

APPENDICES

Appendix A: Distribution of crop calendar's cassava farmers

Table 1: Distribution of crop calendar's cassava farmers

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Select variety												
Maintain variety												
Plow												
Rest bed												
Planting												
Apply fertilizers												
Spaying herbicide												
Spaying pesticide												
Cleaning weed												
Spaying liquid fertilizer/hormone												
Pruning												
Harvesting												

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Appendix B: Breakeven analysis formulas for cassava production

Table 2: Breakeven point analysis formulas on fresh roots

Assumption						
	Units start	Units increment	Units price	Units Variable cost	Total Fixed cost	
	0	4	61.53	34.03	235.22	
Units (T)	Sale (\$)	Variable Cost (\$)	Contribution Margin (\$)	Fixed Cost (\$)	Total Cost (\$)	Net Income (\$)
0	-	-	-	235.22	235.22	(235.22)
4	246.12	136.11	110.01	235.22	371.33	(125.21)
8	492.24	272.21	220.03	235.22	507.43	(15.19)
8.55	526.08	290.93	235.16	235.22	526.15	0.00
12	738.36	408.32	330.04	235.22	643.54	94.82
16	984.48	544.42	440.06	235.22	779.64	204.84
20	1,230.60	680.53	550.07	235.22	915.75	314.85
24	1,476.72	816.64	660.08	235.22	1,051.86	424.86
28	1,722.84	952.74	770.10	235.22	1,187.96	534.88
32	1,968.96	1,088.85	880.11	235.22	1,324.07	644.89
36	2,215.08	1,224.95	990.13	235.22	1,460.17	754.91
40	2,461.20	1,361.06	1,100.14	235.22	1,596.28	864.92
44	2,707.32	1,497.17	1,210.15	235.22	1,732.39	974.93
	Breakeven x	Breakeven y	Label			
	8.55	526.23	BEU approx =8.55			

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Table 3: Breakeven point analysis formulas on dried chips

Assumption						
	Units start	Units increment	Units price	Units Variable cost	Total Fixed cost	
	0.00	2	151.18	78.01	227.97	
Units (T)	Sale (\$)	Variable Cost (\$)	Contribution Margin (\$)	Fixed Cost (\$)	Total Cost (\$)	Net Income (\$)
0	0.00	0	0	227.97	227.97	-227.97
2	302.36	156.02	146.33	227.97	384.00	-81.64
3.116	471.08	243.08	227.98	227.97	471.06	0.00
4	604.72	312.05	292.66	227.97	540.02	64.70
6	907.08	468.07	439.00	227.97	696.05	211.03
8	1,209.44	624.10	585.33	227.97	852.07	357.37
10	1,511.80	780.12	731.67	227.97	1,008.10	503.70
12	1,814.16	936.15	878.00	227.97	1,164.13	650.03
14	2,116.52	1092.18	1024.33	227.97	1,320.15	796.37
16	2,418.88	1248.20	1170.67	227.97	1,476.18	942.70
18	2,721.24	1404.23	1317.00	227.97	1,632.20	1,089.04
20	3,023.60	1560.25	1463.34	227.97	1,788.23	1,235.37
	Breakeven x	Breakeven y	Label			
	3.12	471.04	BEU approx= 3.11			

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Appendix C: Questionnaire for Cassava Producers

Questionnaire code.....Interviewer..... Date.....

Location: Village Commune District..... Province

Tel:

I. General information

- Name of respondent: Sex Male Female Age
- Education level , Illiterate Grade 1-6 Grade 7-9 Grade 10-12
 College Other (specify.....)
- Number of years have you stayed in Before, where did live?
- Number of people in your family?.....persons

Demographic characteristics of sample respondents

No.	Name of HH members	Sex Male=1 Female=2	Age	Marital status Single=1 Married=2 Divorced=3 Widowed=4	Education level Illiterate =1 Grade 1-6=2 Grade 7-9=3 Grade 10-12=4 College= 5 Other= 99 (...)	Occupation Farming= 1 Off-farm=2 Non-farm=3 1&2=4 1&3=5 2&3=6	HH Relationship HHH=1 Father=1 Mother=2 Child=3 Son-in-law=4 Sister-in-law=5 Nephew=6 Niece=7 Grandparent=8
01							
02							
03							
04							
05							
06							
07							
08							

HH=Household, HHH=Household head

2. Do you have to rent land for cassava cultivation? Yes No

If (No Please skips this question)

Plots	Date planted	Date Harvested	Yeild(T)	Planting Last Years	Planting Last 5 years	Price per season
1.....Rai						
2.....Rai						
3.....Rai						

III. Situation of cassava (Last season)

History of cassava cultivation

1. What year did you start to grow cassava?
2. Why did you start to grow it?
3. How many Rai/hectares did you plant the first time?.....
4. Before cultivating cassava, what crops did you plant on this land?
5. Where did you get variety for planting?
 - Local variety (Name:
 - Outside Variety (Name:
 - Thai Vietnam Malaysia China Others
6. Where did you obtain technical knowledge on planting cassava?
 - Self-taught Family Neighbors Government NGOs

Calendar of cassava farming

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Select variety												
Maintain variety												
Plow												
Rest bed												
Planting												
Apply fertilizers												
Spraying herbicide												
Spraying pesticide												
Cleaning weeds												
Spaying hormones												
Pruning												
Harvesting												

Cassava variety for planting now

1. Last season, how man Rai/hectares of cassava did you plant?
2. What type of variety cassava? Name
3. Why did you plant this variety?
4. Where did you get this variety for planting?
 - Their self your family Bought NGO
 - Others

If bought, how much is it per unit? .../Unit, how many units per Rai/hectares?
5. Why you do need to buy this variety?.....

6. How long do you have to wait to do cassava the harvesting, after doing planting?
7. Do you keep a variety for the next season? Yes No (why.....)
8. Please detail how you keep a variety of cassava?

Land preparation

1. How many times do you plow before planting?
 1 time 2 times 3 times (why?.....)
2. How many days do you sterilize your field (By sunlight) before planting?

Cultural practice

1. How do you plant cassava? Horizontally Vertical Inclined
 Why?
2. Please give detail how to plant cassava (Technique of cassava producer)

Technical	Methodology
<ul style="list-style-type: none"> - Plough - Size of bed row - Height of bed row - Distance of bed rows - Distance of stakes - Depth of stakes 	

Cassava management

3. Is cassava crop difficult to take care of? Yes No
 Why?
4. What is your main focus for maintenance? Please rank (1 2 3 4 5.....9)
 Pest Disease Weed Plant nutrient Others (.....)
5. What is the main factor to impact your cassava yield? (1 2 3 4 5.....9)
 Pest Disease Weed Soil Variety Maintain
 Climate changes Others (...)
6. Do you apply fertilizer on your cassava farm? Yes No
 (If no skip to question 8)
7. How much times do you apply it? 1 time 2 times 3times
 First time, how many units? Units, How much per unit?
 Compost fertilizer Chemical fertilizer Compost/Chemical fertilize
 Hormone Others (Why.....)
- Second time, how many units? Units, How much per unit?
 Compost fertilizer Chemical fertilizer Compost/Chemical fertilize
 Hormone Others (Why?
- Third time, how many units? Units, How much per unit?

Compost fertilizer Chemical fertilizer Compost/Chemical fertilize

Hormone Others (Why?

8. Do you use pesticide chemical? Yes No (If no skip to question 9)

First time, how many units? Units, How much per unit?

Name of pesticide chemical: Make in.....

Why?

Second time, how many units? Units, How much per unit?

Name of pesticide chemical: Make in.....

Why?

Third time, how many units? Units, How much per unit?

Name of pesticide chemical: Make in.....

Why?

9. Do you use herbicide chemical? Yes No (If no skip to question 10)

First time, how many units? Units, How much per unit?

Name of pesticide chemical: Make in.....

Why?

Second time, how many units? Units, How much per unit?

Name of pesticide chemical: Make in.....

Why?

Third time, how many units? Units, How much per unit?

Name of pesticide chemical: Make in.....

Why?

10. Do you use hormones? Yes No (If no skip to question IV)

First time, how many units? Units, How much per unit?

Name of hormone chemical: Make in

Why?

Second time, how many units? Units, How much per unit?

Name of hormone chemical: Make in

Why?

Third time, how many units? Units, How much per unit?

Name of hormone chemical: Make in

Why?

IV. Cassava production efficiency

Capital source

1. Do you have to loan for cassava farming? Yes No (If no skip to question Variable cost)

2. Where do you loan? Bank MIF Middle man Relative

Name of loan	Amounts	Rate	Months	Regulation	Season(Why)

3. Compared to 5 years ago, Do your loan for cassava farming is increase?

Yes No (Why

Variables cost

Items	Land size (Rai/Ha)	Quantity	Unit Cost	Total Cost	Others Them self=1 Rent=2
Stem cutting					
Chemical Fertilizer					
Compost Fertilizer					
Herbicide					
Pesticide					
Hormone					
Gasoline					
Bags					
Line					
Plow					
Rest bed					
Transport					

Labor

Specific Activity	Quantity Rai= 1 Hectares=2	Units Person=1 Days=2 Rai=3 Hectares=4 Tone=5 Truck=6	Labor Family=1 Hired=2	Cost units	Total
Planting					
Plow					
Rest bed					
Cleaning weed					
Fertilizing					
Spraying Herbicide					
Spraying Pesticide					
Spraying hormone					
Pruning					
Harvest (Digging/Cutting)					
Drying (Chip cutting & Drying)					
Carrying					
Transport					

Fixed cost

Asset	Quantity	Unit cost	Years bought	Life cycle (year)	% used in cassava farming	Others
Tractors						
Truck						
Machine spaying						
Machine cutting grass						
Storage						

Harvesting

1. Do you have a delay in cassava harvesting when the price goes down?

Yes No

If (yes.....)

If (No

2. What kind cassava do you like to sell? Fresh root Dried root

Why

3. How many differences between a ton of fresh Cassava are lost when drying?

4. How many days do you dry cassava?days

5. How many labors involve with dry cassava?Person Cost

6. Who do you like to sell cassava? Collect trader Silo Others

Why

7. Why you know the price cassava?

8. How many tons did you got from cassava farming?Tones

Land size (Rai/Hectare)	Date	Yeild (T)		Selling (T)				Expenditure
	Planted	Harvested	Fresh	Dried	Price/T	Whom collector=1 Silo=2	where Silo=1 Orchad=2 Home=1	
Plots 1								
Plots 2								
Plots 3								

V. Analysis of problems and constraints

1. What are the problems you encounter during the planting season of cassava? (Rank 1 2 3..9)

No rain fall Lack of stem cutting stem cutting expensive

Lack of capital Lack of labor Other

Specify the main reason

Solution:

2. What are your problems with cassava maintenance? (Rank 1 2 3..9)

Weed Pest Disease Drought Lack of labor

Lack of Capital Other (.....)

Specify the main reason

Solution:

3. What are your problems with cassava on harvesting season? (Rank 1 2 3..9)

Rain Lack of labor Lack of Capital Other (.....)

Specify the main reason

Solution:

4. What are your problems with cassava at time of selling?

Lack of trader Low price Scale unreliable Other (.....)

Specify the main reason

Solution:

5. Did you have any suggestions to improve your cassava production?

Yes, No

If yes, What suggestion?

Thank you very much for your time!

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Appendix D: Questionnaire for Cassava traders

Questionnaire code Name Interviewer..... Date.....

Location: VillageCommuneDistrict..... Province

Tell:

Collectors

Silo

I. Personal Information

1. Respondent's name.....; Sex: M F; Age:.....
2. Respondent's marital status: Single Married Widow/ Widower
3. Education level of household head:year of schooling
4. Type of respondent's shelter (describe materials):.....
5. Household size: _____ persons; Male _____ Female _____
6. No. of family members help in your business: _____ persons
7. Hired workers: _____ person, Salary
8. Why do you need this number of workers?
9. How many business/career do you have?
10. What are they?
11. Why are you interesting in cassava business?
12. Type of ownership: Single proprietorship Partnership Family business
 other (specify.....)
13. Years in cassava trading:
14. Area coverage
15. What about is the Land for your business? Own Rents
If rent, Please provide details.....

II. Marketing Operation

Bought cassava

1. Where do you buy cassava from?
District
- Province
2. Who are your suppliers? Famers Collect traders Agents
 Others.....
3. Do you have suppliers under contract with you? Yes No
(If no please skip to questioner 4)
Number Famers..... Regulation
- Number Collect traders..... Regulation
- Number Agents..... Regulation
- Number others..... Regulation
4. Who do you prefer to buy from?
 Famers Collect traders Agents others (specify.....)
Please detail.....

5. What form of cassava did you buy? Dried chip Fresh roots All form
6. What form do you prefer to buy? Dried chip Fresh roots
Please detail.....
7. Who determines the price of cassava?
 Gov. Thai traders Chines Trader Others
8. According to your business over the last 5 years, what is the trend for the price of cassava?
 Increase
 Decrease
9. What factors considered in pricing cassava? Prevailing price Previous price Expected price Quality Credit tie-up Good relations other (specify).....
10. Who are the main suppliers? Famers Collect traders Agents
 Others (specify).....
11. Last season, how many tons did you buy?
Fresh roots Tons
Dried chip Tons

12. Details of purchases for the traders during the last season

Time of purchase Dec=1 Jan=2	Form of cassava Fresh roots=1 Dried chip=2	Location of purchase Silo=1 Field=2	Supplier Farmer=1 Village trader=2	Volume bought (Kg)	Price/Tonne	Tearm Payments

Cassava sold

1. Do you have contract with customers? Yes No
Please detail.....
2. Who are the main customers? Thai traders Chines Trader Others (specify).....
3. What form do you prefer to sell? Dried chip Fresh roots
Please detail.....
4. Last season, how many tons did you buy? Fresh roots Tons, Dried chipTons

5. Details of the sales of cassava by the traders during last season

Time of sold Dec=1 Jan=2	Form of cassava Fresh roots=1 Dried chip=2	Sold to Silo=1 Thai=2 Others (specify).....	Customers Farmer=1 Village trader=2	Volume sold (Kg)	Price/Tonne	Tearm Payments

Variable cost (Dried fresh root)

1. How many days for you storage dried root?
2. How many ton of Cassava are lost when storage?

List Variable cost incurred per metric ton of cassava

Items	Unit	Cost unit	Labor Farmily			Hired Labor			Total
			F	M	Unit	F	M	Unit	
Drop cassava down									
Cutting cassava root									
Dry cassava									
Collect cassava									
Storage									
Transportation									
Gasoline									
Cards expsnture									
Taxe									

List fixed cost

Items	Unit	Unit Cost	Purchase Years	Life cycle	% using
Truck					
Machine cutting					
Weighing scale					
Warehouse/building					
Campus drying					
Salary					
Office Equipment (phone/fax, internet,)					
Land rental cost					
Tax					

IV. Problems and constraints

Problems and constraints (Input, production, technology, marketing, quality assurance, policy, basic infrastructure, labor and skill, etc)	Possible Solution

1. Do you have any suggestion? Yes No
 If yes, what suggestion?

.....

Thank you very much for your time!

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Appendix E: Guide Question for Input Supplier

I. General Information

Name of respondent Sex Male Female (Age

Education level Illiterate Grade 1-6 Grade 7-9 Grade 10-12

College Other (...)

Key questionnaires

1. How many years have been selling your products?
2. Do you have skills about the use of chemical in agricultural? Yes No
3. What types of agricultural products do you sell?
 Herbicide Pesticide Fertilizer Hormone Other
4. From which county your products come from? Thailand Vietnam
 China
5. What volumes is your selling each year?
 Thailand.....
 Vietnam

 China
6. Which product is highest demand from the cassava farmers?
 Herbicide Pesticide Fertilizer
7. For herbicide products, which country is the most popular for cassava farmers?
 Thailand Vietnam China
8. For pesticide products, which country is the most popular for cassava farmers?
 Thailand Vietnam China
9. For fertilizer products, which country is the most popular for cassava farmers?
 Thailand Vietnam China
10. For hormone products, which country is the most popular for cassava farmers?
 Thailand Vietnam China

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11. list prices to sold of products for cassava farming

Items	Unit	Normal price		Price rate		Terms Months	Source of Product Thailand=1 Vietnam=2 China=3
		Price/Unit	Total	Price/Unit	Total		
Herbicide							
Glyphosates							
48							
Pesticide							
Deltamethrin							
Fertilize							
Hormone							
Fungicides							

12. Compared to 5 years ago, are the demands for agricultural products of cassava farming increasing? Yes No

Why

13. What are the challenges/ constraints you have faced in selling agricultural products to farmers? (What are the feasible solutions?)

.....

.....

.....

.....

Thank you very much for your time!

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Appendix F: Pictures of research activities



Figure F 1. Cassava field trip

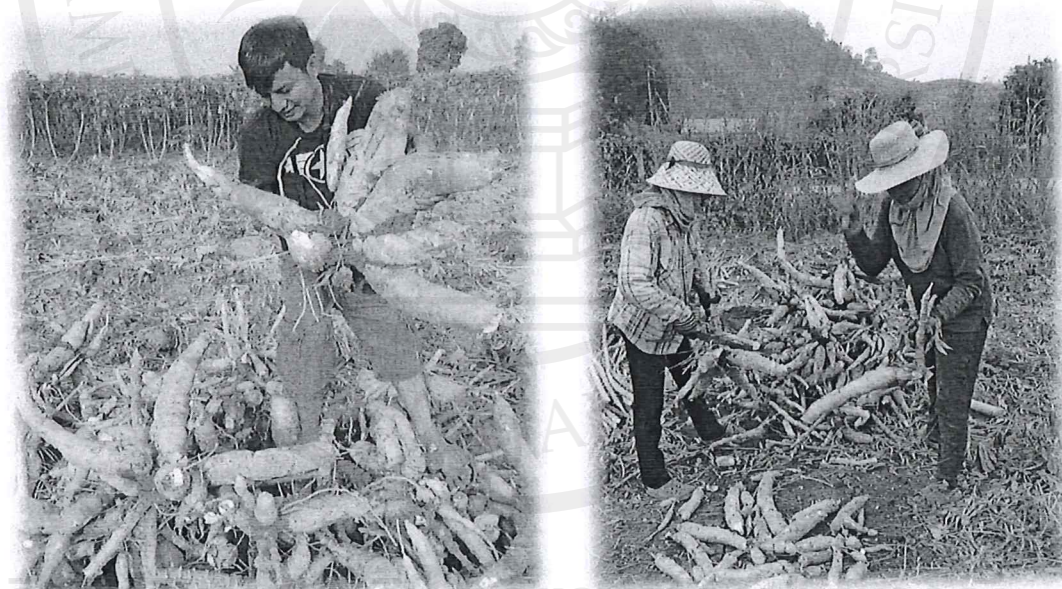


Figure F 2. Cassava harvesting by farmers



Figure F 3. Input suppliers



Figure F 4. Pesticides and liquid fertilizers

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Figure F 5: Interview with trader (Silo)



Figure F 6: Group discussion with district authorities

សិប្បកម្ម និង កសិកម្ម រុក្ខាប្រមាញ់ និង ត្រីមាតិកា

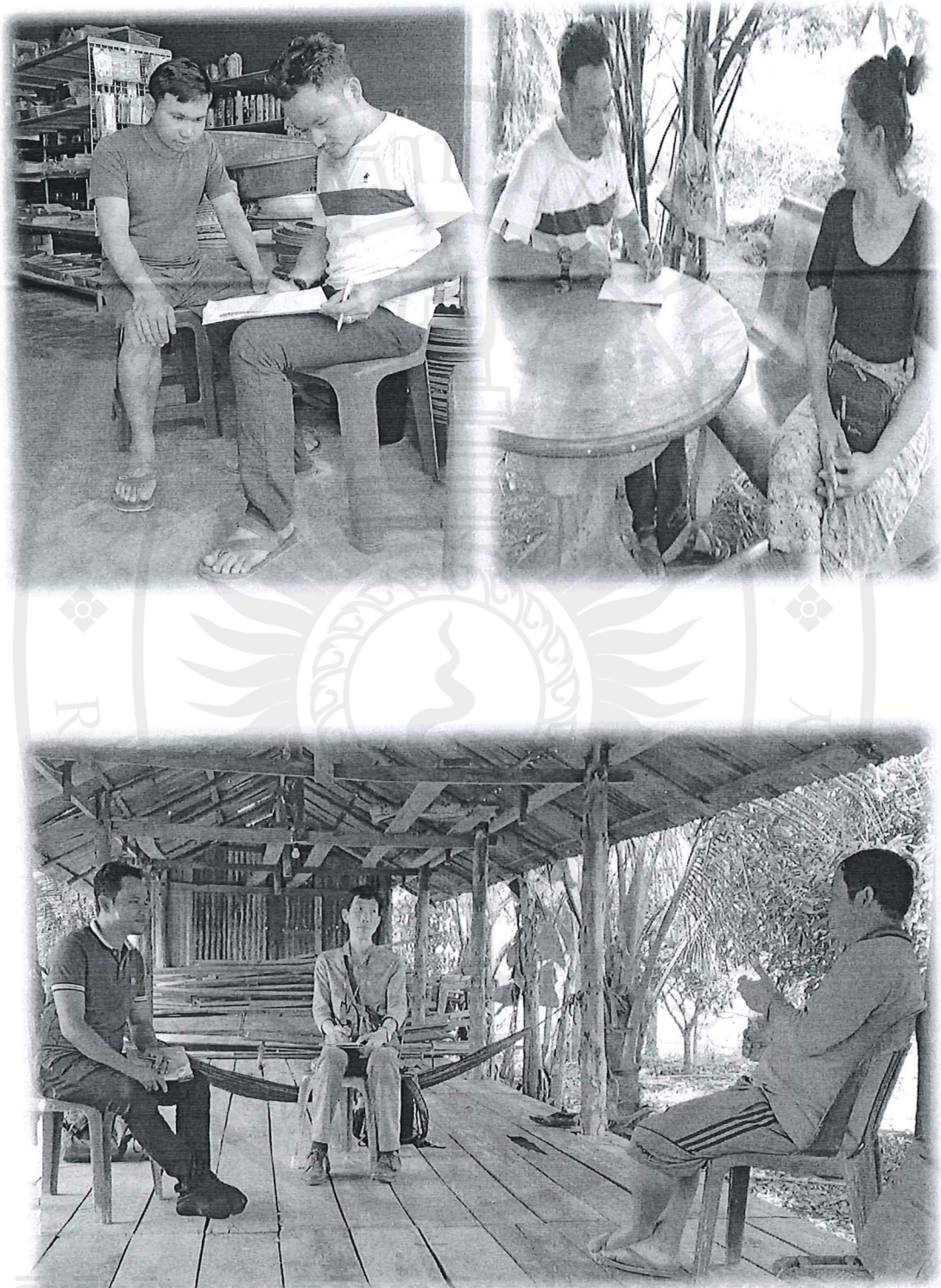


Figure F 7. In-depth interview with cassava farmers and key cassava person

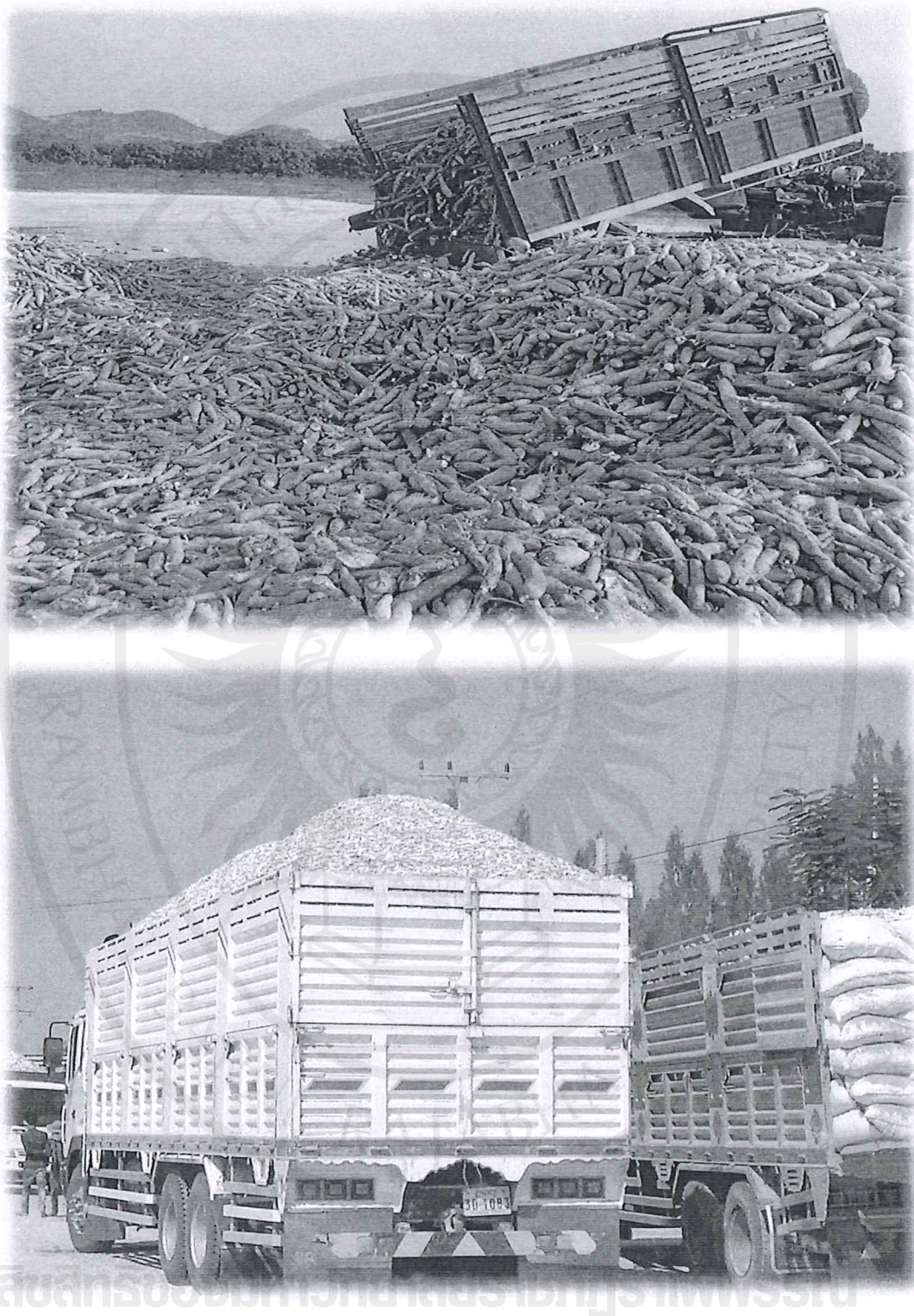


Figure F 8. Marketing channel in study area