project in Phu Binh District of Thai Nguyen Province” is an example of a project framework.

#### **Step 2: Identification and listing of all the stakeholders**

A range of stakeholders potentially live or can be found in the project area. In considering the project framework, it will be the first step to make a list of all individuals, groups, agencies and organizations within the expected framework.

As an example, the following stakeholders may be identified in the project area for the implementation of the production forest development project.

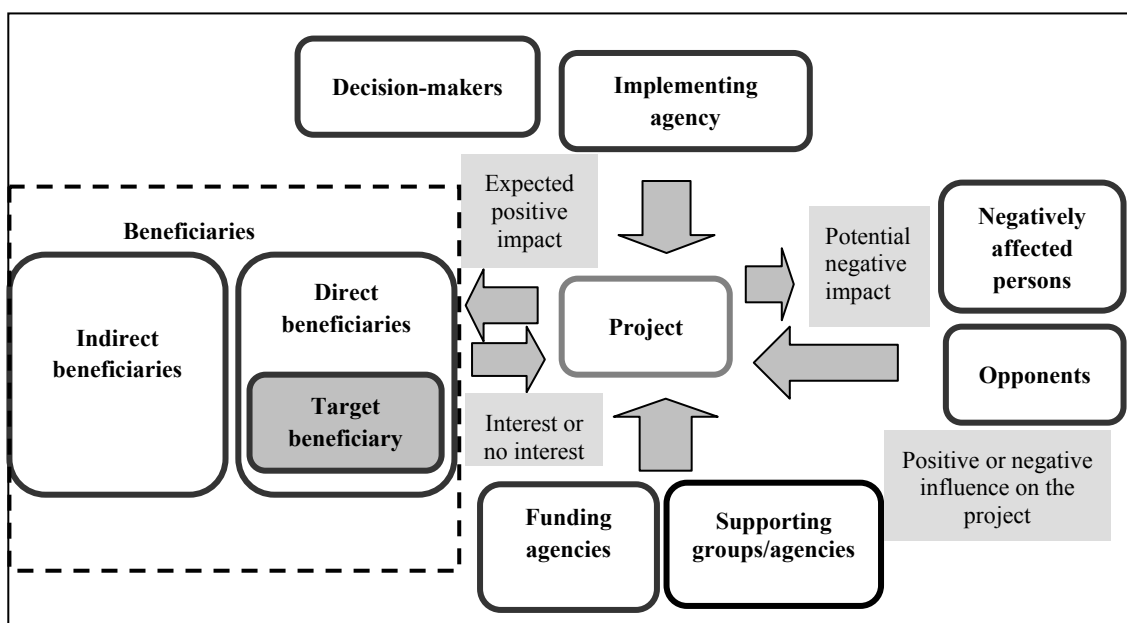
**Example of stakeholders for the production forest development project**

Farmers with land-use right certificates (Red Book) on the forest land	Village leaders
Farmers without land-use right certificates (Red Book) on the forest land	Extension centers
Farmers without forest land	Farmers' groups
Local people without forest land	Farmers' associations
Log traders	Farmers' unions
Retailers of fertilizers	Women's unions
Producers of seedlings	Sub-Department of Forestry
Forest enterprises	Department of Agriculture and Rural Development
Processing factories of wood materials	Department of Forestry
District offices	Ministry of Agriculture and Rural Development
Commune offices	Domestic financial institutions

**Step 3: Classification of the stakeholders**

The next step is classification of the stakeholders, who can be categorized according to the potential roles and positions in relation to the project framework (their influence and interest in the project and positive or negative impact resulting from it). This will help to understand the relationships (cooperation, conflict, instruction etc.) that exist among them. Stakeholders can be classified into groups such as possible beneficiaries, implementing agency, decision-makers, funding agencies, proponents and potential opponents, including potentially affected people.

### Classification of stakeholders (example)



Category (example)	Stakeholders (example)
Target beneficiary	Farmers with land-use right certificates (Red Book) to forest land (farmers' groups/associations), forest enterprises
Beneficiaries	Log traders, processing factories of wood materials, retailers of fertilizers, producers of seedlings
Implementing agency	Commune offices, district offices, forest enterprises
Decision-makers	Commune offices, district offices, forest enterprises, provincial offices, Sub-DoF, MARD, DoF
Supporting groups/agencies	Farmers' unions, women's unions, extension centers
Funding agencies	Domestic financial institutions
Potential opponents	Farmers without land-use right certificates to forest land, farmers without forest lands
Negatively affected groups	Farmers without land-use right certificates to forest land, local people without forest land

#### Step 4: Analysis of selected stakeholders in detail

Conduct detailed analysis on each stakeholder selected. The analysis could cover the basic features of the stakeholders, their problems, weaknesses, needs, strengths/potential and relevance to the project.

### Example of detailed analysis

Basic information	Objective information such as population, age, budget, education level, organizational structure, socio-cultural characteristics, economy, technical ability etc.
Problems/weaknesses	What kinds of problems, issues and weaknesses are there in the subject field?
Needs	What are their needs? What are the desires and demands?
Strengths/ potential	What advantageous qualities or resources already exist? What are the resources and potential capacities that are not being used to their full benefit under current conditions but that could be used in the future? What are the circumstances or external factors to be utilized positively?
Relevance to the project	Potential roles and interest in the project, impact of the project on their needs, their influence on the project etc. (shown in the table below)

Note: Reference was made to FASID [2004], Project Cycle Management – management tool for development assistance – Participatory Planning and JBIC [2005], JBIC Handbook on Poverty Reduction and Social Dimensions

Information that is not known at this stage can be collected during the socio-economic survey and the household socio-economic survey.

In terms of relevance to the project, the following perspectives could be used as key points of the analysis for respective stakeholders.

### Possible key points of analysis on relevance to the project

Category of stakeholder	Possible key points of analysis on relevance to the project
Beneficiaries (target beneficiary in particular)	<ul style="list-style-type: none"> <li>- Is it objectively and logically verified that the expected impact will be on the beneficiaries of the project?</li> <li>- What are the benefits and their coverage?</li> <li>- Affordability of the beneficiaries for cost-sharing and user charges</li> <li>- Interest in participation in the project or their reactions to the project</li> </ul>
Implementation group	<ul style="list-style-type: none"> <li>- Implementation capacity of an implementing agency and their impact on the beneficiaries</li> <li>- Capacity of service delivery to the beneficiaries</li> <li>- Do they have support from the local people in the case of the cost-sharing?</li> <li>- Is their understanding of the local people sufficient?</li> <li>- Possibility and capacity of organizing the local community and people</li> <li>- Technical capacity and know-how of the beneficiaries (e.g. farmers) for sustainable maintenance of the project</li> <li>- Is the level of people's ownership sufficient?</li> <li>- Capacity of community-based organizations</li> </ul>
Management group	<ul style="list-style-type: none"> <li>- Do they have the decision-making authority to make interventions in the project?</li> <li>- Do they have sufficient capacity to make interventions in the project?</li> </ul>
Supporting groups/agencies (including funding institutions)	<ul style="list-style-type: none"> <li>- Capacity to reach the beneficiaries (target beneficiary in particular)</li> <li>- Assistance in organizing the community and people</li> <li>- Possibility for cooperation in the project in a sustainable manner</li> <li>- Is there any positive impact on groups other than the beneficiaries?</li> </ul>
Opponents (including negatively affected people)	<ul style="list-style-type: none"> <li>- Why do they oppose the project?</li> <li>- What is the expected damage to them?</li> <li>- Is there a need to take mitigating measures from a social point of view?</li> </ul>

Source: Reference was made to FASID [2004], Project Cycle Management – management tool for development assistance – Participatory Planning and JBIC [2005], JBIC Handbook on Poverty Reduction and Social Dimensions.

Note: In the case of the Model F/S in Thai Nguyen Province, the target beneficiary is a group of smallholders with Red Books for forest land in the project area. They are classified into the implementation group.

### **Step 5: Confirm the target beneficiary of the project**

Clarify whose problems are to be solved and which group is to benefit from the project, and confirm the target beneficiary of the project from among the various other beneficiaries.

### **Step 6: Outline of a stakeholder participation strategy**

The project needs to find ways to increase the participation of stakeholders in it. For the purpose of participation, it is examined whether or not the assets and capabilities of the groups are sufficient for participation in the project. The assets controlled by the groups can be physical (such as forest land with land-use right certificates, equipment and access roads) as well as financial (such as access to loans, working capital and cash flow). Capabilities include the human resources implied by their health, education, specialized skills, experience and organizational capacity. By analyzing the assets and capabilities of the groups, it is important to identify which assets and capabilities are lacking and what activities need to be designed under the project in order to achieve its objective.

Even if the assets and capabilities of the groups are sufficient, barriers such as informal rules may prevent the groups from using them in an effective way. All societies have systems through which people express their interests and ideas, and participation is carried out through intermediaries such as leaders of farmers' groups, village heads and savings groups. It is therefore important to examine how these existing intermediary institutions could function to promote efficient and effective participation of group members in the project. If the existing institutions are considered unlikely to function, it is necessary to study incentives and mechanisms to induce participation of group members.

#### Reference:

FASID, Project Cycle Management – management tool for development assistance – Participatory Planning, 2004

JBIC, JBIC Handbook on Poverty Reduction and Social Dimensions, 2005

The World Bank, Social Analysis Sourcebook-incorporating social dimensions into bank-supported projects, 2003

## Technical Note 4.16 - Stakeholders analysis (2): Experience from Thai Nguyen Province

### Steps taken for the stakeholder analysis in Thai Nguyen Province

- Propose basic questions to achieve the project objective, e.g. How can we effectively implement a forest project in Phu Binh District?
- Considering the basic questions, put the name of related organizations and individuals on the board.
- Identify the involvement of each party (cooperation, conflict, pressure, financial support, non-financial support, etc.).
- Categorize the stakeholders into the following groups: 1. Project beneficiaries; 2. Implementation group; 3. Management group; 4. Supporting group; 5. Project opponents.



### Box: Key questions for the stakeholders analysis (example)

#### 1. Beneficiaries

- (1) How much and what kind of benefits will be brought by the project to the target beneficiary and other beneficiaries?
- (2) Can the target beneficiary afford to pay the costs of implementing the project? (For some forestry projects, even if a supporting group extends its financial support to the implementation, part of the project cost will be paid by farmers.)

#### 2. Implementing group

- (1) Do the governmental organizations/private enterprises/farmers involved in the project implementation have enough authority and capacity to implement, operate and manage the project?
- (2) Is it possible to develop a farmers' organization or a farmers' community for implementation using a participatory approach?

#### 3. Management group

- (1) How are the authority and capacity of governments/other entities like a forest enterprise in terms of intervention in the project?

#### 4. Supporting group

- (1) Are there any supporters of farmers' organizations for forestry activities?
- (2) Is there any possibility of coordinating for poverty reduction in the area?



(3) Is there any impact on people/groups other than the poor and vulnerable?

**5. Opponents**

(1) Is there any negative impact from the project?

(2) Under what circumstances might opposition to the project arise?

## Technical Note 4.17 - Impact and social impact analysis

### 1 Definition of impact and social impact analysis

#### (1) Definition of impact

Impact is defined as the “positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended”<sup>23</sup>. FASID uses this term to refer to all the positive and negative effects of the project implementation outside the explicitly specified intentions (i.e. the outputs and project objective). Impact includes expected and unexpected effects, intended and unintended effects, and direct and indirect effects from the project.

#### (2) Definition of social impact analysis

The social impact analysis at the project planning stage is to assess the potential effects, both direct and indirect, of the project on the stakeholders and to recommend and institute possible counter-measures in the project design to mitigate any potential negative effects. The results of the financial analysis, stakeholder analysis, household socio-economic survey and needs assessment will be used to conduct the social impact analysis.

Definitions of other similar terminologies can be found on the World Bank website. The World Bank defines social impact assessment (**SIA**) and poverty and social impact analysis (**PSIA**)<sup>24</sup> as follows:

Social impact assessment (SIA) is a form of direct impact analysis used to assess how the costs and benefits of reforms are distributed among different stakeholders and over time. SIA is based on stakeholder analysis, and is particularly useful for disaggregating data on assets (physical, financial) and capabilities (human, organizational) into meaningful social categories. When reasonable national survey data exists, SIA uses a range of qualitative data collection tools (focus groups, semi-structured key informant interviews, ethnographic field research, and stakeholder workshops) to determine impacts, stakeholder preferences and priorities, and constraints on implementation. In the absence of adequate quantitative data, SIA supplements qualitative, sociological impact analysis

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<sup>23</sup> OECD DAC, Evaluation and Aid Effectiveness - Glossary of Key Terms in Evaluation and Results-Based Management – (<http://www.oecd.org/dataoecd/29/21/2754804.pdf>)

<sup>24</sup> <http://lnweb18.worldbank.org/ESSD/sdvext.nsf/81ByDocName/ResourcesGlossary>

with purposive surveys that capture direct impacts and behavioral responses to reform, or specific dimensions (e.g. time-use patterns) that affect reform outcomes.

Poverty and social impact analysis (PSIA) is the analysis of intended and unintended consequences of policy interventions (ex-ante, during implementation, and ex-post) on the well-being of different social groups, with a particular focus on the poor and vulnerable.

## 2 Identification of impact

In order to identify the types of impact the project might have, the cross-cutting viewpoints and impact matrix below may be useful.<sup>25</sup>

### (1) Cross cutting viewpoints

Cross-cutting issues include policies, technologies, environment, society and culture, organizations and institutions, and economy and finance. Project impact may appear in these fields as described in the table below.

Cross-cutting issues	Description of impacts (example)
Policies	Effects on central and local governmental policies
Technologies	Technological innovation
Environment	Impact on environmental preservation
Society and culture	Enhancement of the status of women, violation of human rights, wider gaps between rich and poor. This includes changes caused in the lives of the target beneficiary.
Organizations and institutions	Effects on related organizations and groups, changes to regulations and legislation
Economy and finance	Economic benefits to project participants, related organizations, and local communities

### (2) Impact matrix

The impact matrix classifies impact using two axes: one is an expected/intended vs. unexpected/unintended axis, and the other is a positive/desirable vs. negative/undesirable axis. The overall goal described in the PDM is regarded as the expected and positive effects of the project.

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<sup>25</sup> FASID [2004], Project Cycle Management – management tool for development assistance – Monitoring & Evaluation (M&E).

Impact	Expected/intended	Unexpected/unintended
Positive (+) Desirable		
Negative (-) Undesirable		

### 3 Social impact analysis based on the Model F/S in Thai Nguyen Province

The target of the analysis is the impact from the project. It is thus not possible to ascertain the social impact of the project without knowing the project itself. Information on the project should therefore be shared with other experts in the F/S team who are involved in developing the project design and analyzing the economic and financial aspect, etc. The information-sharing then helps identify expected impact and improve the project design.

Critical assumptions of the PDM are provided in presenting the analysis to evaluate the social impact.

#### (1) Impact on the household economy

Analysis can be made on the short-, medium- and long-term impact of the project on the household economy.

##### To analyze short-term impact on the household economy

- ❑ How much does each household need to invest in the project in the first year? Will the investment amount become a burden for farmers? Can households afford to finance such investment? What is the most expensive investment component for farmers in terms of cash? Do they need to borrow money, or do they receive financial assistance?
- ❑ Is there any income from the project in the initial years? What about the net cash flow? Is it negative or positive? When will their net cash flow turn out to be positive?
- ❑ Is there any labor burden on the household? Do they need to employ external human resources for plantation activity, or does the labor force come from only within the family? To what extent do they have to sacrifice other labor opportunities for the sake of the project implementation?

To analyze medium-term impact on the household economy

- ❑ In the first harvesting year (around the 7th year after the initial planting year), how much net cash flow do households expect to have? How is the cumulative net cash flow in each year of the rotation cycle?

To analyze long-term impact on the household economy

- ❑ In the long term, what is the overall effect on the household economy? How much is the additional annual household income (in %) in real terms? What share of household income is from the project?
- ❑ Is there any positive effect from the project activities? As an example, do the activities improve forestry and/or farming management skills from extension services?

For evaluation of the economic and financial aspects of farm households, results of the financial analysis from a farmer's viewpoint can be utilized. The impact of the cash flow from the project can be analyzed during the project implementation period for a model farm household. For the purpose of the analysis, it is important to clearly present basic pre-conditions for the calculation. Impact on the household economy can be classified into short-term and medium-term effects. Aside from conducting the financial analysis from a farmer's viewpoint, the format below may be prepared to examine the impact of the project on the average household in monetary terms.

## Impact of the project on the average household in monetary terms (in current prices)

*Unit: 1,000 VND*

Year	Item	Net cash flow	Cumulative net cash flow
1 <sup>st</sup> year	Material cost		
	Employed labor cost (paid in cash)		
	Loan		
	Technical fee		
	1 <sup>st</sup> year total		
2 <sup>nd</sup> year	Material cost		
	Loan		
	Fee taken from the loan		
	Interest payment		
	2 <sup>nd</sup> year sub-total		
3 <sup>rd</sup> year	Interest payment		
4 <sup>th</sup> year	Interest payment		
5 <sup>th</sup> year	Interest payment		
6 <sup>th</sup> year	Interest payment		
7 <sup>th</sup> year	Interest payment		
8 <sup>th</sup> year	Interest payment		
	Principal repayment		
	Sales revenue		
	8 <sup>th</sup> year total		

Note: Unlike the cash-flow analysis conducted in the financial analysis, the above table does not take into account family labor as a cost item.

### (2) Impact on other critical issues

Analyze the following critical issues concerning project implementation:

#### Effect on ethnic minority groups

Considering the characteristics of ethnic minority groups residing in the project area, is the project likely to have their participation? If so, are there any special characteristics concerning their participation? If any ethnic minority groups are unwilling to participate in the project, what are the reasons for this? Any attention to be given to particular ethnic minority groups should be described. (If there are no special issues relating to ethnic minority groups, an explanation of the local situation is sufficient rather than detailed reports.) It should be also analyzed whether the livelihoods or the way of living of ethnic minority groups is affected by the implementation of the project.

### Effect on women

Considering the role of women in the household or in the community, is any impact anticipated from project intervention? As an example, are there any anticipated positive or negative effects on women's work-load (labor burden), credit management, livelihood opportunities, skill improvement etc?

### Involuntary resettlement

It is often the case that no involuntary resettlement of households is involved. However, if the project scope includes infrastructure development components such as access road development, water-way building etc., there is a possibility that the project may involve involuntary resettlement. It is therefore necessary to first confirm the project scope, state whether the project involves any involuntary resettlement, and assess the expected social impact to enable the necessary mitigating measures if a negative impact is expected.

### Living and livelihood

Afforestation activities are closely related to people's living and livelihood, as the project is implemented by utilizing people's land. As an example, the form of labor mobilization for forest production may heavily rely on community networking. The anticipated impact on people's living and livelihood from the implementation of the project should be described.

## **Chapter 5. Farming System Survey**

### **5.1 Introduction**

In agro-forestry planning, a farming system survey is conducted to clarify the trends of farming management and the intentions of farmers in the study area. The survey is implemented according to region and classe, and also aims to secure base data to help judge the feasibility of agroforestry and decide the components of wood products and non-wood forest products, the production scale, the project's implementation structure, fund procurement measures etc. This document introduces the farming system survey through the method of interviewing with farmers.

### **5.2 Method**

#### **5.2.1 Process**

The process of the farming system survey is shown below.

1) Clarify the purpose and select farmers for interview. Classify farmers by region and income group using the list of inhabitants kept at the commune, and select those for interview from each region and income group at random.

2) Prepare questionnaires for the interview survey (see attachment).

3) Conduct pre-testing of the interview survey using the questionnaire, and revise the questions based on the results of the pre-test.

4) Visit each farmer and conduct the interview or invite farmers to a meeting place in the region or the house of the village chief and conduct interviews individually.

5) Observe the farmer's house, produce, equipment, machinery, livestock, roads, garden, farmland, forest land, ponds, agricultural work and behavior, then supplement the interview survey with the results of this observation.

6) Visit progressive farmers/excellent agriculture and forestry projects for a broad outlook on agriculture and to secure useful information for the agroforestry plan.

7) Total up the questionnaires (see attachment).

8) Analyze the questionnaires.

9) Hold a workshop for farmers in the study area to inform them of the survey results, then share common perceptions.



### **5.2.2 Survey items**

Examples questionnaire survey items are as follows (see attachment):

- 1) SWOT analysis
- 2) Family structure: name, sex, relationship, age, working type, occupation, educational background and whether living together or separate
- 3) Land use: land-use type, area, land allocation, water resource, kind of products, distance from the house and land-use map (sketch map)
- 4) Livestock: kind of livestock, quantity, disease prevention, self-consumption, selling, marketing and livestock calendar
- 5) Facilities: kind of facilities, area and structure
- 6) Agricultural machines: kind of machines, quantity, purchase year and purchase price
- 7) Farm products—production and sale: kind of crop, annual total of planted acreage, annual harvest, self-consumption, selling, marketing and crop calendar
- 8) Wood products, fish breeding products and other products: kind of products, area, annual harvest, self-consumption, selling and marketing
- 9) Annual income: income from agricultural products, income from agriculture-related sources, non-agricultural income and total income
- 10) Annual expenditure: expenditure for agriculture, expenditure for non-agriculture and total expenditure

### **5.3 Key points for application**

The key points of the farming system survey are itemized below.

#### **5.3.1 Interview survey**

- The purpose of the survey should be clarified, and ways of using the results should be examined beforehand.
- The interviewee farmer should not be biased toward specific regions/groups.
- There should not be too many questionnaire items.
- The interview time should not be too long (within two hours is desirable).
- Questionnaires should be prepared in connection with the summing-up table to summarize the results of the survey.

- Questions should be phrased as intelligible short sentences.
- One matter should be dealt with by one question.
- General matters should be asked first, and specific ones later.
- The number of open questions should be small.
- The interview survey should be supplemented with observations of farm status.

### **5.3.2 *Visits to progressive farmers /excellent agriculture & forestry projects***

- The purpose of the visit should be clarified, and suitable farmers/projects should then be selected.
- A convenient day and time should be confirmed for the selected farmers/projects to accept the visit.
- Questionnaire entries should be arranged in advance.
- The selected farmers/project teams should be informed of the purpose of the visit and matters interviewer wish to know in advance.
- As small number of visitors is desirable (less than 15 people).
- Thank-you letters should be sent to the selected farmers/project teams.

<<Attachment>>

THE DEVELOPMENT STUDY ON CAPACITY BUILDING FOR PREPARING FEASIBILITY STUDIES AND IMPLEMENTATION PLANS FOR AFFORESTATION PROJECTS

**FARMING SYSTEM SURVEY**

Code no.	Income group
-	

Survey date      /      /

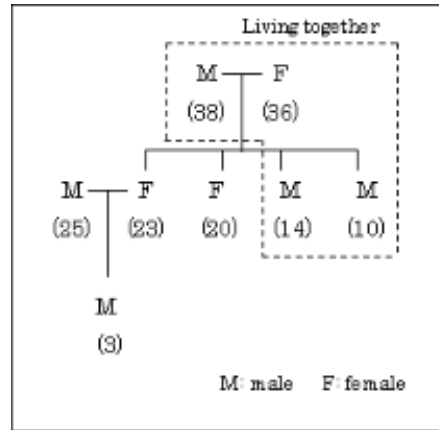
Surveyor: \_\_\_\_\_

<b>Name of householder</b>				
Province	District	Commune	Village	House number
Name of organization/cooperative union of membership	Objective	Number of members	Activity	

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<b>S</b>		<b>W</b>	
<b>O</b>		<b>T</b>	





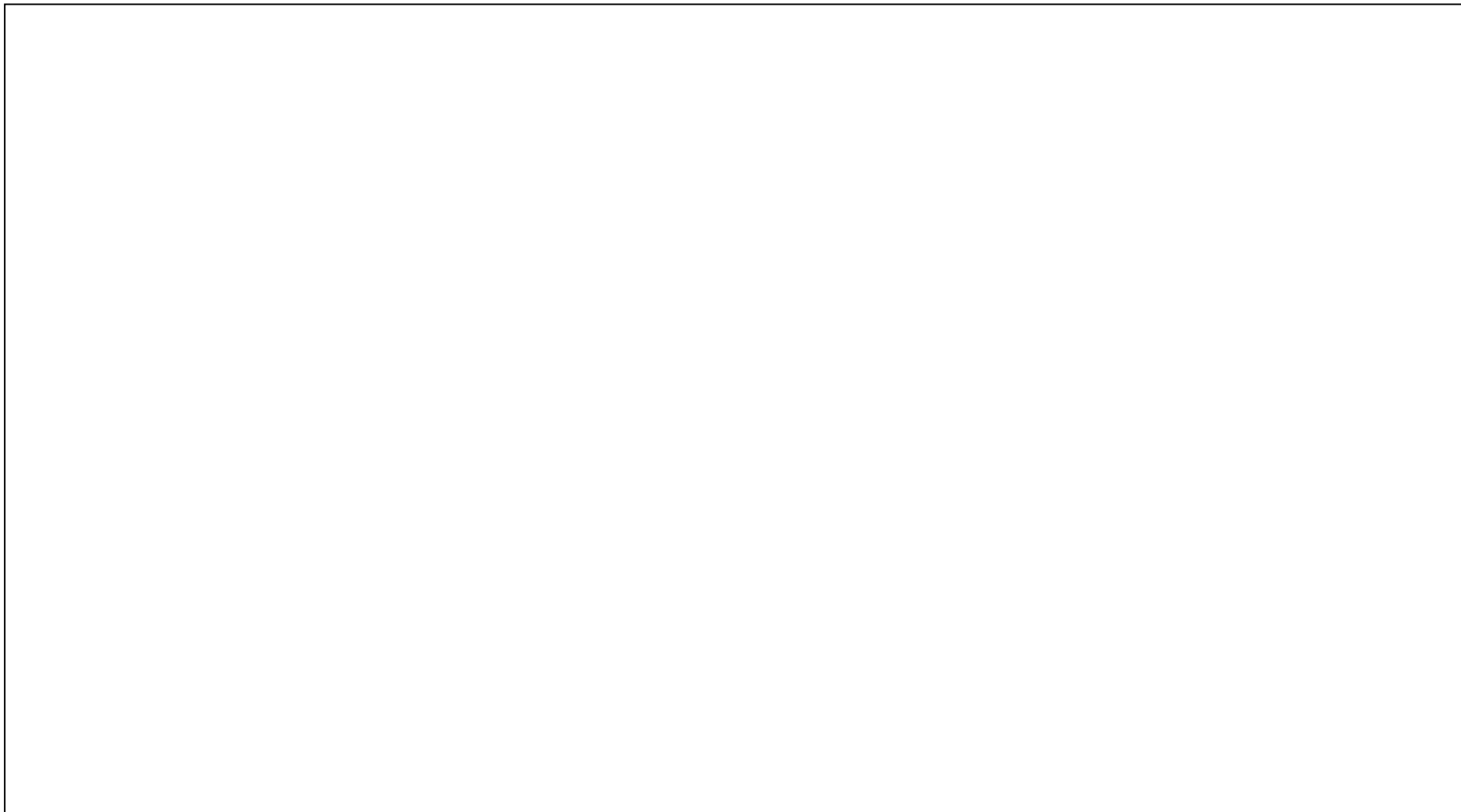
Sample of a family tree

**Figure: Family tree**

2. Land use

Land-use type	Area	unit	Land allocation (Red Book)	Water resources	Kind of products	Distance from the house	Remarks
Paddy field		ha					
Crop field							
Orchard							
Tea plantation							
Grassland							
Forest							
Pond							
House							
Total							

**Figure: Land-use map**



### 3. Livestock

No.	Kind of livestock	QTY	Disease prevention	Self-consumption <i>Tự tiêu thụ</i>	Selling <i>Đem bán</i>			Marketing <i>Thị trường</i>		Remarks <i>Nhận xét</i>
					QTY	Unit price <i>Giá bán(VN\$)</i>	Sales volume (VND)	Where <i>Ở đâu</i>	To whom <i>Bán cho ai</i>	
1	Milk cows (multifarious)									
2	Milk cows									
3	Cattle for meat									
4	Water buffalo									
5	Pigs									
6	Hens for eggs									
7	Chickens for meat									
8										
9										
10										

**Figure: Livestock calendar**

Kind of livestock	Month <i>Tháng</i>															Remarks <i>Nhận xét</i>
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	

#### 4. Facilities

No.	Facilities	Area	Unit	Structure
1	Permanent house / <i>Nhà kiên cố</i>		m2	1) wood, 2) brick, 3) bamboo, 4) others( )
2	Temporary house / <i>Nhà tạm</i>			1) wood, 2) brick, 3) bamboo, 4) others( )
3	Cowshed / <i>Chuồng gia súc</i>			1) wood, 2) brick, 3) bamboo, 4) others( )
4	Pig house / <i>Chuồng lợn</i>			1) wood, 2) brick, 3) bamboo, 4) others( )
5	Chicken house / <i>Chuồng gia cầm</i>			1) wood, 2) brick, 3) bamboo, 4) others( )
6	Paddy storing house / <i>Kho chứa gạo</i>			1) wood, 2) brick, 3) bamboo, 4) others( )
7	Storing house / <i>Nhà kho đồ đạc (nhà ngang)</i>			1) wood, 2) brick, 3) bamboo, 4) others( )
8	Compost house			1) wood, 2) brick, 3) bamboo, 4) others( )
9	Agricultural machinery shed			1) wood, 2) brick, 3) bamboo, 4) others( )
10				1) wood, 2) brick, 3) bamboo, 4) others( )
11				1) wood, 2) brick, 3) bamboo, 4) others( )
12				1) wood, 2) brick, 3) bamboo, 4) others( )
13				1) wood, 2) brick, 3) bamboo, 4) others( )
14				1) wood, 2) brick, 3) bamboo, 4) others( )
15				1) wood, 2) brick, 3) bamboo, 4) others( )

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#### 5. Agricultural machines

No.	Kind of machine	Quantity	Purchase year	Purchase price (unit price: VND)
1	Tractor			
2	Water pump			
3	Manual hand sprayer			
4	Power sprayer			
5	Reaper			
6	Thresher			
7	Winnow			
8	Grass cutter			
9	Cart			
10	Truck			
11	Motorcycle			
12				



6. Farm products--production and sale

No TT	Kind of crop <i>Loại cây</i>	Annual total of planted acreage		Annual harvest <i>Thu hoạch hàng năm</i>		Self-consumption <i>Tự tiêu thụ</i>		Selling <i>Đem bán</i>			Marketing <i>Thị trường</i>		Remarks <i>Nhận xét</i>
								Quantity	Unit price <i>Giá bán (VND)</i>	Sales volume (VND)	Where <i>Ở đâu</i>	To whom <i>Bán cho ai</i>	
1	Paddy / <i>Gạo</i>												
2	Maize / <i>Ngô</i>												
3	Cassava / <i>Sắn</i>												
4	Sweet potato <i>/Khoai lang</i>												
5	Ground nut <i>/Lạc</i>												
6	Tea / <i>Chè</i>												
7	Litchi / <i>Vài</i>												
8													
9													
10													

**Figure: Crop calendar**

Kind of crop <i>Loại cây trồng</i>	Month <i>Tháng</i>															Remarks <i>Nhận xét</i>
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	

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Sowing                  Transplanting                  Harvesting  
 Gieo hạt                  Trồng cây                  Thu hoạch

-----□-----^^^

7. Wood products, fish breeding products and other products

No. <i>TT</i>	Kind of products	Area		Annual harvest <i>Thu hoạch hàng năm</i>		Self-consumption <i>Tự tiêu thụ</i>		Selling <i>Đem bán</i>			Marketing <i>Thị trường</i>		Remarks <i>Nhận xét</i>
								Quantity	Unit price <i>Giá bán (VNĐ)</i>	Sales volume <i>(VNĐ)</i>	Where <i>Ở đâu</i>	To whom <i>Bán cho ai</i>	
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													

8. Annual income

	Income source	Sales volume (VND)	Remarks
Income from agricultural products	Livestock		
	Farm products		
	Wood products		
	Fish breeding products		
	Other products		
	Sub total		
Income from agriculture-related sources	Land lease fee		
	Machinery lease fee		
	Wages		
	Borrowed money		
	Sub total		
Non-agricultural Income	Non-agricultural wages		
	Sub total		
Total income			

9. Annual expenditure

	Expenditure item	Sum expended (VND)	Remarks
Expenditure for agriculture	Seeds		
	Seedlings		
	Chemical fertilizer		
	Organic fertilizer		
	Pesticide		
	Transportation		
	Labor wages		
	Repayment of debt		
	Donation of products		
	Sub total		
Expenditure for non-agriculture	Food expenses		
	Clothing expenses		
	Housing cost		
	Medical expenses		
	Educational expenses		
	Electricity charges		
	Water charges		
	Income tax		
	Other tax		
	Sub total		
Total expenditure			

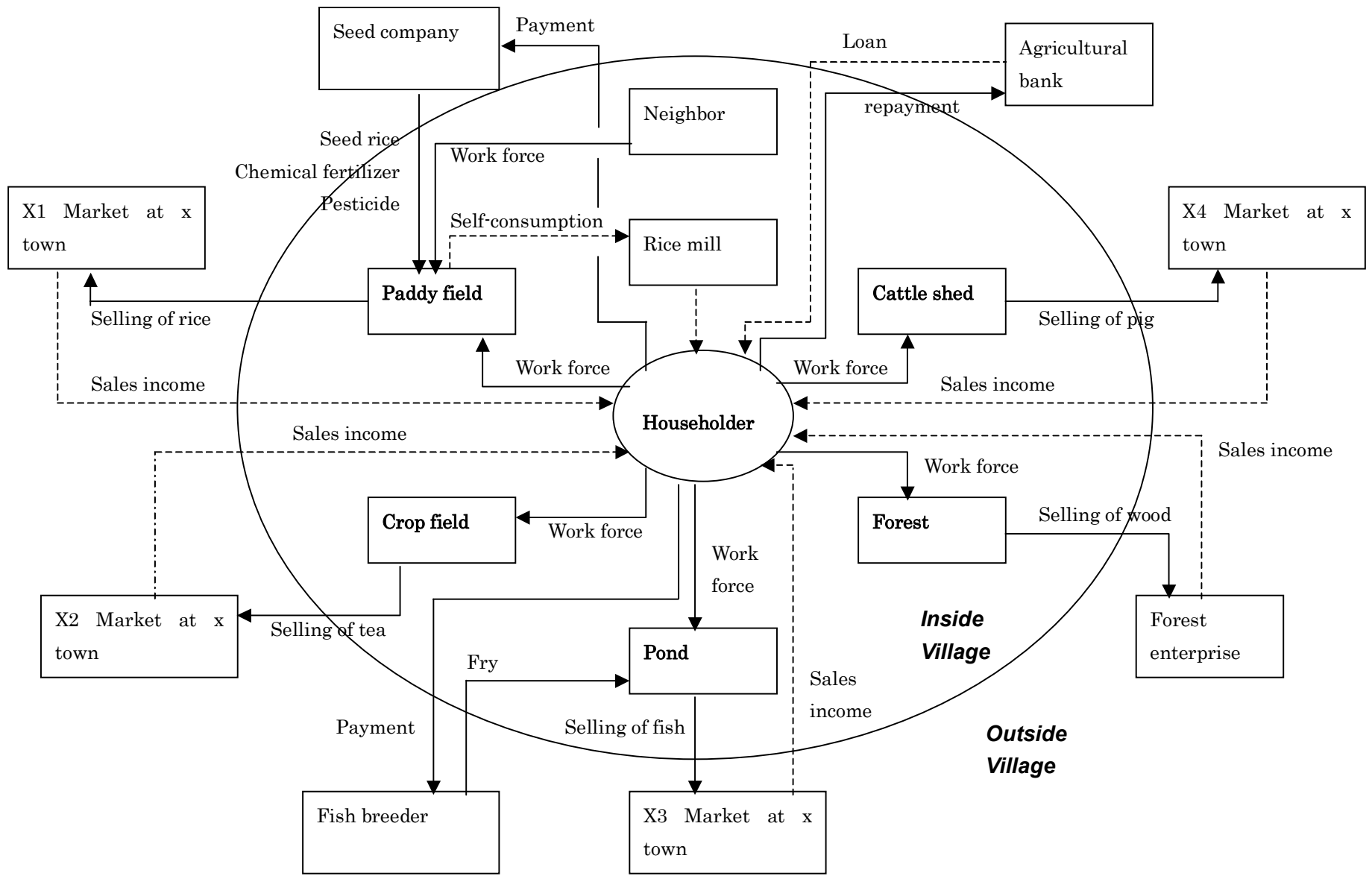


Figure: Resources flow chart

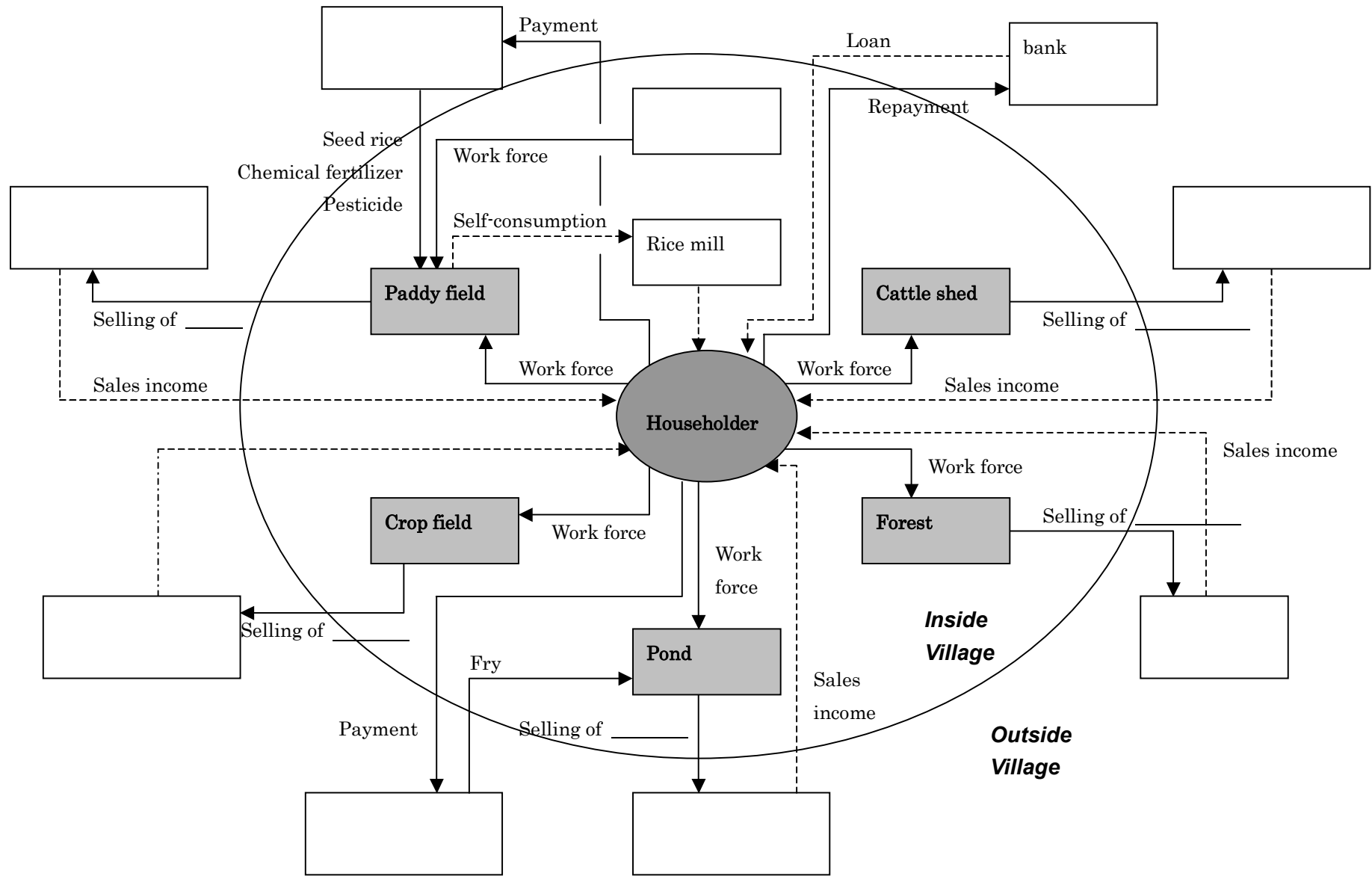


Figure: Resources flow chart

## **Chapter 6. Surveys of Possibility in Agroforestry Application --Preparation of an Agroforestry Possibility Set--**

### **6.1 Introduction**

An agroforestry possibility set shows the layout, benefits, disadvantages, requirements, cost, harvest and remarks of an agroforestry model simply with photographs/figures in unit size. This tool helps the user to understand the various agroforestry components involved.

### **6.2 Contents of an Agroforestry Possibility Set**

#### **6.2.1 Title**

The title of the agroforestry model should be described.

#### **6.2.2 Possible Layout**

A ground plan of the planting pattern in the agroforestry model unit should be drawn, including the whole size of the unit area, planting tree/crop names and planting distances.

#### **6.2.3 Benefits**

The advantages of the agroforestry model should be described.

#### **6.2.4 Disadvantages**

The disadvantages of the agroforestry model should be described.

#### **6.2.5 Requirements**

The requirements for establishment of the agrofoestry model, such as minimum land size, labor, locally available materials and farm implements, should be described.

#### **6.2.6 Estimated cost**

The estimate cost of establishing the agroforestry model, including supplies, quantities, norms, unit price and total amount, should be tabulated.

#### **6.2.7 Estimated harvest**

The estimated harvest expected in the agroforestry model should be described.



### 6.2.8 *Remarks*

Important notes for establishment of the agroforestry model should be described.

### 6.2.9 *Photographs/figures*

Photographs/figures to explain field conditions, plantation conditions and the growth process of the plantation should be attached.

## 6.3 **Key points for application**

The document should be legible with a facile style, tables, figure, ground plans and photographs/figures to enable the user to understand easily.

## 6.4 **Example of agroforestry possibility set in Thai Nguyen Province**

An example using the agroforestry possibility set in Phu Binh District of Thai Nguyen Province is shown in the attachment.

### **Sample Format of Agroforestry Possibility Set**

<i>Title of the agroforestry type</i>			
<i>Photograph/figure to show the activity</i>		<i>Photograph/figure to show the activity</i>	
<u>Possible layout</u>			
<i>Ground plan of planting pattern</i>			
<u>Benefits</u>			
<u>Disadvantages</u>			
<u>Requirements</u>			
<u>Estimated cost</u>			
Item	Quantity/norm	Unit price	Amount
Total			
<u>Estimated harvest</u>			
<u>Remarks</u>			

## Example of a Possibility Set

**3. Wood lot for poles or firewood**

**Possible Layout**

**Benefits**

- Provision of firewood, poles and posts
- Generation of income within a short period (3 to 5 years)
- Farmers could produce food crops for 10-15 years
- Land rehabilitation for degraded woodlot, thus allowing more time for crop activities

**Disadvantage**

- After one year, the tree crowns shall interfere with crop production

**Requirements**

- Land 17 m by 29 m (0.6 Acres)
- Labour
- Locally available materials
- Farm implements

**Estimate Cost**

Requirement	Quantity	Unit Price	Total
1. Seedling of species 1	20	10000	200000
2. Seedling of species 2	20	10000	200000
3. Labour (planting 1000 trees)	10	10000	100000
4. Fertilizer (1000 trees)	10	10000	100000
5. Labour (weeding 1000 trees)	10	10000	100000
6. Labour (planting 1000 trees)	10	10000	100000
7. Labour (weeding 1000 trees)	10	10000	100000
<b>Total</b>			<b>800000</b>

**Establishment Period**

Planting	1 day
Monitoring	Once a week

**Remarks**

- A 2.5m wide strip shall be planted with pigeon peas to ensure protection of the woodlot against animals
- Trees will be planted at a spacing of 3 m by 3 m
- The group will select one favourable tree species and the other one will be recommended by the project
- The group can reduce the cost of termite control by using local materials such as ashes, manure, etc. and other in place of using pesticide
- Possible species: *Eucalyptus camaldulensis*, *Eucalyptus grandis*, *Camellidulensis hybridus*, *Pinus sp.*, *Berua sp.*, *Casuarina equisetifolia*, *Acacia sp.*

**Representative photos of operational person, field condition and plantation condition (a size of operational person gives a rough idea as to how large trees are)**

**Plane figure of planting pattern (note roughly whole size, planting distance and hedge width)**

**Understanding the points of loss and gain**

**Supposed matters in this model are:**

1. benefit
2. disadvantage
3. required item

**Understanding cost**

**Expense account:**

1. supplies
2. quantity
3. unit price
4. total amount

**Understanding establishment period**

1. work content
2. working time

**Understanding the context**

**Points for implementation**

1. view of planting distance
2. role of participating group (species selection and reduction in cost)

(Source: Intensified Social Forestry Project in Semi-arid Areas, 2004, Group Activity Catalogue)

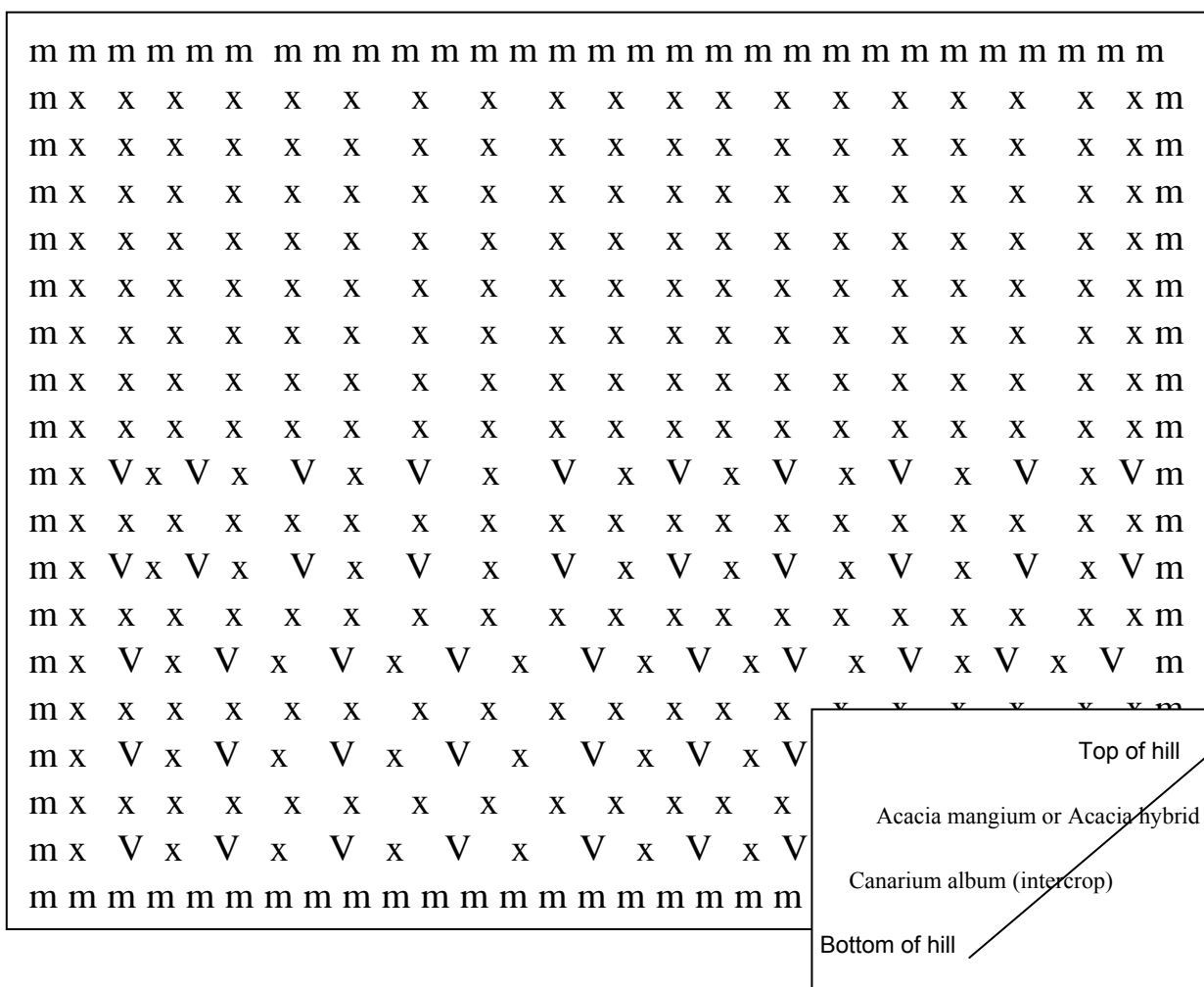
**Attachment: Example of agroforestry possibility set in Thai Nguyen Province**

**Model of Acacia mangium,Canarium album, Calamus tenuis andCassava**

Cassava should only be alternatively planted in the first year because the timber species' canopy has not yet closed, giving them sufficient light to grow.

Dracontomelon mangiferum demands shade during the first years, and should be planted alternatively with Acacia.

Acacia has a fast growth rate, so it can create storeys to shade Canarium and Dracontomelon mangiferum



Note: x: Acacia mangium; V: Canarium album; m: Calamus tenuis

Remarks:

Plot size = 50m x 50m

Distance between Acacia mangium and Acacia mangium = 2.5m x 2.5m

Distance between Canadium album and Canarium album = 5m x 5m

Distance between Calamus tenuis and Calamus tenuis = 0.3m x 0.3m

Distance between Cassava and Cassava = 0.3m x 0.3m

### 1) Benefits:

Sustainable farming on sloping land

Income is derived from a variety of products, including Cassava in the first year. After six years of tree growth, fruit can be harvested from the Canarium album, and after seven years Acacia mangium wood and Canarium album fruit is yielded. The 10-year point allows harvesting of 600 kg/ha of rattan. Rattan also prevents the plantation from being destroyed by cows.

Acacia mangium is resilient to being knocked over by strong winds.

### 2) Disadvantages:

Poor soil and lack of fertilizer

Lack of water for agro-forestry model

Most of the hill is not high up, making the agro-forestry model vulnerable to being destroyed by cows

Farmers have insufficient funds to set up the model

### 3) Requirements:

Labor

Land

Locally available materials

Farm implements

**Estimated cost for 2500 m2**

No	Item	Unit price	Quantity	Cost
I	Labor	26,568	25	664,200
1	Land preparation	26,568	6	159,408
2	Digging holes	26,568	6	159,408
3	Putting soil into holes	26,568	2	53,136
4	Putting NPK into holes	26,568	2	53,136
5	Transport of seedlings and planting	26,568	2	53,136
6	Land preparation for plot boundaries	26,568	3	79,704
7	Protection	26,568	3	79,704
8	Casava harvesting	26,568	1	26,568
II	Seedlings and fertilizer			2,068,650
1	Seedlings		1,215	1,316,250
	Acacia mangium	340	375	127,500
	Canarium album	13,000	75	975,000
	Calamus	500	390	195,000
	Cassava	50	375	18,750
2	Fertilizer		432	752,400
a	Fertilizer for wood species		376	651,600
	NPK	1,800	313	563,400
	Micro-organic fertilizer	1,400	63	88,200
b	Fertilizer for crops		56	100,800
	NPK	1,800	56	100,800
III	Others		5	230,680
1	Site design	46,136	2	92,272
2	Evaluation	46,136	1	46,136
3	Fee management	46,136	2	92,272
A	Total			2,963,530
	Tending in the 2 <sup>nd</sup> - 10 <sup>th</sup> years		-	
I	Total Labor		42	1,174,560
1	Labor		39	1,036,152
	Weeding(1- 2 times)	26,568	11	292,248
	Tending	26,568	10	265,680
	Protection	26,568	18	478,224
2	Other		3	138,408
	Evaluation	46,136	2	92,272
	Fee management	46,136	1	46,136
II	Product harvesting		31	823,608
1	Canarium product harvesting	26,568	14	371,952
2	Calamus product harvesting	26,568	10	265,680
3	Wood logging	26,568	7	185,976
B	Total		73	1,998,168
C = A+B	Total			4,961,698

### Estimated product harvesting

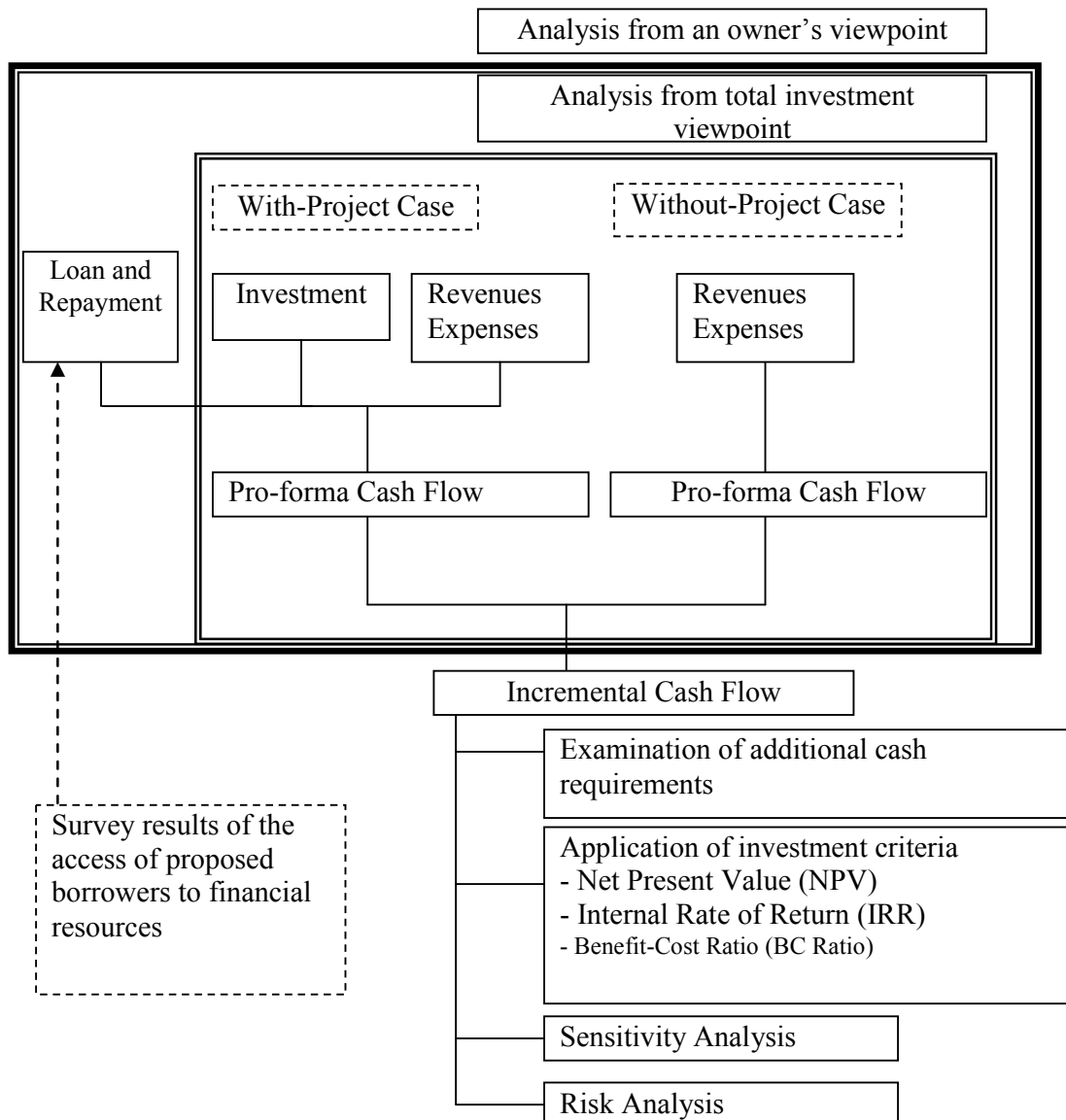
*Model: 2500 m<sup>2</sup>*

No	Item	Cost/ha (VND)	Volume (kg)	Cost (VND)
I	Wood products			7,258,500
1	Firewood (= ster)	120,000	3	360,000
2	Acacia wood (= M3)	459,900	15	6,898,500
II	Cassava	500	750	375,000
III	Canarium album fruits		-	9,565,000
1	In the 6 <sup>th</sup> year (1)	5,000	266	1,330,000
2	In the 7 <sup>th</sup> year (2)	5,000	319	1,595,000
3	In the 8 <sup>th</sup> year (3)	5,000	372	1,860,000
4	In the 9 <sup>th</sup> year (4)	5,000	425	2,125,000
5	In the 10 <sup>th</sup> year (5)	5,000	531	2,655,000
IV	Calamus		-	2,832,000
1	In the 6 <sup>th</sup> year (1)	6,000	65	390,000
2	In the 7 <sup>th</sup> year (2)	6,000	81	486,000
3	In the 8 <sup>th</sup> year (3)	6,000	98	588,000
4	In the 9 <sup>th</sup> year (4)	6,000	114	684,000
5	In the 10 <sup>th</sup> year (5)	6,000	114	684,000
	Total		3,153	20,030,500

## Chapter 7. Financial and Economic Analyses

### 7.1 Purpose of financial analysis and overall analytical framework

Financial analysis at the project level aims to examine the project's financial feasibility from a total investment viewpoint as well as from the viewpoints of specific stakeholders such as project owners. Economic analysis, on the other hand, aims to examine the economic feasibility of the project from the country's viewpoint. Financial analysis at the project level will look to calculate the incremental benefits and costs expected from the project (comparison of with-project and without-project cases). It will examine the additional cash requirements, apply investment criteria such as the Net Present Value (NPV), the Financial Internal Rate of Return (FIRR) and the Benefit and Cost Ratio (B/C Ratio), and undertake the sensitivity and risk analysis. The diagram shown below illustrates the entire process of the financial analysis at the project level.



## 7.2 Financial and economic analyses in F/S and IP reports

The financial and economic analyses will form part of the “Project justification”, which will be described in Part 3 of the F/S report.

## 7.3 Flow of financial analysis

Outlined below is a sequence of the analysis applied to both with- and without-project cases for a total investment analysis.

### **Technical Note 7.1 – With/without project analysis (incremental analysis)**

The Technical Notes 7.1 to 7.12 provide more detailed explanations on relevant topics at the end of this chapter on financial and economic analyses.

#### 7.3.1 *Analysis from a total investment viewpoint and from an owner’s viewpoint*

##### 7.3.1.1 Analysis from a total investment viewpoint

Analysis from a total investment viewpoint aims to analyze the overall strength of the project by taking into account the direct financial benefits and costs (including taxes and subsidies) valued at their financial prices. The following equation shows the formula for calculating the cash flow from a total investment viewpoint.

$$\text{Total investment viewpoint} = \text{Direct financial benefits} - \text{Direct financial costs} - \text{Opportunity cost of existing facilities}^{26}$$

The steps below describe the flow of the analysis from a total investment viewpoint. The analysis is initially conducted on a per-ha basis. The Excel spreadsheet prepared for the case study can be referred to as a sample way of arranging the data and tables.

### **Technical Note 7.2 - Example of Excel spreadsheet table format on the attached CD**

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<sup>26</sup> The previous expenditures are referred to as “historical costs” or “sunk costs”, and will not be taken into account under the financial analysis. However, while historical costs are irrelevant, the financial opportunity costs of any existing facilities that could have been sold if the new investment were not undertaken (but are instead integrated into the new facilities when the project is implemented) are included in the financial flow of the project.



(1) Set pre-conditions for the analysis. As the results of the analysis depend on how pre-conditions are set, it is important to clearly state under what pre-conditions the analysis is being conducted. Pre-conditions for the analysis include the base year for the analysis, the expected rate of inflation, physical contingency, expected benefits and costs.

(2) Prepare **Table 1: Parameter Table** that shows all the relevant price and quantity information. Describe relevant information on prices to be applied in the analysis (such as the year and locations for which prices are quoted and whether or not taxes and subsidies are included). In the Excel spreadsheet, values in the parameter table are linked to values in other tables so that any changes in the parameter table will be automatically reflected to the relevant values in the others.

(3) Prepare **Table 2: Table of Index** that shows the yearly change in key economic indicators and/or that also affect all variables. The table of index may include expected rates of yearly inflation and cumulative inflation, foreign currency exchange rates etc.

(4) Prepare **Table 3: Operating Plan** based on the production forest or agro-forestry models by creating a plantation schedule, a tending schedule and a felling schedule.

(5) Prepare **Table 4: 1) Receipt (Sales) Plan** (cash inflow), **2) Expenditure Plan** (cash outflow) and **3) Estimated Investment Cost** for one ha in accordance with the production forest or agro-forestry models and the operation plan.

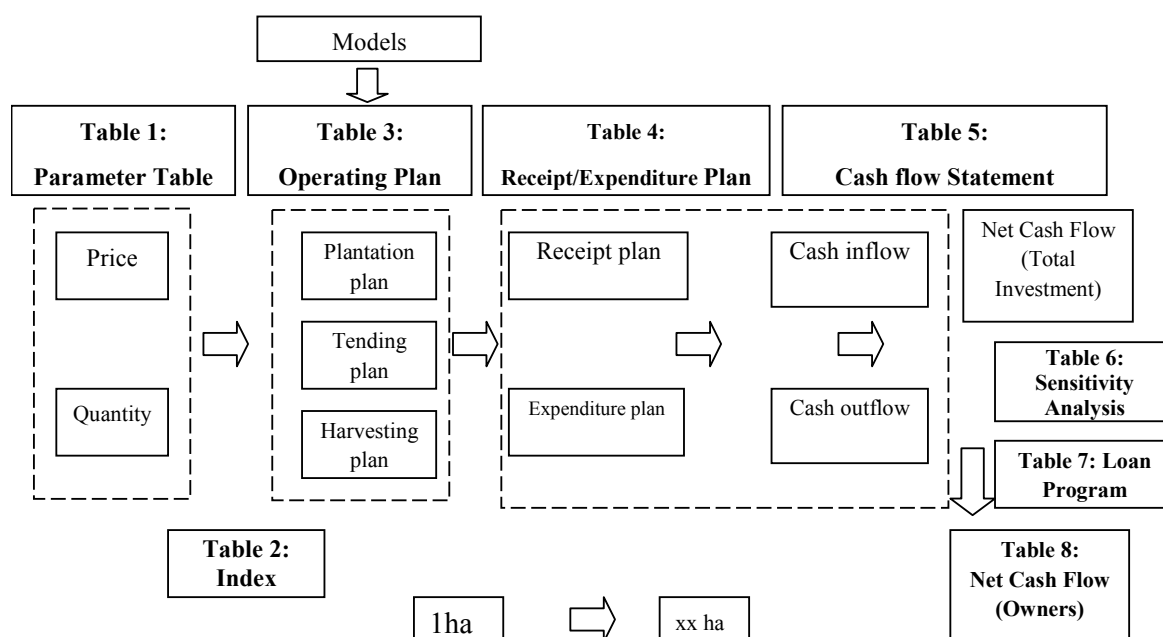
(6) Prepare **Table 5: Cash Flow Statement** based on the receipt (sales) plan and expenditure plan.

(7) Calculate a net cash flow for the project and then an incremental net cash flow by subtracting the net cash flow of the without-project case from that of the with-project case. Look at the incremental net cash flow to find years in which the project faces difficulties in meeting additional cash requirements and therefore needs financing.

(8) Calculate discount factors and present values for the incremental net cash flow. Calculate a Net Present Value (NPV), a Financial Internal Rate of Return (FIRR) and a Benefit and Cost Ratio (B/C Ratio) for the project from a total investment viewpoint of one (1) ha of afforestation forest for each model.

(9) Conduct sensitivity analysis by changing critical values in order to find the extent to which the results of the analysis are affected (**Table 6: Sensitivity Analysis**).

The following diagram shows the flow of the financial analysis for a one-ha model:



The Excel spreadsheet provided shows the tables in the above diagram.

As seen from this diagram, one (1) ha analysis from a total investment viewpoint is expanded to cover the entire planting/cultivating sites later.

In addition to the production forest/agro-forestry development component, the costs of other project components such as project management and supporting services are estimated to provide a total cost for the project.

### 7.3.1.2 Analysis from an owner's viewpoint

**Table 7: Loan Schedule** will be prepared to calculate a repayment schedule for possible loans. The project is then analyzed from the viewpoint of an owner by incorporating disbursement and repayment schedules for a loan into the net cash flow from a total investment viewpoint (**Table 8: Cash Flow Statement from Owner's Viewpoint**). This analysis can be made by setting several types of model farmers. As an example, take an average size of forest land for an average farm household.<sup>27</sup>

<sup>27</sup> If the distribution of the forest land owned by farmers is skewed, it may be better to take a median value of the forest land for the analysis instead of an average size.


## 7.4 Pre-conditions for analysis

Set pre-conditions for the analysis. These may include the following:

- Base year of the analysis
- Expected rate of annual inflation<sup>28</sup>
- Physical contingency
- Rate or amount of taxes
- Rate or amount of subsidies
- Discount rate to calculate the Net Present Value

All the information will be entered into Table 1: Parameter Table.

 **Technical Note 7.3 - Contingencies**

 **Technical Note 7.4 – Constant (or real) price vs. current (or nominal) price, and Consumer Price Index**

## 7.5 Models for analysis

### 7.5.1 *Description of the model for the financial analysis*

The model for the analysis is described here. As a detailed description is given in the project plan of the F/S report, to avoid overlapping the description in the financial and economic analyses chapter will be limited to the level required for users of the F/S report to understand what the model is. The information includes the basic assumption (pre-conditions) and features such as the base year, physical and price contingencies, types of species, rotation cycles, a without-project case and so on.

### 7.5.2 *Expected benefits from the project*

#### Prices of forest/agro-forestry products

The prices of forest/agro-forestry products will differ depending on volume, specifications, timing and the location where the relevant information is taken.<sup>29</sup> When

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<sup>28</sup> Although the expected rate of annual inflation is calculated, the financial analysis is conducted for the cash inflow and cash outflow of the project on a constant price basis.

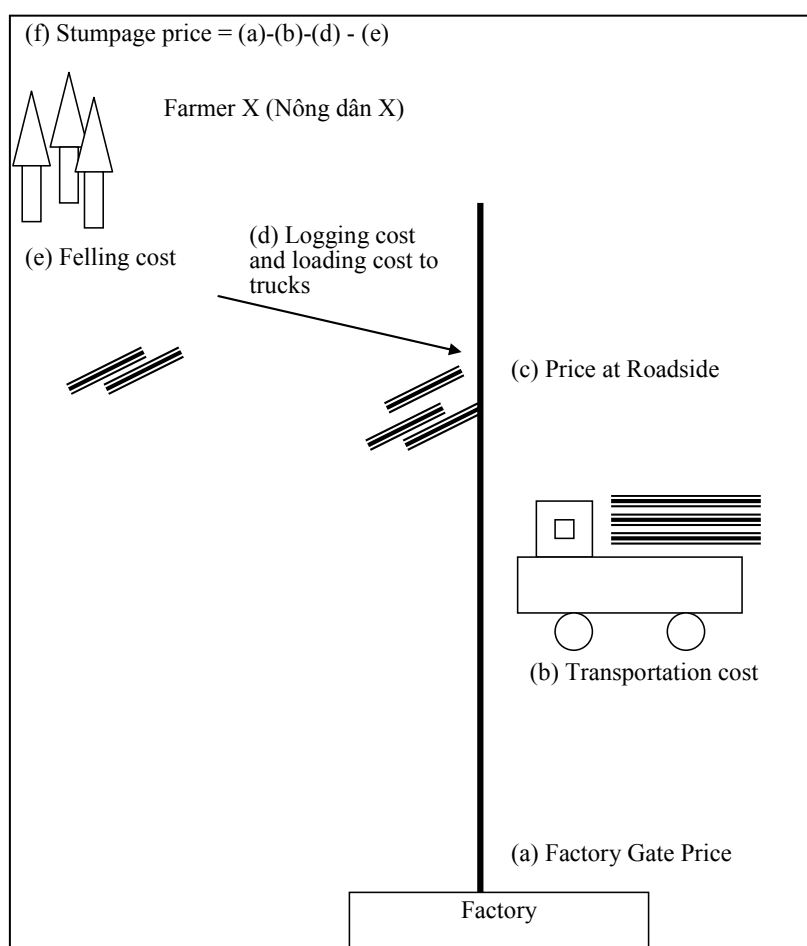
<sup>29</sup> Refer to “Market trend reference book on wood-based and agro-forestry products” (Book 7) in FICAB training package.

collecting information on prices, be it on inputs or outputs, it is important to note when and where the relevant information was taken. As an example, estimated stumpage and prices at the roadside can be calculated backward based on prices at the factory gate as shown in the following table:

	Prices	Description
(f)	Stumpage	Standing value of the wood materials
(e)	Felling cost	Wood-cutting cost
(d)	Logging cost and loading cost	Transportation cost from felling site to the roadside + cost of loading onto trucks
(c)	Price at roadside	Stumpage + felling cost + logging cost from felling site to the roadside + cost of loading onto trucks
(b)	Transportation cost	Transportation cost from the roadside to the factory gate
(a)	Factory gate price	Price at the factory gate

Prices sometimes include taxes, and it is important to specify whether this is the case with the prices referred to.

In terms of the agricultural commodities produced in the project, a good rule for determining a market price is to seek the price at “the point of first sale.” The best point of first sale to use is generally the boundary of the farm. What farmer receives on selling their products - the “farm gate” price - will be examined.



#### Technical Note 7.5 – Farm gate price

The following simplified format of receipt (sales) plan format shows how sales will be calculated from thinning and log volumes. The table is linked with the unit sales data and quantity per ha in **Table 1: Parameter Table**.

**Receipt (sales) plan for 1 ha**


Calendar Year	2005	2006	...	...	...	...
Implementation year	0	1				
Inflation index	1.0	xx				
Operating plan						
Thinning volume (m3)						
Log volume (m3)						
Sales plan						
Thinning (VND)						
Log (VND)						
Receipt (sales) per ha at constant price (VND)						
Receipt (sales) per ha at current price (VND)						

It should be noted that the values are first calculated based on constant prices, and then the inflation index is applied to adjust them to current prices.

### 7.5.3 *Expected costs*

Farm gate prices when purchasing input materials such as seedlings and fertilizer will be referred to as expected costs of input materials. For projects in the Vietnamese forest sector, labor cost usually accounts for a larger portion of the investment cost. The labor cost can be classified into skilled and unskilled labor. For unskilled labor costs, it is considered that the rural wage rate represents the opportunity cost of labor, as farmers are expected to give up on-farm/off-farm benefit-earning opportunities if they participate in the project. In order to ascertain the level of rural wage rates, the interview survey was conducted inside and outside the project area.

For the skilled labor in the feasibility study in Thai Nguyen Province, the MARD cost norm<sup>30</sup> was used as it is considered that skilled laborers would demand a higher wage to be induced to work on a project in a rural area.

 **Technical Note 7.6 - Labor costs**

 **Technical Note 7.7 - Sample Questionnaire Form used in Phu Binh District, Thai Nguyen**

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<sup>30</sup> The MARD cost norm for skilled labor was higher than the rural wage rate applied for unskilled labor at the time of the survey.

The information on unit costs will be entered into the parameter table. An annual expenditure plan for the one-ha model is constructed based on unit prices, quantities and the operating plan. The table below can be used for estimating expenditure over the project period.

### Expenditure plan for a one ha model of production forest development

*Unit:* \_\_\_\_\_

Calendar Year	2005	2006	...	...	...
Implementation year	0	1			
Inflation index	1.0	xx			
Material cost					
Seedlings					
Fertilizer					
Total material cost/ha					
Labor cost					
Year 1					
Year 2					
Year 3					
Year ...					
Year of felling trees					
Total labor cost/ha					
Baseline cost/ha (constant price) (a)					
Physical contingency (b) = (a) x physical contingency rate					
Price contingency (c) = [(a) + (b)] x price contingency rate					
Total cost per ha (including contingency) (a) + (b) + (c)					

It should be noted that physical contingency is obtained by multiplying the rate of physical contingency with the baseline cost. Price contingency is obtained by multiplying the sum of the baseline cost and physical contingency by the rate of price contingency.<sup>31</sup>

The one ha model is used as a basis to estimate the total cost of the production forest/agro-forestry development component. In addition, the costs of other project components such as project management and supporting services will be estimated in a similar manner and summed up to calculate the total project cost together with the cost of the production forest/agro-forestry development component.

<sup>31</sup> The rate of the price contingencies needs to be adjusted with the inflation index.

## 7.6 Results of financial analysis

### 7.6.1 Analysis from a total investment viewpoint

The cash flow table is developed by combining the receipt (sales) plan and the expenditure plan. The type of cash flow statement shown below will be prepared. It is important to maintain consistency in terms of price level in the process of the analysis. If current prices are used, all the prices used in the process of the analysis should be current. If constant prices are used, all the prices should be constant in the process of the analysis. As the final analysis concerned is to be made on a constant-price basis, all the current prices should be ultimately adjusted to constant prices. Constant prices are obtained by deflating current prices with the inflation index.


#### Cash flow statement from a total investment viewpoint

*Unit:*

Calendar Year	2005	2006	...	...	...
Implementation year	0	1			
Inflation index	1.0	xx			
Cash inflow (at current price )					
Cash outflow (at current price)					
Net cash flow (at current price)					
Cash inflow (at constant price)					
Cash flow (at constant price)					
Net cash flow (at constant price)					
Discount factor					
PVB (present value of cash inflow) (a)					
PVC (present value of cash outflow) (b)					
NPV (real discount rate at xx %)					
FIRR					
B/C ratio (a)/(b)					

The following investment criteria will be applied to examine the feasibility of the project: Net Present Value (NPV), Financial Internal Rate of Return (FIRR) and Benefit-Cost Ratio (B/C Ratio).

 **Technical Note 7.8 – Discounting and discount rate**

 **Technical Note 7.9 – Investment criteria**

### 7.6.2 Analysis from an owner's viewpoint

The financial analysis is conducted from an owner's viewpoint. It aims to examine how attractive the project will be from the viewpoint of owners such as farmers and forest enterprises. The following formula will be used:

Analysis from an owner's viewpoint=  
 Net cash flow of the total investment viewpoint + loan – payment of interest and principal

**Technical Note 7.10 – Loan schedule**

In order to estimate a loan amount for the analysis, the results of the socio-economic survey and interviews with potential funding institutions can be utilized. Financial institutions may have standard terms and conditions for a specific loan program to a farmer or a project owner in the project area. The amount of a loan may be calculated based on the expected cash needs, or it may be based on the average or median amount per ha (whichever is appropriate) of loans that project owners currently have from financial institutions.

Analysis is then made of the net cash flow and the feasibility of the project by calculating NPV and FIRR.

**7.6.3 Sensitivity analysis**

Sensitivity analysis aims to systematically examine the profitability of a project if critical values, which have a greater influence on the results of the analysis, change from the estimates made about them at the project planning stage. Critical values could include the sales prices of products, harvesting volumes, costs and quantities of input materials, labor costs and the implementation schedule. For the purpose of identifying the critical values for a specific project, it is good to first study its cost-and-benefit structure. Areas that account for a larger share in terms of costs and benefits can be tested for their influence on the results by changing their values. A possible range of values is discussed with other experts in and outside the F/S team, and the historical data and future forecast of commodity prices can be referred to. The table below shows an example of a table for sensitivity analysis, and aims to examine the combined effects on the results of the analysis by changing the values of Variables X and Y.

**Sensitivity analysis**

NPV (VND)		Variable X				
		X1	X2	X3	X4	X5
Variable Y	Y1					
	Y2					
	Y3					
	Y4					
	Y5					



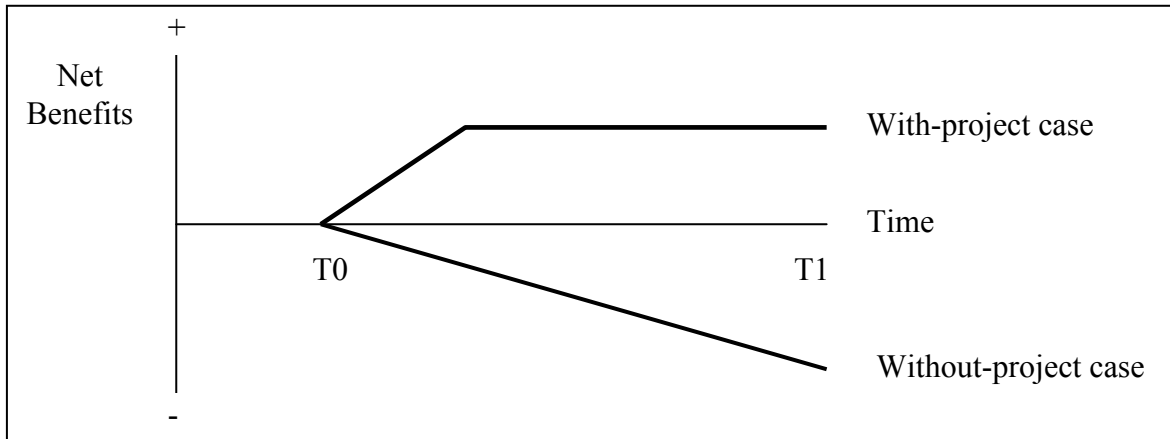
## **7.7 Economic analysis**

Economic analysis combines the benefits and costs of all stakeholders to be affected by the project, and aims to assess the contribution of the project to social welfare. The analysis is developed based on the information and data collected and used for financial analysis after making necessary adjustments for price distortions. It is conducted through collection and use of information and data required for converting financial prices into economic ones. Information and data to be used for the adjustments in the economic analysis include: (1) taxes and subsidies, (2) labor, and (3) externalities. The analysis will be undertaken from the country's viewpoint by calculating expected benefits and costs on a constant-price basis, applying investment criteria (economic indicators such as NPV (at economic discount rate), Economic IRR and B/C Ratio) and conducting sensitivity analysis.

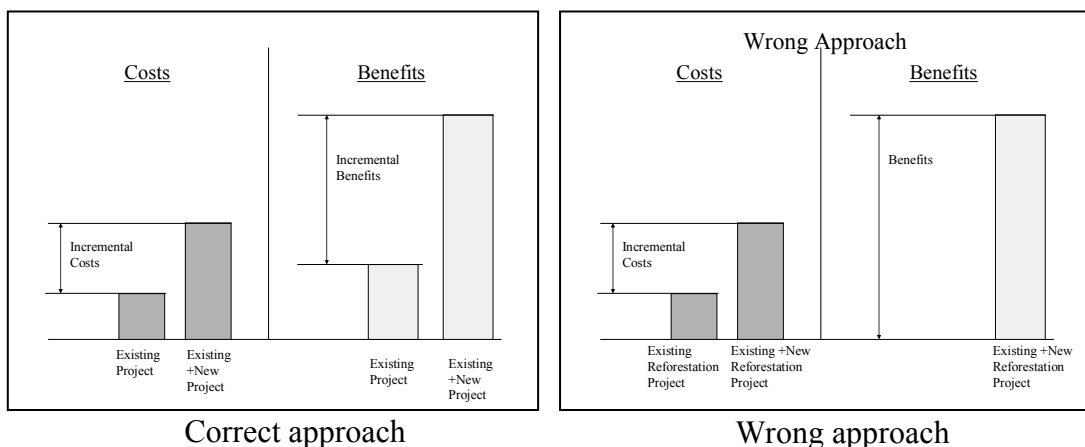
## Technical Note 7.1 – With/without project analysis (incremental analysis)

### 1 Without-project case compared against with-project case

The without-project case is not the same as the before-project case. It describes how the situation will change if the project is not implemented. The outline below shows that benefits decrease over time under the without-project case. The before/after comparison simply compares the net benefits at T0 with those at T1 under the with-project case.



The illustrations below compare the correct approach (on the left) for the incremental analysis with the wrong approach (on the right). As seen in the wrong approach, people tend to overestimate the benefits without taking into account those that the existing project is expected to bring about under the without-project case where the new project is not undertaken.



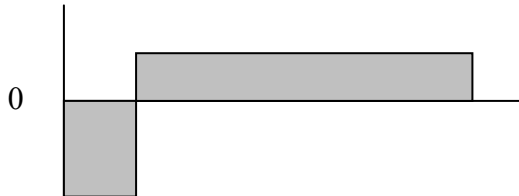
### 2 Incremental analysis using the spreadsheet

In a way similar to that of the with-project case, all the data and information related to the without-project case will be arranged in the parameter table. The net cash flow from

the with-project case and the without-project case will be calculated. The incremental net cash flow will be obtained by subtracting one from the other.

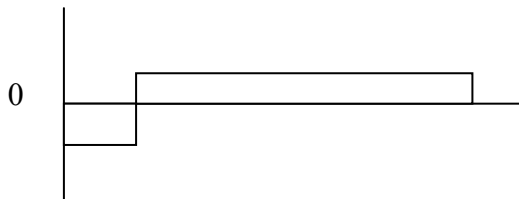
(1) With-project case

Year	0	1	2	3
Cash inflow	0	150	150	150
Cash outflow	300	0	0	0
NCF (1)	-300	150	150	150



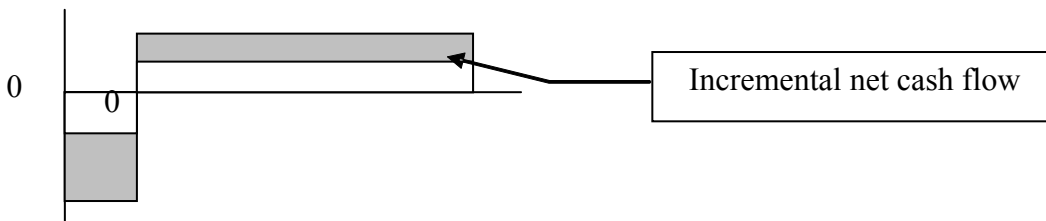
(2) Without-project case

Year	0	1	2	3
Cash inflow	0	50	50	50
Cash outflow	120	0	0	0
NCF (2)	-120	50	50	50



(3) Incremental net cash flow

Year	0	1	2	3
NCF (1)-(2)	-180	100	100	100



The case of a motorbike taxi

At the end of Year 0, you are given a motor cycle. You have a choice of whether to sell it on the market at 5 million VND (the value of the bike does not change from the previous year if not used) or operate a motorbike taxi service for one year to earn 4 million VND at the end of Year 1 with no liquidation value.

(1) With-project case: Operation of motorbike taxi for one year

Year	0	1
Cash inflow	0	6
Cash outflow	5	2
NCF (1)	-5	4

(2) Without-project case: Sales of motorbike at the end of Year 1

Year	0	1
Cash inflow	0	5
Cash outflow	5	0
NCF (2)	-5	5

(3) Incremental net cash flow

Year	0	1
NCF (1) – (2)	0	-1

### 3 Sunk cost, in-use value and liquidation value

**Sunk cost:** Previous expenditures are referred to as “historical costs” or “sunk costs” and must be disregarded in the evaluation of incremental investments.

**In-use value** and **liquidation value:** The point at which assets from previous expenditures need to be considered in the appraisal of a new project occurs when these assets could have been sold if the new investment were not undertaken but are instead integrated into the new facilities when the project is undertaken. In these cases, it is not the historical cost of previous expenditures, but rather the **liquidation value** of the existing assets that is relevant. If assets are to be retained, their liquidation values should be included in the costs of a project that will keep the activity going. If the existing facilities could be sold as a going concern rather than liquidated, then the resource cost of the existing facilities to be included as a cost of the project is the **in-use value** of the assets. The resource cost is always the greater of the scrap value or the in-use value of the existing assets (Jenkins and Harberger [1991]).

## Technical Note 7.2 - Example of Excel spreadsheet table format on the attached CD

Refer to the case study “Is Acacia a good option?” in Annex 3 of F/S Manual (Volume IV).

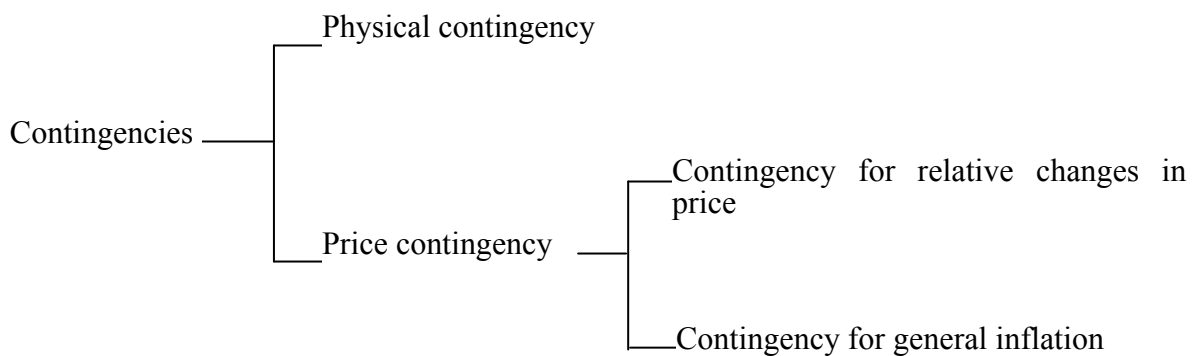
## Technical Note 7.3 - Contingencies

### 1 Why do we incorporate contingencies into the cost estimates?

Sound project planning requires that provision be made in advance for possible adverse changes in physical conditions and/or prices that would add to the baseline costs.<sup>32</sup> Possible adverse changes stem from various factors such as modifications in design that would necessitate changes in the physical work, exceptional conditions such as unanticipated geological formations, adverse phenomena such as floods, landslides or unusually bad weather, and unexpected downturn of the economy. Contingency allowances are thus included as a regular part of the project cost estimates.

### 2 Types of contingencies

Gittinger (1982: p.53-54) classifies contingency allowances into the two categories of physical contingencies and price contingencies. Price contingency allowances comprise two categories, those for relative changes in price and those for general inflation.



“Physical contingencies and price contingencies that provide for increases in relative costs underlie our expectation that physical changes and relative price changes are likely to occur, even though we cannot forecast with confidence just how their influence will be felt. Increase in the use of real goods and services represented by the physical

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<sup>32</sup> Baseline costs are best estimates of project costs at a specified date, assuming that: (1) quantities of work, goods and services and relevant prices are accurately known; (2) quantities and prices will not change during implementation, and (3) the project will be implemented exactly as planned.

contingency allowance is a real cost and will reduce the final goods and services available for other purposes; that is, it will reduce the national income and, hence, is a cost to the society. Similarly, a rise in the relative cost of an item implies that its productivity elsewhere in the society has increased; that is, its potential contribution to national income has risen. A greater value is forgone by using the item for our project; hence, there is a larger reduction in national income. Physical contingency allowances and price contingency allowances for relative changes in price, then, are expected – if unallocated – project costs, and they properly form part of the cost base when measures of project worth are calculated.

General inflation, however, poses a different problem. As we will note (...) in discussing future prices, in project analysis the most common means of dealing with inflation is to work in constant prices, on the assumption that all prices will be affected equally by any rise in the general price level. This permits valid comparisons among alternative projects. If inflation is expected to be significant, however, provision for its effects on project costs needs to be made in the project financing plan so that an adequate budget is obtained. Contingency allowances for inflation would not, however, be included among the costs in project accounts other than the financing plan.”<sup>33 34</sup>

### **3 Explanation of price contingency**

Gittinger explains that the price contingency allowances for relative changes in price are expected project costs. The examples below compare Case A in which no relative changes in prices are expected with Case B where relative changes in prices are expected. In Case A, the seedling prices of both *Acacia hybrid* and *Acacia mangium* are expected to increase by the same proportion so that there will be no change in the relative price. On the other hand, in Case B, the seedling price of *Acacia hybrid* increases from 500 VND/seedling in Year 1 to 600 VND/seedling in Year 2, while the seedling price of *Acacia mangium* decreases from 400 VND/seedling in Year 1 to 300 VND/seedling in Year 2. As a result, the relative price in Case 2 changes from 1.25 to 2.00, meaning that the price of *Acacia hybrid* is relatively higher than that of *Acacia mangium*.

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<sup>33</sup> Gittinger, J.P., *Economic Analysis of Agricultural Projects*. Baltimore, Md.: Johns Hopkins University Press, 1982.

<sup>34</sup> With regard to the last sentence of the quotation, there is, however, some debate about the extent of inflation's impact on the results of the financial analysis, as explained in the section that follows this Technical Note.

### Case A

*Unit: VND/Seedling*

Year	Year 1	Year 2
Seedling ( <i>Acacia hybrid</i> )	500	550
Seedling ( <i>Acacia mangium</i> )	400	440
Relative price	1.25	1.25

### Case B

*Unit: VND/Seedling*

Year	Year 1	Year 2
Seedling ( <i>Acacia hybrid</i> )	500	600
Seedling ( <i>Acacia mangium</i> )	400	300
Relative price	1.25	2.00

Note: Only relative changes in prices are expected over the two periods in the case of Case B above.

In terms of the contingencies for general inflation, Gittinger explains that they would not be included in the project costs except when the financing plan is prepared. This is because all prices are expected to be affected equally by any rise in the general price level, so they will not reduce the availability of the goods and services for other use if compared with the situation under no inflation. However, Jenkins and Harberger (1991)<sup>35</sup> argue that there are a number of ways in which changes in the general level of prices can and do affect the financial and economic performance of projects. They list six principal ways in which movements in the general price level can have an impact on the financial analysis of a project. These are described as follows:

(1) If the project will entail loan or equity financing for future outlays, the amount required will depend on the amount of price inflation that has taken place.

(2) As most countries that levy corporation income taxes base the deductions for depreciation expense on the historical cost of the depreciable assets, inflation will cause the relative value of this deduction to fall, resulting in an increase in the real amount of income tax liabilities relative to the no-inflation situation.

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<sup>35</sup> Jenkins, Glenn P. and Harberger, Arnold C. [1991], Program on Investment Appraisal and Management. Harvard Institute for International Development.

(3) Because companies in many countries are required to carry the value of inventories in their accounts on a first-in-first-out (FIFO) basis, the oldest inventories are the ones that are included in the cost of goods sold, resulting in an inflated real tax burden.

(4) Inflation will alter the real net financial cash flow of a project through its impact on nominal interest rates.

(5) The increased nominal interest payments have an impact on the income tax liabilities of the enterprise, as in most countries interest payments are deductible from income for the calculation of taxable income.

(6) Inflation will have an impact on the real value of cash balances held in order to facilitate transactions.

It should also be noted that Jenkins and Harberger point out that it is only the financial analysis of the project that is directly altered by inflation. However, if the financial viability of a project is lowered and as a result its operations are constrained, this is likely to have a significant impact on the project's economic performance.

#### **4 Incorporation of the contingencies in the analysis**

The contingencies will be incorporated in the expenditure plan of the project. Allowances for physical contingencies reflect increases in the base-cost estimates of a project due to changes in quantities, methods and the implementation period. The acceptable ranges of the physical contingencies will vary from sector to sector as well as for the various components of a project.

Price contingency is expressed as a percentage of the baseline costs plus physical contingencies. Case C below shows an example of a one (1) year project to show the calculation of the physical and price contingencies. In this example, all the investment takes place in Year 1, and physical and price contingencies are set at 5% and 10% respectively. As seen in Case C, calculation is made firstly on the physical contingencies and then on the price contingencies. Changing the order of the calculation will produce different results as in Case D, although the total amount for Cases C and D is the same.



Example:

The duration of the project is one (1) year.

All the investment takes place in Year 1.

The expected rate of inflation is 10% per year, and the inflation index in Year 1 is 1.1 (=1.1<sup>1</sup>).

Case C (correct)		Case D (wrong)	
Baseline cost	100.0	Baseline cost	100.0
Physical contingency (5%)	5.0	Price contingency (10%)	10.0
Price contingency (10%)	10.5	Physical contingency (5%)	5.5
Total	115.5	Total	115.5



Price contingency =  
(baseline cost + physical contingency) \* (inflation index - 1)  
= (100 + 5) \* (1.1 - 1) = 10.5

## **Technical Note 7.4 – Constant (or real) price vs. current (or nominal) price, and Consumer Price Index**

### **1 Constant (or real price) vs. current (or nominal) price**

In general, current or nominal prices refer to those expressed at the time when the prices of goods and services are measured. On the other hand, constant or real prices will be obtained after adjusting nominal prices with inflation.<sup>36</sup> Gittinger (1982: p.496) compares “real” and “nominal” in terms of physical quantity and money value, respectively, as follows: [R]eal reflects the physical quantities of goods or amounts of services. A financial price or economic value quoted in real terms refers to the same physical quantity of goods or actual amount of services whenever it appears in a series. A financial price or economic value quoted in money (or nominal) terms refers to the monetary prices of goods and services and, because of the effect of general price inflation, may vary at different times even though it refers to the same quantity of goods and services.

Constant or real prices are obtained by adjusting nominal prices with inflation.<sup>37</sup> Inflation is measured by several economic indicators such as the consumer price index and producer price index.

Suppose that the wage rate of a farmer was 25,000 VND/man-day a year ago. This year the rate increased to 30,000 VND/man-day. Although this means that the nominal wage rate increased by 20% over the previous year, it does not necessarily mean that the purchasing power of the farmer increased by the same extent. This year’s wage rate needs to be adjusted with the inflation rate. If the rate of inflation over the previous period was 20%, the purchasing power of the farmer remains unchanged. The wage rate of the farmer did not change in terms of real or constant prices.

### **2 Consumer Price Index as an indicator to estimate the rate of inflation in the future**

For the purpose of forecasting the future inflation rate, various data and information, including the monetary policy of the central bank and the trend of the exchange rate, may be referred to. However, due to the easy availability of the data, the

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<sup>36</sup> For the sake of simplicity, nominal price is used interchangeably with current price and real price with constant price in this text. However, real prices, in fact, do not necessarily remain constant over time but change in response to changes in the underlying conditions of demand and supply of the goods.

<sup>37</sup> Inflation is defined as “a sustained rise in the general price level. The proportionate rate of increase in the general price level per unit of time .” (MIT Dictionary of Modern Economics)

Consumer Price Index in the past few years can be made use of as a basis to forecast an expected rate of inflation.

The Consumer Price Index (CPI) is an indicator reflecting the tendency and change in the price of a “basket” of selected consumer goods and services over a certain period of time. The price of the basket in the base period is set at 100, and is calculated for future periods as a percentage compared to the base period. The goods and services in the basket used to measure CPI are popular ones used by consumers. They are revised and updated every five years.

The weight to calculate CPI is the expenditure proportion of each commodity group as compared to the total annual expenditures of households. It is gathered from the household living standard survey and used for five years. The Laspeyres formula is utilized to calculate CPI as follows:

$$CPI = \frac{\sum P_t Q_0}{\sum P_0 Q_0} \times 100$$

Where:  $P_0$  = Price in base period

$Q_0$  = Volume of goods and services in base period

$P_t$  = Price in reported period

As an example, Vietnam’s CPI in the last four years is shown in the table below. It is compared with the trend of the Producer Price Index (PPI). The average annual increase in CPI and PPI ranges from 4 to 5% with an increasing trend.

Index	2001	2002	2003	2004	Average annual increase (%)
Consumer Price Index (CPI)	100.8	104.0	103.0	109.5	4.3
Producer Price Index (PPI)	96.2	107.4	106.9	108.7	4.8

Source: Statistical Yearbook in 2004, NSO

### 3 Adjustment of nominal and real prices with inflation

The rate of inflation may change year after year, but because of difficulties in forecasting changes in the inflation rate, it is assumed that the expected rate of inflation is constant during the project life.

The following table can be constructed to calculate the yearly changes in the nominal price for Good X:

Year	Year 0	Year 1	Year 2	Year 3
Expected rate of inflation	5%	5%	5%	5%
Inflation index (cumulative inflation rate) (a)	1.00	1.05	1.10	1.15
Good X (current price) (b)	100	105	110	115
Good X (constant price) (b)/(a)	100	100	100	100

The inflation index or cumulative inflation rate is calculated based on the expected rate of inflation. By multiplying the constant or real price of Good X with the inflation index, current prices for Good X can be obtained for each of the years. If the current prices are divided by the inflation index, the constant prices are obtained for the base year of Year 0.

## **Technical Note 7.5 – Farm gate price<sup>38</sup>**

In order to properly estimate the benefits and costs of the project, technical inputs and costs are first identified and then valued at market prices. To find market prices for the inputs and outputs, inquiries will be made on actual prices in recent transactions, and consultation will be made with various sources such as farmers, merchants, retailers, manufacturers, importers and exporters, extension officers and government offices. Published or privately held statistics about national and international markets will also be examined.

A good rule for determining a market price for agricultural commodities produced in a project implemented with the participation of farmers is to seek the price at the point of first sale. If the point of first sale is in a relatively competitive market, then the level at which the commodity is sold in this market is probably a relatively good estimate of its value in economic as well as financial terms.

The best point of first sale to use is generally the boundary of the farm. We pay attention to what farmers receive when they sell their products - the “farm gate” price. Usually the price at the point of first sale can be accepted as the farm gate price; even if this point is in a nearby village market, the farmers sell their outputs there and thus earn for themselves any fee that might be involved in transporting the commodity from the farm to the point of first sale. However, if any new equipment is necessary to enable the farmers to do this – say, a new bullock cart or a new truck – then that new equipment must be shown as a cost incurred to realize the marketing benefit in the project.

In the project area of Thai Nguyen Province, it was often heard that traders used to purchase standing trees at stumpage prices. In this case, we can apply stumpage prices as the sale prices that farmers receive by selling trees. Meanwhile, the stumpage price is also estimated by subtracting from the factory gate prices necessary expenses such as felling, logging and transportation costs to bring the materials to the factory as a nearby particle-board factory purchases wood materials at factory gate prices. The estimated stumpage prices can be compared with those offered by traders in order to study the appropriate price level for the analysis.

The concept of the farm gate price (the price at the boundary of the farm) is also applied to input materials such as seedlings and fertilizer. Inquiries will be made on how much farmers pay when they purchase these input materials. Prices at a nearby retailer can

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<sup>38</sup> In preparing this note, reference was made to Gittinger (1982: p.70).

also be accepted, although farmers use motorcycles to transport materials to their farms, forests or houses. However, if any new investment is required to transport a larger amount of materials for the project implemented, for instance, by a forest enterprise, the cost of transport equipment and its operation needs to be taken into consideration.

If the prices in a reasonably competitive market or in the price records kept by the government's statistical service include services not properly attributable to investment in the project itself, adjustments need to be made to the market price in order to reduce it to the farm gate price. If the farm gate price is a poor indicator of the true opportunity cost to be used for the economic analysis, the price distortion needs to be corrected in the economic analysis.

## **Technical Note 7.6 - Labor costs**

Labor accounts for a large portion of the investment cost in the production forest and agro-forestry projects. As an example, the production forest project prepared in Thai Nguyen Province revealed that the labor cost is more than 70% of the baseline cost of a one-ha model. A number of discussions are being held on the labor costs.

### **1 Cost of family labor**

According to Gittinger (1982: p.138-139), the general principle is to value family labor at its opportunity cost; that is, the benefit the family must forgo to participate in the project. The cost of family labor is taken to be the amount the family could earn in its next most remunerative alternative without the project. To accomplish this, the farm budget must compare the with-project situation against the without-project situation, and off-farm labor income must be included in the budget - at least if there is to be any change in the amount earned from off-farm labor.

The cost of the family labor needed to adopt the with-project cropping pattern, then, is the labor income in the without-project situation that must be given up. If the number of days of off-farm work must be reduced for the farm family to participate in the project, to that extent the cost of incremental family labor is the off-farm wage.

If the with-project cropping pattern calls for a shift of family labor from one production activity on the farm to another, the cost of the labor shifted is implicitly set at the labor income forgone in the without-project activity.

Finally, if more total family labor is called for in the with-project cropping pattern than in the pattern without the project, (...), this additional labor is implicitly priced at an opportunity cost of zero, since no income must be forgone to use the labor in the with-project cropping pattern. This assumes, in effect, that the family would have worked more days of the year in the without-project situation had there been suitable opportunities available either through additional farm work or off the farm. Any incremental labor needed in the with-project cropping pattern compared against the without-project cropping pattern plus off-farm employment is assumed to be taken from undesired leisure given up....

However, some debate exists with regard to the assumption of an opportunity cost of zero, as described in the following section.

## 2 Economic opportunity cost of labor in rural areas : unskilled labor

Jenkins and Harberger (1991) present a proposition that the rural market wage rate is a good measure of the marginal productivity of rural unskilled labor. According to them, fifteen to forty per cent of labor in the agriculture sector is associated with landless labor in almost all rural sectors of developing countries. Since no extended family that already has surplus labor can be expected at the same time to employ additional landless labor, they expect that the wage of the landless labor will be pushed down to at least the level of the marginal productivity of the extended family labor in agriculture. At the same time, they argue that the hypothesis that a great deal of time is spent idle in the rural extended family situation has been shown to be a myth by citing the fact that even in India, the average landless agricultural laborer works some 250 full-time equivalent days per year. As rural laborers almost never pay income taxes unless working for a government project, the rural wage of the unskilled landless is considered a measure of the economic opportunity cost of rural labor.

Jenkins and Harberger pay attention to the timing of the project's demand for unskilled laborers as compared to the seasonal demand for labor in agriculture. If the seasonality of demand for rural laborers and their wage rates precludes the use of a simple annual average for the economic opportunity cost of labor used in a project, the weighted average can be calculated. It will be equal to the rural wage rate for that particular month ( $W_{ri}$ ) times the share ( $K_i$ ) of the total yearly man-months of that type of labor employed in that particular month ( $i$ ). The average economic opportunity cost of unskilled laborers ( $EOCLur$ ) for a year can be expressed as follows:

$$\text{Average economic opportunity cost of unskilled labor} = EOCLur = \sum_{i=1}^{12} K_i * W_{ri}$$

Where  $i$  is the month of the year,  $K_i$  is the share of the total yearly man-months of labor of a similar type being employed in that particular month, and  $W_{ri}$  is the rural wage rate for that particular month.



**Technical Note 7.7 - Sample Questionnaire Form used in Phu Binh District, Thai Nguyen Province**

**Questionnaire format to rural wage earners**

Questionnaire Interviewer \_\_\_\_\_ Code \_\_\_\_\_  
 Date \_\_\_\_\_  
 Place \_\_\_\_\_

We are conducting a socio-economic survey to find out about lives of farmers. We would like to ask you some questions, and would very much appreciate your participation in this survey. It will take about 10 minutes. Participation is voluntary, and you can choose not to answer any individual question or all the questions. The information obtained will be used only for study purposes. Do you have any questions about this survey? May we begin the interview with you?

1. Age: \_\_\_\_\_ Male/ Female
2. Family structure
  - Husband = \_\_\_\_\_ (age)
  - Wife = \_\_\_\_\_ (age)
  - Child 1 = \_\_\_\_\_ (age)
  - Child 2 = \_\_\_\_\_ (age)
  - Others (.....) = \_\_\_\_\_ (age)
3. Village and district \_\_\_\_\_
4. How long does it take to this market? \_\_\_\_\_ minutes
5. Mode of transportation \_\_\_\_\_
6. Type of products you are selling today \_\_\_\_\_
7. Average daily sales \_\_\_\_\_
  - (1) \_\_\_\_\_ unit price \_\_\_\_\_ VND/ x quantity sold \_\_\_\_\_ =
  - (2) \_\_\_\_\_ unit price \_\_\_\_\_ VND/ x quantity sold \_\_\_\_\_ =
  - (3) \_\_\_\_\_ unit price \_\_\_\_\_ VND/ x quantity sold \_\_\_\_\_ =
8. How long does it usually take to sell all the products? From \_\_\_\_\_ to \_\_\_\_\_
9. Which months of the year do you come to sell these products?  
 \_\_\_\_\_
10. When were the products you are selling today planted? \_\_\_\_\_
11. What is the size of your paddy field? \_\_\_\_\_ M2
12. What is the size of your garden? \_\_\_\_\_ M2
13. What is the size of your forest land? \_\_\_\_\_ M2
14. What domestic animals do you raise? \_\_\_\_\_
15. What is the rural wage rate in your area? \_\_\_\_\_ VND/man-day

Thank you very much for your cooperation.

## Technical Note 7.8 – Discounting and discount rate

### 1 Discounting

“Discounting” implies a greater weight on present benefits and costs compared to the future. This is because money available at present allows profitable investment or consumption between present and future so that borrowers of a loan are willing to pay a positive interest rate for the use of the funds, while lenders

will receive an interest payment on the loan.

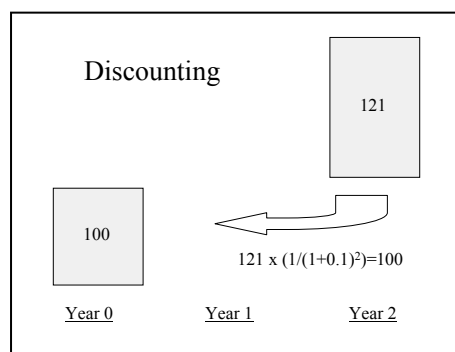
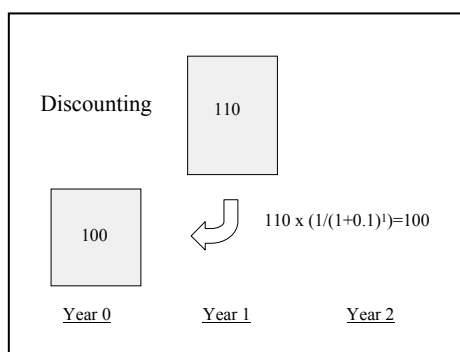
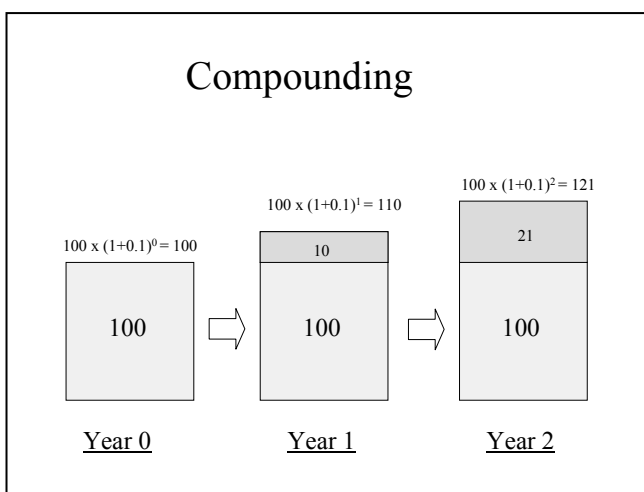
If  $r$  is an interest rate and is equal to 10%,

100 VND in Year 0 will become  $100 \times (1+r) = 100 \times (1+10\%)^1 = 110$  VND in Year 1, and  $100 \times (1+10\%)^2 = 121$  VND in Year 2. This is known as compounding.

If  $r$  is a discount rate and is equal to 10%, 110 VND in Year 1 will become  $110 / (1+r) = 110 / (1+10\%)^1 = 100$  VND in Year 0, and 121 VND in Year 2 will become  $121 / (1+r)^2 = 121 / (1+10\%)^2 = 100$  VND in Year 0. This is known as discounting, and  $1 / (1+r)^t$  is the discount factor for Year  $t$ .

The present values of net benefits in respective years are calculated by multiplying the discount factors with the values of the net benefits for the corresponding years. The table below shows an example of calculating present values from Year 0 to Year 2.

As an analytical convention, it is implicitly assumed that every transaction falls at the end of the accounting period.



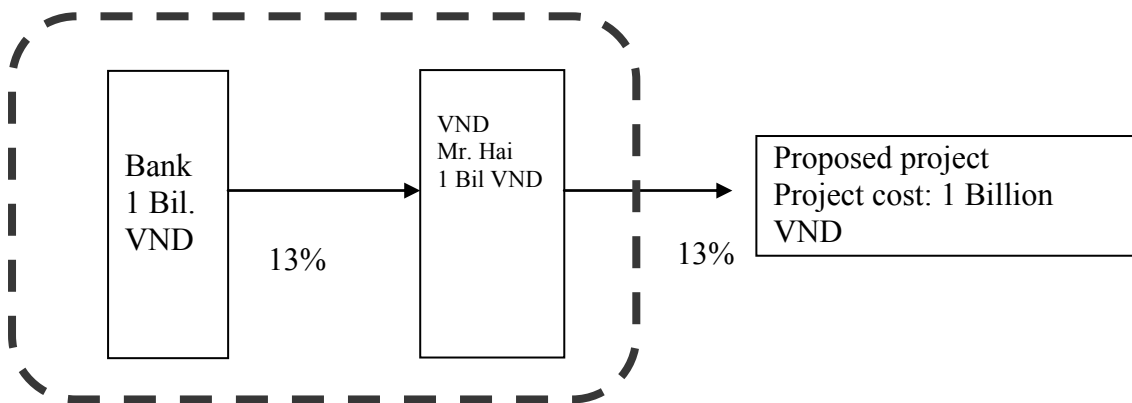
## Cash Flow Table

	Year 0	Year 1	Year 2
Receipt (a)	200	240	270
Expenditure (b)	100	130	149
Net Benefits (c)=(a) – (b)	100	110	121
Discounting Factor (d)	$1/(1+0.1)^0$	$1/(1+0.1)^1$	$1/(1+0.1)^2$
Present Value (c) * (d)	100	100	100

### 2 Discount rate

For private sector investment, the appropriate rate of discount is derived from the private cost of funds that the firm must pay to finance new investments. This cost of funds is derived as the weighted average cost of funds obtained through the sale of equity (or retained earnings) and the cost of borrowed funds.

Suppose Mr. Hai borrows 1 billion VND from a bank at an annual interest rate of 13% and invests the entire amount in Project A (it is assumed that there is no equity participation from Mr. Hai). In this case, the discount rate Mr. Hai applies to analyze the feasibility of the proposed project will be 13%.



### 3 Economic opportunity cost of capital

On the other hand, the discount rate for economic evaluation of projects is different from the weighted average private financial cost of capital. It should reflect the economic return foregone by the economy as the investment activities expand because other investment activities are displaced (perhaps postponed) and because private consumption is decreased in order to free up resources for the project to be undertaken.

## Technical Note 7.9 – Investment criteria<sup>39</sup>

The three investment criteria (Net Present Value, Internal Rate of Return and Benefit-Cost Ratio) are explained in this technical note.

### 1 Net Present Value (NPV)

#### 1.1 What is Net Present Value (NPV)?

Net Present Value (NPV) is obtained by summing up present values of the net benefits over the length of the project life. This is expressed algebraically as follows:

<p>Net Present Value</p> $NPV_r^0 = \frac{B_0 - C_0}{(1+r)^0} + \frac{B_1 - C_1}{(1+r)^1} + \dots + \frac{B_n - C_n}{(1+r)^n}$ <p><i>B</i>: Benefits <i>C</i>: Costs <i>r</i>: Discount Rate <i>t</i>: time period (month, year)</p>	$NPV_r^0 = \sum_{t=0}^n \frac{B_t - C_t}{(1+r)^t}$ <p><i>B</i>: Benefits <i>C</i>: Costs <i>r</i>: Discount Rate <i>t</i>: time period</p>
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#### 1.2 When should projects be rejected if the NPV criterion is to be used?

The following rules will be applied for the evaluation of the project.

**NPV Rule 1:** Do not accept any project unless it generates a positive net present value when discounted by the opportunity cost of funds.

**NPV Rule 2:** Within the limit of a fixed budget, choose the subset of the available projects that maximizes net present value.

Example:

The following projects have been nominated to be selected for implementation with a fixed budget.

Project E costs 1 billion VND: NPV 60 million VND

Project F costs 3 billion VND: NPV 400 million VND

Project G costs 2 billion VND: NPV 150 million VND

Project H costs 2 billion VND: NPV 225 million VND

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<sup>39</sup> In preparing this note, reference was made to Glenn P. Jenkins and Arnold C. Harberger (1991).

If the budget is fixed at 4 billion VND, Projects E and F will be undertaken. If Project E has an NPV of negative 60 million VND, the best strategy is to undertake only Project F and put the remaining 1 billion VND of the budget to use in the capital market.

**NPV Rule 3:** In a situation where there is no budget constraint but a project must be chosen from mutually exclusive alternatives, we should always choose the alternative that generates the largest net present value.

Project I costs 1 billion VND: NPV 300 million VND

Project J costs 4 billion VND: NPV 700 million VND

Project K costs 1.5 billion VND: NPV 600 million VND

Since the above projects are mutually exclusive (i.e. it may not be possible to undertake more than one project), only Project J will be undertaken. Compare Project J with Project K. On the incremental investment of 2.5 billion VND, if we undertake Project J instead of Project K, there is an incremental gain in net present value of 100 million VND over and above the opportunity cost of the additional investment. In undertaking Project I instead of Project J, it is assumed that we could only expect to obtain an NPV of 0 by investing the remaining funds in the marginal Project L, which does not appear on the above list of projects. This is necessarily implied by the use of the opportunity cost of funds as the rate of discount. Thus, the combination of Project I plus the other Project L would also cost 4 billion VND, but its NPV would be only 300 million VND.

NPV measures the value or surplus generated by a project over and above what would be produced by these funds if not used in alternative investments.

## 2 Internal Rate of Return (IRR)

To calculate the NPV, the discount rate is given and used to find the present value of benefits and costs. In contrast, the Internal Rate of Return (IRR) is obtained by setting the NPV of the net benefit stream to zero. The IRR is the rate of discount that provides the solution to the equation on the right.

$$\sum_{t=0}^n \frac{B_t - C_t}{(1 + K)^t}$$

where:

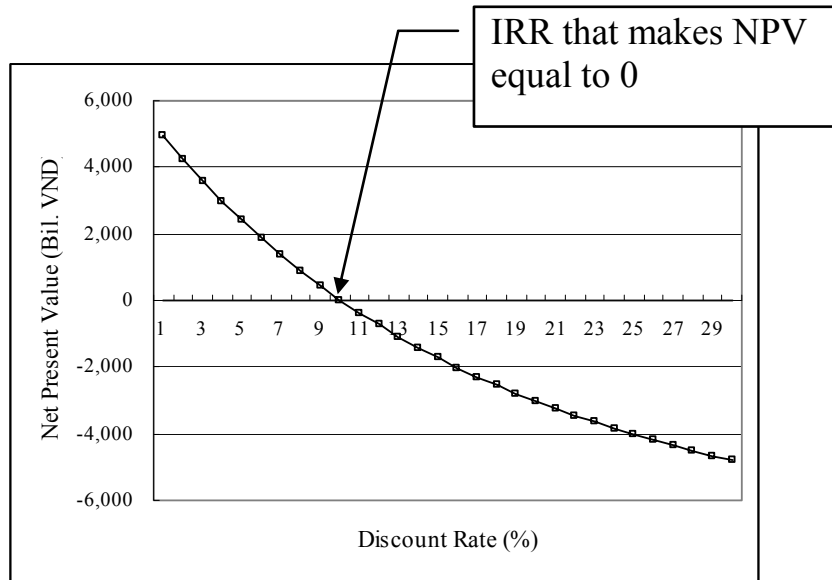
*B*: Benefits

*C*: Costs

*k* : Internal Rate of Return

*t* : time period

The following graph shows the relationships between the discount rate, NPV and IRR:



As an example, the IRR of the net cash flow below will be zero, as a discount rate of zero will make the NPV equal to zero.

*Unit: million VND*

	Year 0	Year 1
<b>Benefit</b>	0	120
<b>Investment</b>	100	0
<b>Operating Costs</b>	0	20
<b>Net Benefit (Net Cash flow)</b>	-100	100

The IRR of the net cash flow below will be 10%, indicating that the capital invested in the project will produce a yield of 10% after allowing for capital recovery.

*Unit: million VND*

	Year 0	Year 1
<b>Benefit</b>	0	130
<b>Investment</b>	100	0
<b>Operating Costs</b>	0	20
<b>Net Benefit (Net Cash flow)</b>	-100	110

The advantage of the IRR lies in the fact that it can be calculated on the basis of the project data without obtaining the opportunity cost of capital. On the other hand, there are

several disadvantages to which attention should be paid.

**Disadvantage 1: Multiple solutions**

If the net benefit stream is negative during the initial investment period and then positive for the rest of the project life, there will be a unique solution for the IRR. However, for projects with a net benefit stream that changes from negative values to positive more than once, it may be possible to have multiple solutions for the equation. The example below illustrates two solutions for the equation: one is 0% and the other 100%.

*Unit: million VND*

	Year 0	Year 1	Year 2
Benefit		320	10
Cost	100	20	-210
Net Benefits	-100	300	-200

**Disadvantage 2:** When projects are strict alternatives (i.e. it may not be possible for both projects to be undertaken for technical reasons) and require different sizes of investment

In the examples below, Project A produces an NPV of 27.2 million VND with an IRR of 40%, while Project B has an NPV of 181 million with an IRR of 30%. If IRR criterion is applied, Project A will be taken up, but if the NPV criterion is applied, Project B will be selected.

*Unit: Million VND*

Project A	Year 0	Year 1
Net Cash Flow (NCF)	-100	140
Discounted at 10%	-100	127.2
NPV at 10%	27.2	

Project B	Year 0	Year 1
Net Cash Flow (NCF)	-1,000	1,300
Discounted at 10%	-100	1,181
NPV at 10%	181	

**Disadvantage 3:** When projects are strict alternatives and have different lengths of life

In the examples below, Project A produces an NPV of 18.1 million VND with an IRR of 30%, while Project B has an NPV of 23.9 million VND with an IRR of 22%. If the

IRR criterion is applied, Project A will be taken up, but if the NPV criterion is applied, Project B will be selected.

*Unit: million VND*

Project A	Year 0	Year 1	Year 2
Net Cash Flow	-100	130	
Discounted at 10%	-100	118.1	
NPV at 10%	18.1		
IRR	30%		

Project B	Year 0	Year 1	Year 2
Net Cash Flow	-100	0	150
Discounted at 10%	-100	0	123.9
NPV at 10%	23.9		
IRR	22%		

**Disadvantage 4:** When projects are strict alternatives and represent different timings in the same project

In the examples below, Project A produces an NPV of 18.1 million VND with an IRR of 30%, while the project B has an NPV of 16.5 million VND with an IRR of 30%. The IRR criterion does not tell us which project should be taken.

*Unit: million VND*

Project A	Year 0	Year 1	Year 2
Net Cash Flow	-100	130	0
Discounted at 10%	-100	118.1	0
NPV at 10%	18.1		
IRR	30%		

Project B	Year 0	Year 1	Year 2
Net Cash Flow	0	-100	130
Discounted at 10%	0	-90.9	107.4
NPV at 10%	16.5		
IRR	30%		



### 3 Benefit – Cost Ratio (B/C Ratio)

The Benefit-Cost Ratio (B/C Ratio) is calculated by dividing the present value of benefits by the present value of costs, using the opportunity cost of funds as the discount rate. In this investment criterion, for a project to be accepted, the ratio must have a value greater than one. For choices among mutually exclusive projects, the rule is to choose the alternative with the highest B/C Ratio. However, this criterion could produce a ranking different from that based on the NPV. In the example below (which shows three mutually exclusive projects), Project A will be taken up if the B/C Ratio is used, while Project B will be selected if NPV is applied.

The B/C Ratio is also sensitive to the way in which costs have been defined by the accountants in setting out cash flows. As an example, the cash flow item for receipts could be recorded either net of these sales taxes or gross of sales taxes with sales taxes recorded as an offsetting cash outflow.

	PV of Benefits	PV of Costs	NPV	BC Ratio
Project A	4 Bil. VND	1 Bil.VND	3 Bil.VND	4.0
Project B	9 Bil. VND	5 Bil. VND	4 Bil. VND	1.8
Project C	5 Bil. VND	3 Bil. VND	2 Bil. VND	1.6

## Technical Note 7.10 – Loan schedule

### 1 Loan amount and outstanding balance

To construct a loan schedule, several terminologies need to be recalled. As an example, if a total loan amount of 100 million VND is disbursed, the outstanding balance of the loan is 100 million VND. If a portion of the loan (e.g. 70 million VND out of the 100 million VND) is repaid, the outstanding balance, which is uncollected or not repaid, will become 30 million VND ( $30 = 100 - 70$ ). The interest is charged against the outstanding balance of the loan.

$$\text{Total Loan Amount} - \text{Repaid Amount} = \text{Outstanding Balance}$$

Total Loan Amount 100 Million VND	
70 Mil VND	30 Mil
Repaid amount	Outstanding balance

In order to calculate the loan disbursement and repayment schedule, the following table may be used.

Item	Item	Year 0	Year 1	Year 2
Outstanding balance at beginning of year	(a)	0	100	30
Disbursement (at end of year)	(b)	100	0	0
Repayment (at end of year)				
Interest (10% p.a.)	(c) = (a) x annual interest rate	0	10	3
Principal	(d)	0	70	30
Outstanding balance at end of year	(e) = (a) + (b) – (d)	100	30	0

### 2 Fixed interest rate vs. variable interest rate

When examining the interest rate, it is necessary to obtain information on whether it is fixed or variable. A variable interest rate is one that varies as inter-bank interest rates change, while a fixed rate will remain unchanged throughout the agreed period.

### 3 Nominal interest rate vs. real interest rate<sup>40</sup>

The market interest rates referred to by financial institutions are expressed in nominal terms. The nominal interest rate ( $i$ ) determined in financial markets is made up of at least three components:

( $r$ ) is an element reflecting the real-time value of money that lenders require in order to be willing to forego consumption or other investment opportunities;

( $R$ ) is a risk element measuring the compensation that lenders demand to cover the possibility of the borrower defaulting on the loan;

$(1+r+R) \cdot {}_gP^e$  is an element representing compensation for the expected loss in the real purchasing power of the loan principal still outstanding because of the expected future rate of inflation  ${}_gP^e$ .

The nominal or market rate of interest ( $i$ ) can be expressed as:

$$i = r + R + (1+r+R) \cdot {}_gP^e$$

For the sake of simplicity, let us put the risk element ( $R$ ) together with element ( $r$ ). Then, the following formula is presented.

$$i = r + (1+r) \cdot {}_gP^e$$

If  $r$  is 5% p.a. and  ${}_gP^e$  is 3% under the conditions above, the nominal interest rate ( $i$ ) is calculated as:

$$\begin{aligned} i &= r + (1+r) \cdot {}_gP^e \\ &= 5\% + (1+5\%) \cdot 3\% \\ &= 8.15\% \text{ p.a.} \end{aligned}$$

Likewise, if the nominal interest rate is 8.15%, the real interest rate is calculated as 5% using the following formula:

$$r = (i - {}_gP^e) / (1 + {}_gP^e) = (8.15\% - 3\%) / (1 + 3\%) = 5\%$$

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<sup>40</sup> Reference was made to the following: Glenn P. Jenkins and Arnold C. Harberger, Program on Investment Appraisal and Management, 1991, HIID.

## Technical Note 7.11 – Sensitivity analysis

### 1 What is sensitivity analysis?

Sensitivity analysis is an analytical technique to test systematically what happens to the earning capacity of a project if events differ from the estimates made about them in planning. Sensitivity analysis is performed by varying one element or a combination of elements and determining the effect of that change on the outcome, most often on the results of the project evaluation by applying the investment criteria. In agricultural project analysis, most projects should be tested at least for the effects on earning capacity of changes in prices, cost overrun, delay in implementation, and changes in yield (Gittinger, 1982: p.498).

### 2 Sensitivity analysis of the F/S in Thai Nguyen Province

The sensitivity analysis of the F/S in Phu Binh District of Thai Nguyen Province was conducted by first identifying factors likely to have a greater impact on the outcome of the project. Such factors may range from prices to quantities, schedules, models and a combination of these different factors. NPV may be calculated for each benefit and cost component to check the likely impact of the changes at the initial stage of the analysis.

As an example, the F/S examined how changes in the prices of wood materials and labor cost per man-day would affect the NPV, IRR and B/C Ratio. The tables below were prepared to show the results of the analysis.

**Table of sensitivity analysis for output price**

Table of sensitivity analysis - output price - wood materials				
(%)	Unit price (VND/m <sup>3</sup> )	NPV (at real discount rate of 10%)	IRR	B/C Ratio
100%				
90%				
...				

**Table of sensitivity analysis for input price**

Table of sensitivity analysis - input price - labor man-day			
Unit cost (VND/man-day)	NPV (at real discount rate of 10%)	IRR	BC Ratio
40.000			
38.500			
...			

The table below summarizes the extent to which changes in the loan amount, labor cost per man-day and interest rates affect NPV and IRR.

**Table of sensitivity analysis for the impact of changes in loan amount, unit labor man-day and interest rate**

Conditions changed				Value		
Loan amount		Man-day	Unit cost man-day	Interest rate (%)	NPV (Thou. VND)	IRR (%)
85% total cost		Man-day	38,500 VND			
			25,000 VND			
			15,000 VND			
70% total cost		Man-day	38,500 VND			
			25,000 VND			
			15,000 VND			
50% total cost		Man-day	38,500 VND			
			25,000 VND			
			15,000 VND			

### 3 Switching value

The variation of the sensitivity analysis determines the switching value. It is the value that an element of a project would have to reach as a result of a change in an unfavorable direction before the project no longer meets the minimum level of acceptability as indicated by the investment criteria (Gittinger, 1982: p.501).

## Technical Note 7.12 - Brief explanation of conversion from financial price to economic price, and comparison of different viewpoints

### Question: Why do we need to convert prices?

The objective of the economic analysis is to examine a project from society's overall viewpoint in order to determine whether its implementation will improve the economic welfare of the society. The contribution of the project to economic welfare is studied by applying economic investment criteria such as Net Present Value (NPV) using the economic discount rate and economic internal rate of return (EIRR). For calculation, financial prices are adjusted to economic prices. Economic prices are those that reflect economic benefits and costs to society, i.e. the opportunity cost to society.<sup>41</sup>

When we conduct a project, we utilize economic resources. These include, for example, various types of labor, capital, land and entrepreneurship. Since the resources of every society are not abundant but are limited or scarce, the ability of every society to produce goods and services is also limited. Because of this scarcity, all societies face the problems of what to produce, how to produce and from whom to produce. In an economy where the government does not control economic activities and where no externalities and monopolistic enterprises exist, all these problems are solved by the price mechanism in the market. However, in reality, market prices do not necessarily reflect scarcity values to society due to *market distortions* (a state in which the market price of an item is different from the economic price) created by the government and/or the private sector.

If the economy is characterized by few distortions, market (financial) prices are used as a reasonably good approximation of the opportunity costs of inputs and outputs to the society. However, if the economy is characterized by distortions, market (financial) prices are a poor reflection of opportunity costs.

### Question: What prices do we need to convert?

In principle, all prices should be adjusted to reflect opportunity costs to society (i.e. converted to economic prices). However, these calculations would be extremely time-consuming and expensive. If the share of inputs in the total project cost is small and the results of the analysis are not sensitive to variations in their prices, conversion may not

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<sup>41</sup> The opportunity cost is the benefit foregone by using a scarce resource for one purpose instead of for its next best alternative. Suppose you produce rice and maize but apply fertilizer only to rice. If you transfer some of the fertilizer to your maize, you would reduce the value of your rice production somewhat, but you might gain a much higher value from your increased maize production instead. The value of your rice production foregone would be the opportunity cost of the fertilizer used for your maize production.

be worth the cost and time it involves. In practice, only a few adjustments are undertaken. The important price adjustments are for (1) transfer payments, (2) tradable goods, (3) wage rate and (4) exchange rate. Other adjustments may also be made for (5) the opportunity cost of public funds and (6) externalities. The F/S team may conduct the sensitivity analysis for these variables and examine whether the change affects their conclusion for the analysis.

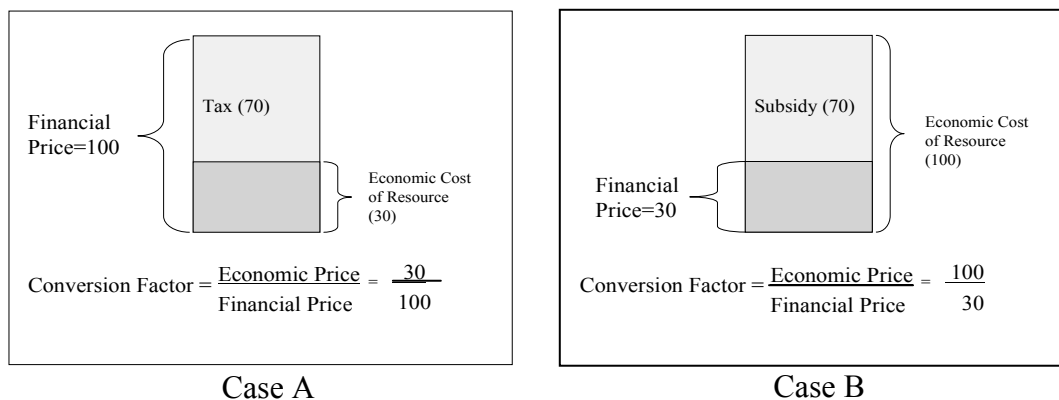
**Question: How do we convert?**

(1) Price adjustment for transfer payments

As an example, taxes and subsidies are treated as transfer items, not economic costs. An income tax payment by the forest enterprise is a cash outflow from the enterprise but a cash inflow to the government. A subsidy for the forest enterprise is a cash inflow to the enterprise but a cash outflow from the government. The flows between the government and the forest enterprise cancel each other out from the viewpoint of society. Another example of a transfer payment is represented by loans from banks and the repayment of the principal and interest from borrowers.

Although the results of the analysis differ depending on demand and supply conditions, the illustration below shows a simplified comparison of financial and economic prices for input materials involving taxes and subsidies. These may be input materials such as fertilizer including sales taxes and seedlings provided at subsidized prices.

**Simplified comparison of financial and economic prices for input materials with taxes and subsidies at producer level**



(2) Price adjustment for tradables

Tradables include both traded and potentially tradable goods, while non-tradables are those that by their nature either cannot be traded or are uneconomical to trade

internationally. The international market is **competitive** and less distorted than domestic markets. International market prices can therefore be used as **economic prices (opportunity costs to society)**.

As an example, the prices of importable inputs may consist of the CIF (Cost, Insurance and Freight) price of the imported good, tariffs and subsidies, the trade profits of local wholesalers and retailers, and transportation costs from the port to the project site. As an example of importable inputs, the economic price of fertilizer can be calculated as follows:

#### Example of estimation of economic price for importable inputs (fertilizer)

Item	Phân bón (SSP)	Unit
World market prices of fertilizer - Giá phân bón tại thị trường thế giới	80	US\$/ton
Quality adjustment - Điều chỉnh chất lượng	0%	
Ocean freight - Phí vận chuyển biển	25	US\$/ton
CIF - Phí bảo hiểm vận chuyển hàng hoá	105	US\$/ton
Port charges - Lệ phí cảng	7	US\$/ton
Landed price - Giá tại cầu tàu	1,232	1000VND/ton
Transport costs, etc. - Chi phí vận chuyển v.v.		
Port to wholesaler - Bán sỉ tại cảng	150	1000VND/ton
Wholesaler to retailer - Từ người bán buôn đến người bán lẻ	400	1000VND/ton
Trading/marketing profit - Cận biên thương mại/thị trường	276	1000VND/ton
Ex-retailer economic value - Giá trị kinh tế bán lẻ Ex	2,058	1000VND/ton
Transport from retailer to farm - Vận chuyển từ người bán lẻ đến trang trại	50	1000VND/ton
Conversion of economic price		
Economic farm/forest gate price - Giá tại cửa rừng	2,108	1000VND/ton
Financial price - Giá tài chính	2,000	1000VND/ton
Conversion factor - Nhân tố chuyển đổi	105%	

Source: FAO/ADB, "Forestry Sector and Watershed Management Project – Preparation Report," April 1996.

#### Note:

- 1) Exchange rate 11,000 VND/US\$
- 2) CIF (Cost, Insurance and Freight): The landed cost of an import on the dock or other entry point in the receiving country. It includes the costs of international freight and insurance, and often also includes the cost of unloading onto the dock. It excludes any charges after the import touches the dock, and excludes all domestic tariffs and other taxes or fees.



As an example of exportable outputs, the economic price of timber for woodchips at the forest gate can be calculated as shown below.

**Example of estimation of economic price for exportable outputs (timber for woodchips)**

		Woodchips - Dăm gỗ (in m3)	
	World market price of woodchips - Giá ở thị trường thế giới	116	US\$/m3
	Quality adjustment - Điều chỉnh chất lượng	0%	
	Ocean freight - Cước phí vận chuyển đường biển	-25	US\$/m3
	Port charges - Phí cảng biển	-8	US\$/m3
	FOB price - Giá FOB	83	US\$/m3
	FOB price - Giá FOB	912	1000VND/m3
Transport cost etc. - Chi phí vận chuyển v.v.			
	Wholesaler to port - Từ nhà bán buôn đến cảng	-20	1000VND/m3
	Processor to wholesaler - Nhà máy đến nhà bán buôn	-300	1000VND/m3
	Wholesale margin - Cận biên bán sỉ	-45	1000VND/m3
At the factory - Tại nhà máy			
	Ex-factory economic value (a) - Giá trị kinh tế tại cửa ra của nhà máy (a)	547	1000VND/m3
	Conversion rate (b) - Tỷ lệ chuyển đổi (b)	54%	
	After conversion rate is applied (a) x (b) - Sau khi áp dụng tỷ lệ chuyển đổi: (a) x (b)	295	
	Processing costs - Chi phí chế biến	-80	1000VND/m3
	Factory gate price of timber - Giá gỗ tròn tại cổng vào của nhà máy chế biến	215	
Transport cost - Chi phí vận chuyển			
	Transport from farm to processor- Vận chuyển từ trang trại đến nhà máy chế biến	-50	1000VND/m3
Calculation of conversion factor - Tính toán hệ số chuyển đổi			
	Economic forest gate price - Giá kinh tế của gỗ tròn tại cổng trang trại	165	1000VND/m3
	Financial price - Giá tài chính	110	1000VND/m3
	Conversion factor - Hệ số chuyển đổi	150%	

Source: FAO/ADB, "Forestry Sector and Watershed Management Project – Preparation Report," April 1996.

**Note:**

- 1) Exchange rate 11,000 VND/US\$
- 2) FOB (Free on Board): The price of an export loaded onto the ship that will carry it to foreign buyers.

### (3) Price adjustment for wage rate

Labor can be classified into unskilled and skilled labor. In the case of **unskilled labor**, the rural wage rate (market rate) in the project area is a good approximation of the opportunity cost of labor. The wage rate in the project area can be checked to find the rural wage rate through interviewing a number of farmers.

In the case of **skilled labor**, a shortage may be found in rural areas. Skilled workers who are used to urban life styles will demand a higher wage to work on a project in a rural area. To calculate the economic opportunity cost of skilled labor, we have to consider how much they would receive as income and pay as taxes in an urban area. For the sake of simplicity, the financial wage rate that the project plans to pay to skilled labor was used for preparation of the feasibility study in Thai Nguyen Province.

### (4) Price adjustment for foreign exchange

Prices expressed in foreign currencies should be converted to their domestic equivalents using the official or market exchange rate. These rates may not reflect the true economic value due to trade policies (e.g. import duties, quantitative restrictions, export subsidies and export taxes). If the official or market exchange rate is considered to be far from the economic value, and the foreign component takes a larger share of the investment and outputs, it is important to consider price adjustments for the foreign exchange. However, it is sufficient to use the prevailing exchange rate for the feasibility study under FICAB in the existing economic conditions.

### (5) Opportunity cost of public funds

Theoretically, the economic opportunity cost of public funds is a weighted average of the rate of time preference for consumption and the rate of return on private investment.<sup>42</sup> In the economic analysis of the feasibility study, the economic discount rate of 10% (the real discount rate) is considered appropriate. As an example, international financial institutions such as the World Bank use 10 to 12 percent for evaluating the economic aspects of Bank-financed projects.

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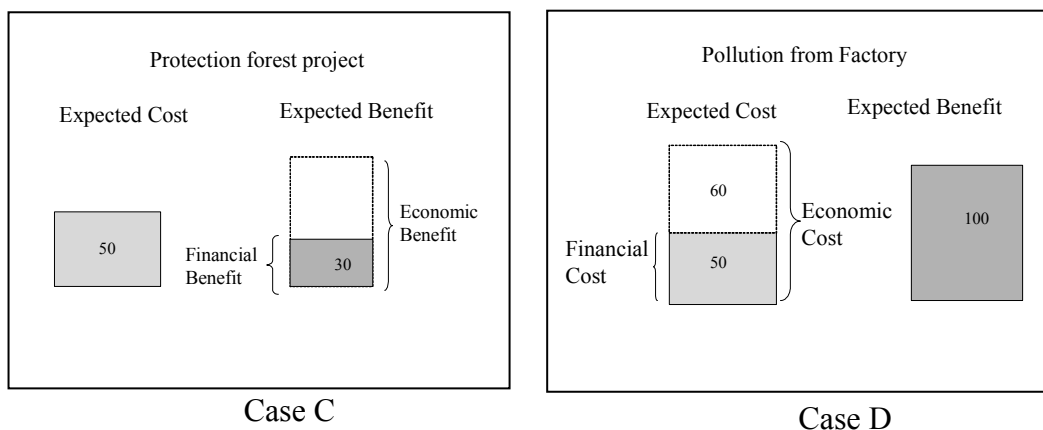
<sup>42</sup> There has been some debate over the choice of discount rate to be used in economic analysis (Jenkins G. P. and Harberger, A.C.[1991]).

## (6) Externalities

An externality is a cost or benefit from an economic transaction that parties "external" to the transaction bear. It can be described as the difference between the benefits (costs) that accrue to society and those that accrue to the project entity, the farmers participating in the project etc.

Even if the expected benefits are far greater than the expected costs, the project may not be implemented if only financial benefits are taken into account. Case C in the diagram below describes an example where an afforestation project protects watersheds but is not financially attractive. Such external benefits are called externalities, and these are specifically positive externalities. Case D, on the other hand, describes an example of a negative externality. In this case, a factory produces pollution that has a negative impact on local residents in the area, but these residents are not compensated for such an impact.

The factory bears costs that are far lower than they should be.



As quantitative tools are required to monetize the value of externalities, qualitative description of the positive and negative externalities of the project will be sufficient in the feasibility report under FICAB. If negative externalities are expected, it is important to incorporate mitigating measures into the project design.

### Comparison of different viewpoints<sup>43</sup>

The economic analysis will be undertaken from the viewpoint of the country as a whole. In the case of the financial analysis, examination is conducted from various perspectives such as a total investment viewpoint, a project owner's viewpoint and a

<sup>43</sup> In preparing this note, Jenkins G. P. and Harberger, A.C.[1991] was referred.

government viewpoint. The following equations compare the differences in variables depending on the analysis.

(1) Economic analysis

Country as a whole=

total benefits – costs (both investment and operating) valued at economic prices

(2) Financial analysis from different viewpoints

As explained earlier, the financial analysis of the project can be performed from the perspective of different parties. As an example, the formula below compares (a) the total investment viewpoint with (b) the farmer’s viewpoint and (c) the viewpoint of the government budget office.

(a) Total investment viewpoint =

direct financial benefits – direct financial costs

– opportunity cost of existing facilities

(b) Farmer’s Viewpoint =

direct financial benefits – direct financial costs

– opportunity cost of existing facilities + loan – repayment of interest and principal

(c) Government budget office =

direct and indirect taxes and fees – direct and indirect subsidies and other outlays

**Financial analysis vs. economic analysis**

It is important to implement projects that are attractive from both a financial and a social point of view. However, what is the best way to consider cases where the financial and economic analyses lead to different results? The following table represents four possible cases.

		Economic viewpoint (country as a whole)	
		+	-
Financial viewpoint of a private entity	+	Case (a)	Case (b)
	-	Case (c)	Case (d)

In each of these cases, the following considerations will be made:

Case (a): The project ought to be undertaken because it generates net benefits to both the private entity and the economy.

Case (d): The project generates net losses to both parties and should not be undertaken.

Case (b): The project is profitable to the private entity but unprofitable to society. This is a case of negative externality. If the government announces taxation on the concerned activities of the private entity, the entity may find it unprofitable to implement the project. Thus, the activities will be shifted from (b) to (d).

Case (c): The project generates net economic benefits to society but net losses to the private entity. The private entity will therefore not undertake the project on its own. Such projects may include the cultivation of trees to enhance watershed protection, biodiversity and erosion control. If the government provides subsidies to encourage the private entity to invest in the activity, the project will shift from Case (c) to (a).

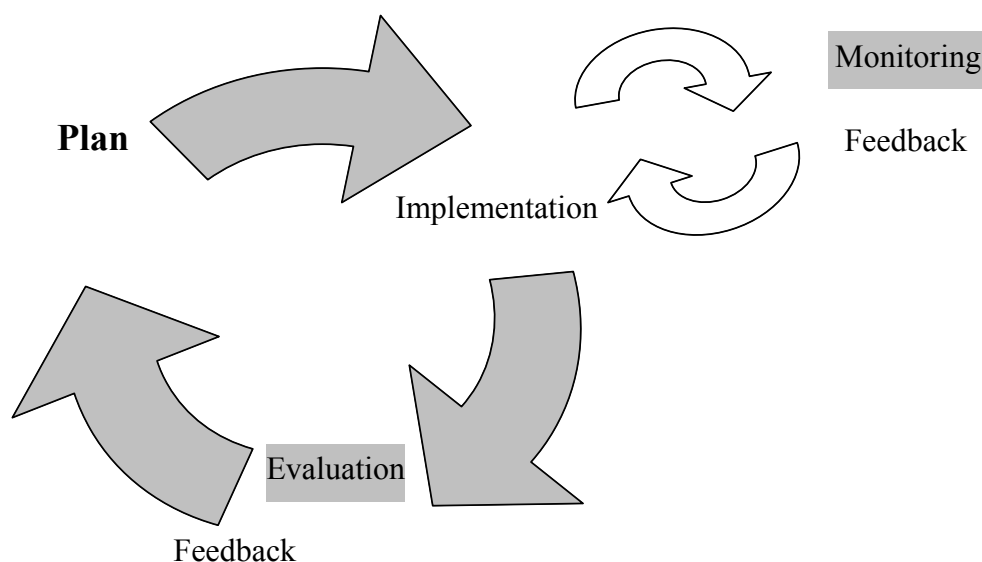
In order for socially profitable projects to be implemented, they must be designed to be financially viable. On the other hand, projects that are financially attractive but have negative economic returns will cause damage to the economy and are worse than doing nothing

## Chapter 8. Monitoring and Evaluation of Project Results

### 8.1 Purpose of monitoring and evaluation (M & E)

Monitoring aims to check the progress of an on-going project against the plan and make any necessary modifications to the plan in consideration of the achievement of the results. Evaluation, on the other hand, systematically and objectively examines the results of the project as it progresses or at/after its completion. Analysis of factors in the evaluation that may be the causes of success or failure for the project will help to improve the design of successive phases of the project or other projects.

In a simplified model of a project cycle, the monitoring and evaluation stages are outlined below.



Monitoring and evaluation of the project are conducted in consideration of the Project Design Matrix (PDM) or the logical framework (see Technical Note 8.2 for an example of a PDM) and the overall plan of the project (see Technical Note 8.3 for an example of an overall plan of the project). While monitoring centers on inputs, activities, outputs and the project objective in terms of the PDM, evaluation focuses on all the results of the project, particularly the achievement of the project objective and the overall goal. For the monitoring and evaluation, institutional arrangements will be required. The monitoring, which takes place at appropriate times and with sufficient information, will enable the implementing agency of the project to utilize the results swiftly and make the necessary adjustments to the plan and/or activities. It is therefore preferable for monitoring to be undertaken by those directly involved in the project's activities. Evaluation, on the

other hand, aims to make recommendations on the future course of the project and draw out lessons for other projects. As this requires a more objective perspective, it is preferable for it to be undertaken by a third party that is independent from the planner and the implementer. In order to evaluate the project from various perspectives, it is also important to include experts from different fields.<sup>44</sup> The project may need to set aside a portion of budget for the purpose of M & E.

 **Technical Note 8.1 – Purpose and definition of monitoring and evaluation**

 **Technical Note 8.2 – Project Design Matrix (PDM)**

 **Technical Note 8.3 - Example of Overall Plan of the Project**

The Technical Notes 8.1 to 8.5 provide more detailed explanations of the relevant topics at the end of this chapter on the monitoring and evaluation of project results.

The table below briefly compares the major characteristics of monitoring and evaluation.

**Table 1: Comparison of Major Characteristics of Monitoring and Evaluation**

	Monitoring	Evaluation
Objective	Improvement of the quality of the project Improvement of the quality of other projects Improvement of the transparency of the use of funds	
Definition	- Ascertaining the status of progress - Revision of the plan and/or activities if necessary	- Judgment of the results of a completed or on-going project - Improvement of on-going and other projects using lessons learned
Main focus in terms of PDM	Inputs, activities, outputs, and project objective	Project objective and overall goal, results based on the five evaluation criteria
Timing	During the implementation period	During the implementation period, upon completion and/or after completion of the project.
Conducted by	In principle, those involved in its implementation	In principle, a third party consisting of experts in different fields

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<sup>44</sup> In fact, the difference between the terms “monitoring” and “evaluation” is not always clear depending on the documents used.

## **8.2 Monitoring and evaluation in F/S and IP reports**

The monitoring and evaluation (M&E) will form part of the project plan to be described in Part 2: Chapter 7 of the F/S report and Part 2: Chapter 7 of the IP. These chapters describe M & E indicators and the institutional mechanism for conducting M & E. If separate budgets are required for the M & E activities, the amount needs to be estimated and included in the project cost.

## **8.3 Methodology of monitoring and evaluation**

### **8.3.1 *Monitoring***

The monitoring of the project is conducted against the project plan in terms of the inputs, the progress of activities, the achievement of outputs and the project objective, and also for other items such as internal and external conditions (especially critical assumptions). For the purpose of monitoring, various indicators are set in accordance with the project's outputs and objective, and the overall plan of the project and monitoring and evaluation plan will be used to examine whether or not the project implementation is on schedule.

During the monitoring process, if a gap is found between the actual conditions and the project plan, or if a problem is found in the process, the causes of the discrepancy will be identified. In order to analyze the causes of problems and devise proper counter-measures, it is useful to refer to the vertical logical relationship of the PDM. As an example, if monitoring reveals that the project objective is not likely to be achieved, attention will be paid to the outputs or imperfections in the critical assumptions for the outputs. If there is a defect in the outputs, the corresponding activities or critical assumptions will be examined.

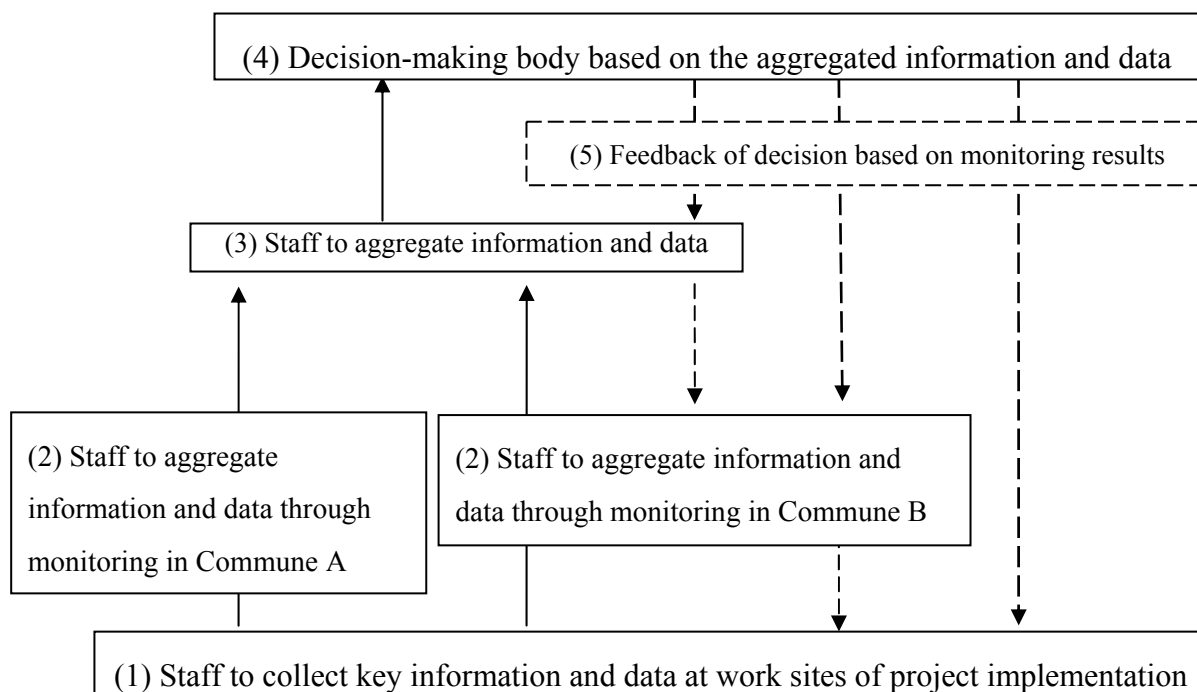
A monitoring system must be established to monitor the project for improvement. The following are the important points to be considered:

- (1) Identification and collection of key information and data for monitoring
- (2) Staff members, timing, frequency and methods for aggregating data and information at a lower level of the implementing agency
- (3) Staff members, timing, frequency and methods for aggregating data and information at a higher level of the implementing agency
- (4) People responsible for decision-making based on the monitoring results
- (5) Methods and timing of feedback on the monitoring results



The figure below illustrates the flow of information from (1) identification and collection of key information at work sites to (5) feedback of decision.

**Figure 1: Monitoring Mechanism and Information Flow**



In the case of Thai Nguyen Province, it is planned that the Project Management Board (PMB) and Project Implementation Units (PIUs) would take responsibility for monitoring the project. The staff (extension workers) of each PIU will collect information and data from the work sites and sent it to the PMB. The staff (the technical and extension coordinator) of the PMB will aggregate the information and data from the PIUs and submit the results to the director of the PMB for decision-making. Depending on the type of information and data, it should also be sent to the District People’s Committee (DPC), the Provincial People’s Committee (PPC) and other relevant agencies. If it is difficult to collect readily available information and data generated within the implementation arrangements, it is necessary to institute data collection activities within the project.

### 8.3.2 Evaluation

Evaluation of the project begins with the preparation of an evaluation plan, which specifies the purpose of the evaluation, methods, evaluators, costs, timing etc. As a methodology for the evaluation of the project, the five evaluation criteria (relevance, effectiveness, efficiency, impact and sustainability) can be used, and the causes of any problems are analyzed. In the case of JICA, examples of the major checkpoints in terminal

evaluation studies of the project are described in accordance with the following five evaluation criteria:<sup>45</sup>

(1) Relevance:

Examines the justifiability or necessity of project implementation

(2) Effectiveness

Examines the effects of the project

(3) Efficiency

Examines the efficiency of the project

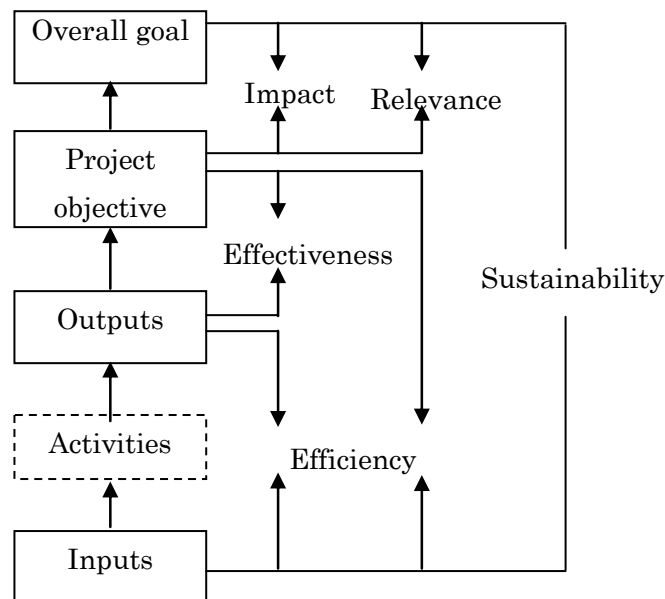
(4) Impact

Examines the project's effects, including ripple effects in the long term

(5) Sustainability

Examines sustainability after the termination of the assistance.

**Figure 2: Relationships between the five evaluation criteria**



The relationships between the five evaluation criteria and the Project Design Matrix (PDM or logical framework) are shown in the figure above. For a more detailed explanation of the five evaluation criteria, refer to Technical Note 8.5 – Five evaluation criteria.

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<sup>45</sup> JICA Guideline for Project Evaluation (2004), JICA.

**Technical Note 8.4 - Monitoring and Evaluation Plan**

**Technical Note 8.5 – Five evaluation criteria**

Possible focuses in setting survey items for the five evaluation criteria are explained in the table below:

**Table 2: Possible focuses in setting survey items for the five evaluation criteria**

Criteria	Description of criteria	Possible focuses in setting survey items for evaluation
Relevance	Considers whether the project objective and overall goal are meaningful.	<ul style="list-style-type: none"> <li>- Are the project objective and overall goal consistent with government policy, the needs of the target beneficiary and the policy stance of the donors/funding institutions?</li> <li>- Are the project objective and overall goal appropriate from broader viewpoints such as those of the market, the environment and society?</li> <li>- What are the causes of consistency, inconsistency and adequacy in the factors discussed above?</li> </ul>
Effectiveness	Examines the extent to which the project objective has been or is expected to be achieved as a result of the outputs.	<ul style="list-style-type: none"> <li>- Do the indicators for the project objective show the consequences of outputs? Alternatively, look for survey items that help clarify the relationship between the project objective and outputs.</li> <li>- Examine the actual results for the indicators or survey items.</li> <li>- Check the status of external conditions and analyze what effects they have on the project objective.</li> <li>- Study and analyze the factors that contributed to (or hindered) the achievement (or failure) of the project objective.</li> </ul>
Efficiency	Concerns the productivity of the implementation process. This cost effectiveness is examined by referring to the relationships between the inputs and outputs, and inputs and project objective.	<ul style="list-style-type: none"> <li>- Confirm how high outputs have been achieved using indicators of outputs.</li> <li>- Confirm what was inputted during the project implementation period.</li> <li>- Focus on main inputs, and check whether they were used in a manner that should contribute to the achievement of outputs.</li> <li>- Study and analyze the factors related to the status of output achievement and the extent to which inputs were applied. For this purpose, various factors may be examined: the implementation of related activities, the organizational management, critical assumptions, preconditions, the proposal of the project plan, the appropriateness of modifications and so on.</li> </ul>
Impacts	Direct and indirect, positive and negative effects or influences of the project on entities and/or people inside and outside it. The overall goals of the project are considered as expected positive effects.	<ul style="list-style-type: none"> <li>- To what extent has the overall goal been achieved? Is this the result of achieving the project objective?</li> <li>- What positive or negative effects has the project had on each item from broader viewpoints such as those of the environment and society?</li> <li>- Regional spread: has the implementation of the project caused any effect or influence on areas outside the project area?</li> <li>- What changes have been brought about in the lives of the target beneficiary?</li> <li>- What were the factors that caused the above effects?</li> </ul>
Sustainability	Examines whether the benefits of the project	<ul style="list-style-type: none"> <li>- The following points should be noted for the evaluation at the completion of the project:</li> </ul>

Criteria	Description of criteria	Possible focuses in setting survey items for evaluation
	implementation will continue after its completion. Emphasis is placed on the self-reliance of the project. Concerns all levels of the PDM (logical framework).	<p>Will the activities initiated by the project be continued after completion?</p> <p>Will the investment necessary for activities be continued after completion?</p> <p>Will pursuit of the outputs and project objective continue after completion?</p> <p>Will the overall goal be achieved and maintained in the future?</p> <p>What were the reasons for the existing conditions?</p> <p>- Taking the above points into consideration, the following organizations will be studied in terms of personnel, budgets, the decision-making process etc.:</p> <p>The implementing agency that has been responsible for achievement of the project objective</p> <p>The management group that set policy directions for the project</p> <p>Groups that the project has tried to organize</p> <p>Supporting group that supported implementation of the project</p> <p>Other organizations that played important roles in the implementation of the project</p>

In the case of the feasibility study in Thai Nguyen Province, mid-term and final evaluations were planned to evaluate the project performance through a third party.

Reference
FASID [2004], Project Cycle Management – management tool for development assistance – Participatory Planning.
FASID [2004], Project Cycle Management – management tool for development assistance- Monitoring & Evaluation (M & E).
JICA [2004], JICA Guideline for Project Evaluation – Practical Methods for Project Evaluation.
UNDP, Handbook on monitoring and evaluation for results.

## **Technical Note 8.1 – Purpose and definition of monitoring and evaluation**

Definitions of monitoring and evaluation are given by a number of institutions involved in development assistance.

### **1 Japan International Cooperation Agency**

As is the case with other donor agencies, the Japan International Cooperation Agency (JICA) conducts monitoring and evaluation of projects.<sup>46</sup> JICA sets the following three objectives for the use of evaluation: 1) a tool for project cycle management, 2) a tool for enhancing learning effects for more effective project management, and 3) to ensure accountability. Thus, monitoring and evaluation is considered as a management tool for improvement of development assistance and to ensure accountability to the public.

### **2 Foundation for Advanced Studies on International Development**

The Foundation for Advanced Studies on International Development (FASID) defines monitoring as “an ongoing process designed to determine the progress of an active project in light of the activity plan and indicators, and to modify the plan if necessary”. Evaluation is defined by FASID as “a process designed to judge the results of a completed or ongoing project in terms of the five evaluation criteria (relevance, effectiveness, efficiency, impact, and sustainability) systematically and objectively, and to help improve ongoing and other projects”.

### **3 United Nations Development Programme**

According to the United Nations Development Programme (UNDP), monitoring is defined as “a continuing function that aims primarily to provide the management and main stakeholders of an ongoing intervention with early indications of progress, or lack thereof, in the achievement of results. An ongoing intervention might be a project, programme or other kind of support to an outcome”. On the other hand, evaluation is regarded as “a selective exercise that attempts to systematically and objectively assess progress towards and the achievement of an outcome. Evaluation is not a one-time event, but an exercise involving assessments of differing scope and depth carried out at several points in time in response to evolving needs for evaluative knowledge and learning during the effort to achieve an outcome. All evaluations - even project evaluations that assess relevance, performance and other criteria - need to be linked to outcomes as opposed to only implementation or immediate outputs”.

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<sup>46</sup> In the JICA Guideline for Project Evaluation (2004), the word “evaluation” is used in a broader sense. The project-level evaluation is classified into four types depending on the evaluation to be conducted at the different levels: ex-ante evaluation, mid-term evaluation, terminal evaluation and ex-post evaluation.

## **Technical Note 8.2 – Project Design Matrix (PDM)**

The matrix on the following page shows the PDM prepared during the feasibility study in Thai Nguyen Province. It shows examples of indicators with means of verification and critical assumptions together with a narrative summary.

Indicators for the M & E will be selected to examine achievement in an objective manner. For each of the indicators, the type, quantity and quality of data to be collected should therefore be specified, and the frequency and timing of data collection should be clearly stated. In selecting the indicators, the reliability and accessibility of the data are critically important aspects to consider. Data sources including names of organizations, places, methods and names of documents are specified in the PDM and the monitoring and evaluation plan (refer to the “Means of verification” column in the PDM and Technical Note 8.4 Monitoring and Evaluation Plan).

Indicators can be classified into development impact indicators and progress indicators. While development impact indicators are used as measures to evaluate the achievement of the project objective and overall goal, progress indicators are used to monitor the progress of project implementation in terms of inputs, activities, outputs and the project objective.

**Project Name:** Smallholder Production Forest Development Project in Thai Nguyen Province  
**Project Area:** Ban Dat, Tan Khanh, Tan Kim, Tan Hoa Communes-Phu Binh District-Thai Nguyen Province  
**Assistance Period:** 2006 – 2013  
**Project period:** 2006 – 2020  
**Target Beneficiary:** Smallholders who have Red Books for forest land in the project area.

Version 1 Date: November 2005

Narrative summary	Indicators	Means of verification	Critical assumptions
<b>Overall Goal</b> Livelihood is improved through development of production forest in the project area.	- Poverty rate is reduced.	- Provincial/district poverty statistics	- Government support for production forests continues.
<b>Project Objective</b> The production value of the forest land is increased.	- Around 20,000 m3 (wood materials) is harvested each year from 2014 onward.	- Records of Provincial Department of Forest Protection	- Payment is promptly made as agreed between smallholders and buyers.
<b>Objective of Assistance</b> Production forest area is established in forest land.	- Around 1,500 ha of forest land is rehabilitated by 2013.	- Project implementation reports	- Demand for and sales price of wood materials remain buoyant.
<b>Outputs</b> 1. The production forest land is planted with species of commercial values. 2-1. A model loan scheme is established for production forest development projects. 2-2. Smallholders' collective negotiation capacity is enhanced. 2-3. Market linkages between smallholders and the markets are promoted. 2-4. Smallholders, extension workers and village leaders are trained in appropriate afforestation techniques and management. 3. Institutional capacity to manage the production forest development project is enhanced.	1. Forestry plantation area (around 1,500 ha) is planted with Acacia species by 2013. 2-1 Participating smallholders start to obtain institutional loans by 2008. 2-2 Production Forest Association is established in four communes by 2013. 2-3 Harvesting and marketing plans and purchasing agreements with traders are established by 2013. 2-4 About 70 training courses will be offered to participating smallholders, extension workers and village leaders. 3. One PMB and four PIUs are established by the 1 <sup>st</sup> quarter of 2006.	- Project implementation reports	- There will be an absence of natural disasters. - There will be an absence of major pest and disease outbreaks.

<b>Activities</b>	<b>Inputs</b>	
<p>1. Facilitate plantation activities by smallholders.</p> <p>2-1. Design and agree a loan scheme with financial institutions.</p> <p>2-2. Facilitate /mobilize smallholders to form farmers' groups and a Production Forest Association.</p> <p>2-3. Prepare harvesting and marketing plans and purchasing agreements with traders.</p> <p>2-4. Provide training for trainers, village support groups and smallholders.</p> <p>3. Establish a Project Management Board (PMB) in Phu Binh District and four (4) commune Project Implementation Units (PIU).</p>	<p>Total project cost: VND 21.2 billion (US\$ 1.33 million).</p> <p>(1) Production Forest Development (PFD): VND 12.9 billion (US\$0.80 million).</p> <p>(2) Support for Production Forest Development (SFFD): VND2.2 billion (US\$0.14 million).</p> <p>(3) Project Management and Monitoring &amp; Evaluation (M&amp;E): VND0.7 billion (US\$41,000).</p> <p>- PMB: 4 officers</p> <p>- PIU: 8 officers (including 4 extension workers)</p> <p>(4) Contingencies: Physical contingencies: 5%. Price contingencies: 5%.</p>	<p>- An adequate number of experienced staff and budget is allocated by the government throughout the assistance period.</p> <p>- The interest (financial and environmental) of participants in replanting is maintained.</p> <p>- Smallholders gain experience of developing production forests in infertile soils.</p>
		<p style="text-align: center;"><b>Pre-conditions</b></p> <p>-The local (provincial and district) government approves the project.</p> <p>-A loan scheme is agreed with the VBSP/VDB, with terms and conditions in line with other similar projects in Vietnam.</p>



### Technical Note 8.3 - Example of Overall Plan of the Project

Below is an example of a format for the overall plan of the project.

#### Overall Plan of the Project during the Assistance Period in the Model F/S in Thai Nguyen Province

Calendar year		2006	2007	2008	2009	2010	2011	2012	2013	Person in charge of implementation including facilitation	Principal party involved in implementation	Remarks
Implementation Year		1	2	3	4	5	6	7	8			
Activities	Expected results	Preparation period	Operation period									
<b>1. Facilitate plantation activities by smallholders.</b>	The production forest land (around 1,500 ha in total and around 200 ha/year) is planted with species of commercial value.									Director of PMB	Smallholders	Need participation of smallholders
1-1 Community mobilization												
1-2 Preparation of detailed afforestation plan												
1-3 Timber harvesting and site cleaning												
1-4 Afforestation plot design												
1-5 Site preparation												
1-6 Delivery of seedlings and fertilizer												
1-7 Refilling												
1-8 Planting												
1-9 Beating up												
1-10 Tending												
1-11 Protection												

Calendar year		2006	2007	2008	2009	2010	2011	2012	2013	Person in charge of implementation including facilitation	Principal party involved in implementation	Remarks
Implementation Year		1	2	3	4	5	6	7	8			
Activities	Expected results	Preparation period	Operation period									
1-12 M & E												
<b>2-1. Design and agree a loan scheme with financial institutions.</b>												Agreement between MARD and the financial institution
2-1-1. MARD and the financial institution agree to establish a loan scheme for the project.	Agreement between MARD and the financial institution									Director of DoF, MARD	Staff of DoF and the financial institution	
2-1-2. Experts to be employed under the project design a loan scheme in collaboration with the provincial and district branch offices of the financial institution.	Loan scheme									Director of PMB  Director of provincial branch office of the financial institution	Experts to be employed under the project and staff of the financial institution at provincial/district branches	

Note: Only part of the overall plan of the project is shown.

## Technical Note 8.4 - Monitoring and Evaluation Plan

Below is an example of a format for the Monitoring and Evaluation Plan.

### Monitoring and Evaluation Plan of the Model F/S in Thai Nguyen Province

Description	Indicators	Evaluation means	Information collection			Aggregation of information			Decision making		Decisions sent for implementation	
			Collected by	Time	Method	Sent to	Time	Method	Person/agency	Time	Time	Method
Overall goal	Poverty rate is reduced.	Statistics of Phu Binh District and TN Province	Evaluation team	December, every three years from 2014	- Collection of data from district and provincial statistics - Interview survey	DARD	December, every three years from 2014	Synthesis and analysis of collected data	Provincial PC	December, every three years from 2014	January of the following year	Evaluation report
Project objective	Around 20,000 m <sup>3</sup> (wood materials) is harvested each year from 2014 onward	Business report of particle-board factory (TNPBF), statistics of district and province (provincial department of forest protection)	Evaluation team	December, every three years from 2014	- Collection of data from district and provincial statistics - Interview survey	DARD	December, every three years from 2014	Synthesis and analysis of collected data	Provincial PC	December, every three years from 2014	January of the following year	Evaluation report
Objective of the assistance	Around 1,500 ha of forest land is rehabilitated by 2013.	Project progress report	Evaluation team, extension workers	3rd quarter of 2013	- Study existing documents and directly collect data on site - Interview survey	DARD, PIUs, technical & extension coordinator of PMB	3rd quarter of 2013	Synthesis and analysis of collected data	Provincial PC, Director of PMB	3rd quarter of 2013	4th quarter of 2013	Evaluation report, instruction from Director of PMB
Output 1												

Note: Only part of the Monitoring and Evaluation Plan is shown.

## Technical Note 8.5 – Five evaluation criteria

For the purpose of the project evaluation, the five evaluation criteria (relevance, effectiveness, efficiency, impact and sustainability) can be used, and the causes of any problems will be analyzed. Examples of the major checkpoints in evaluation studies of the project are described in accordance with the five evaluation criteria as follows<sup>47</sup>:

### (1) Relevance:

Relevance examines the justifiability or necessity of project implementation. The following perspectives are used for the examination:

**Necessity:** Was the project in line with the needs of the target beneficiary?

**Priority:** Is the project consistent with the development policy of the country?

**Suitability as a means:** Was the selection of the target beneficiary appropriate? (target, volume, gender distribution etc.)?

### (2) Effectiveness

Effectiveness examines the project's effects. The following perspectives are utilized for the examination.

**Achievement of project objective:** Was the project objective achieved?

**Causal relationships:**

- Were the outputs sufficient to achieve the project objective? Was the logic “if this output is produced, we will be able to achieve the project objective” reasonable?
- Are the critical assumptions from the outputs to the project objective also correct now? Was there any influence from the critical assumptions?
- What were the inhibiting and promoting factors for the achievement of the project objective?

### (3) Efficiency

This examines project efficiency. It is evaluated from the following perspectives:

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<sup>47</sup> Reference was made to JICA Guideline for Project Evaluation (2004), JICA. The key words used in the documents have been changed to be in line with those used in the F/S Manual.

**Production of outputs:** Is the output production adequate?

**Causal relationships:**

- Were the activities sufficient to produce the outputs?
- Are the critical assumptions from the activities to the outputs also correct now? Was there any influence from the critical assumptions?

**Timing:** Were inputs of an adequate quantity and quality performed at the right time to conduct the activities?

**Cost:** Do the outputs and the project objective justify the project cost compared to similar projects (comparison of total or unit cost with similar projects in the country)? Were there any alternative means to achieve the same outputs at a lower cost? Would it have been possible to achieve more at the same cost?

#### (4) Impact

Impact examines the project's effects, including ripple effects in the long term. The following perspectives are used for the examination:

Prospect for the achievement of the overall goal: Looking at the input and output performance and activity status, is there a prospect of the overall goal being achieved as an effect of the project? Can the effect be verified in the ex-post evaluation?

**Causal relationships:**

- Are the overall goal and the project objective consistent?
- Are the critical assumptions from the project objective to the overall goal also correct now? Is the possibility high that the critical assumptions are true?

**Ripple effects:**

- Was there any positive or negative impact beside the overall goal (e.g. influences on the establishment of policies, on the preparation of laws, systems and standards, on social and cultural aspects, on environmental protection etc.)?
- Does the impact differ depending on differences in gender, ethnic group, or class (particularly for negative impacts)?
- Are there any other negative influences?

## (5) Sustainability

This examines sustainability after the termination of assistance.<sup>48</sup> The following aspects are examined:

### **Policies and systems:**

- Will policy aid continue after the assistance by supporting groups is finished?
- For projects targeting pilot sites, will there be reliable efforts to aid their spread afterwards?

### **Organizational and financial aspects:**

- Is there sufficient organizational capacity to implement activities to produce effects even after the assistance by supporting groups has ended (assignment of human resources, decision-making process etc.)?
- Is the budget secured (including operating expenses)? Are sufficient budget measures taken on the part of the implementing agency and/or relevant local governments?
- Was (or is) the ownership of the implementing agency and/or relevant local governments assured?

### **Technical aspects:**

- Are the methods of technology transfer used in the project being accepted (level of technology, social and conventional factors etc.)?
- For pilot projects, is the technology transferable to other sites?

### **Society, culture and environment:**

- Is it possible that a sustained effect is inhibited through a lack of consideration for women, the poor and the socially vulnerable?
- Is it possible that a sustained effect is inhibited through a lack of consideration for the environment?

### **Sustainability in general:**

- Considering the above aspects as a whole, is the sustainability high or low?

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<sup>48</sup> Sustainability to be examined is the one after the termination of assistance by supporting institutions and/or the termination of the project, depending on the project plan and its M & E plan.