VALUE CHAIN STRUCTURE AND RESULTS OF HOUSEHOLD SURVEY IN SON LA

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  - Dak Lak
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  - Cassava role in the HH livelihoods
  - Cassava production practice
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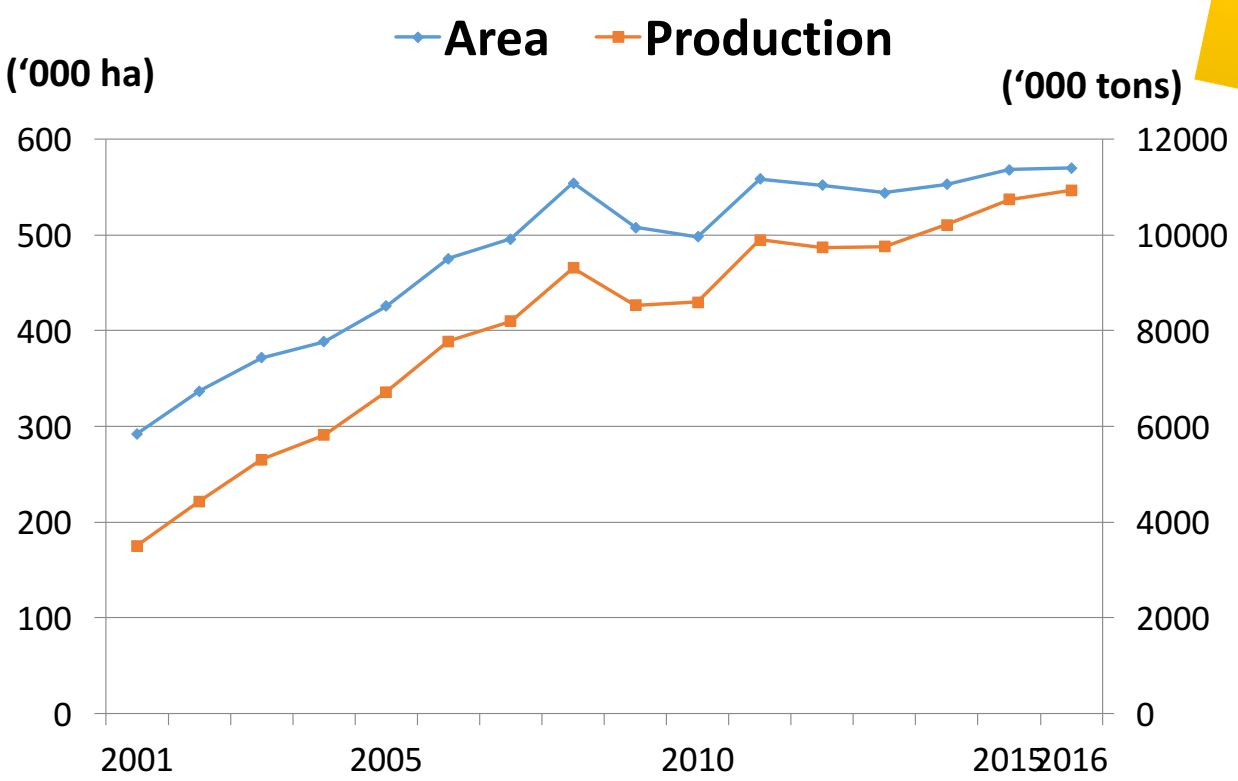
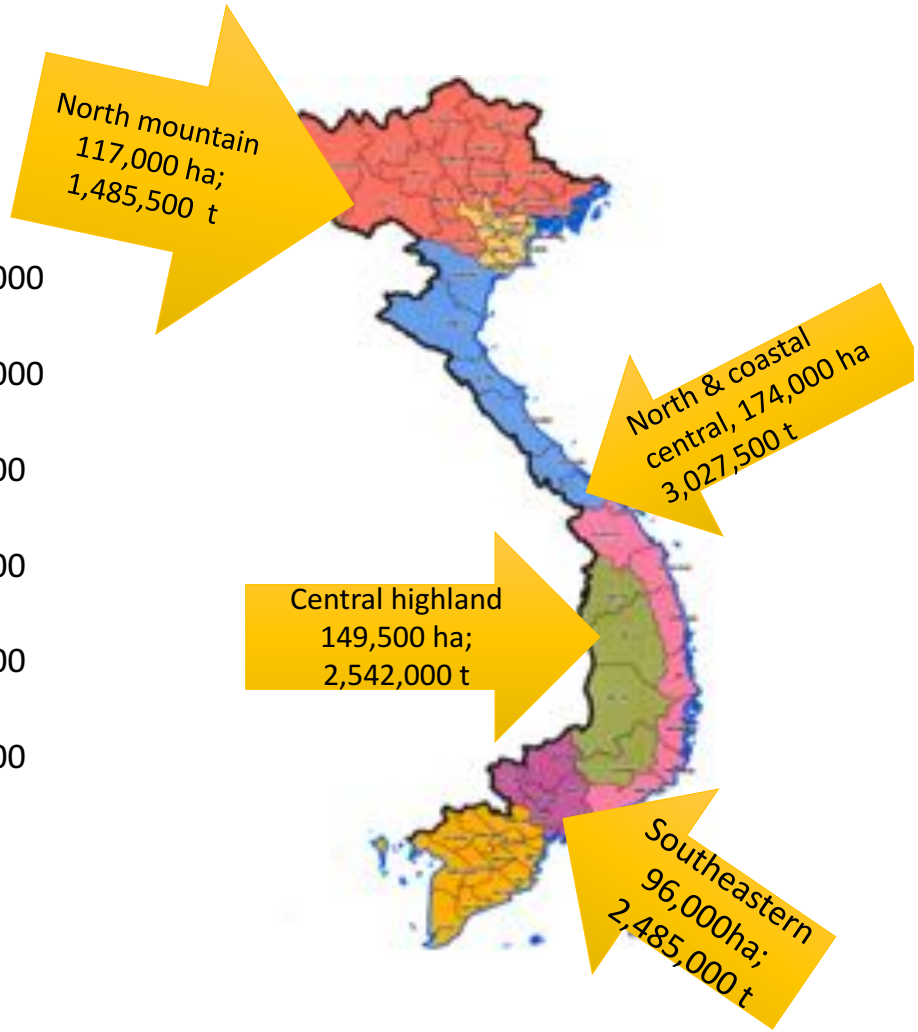
Cassava in Vietnam

Country's total cassava area and production





Country level statistics of cassava processing

- 94 cassava starch processing factories, producing 2.2 - 2.3 million tons of starch per year (2014). Only in Tay Ninh province 38 factories
- There 6 ethanol processing plants, but only 3 (Tung Lam, Dai Viet, Nhiên liệu sinh học miền trung) are operating with 50-60% of capacity, using 130,000 tons of cassava chips per year.
- A network of small-scale dry chip processing in all the cassava material areas throughout the country

Country level statistics of trade

- Vietnam exports both fresh root and starch; export value is more than 1 billion USD/year
- Main markets:
  - China: 85%
  - Taiwan: 4.6%
  - Philippines: 3.8%
  - Malaysia: 3.5%
  - Indonesia: 1.6%

Cassava in Sơn La

- 360,000 tons/year fresh cassava
- 40,000 tons fresh roots processed into starch in Son La factory
- 12,000 tons fresh roots processed into chips by farmers
- 308,000 tons fresh roots processed into dry chips by small-medium scale processors

Chips mainly to animal feed processing factories in Vietnam

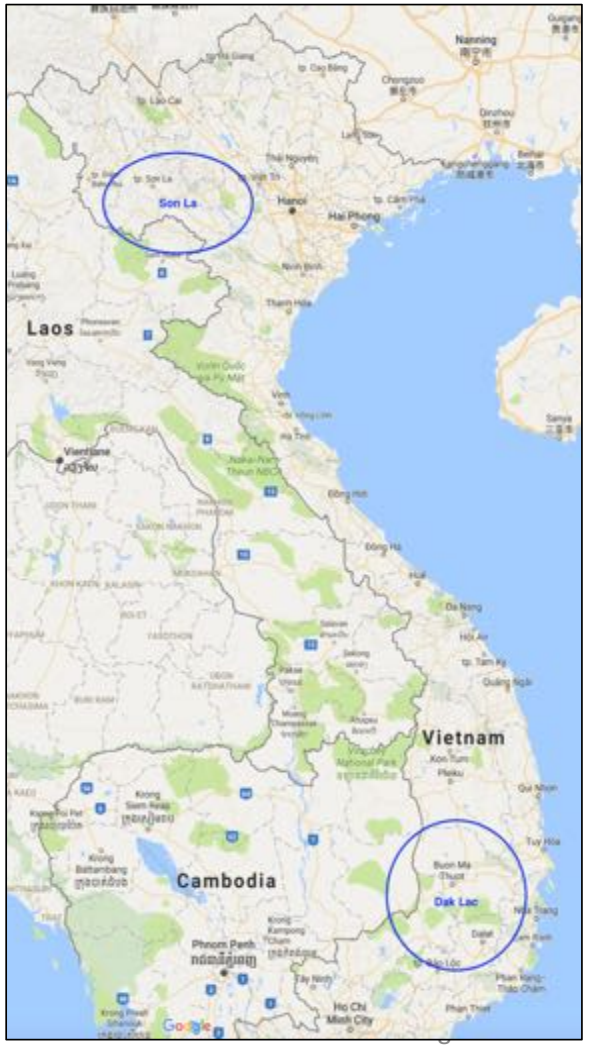
Starch for export (90% to China)

(Colleagues from TNU will present about Dak Lak)

The project's sites: Son La and Dak Lak

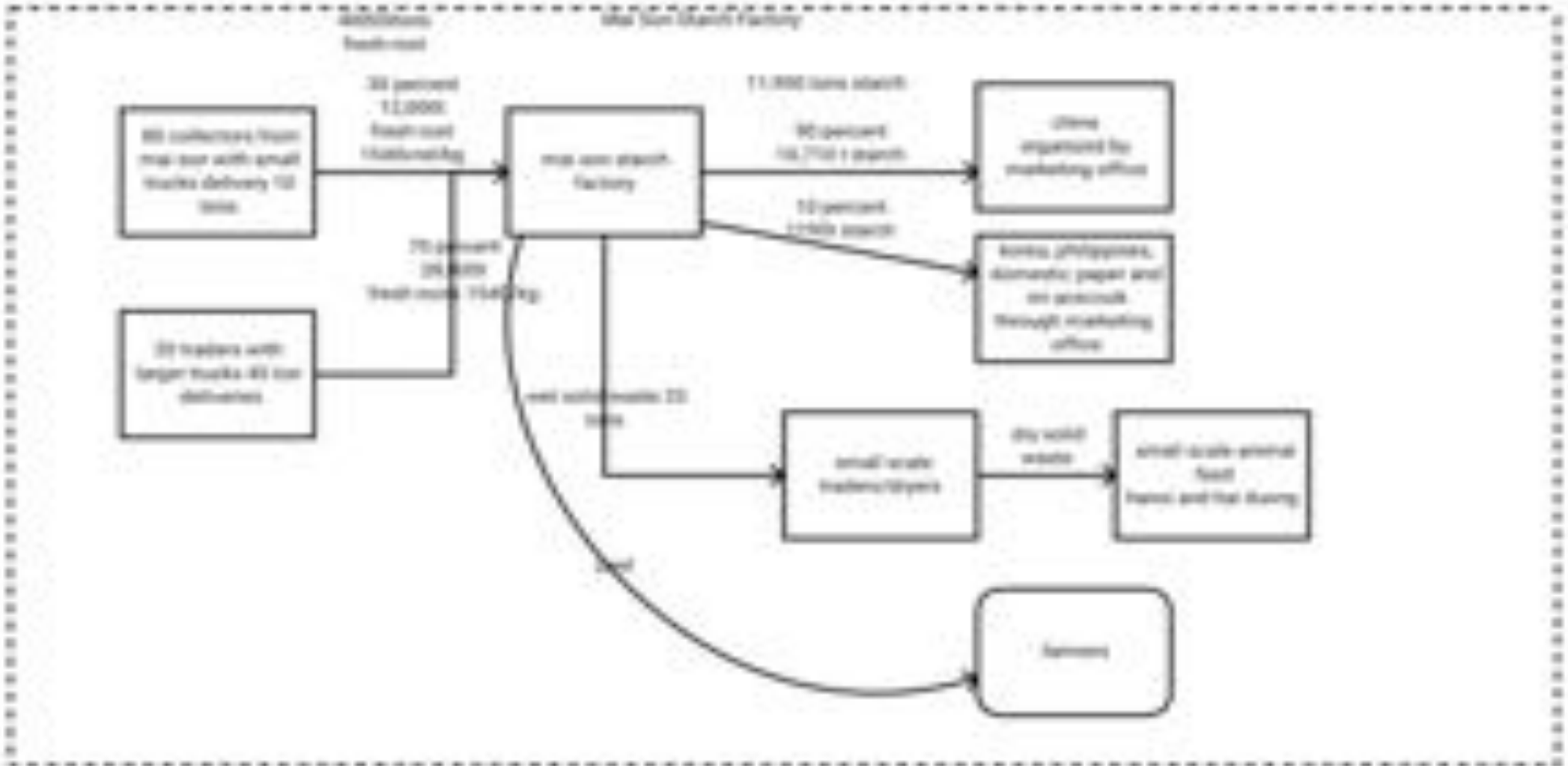
Province	Area of cassava (ha)	Average fresh root yield (t/ha)	Annual Production (t)	Main industries	Number of factories
Dak Lak	25,720	18.4	473,248	Starch, Ethanol, Dry chips	5 starch 1 ethanol (Dak Nong)
Son La	31,216	11.5	359,485	Starch Dry chips	1 starch

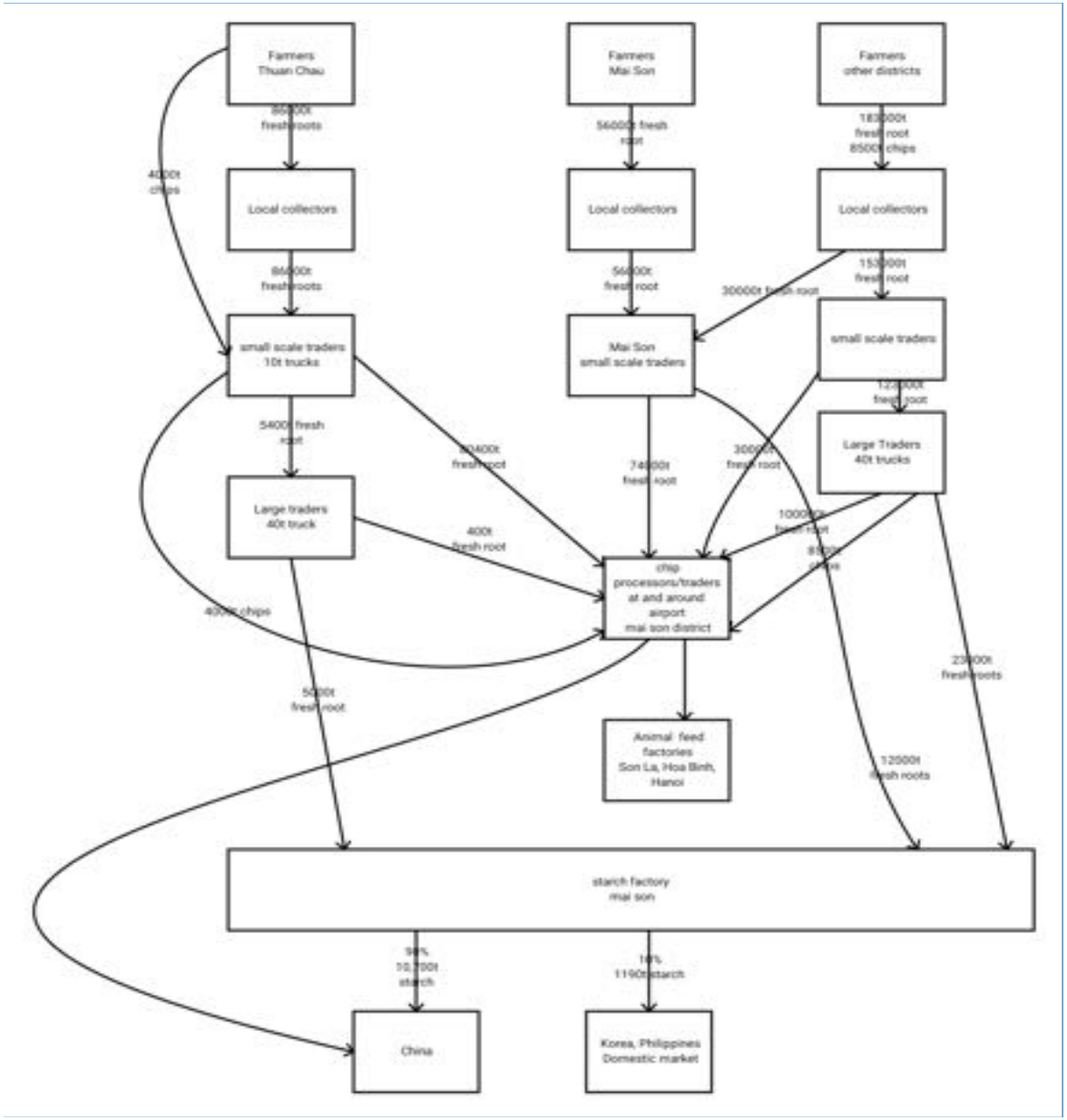
- Highland provinces, high rate of poor HHs (31.9% for Son La, 19.4% for Dak Lak)
- Cassava considered a crop for the poor
- Cassava on slopes, causing soil erosion & land degradation
- Low inputs, lack of techniques → low and unstable yield & income
- So far no inputs for value chains study



Structure of cassava value chain in Son La

Product flows and values, starch factory, Mai Son, Son La





- Complex, well developed value chain for starch and chips
- Many intermediate layers between farmers and final processors
- Price differential between producers and processors indicates well-functioning value chain

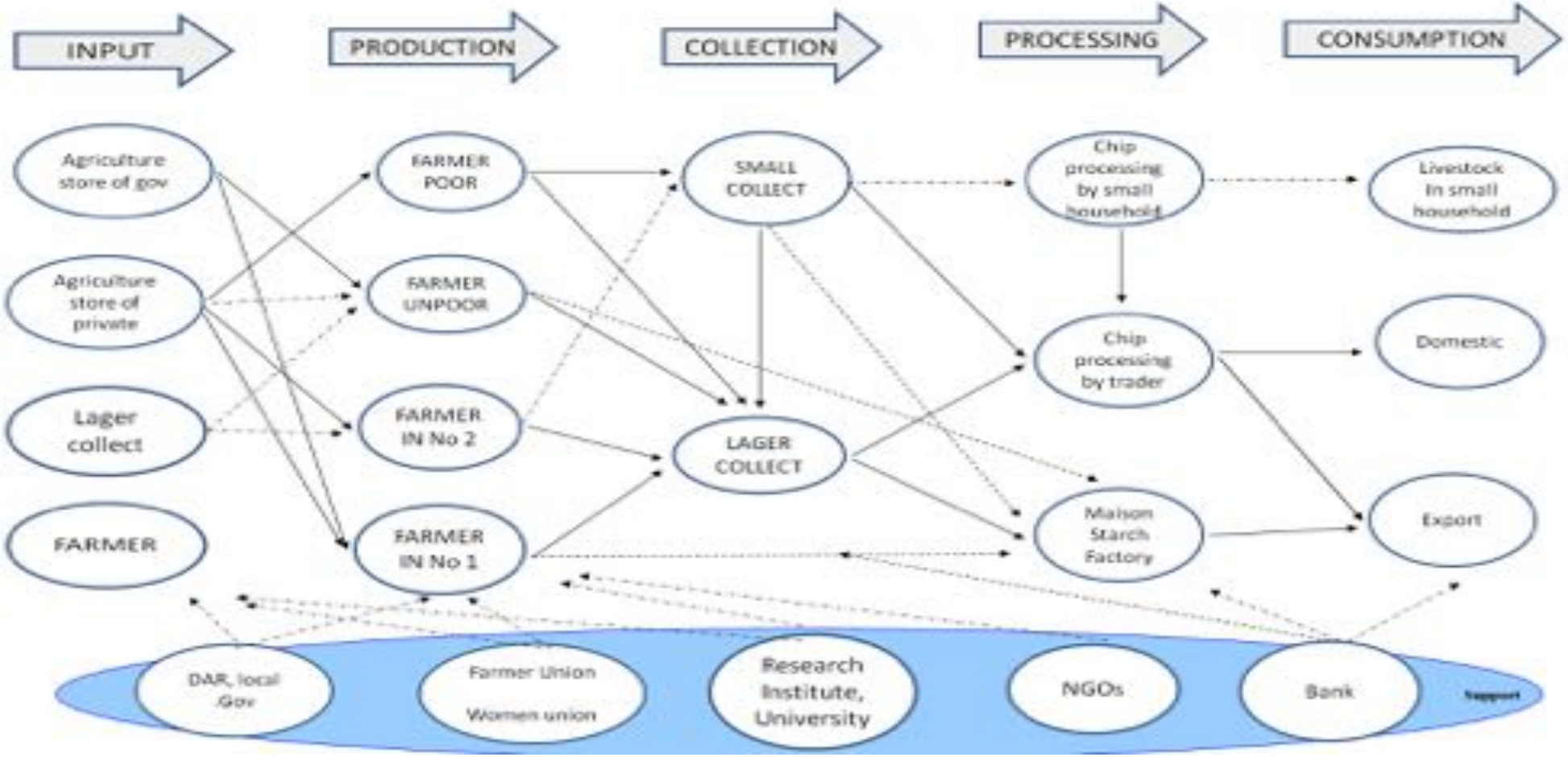
Prices of fresh cassava root for different value chain actors in Son La (2015)

Value Chain Actor	Buying Price	Selling Price
Farmer		VND1000/kg
Collector	VND1000/kg	VND1100/kg
Small Trader	VND1100/kg	VND1200/kg (sale to large trader) VND1400-1550/kg (sale to processor)
Large Trader	VND1200/kg	VND1400-1550/kg
Starch Factory	VND1400-1550/kg	
Chip Processor	VND1400-1550/kg	

Prices of dry cassava chips for different value chain actors in Son La (2015)

Value Chain Actor	Buying Price	Selling Price
Farmer/household chip processor		VND3200-3300/kg
Collector	VND3200-3300/kg	VND3400/kg
Small/Large Trader	VND3400/kg	VND3600-3700/kg
Chip Processor/Trader	VND3600-3700/kg	VND4000/kg

Value chain stakeholders

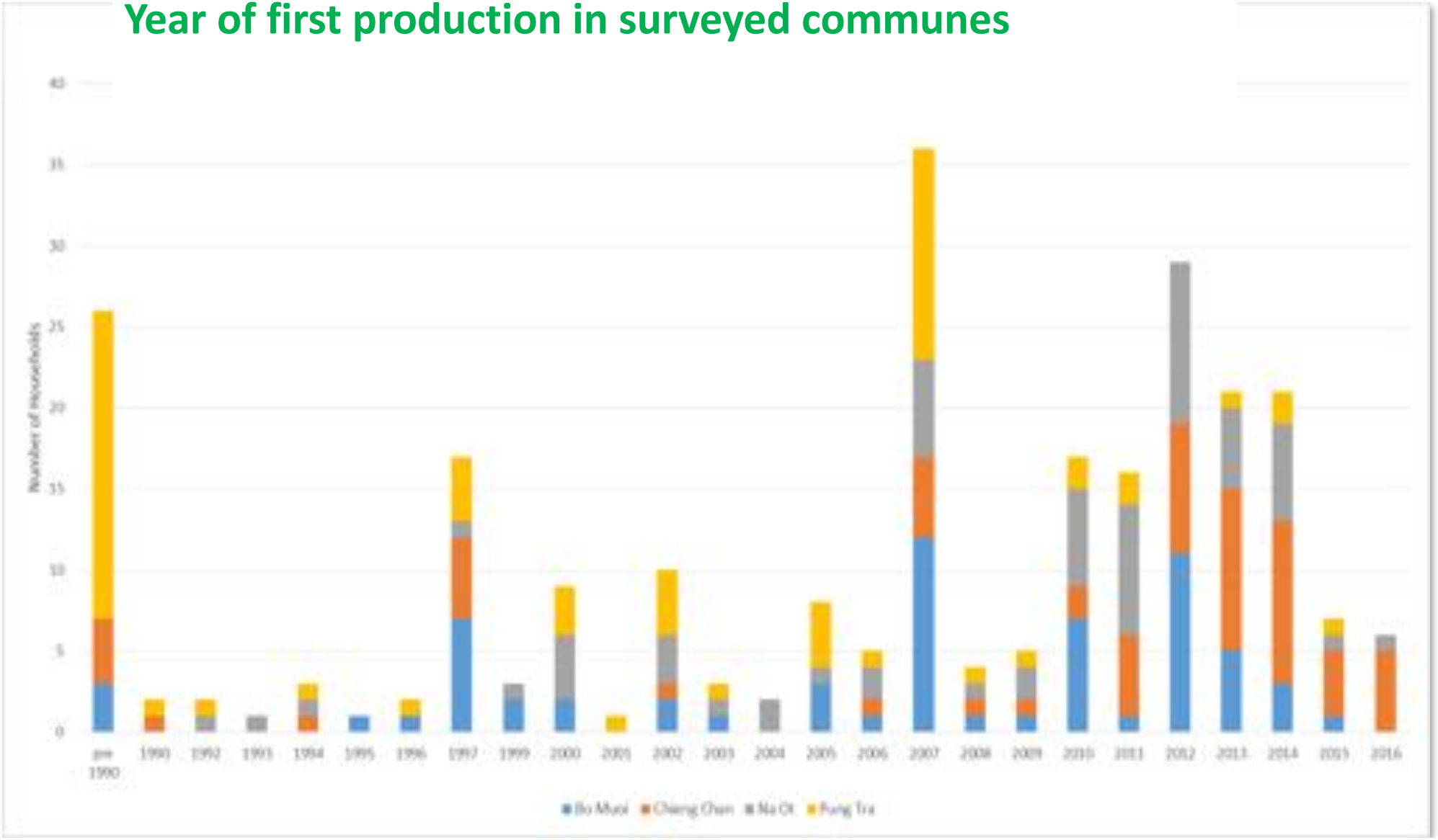


Results of household survey

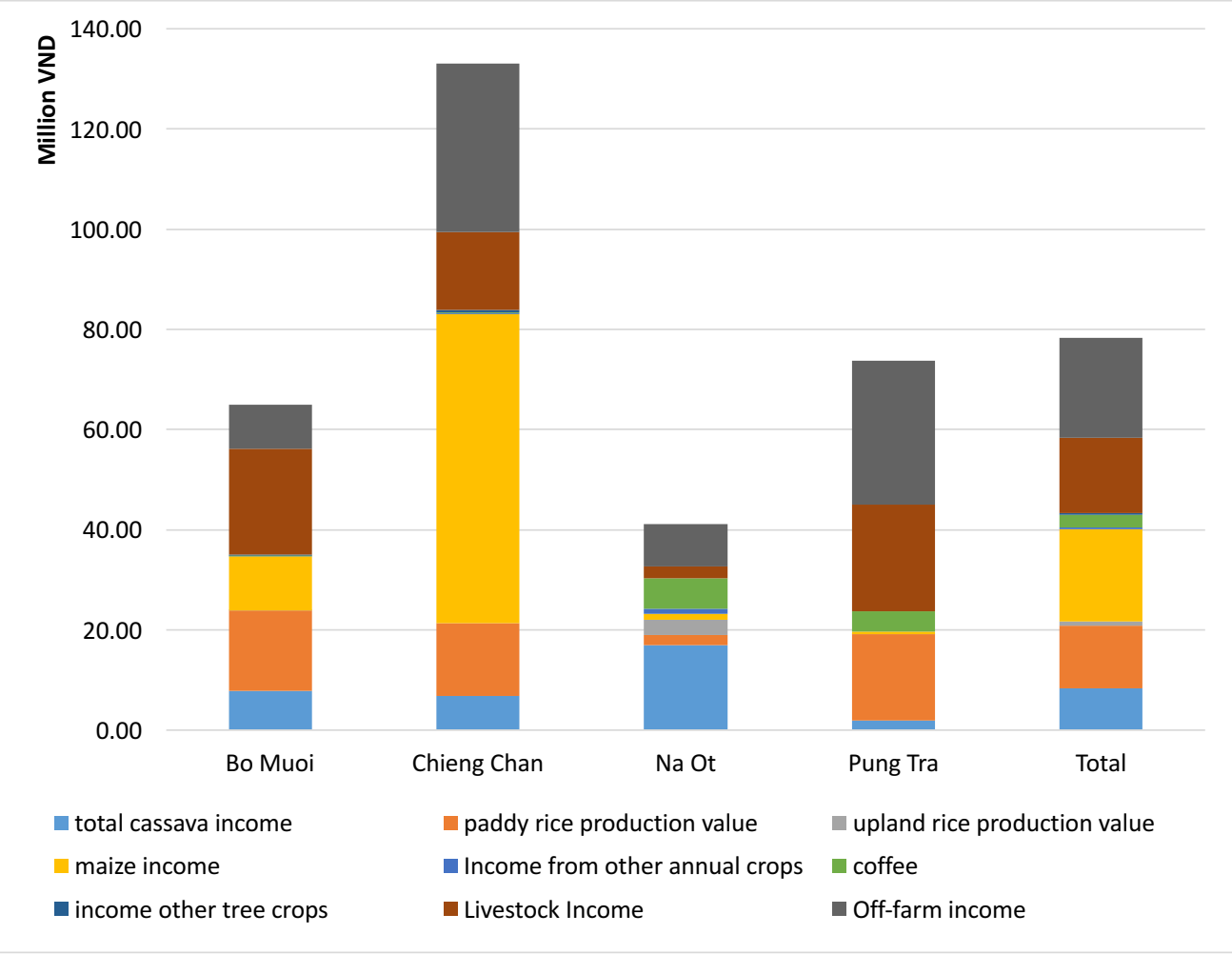
Survey sites:

- 256 HHs/ 8 villages/4 communes/2 districts
- 2 types of villages: difficult vs. less difficult
- HHs randomly selected from cassava HHs lists of the village

Year of first production in surveyed communes

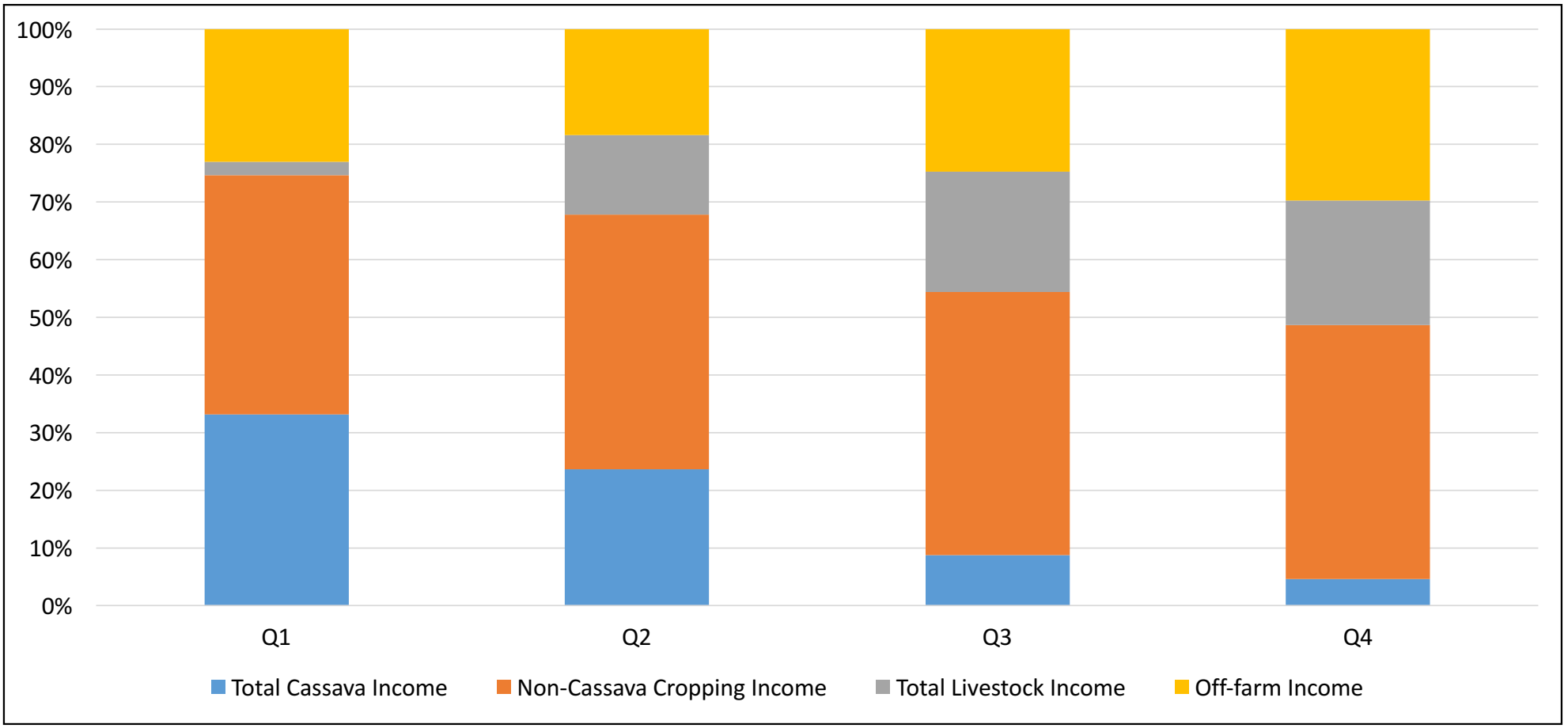


Source of livelihoods of smallholder cassava farmers by communes

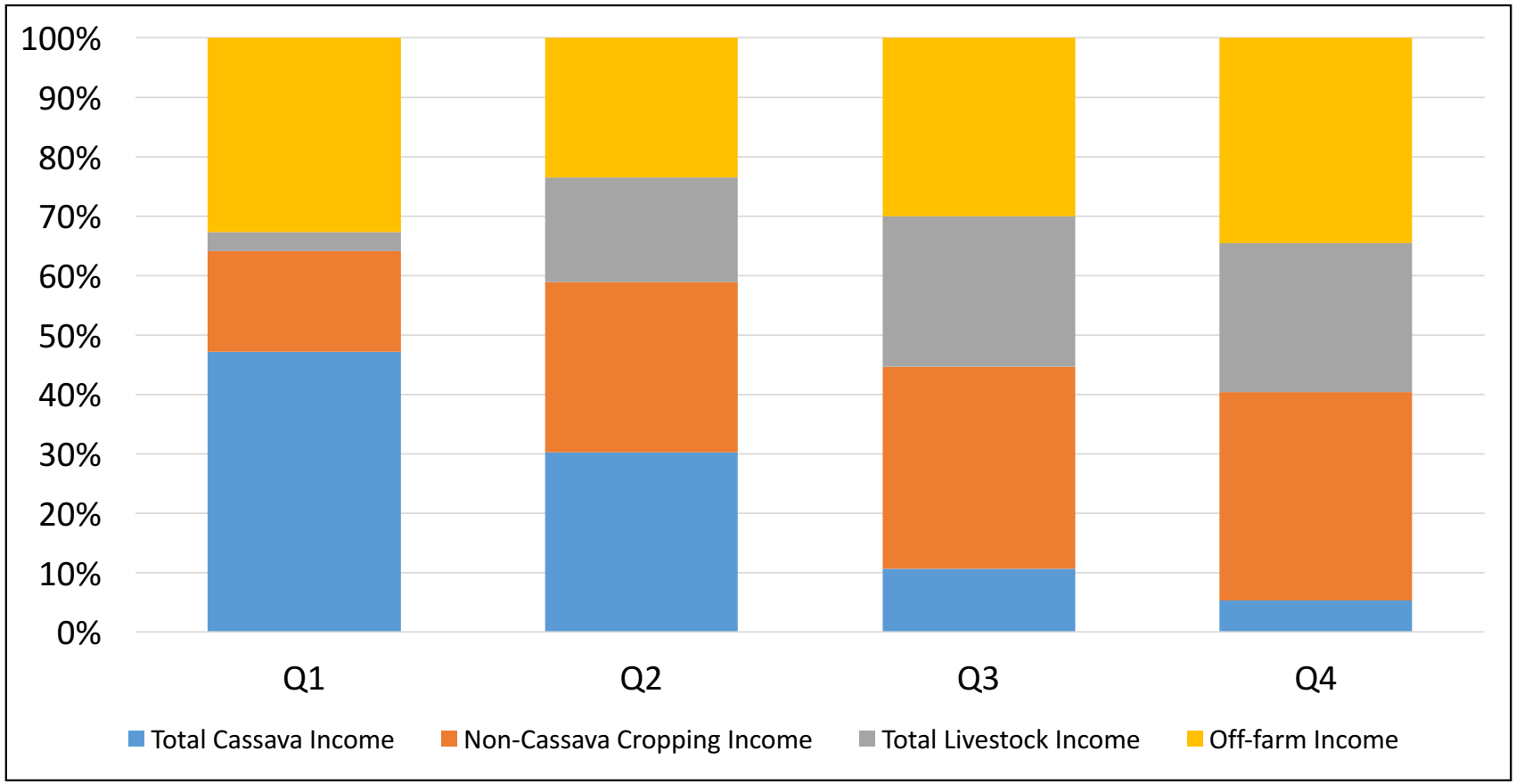


- Almost all households have some lowland or upland rice areas
- Maize is a significant upland crop in Bo Muoi and Chieng Chan, while coffee is cultivated by a majority of households in Na Ot and Pung Tra
- Livestock - especially large livestock - is an important contributor to livelihoods
- Off-Farm income are important contributor to livelihoods

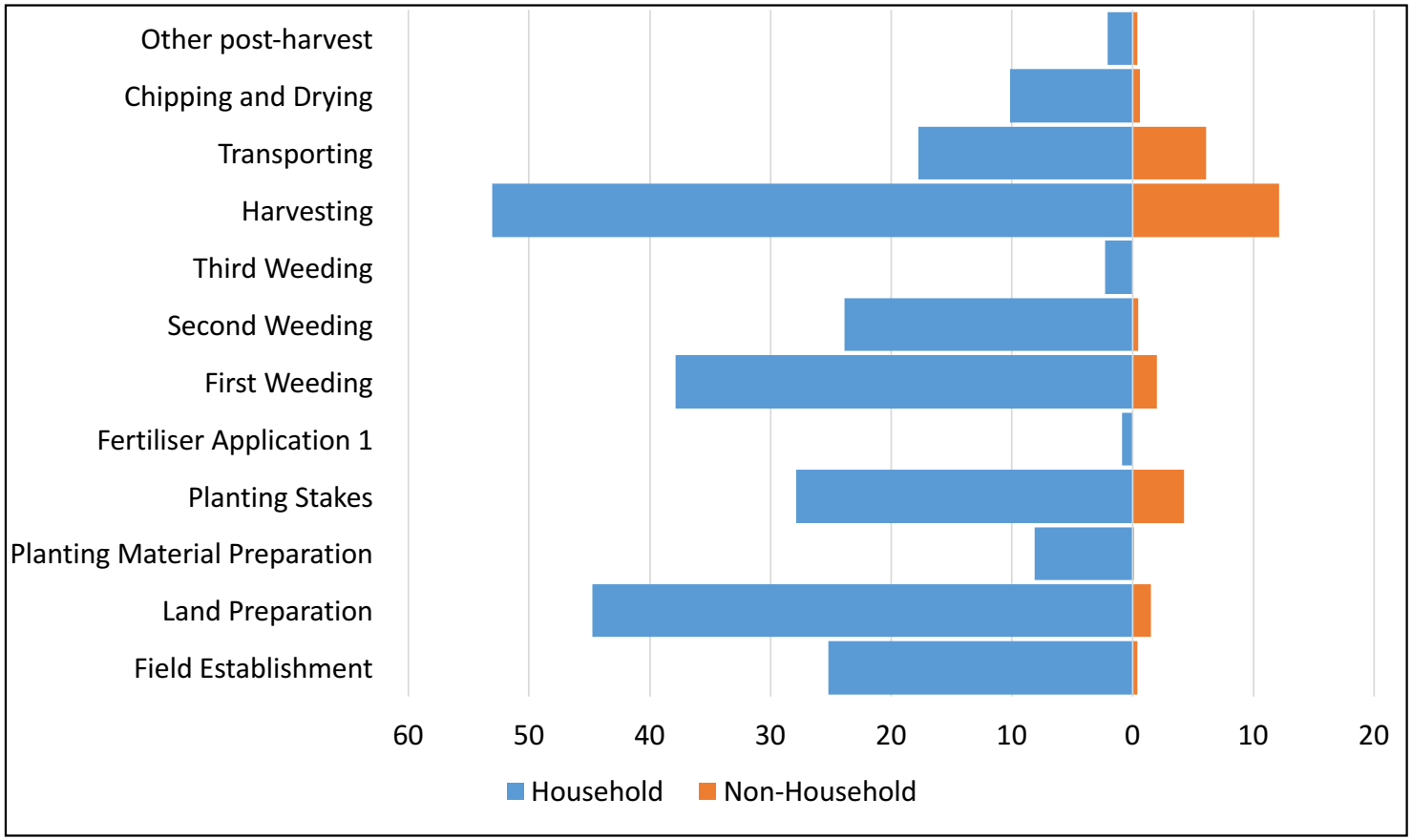
Source of income for smallholder cassava farmers by quartiles



Annual cash incomes of smallholder cassava farmers by quartiles

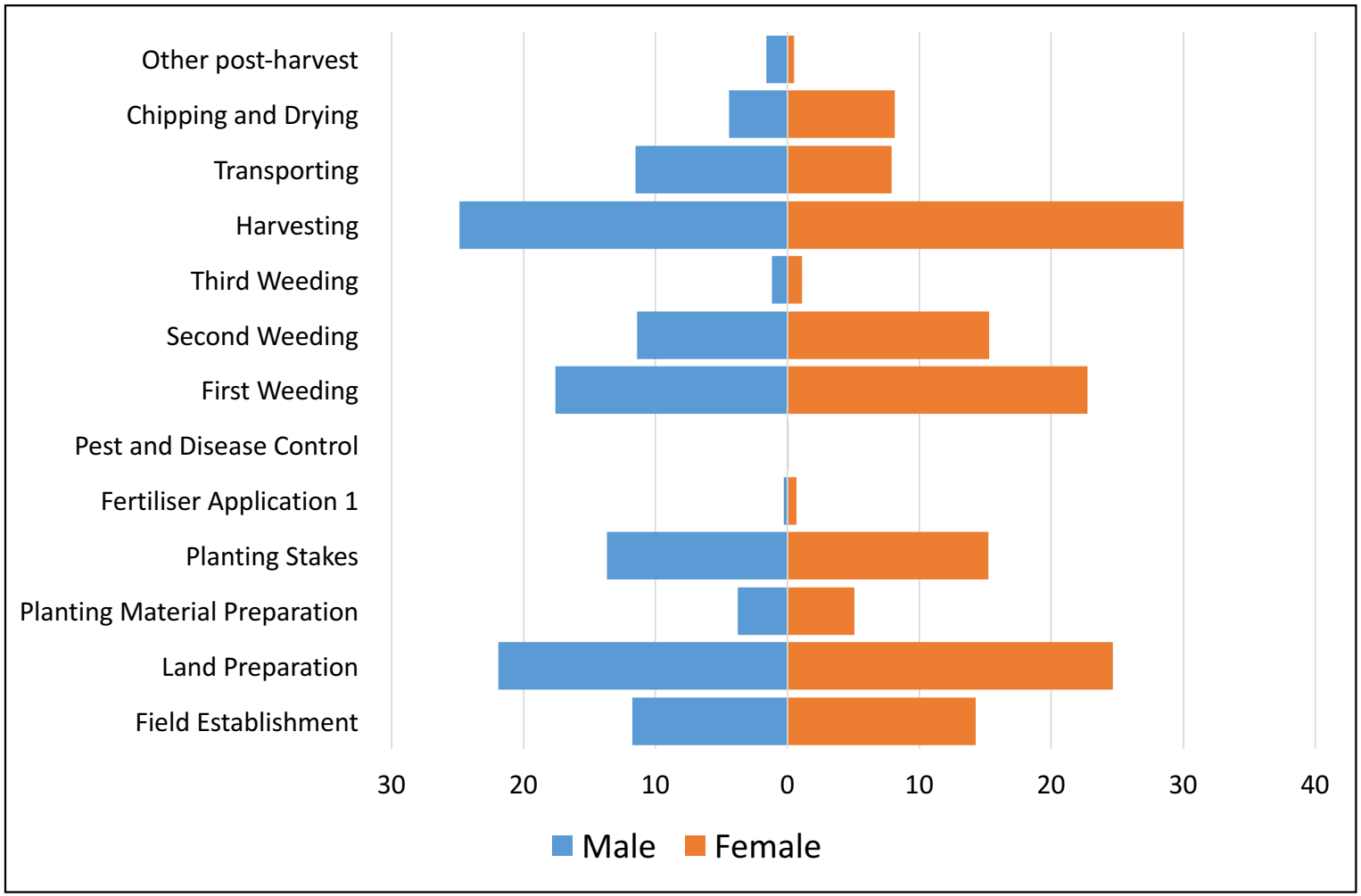


Agricultural labour force of cassava households



- Average household size was 5.5
  - 3.1 members having some involvement in agriculture
  - 2.4 full-time working in agriculture
- For cassava: mainly HH labour
- For planting, haversting, transporting: significant hired labour

Household labour working-day per hectare, by gender



Even distribution of labour by gender

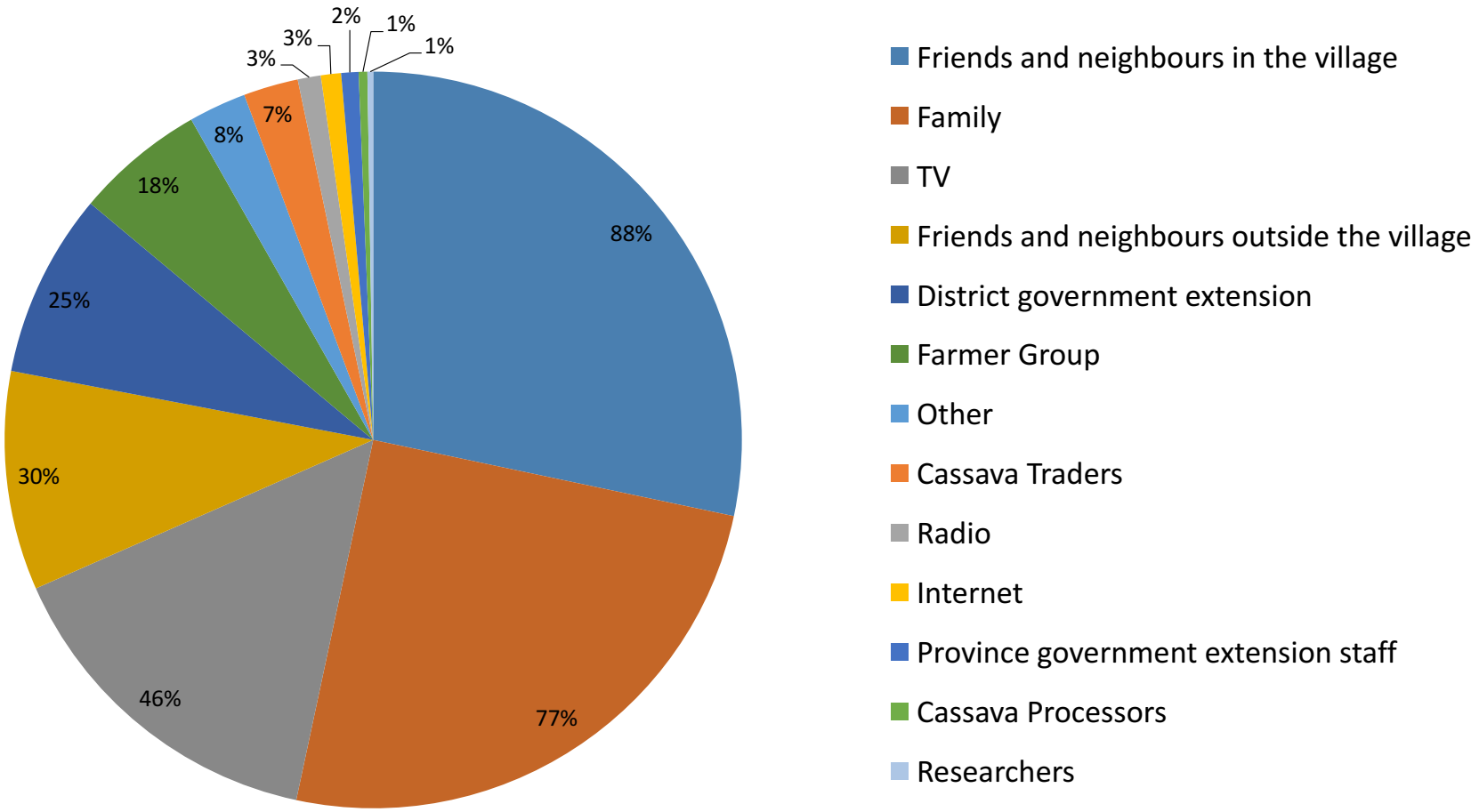
Access to credit

Ratio of surveyed HHs received loans in past 12 months, by quartiles

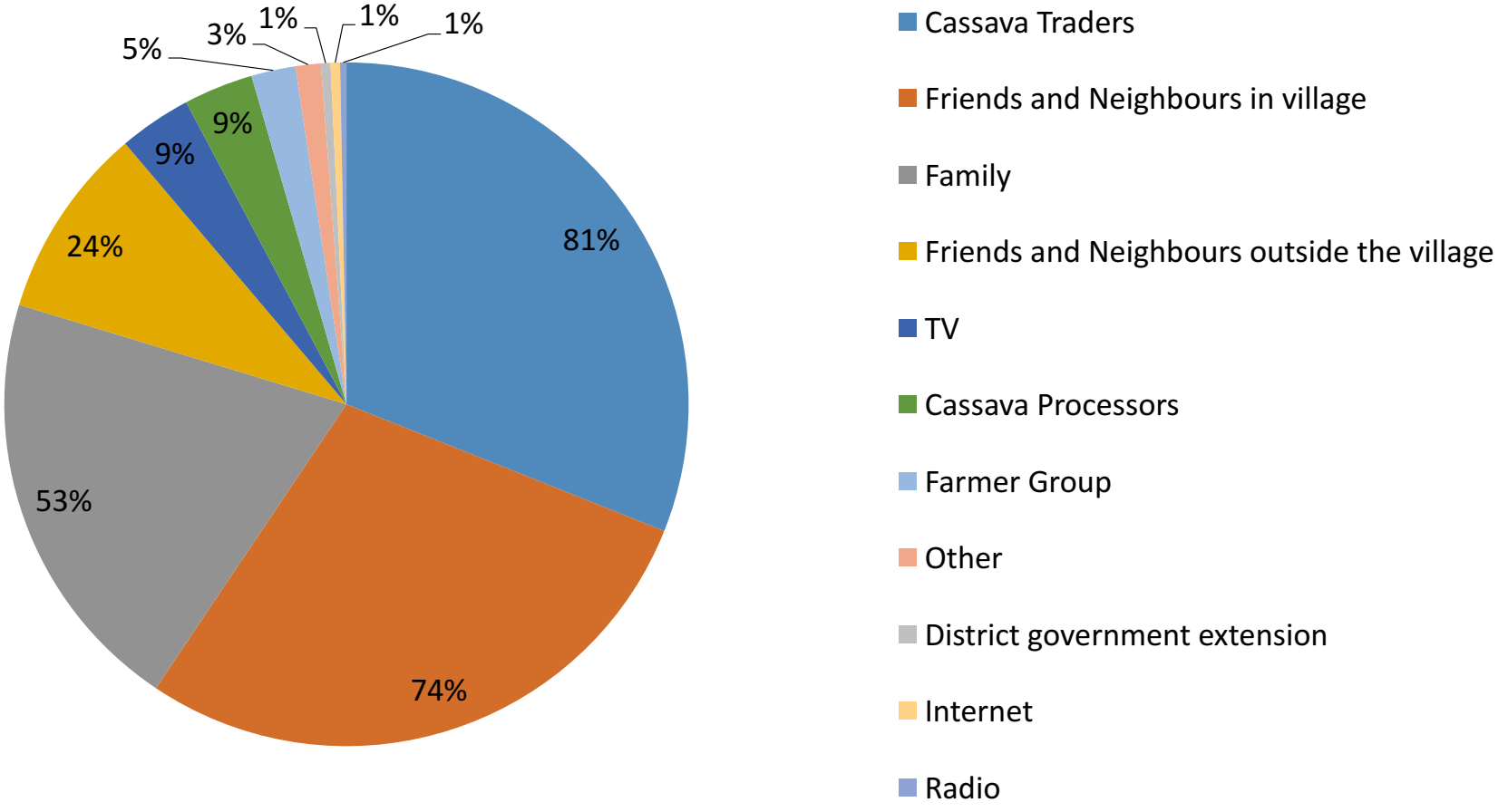
Access to Credit	Q1	Q2	Q3	Q4	Total
Total % HHs with loan	57.81	70.77	57.81	45.31	57.98
% HHs with 1 loan	48.44	64.62	54.69	40.63	52.14
% HHs with 2 loans	7.81	3.08	3.13	4.69	4.67
% HHs with 3 loans	1.56	1.54	0.00	0.00	0.78
Average value of total loans received (vnd/HHs)	13,828,125	19,030,769	24,343,750	21,359,375	19,638,132

Source of Loan	Frequency (out of 256 surveyed HHs)
Bank for Social Policies	68
Family/Friend/Relative	43
Agribank	27
Credit fund	6
fertiliser, seed seller	6
Other Bank	1
farmers union	1
trader	1
veterans credit fund	1

Access to production information sources



Access to market information sources



Group membership

- 186 households (72% of all households) had member participating in a group or a mass organization.
- The most common organizations were the Women's Union and the Farmer's Union

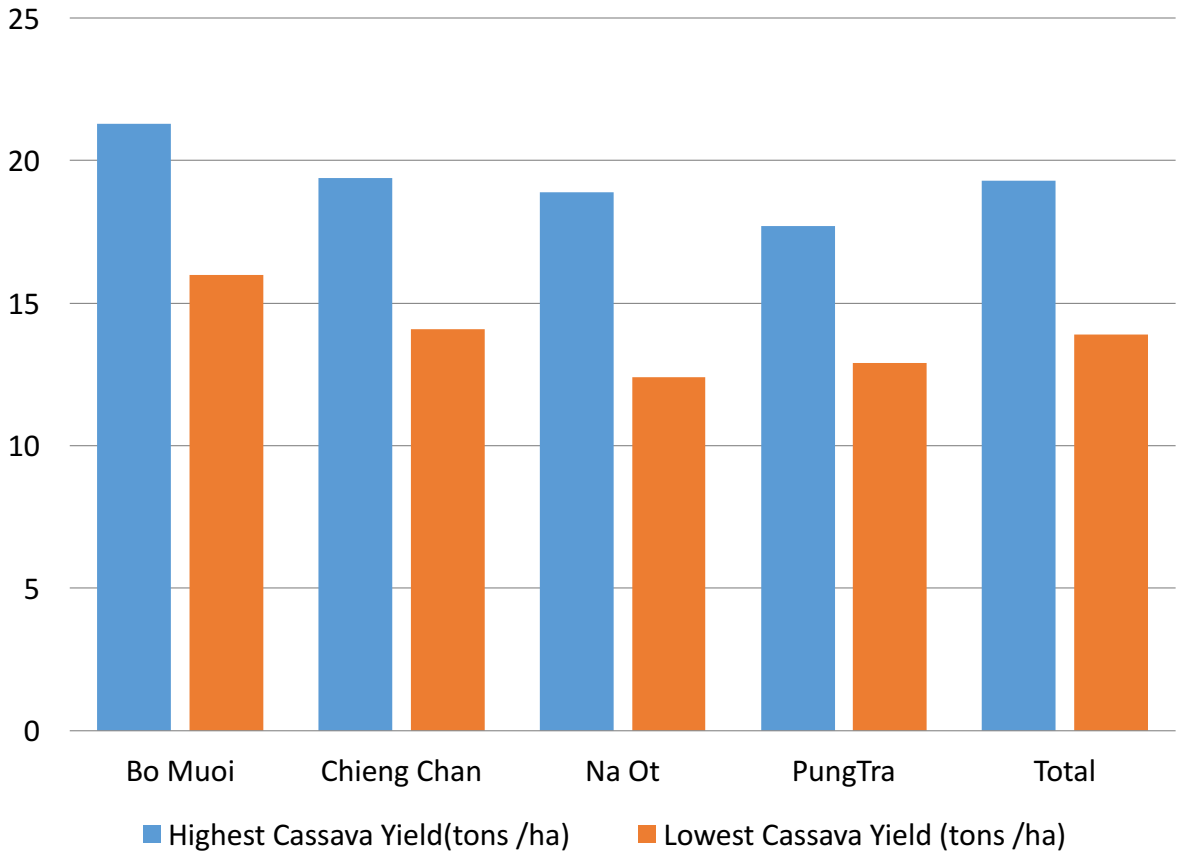
Name of Organization	Frequency out of 256 surveyed HHs
Womens' Union	119
Farmers union	83
Youth Union	56
Veterans union	26
Senior Citizens Association	18
Fatherland Front	3
Communist party	3
Cooperative	1
Public security	1

Ownership of assets: % HHs owning assets, by quartile

- Overall, ca. 90% HHs owned motorbikes.
- Only 67% of HHs in Q1 owned motorbikes.
- Around 20% of HHs had 2- or 4-wheel tractors, but not generally for cassava cultivation.
- More than 80% of farmers had a mobile phone and almost 35% had a smart-phone.

Assets	Q1	Q2	Q3	Q4	Total
truck	0.00	0.00	0.00	3.13	0.78
car	0.00	0.00	0.00	0.00	0.00
motorbike	**67.19**	**96.92**	**98.44**	**98.44**	**90.27**
two wheel tractor	1.56	6.15	14.06	28.13	12.45
four wheel tractor	3.13	3.08	9.38	14.06	7.39
water pump	1.56	16.92	15.63	32.81	16.73
generator	4.69	3.08	0.00	1.56	2.33
mobile phone	71.88	84.62	89.06	85.94	82.88
smart phone	23.44	27.69	37.50	50.00	34.63
tv	85.94	90.77	98.44	96.88	93.00
dvd player	54.69	63.08	79.69	67.19	66.15
radio	12.50	4.62	7.81	14.06	9.73
refrigerator	3.13	20.00	46.88	71.88	35.41

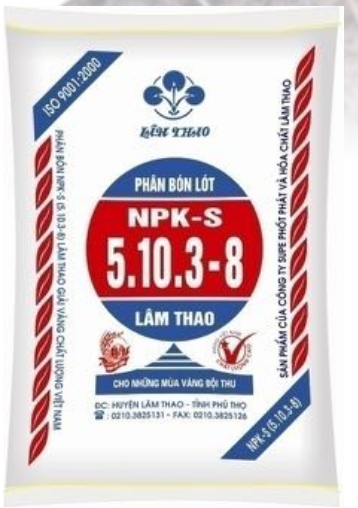
HH cassava area, production, current yields and trends



- HH average cassava area: 0.57 ha (0.31 ha in PungTra, 0.96 ha in Na Ot_
- HH average production: was 7.9 tons
- Average yield: 15.5 tons/ha
- Yields were declining: only 4.3% of farmers reported that yield was increasing 74 percent reported declining yields

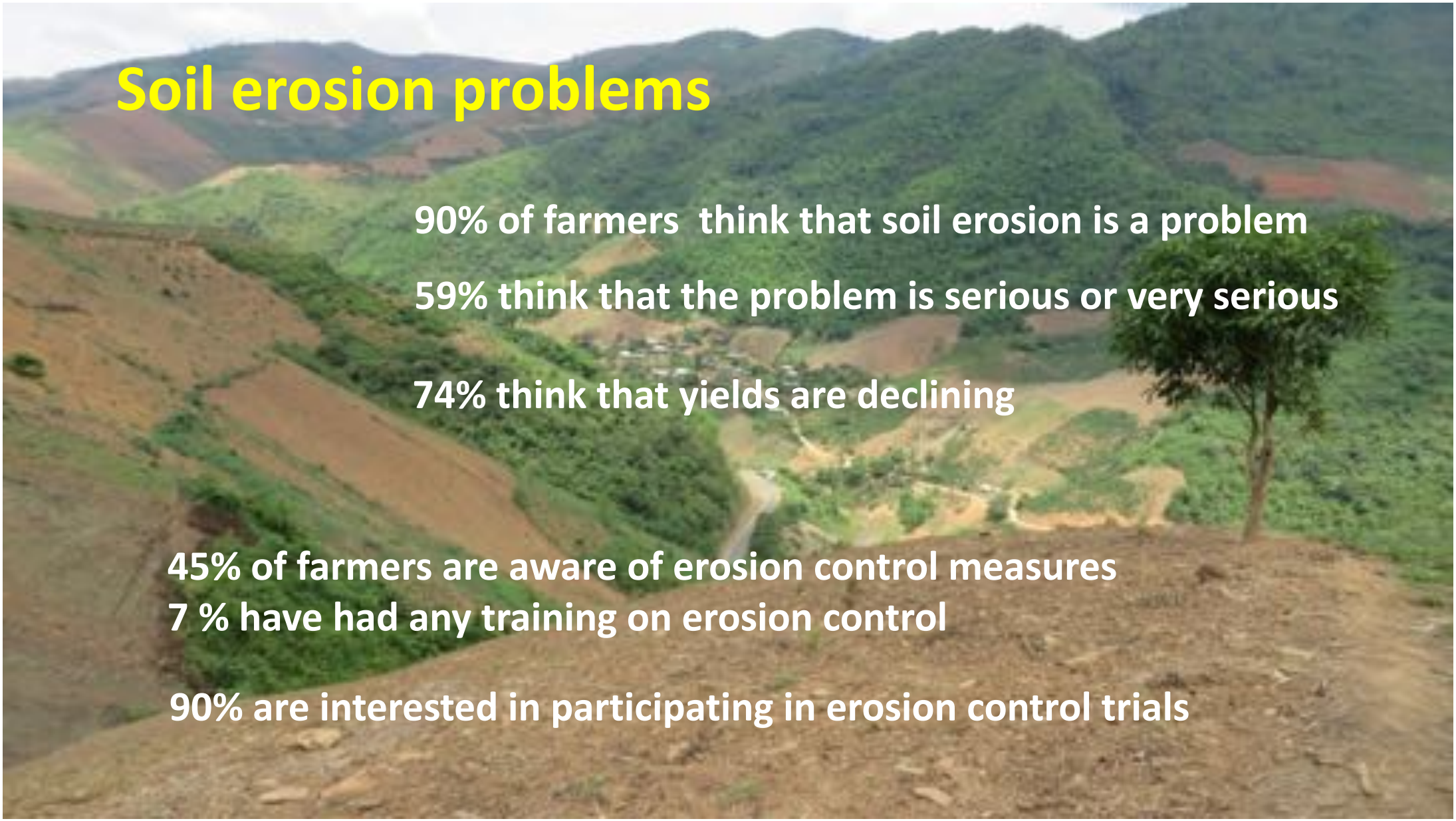
Application of fertilisation

- High rate of adoption of chemical fertilizers: 74% HHs use NPK.
- Only 1.2% HHs apply organic fertilizers
- Small quantities of fertilizers used: around 50-60kg/ha NPK (5:10:3)
- Lack of understanding of the roles of N, P, K and the formula of fertilizers used



Most common fertiliser formulation


Land preparation technique
Tractor - 2%
Cattle - 22%
Manual - 76%

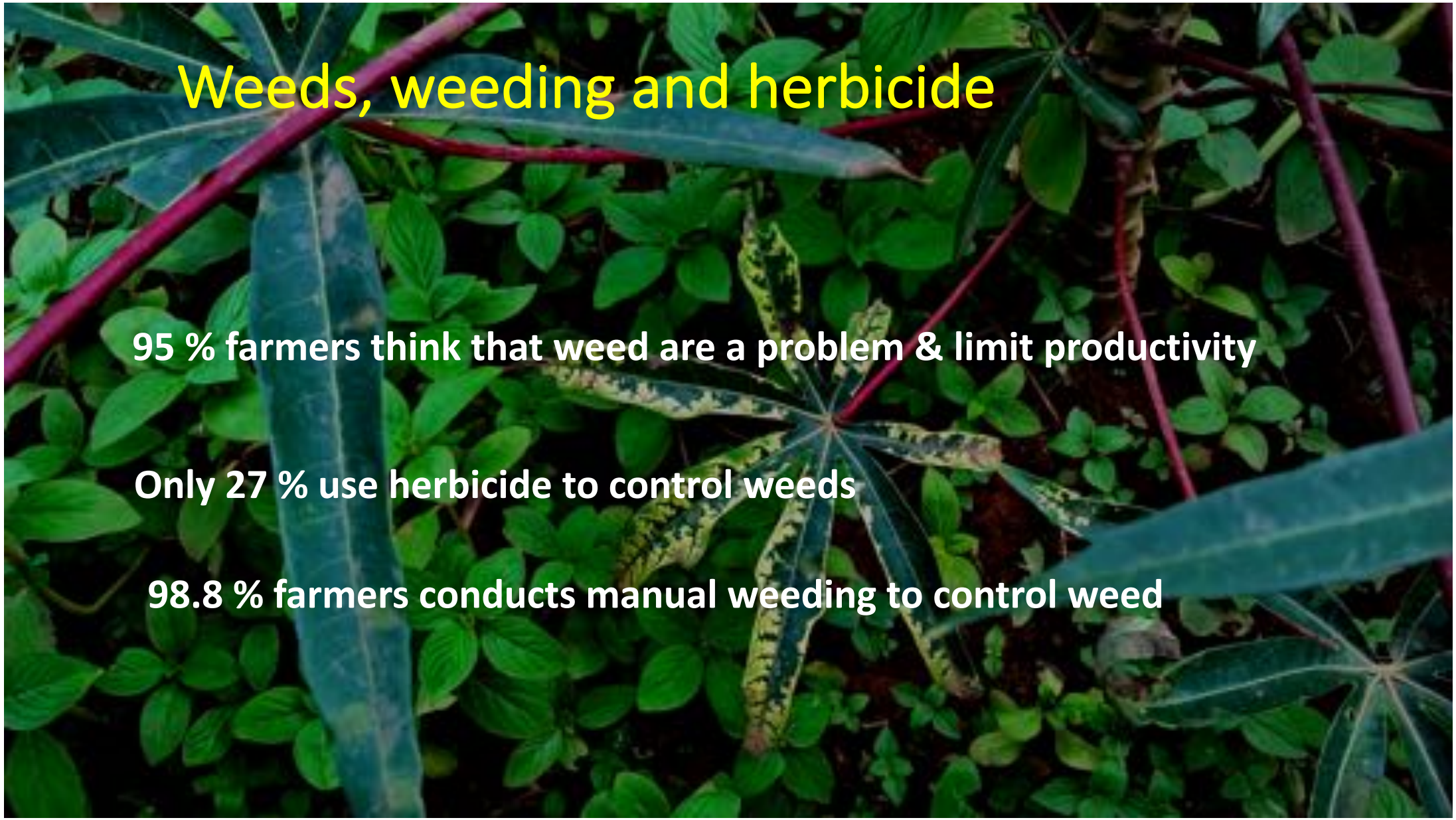

Soil erosion problems
90% of farmers think that soil erosion is a problem
59% think that the problem is serious or very serious
74% think that yields are declining
45% of farmers are aware of erosion control measures
7 % have had any training on erosion control
90% are interested in participating in erosion control trials

Awareness of intercropping, by commune

% HHs out of 256 HHs surveyed	Bo Muoi	Chieng Chan	Na Ot	Pung Tra	Total
Have ever grown intercrops with cassava	4.60	4.7%	17.2%	3.1%	7.4%
Are currently growing some intercrops with cassava	3.1%	1.6%	6.3%	0.0%	2.7%
Are interested in trialling intercrops	29.2%	14.1%	65.6%	35.9%	36.2%

Varieties planted

Variety Name	Proportion of total varieties
Cao San (KM94?)	55.3%
La Tre	27.5%
San Den	12.1%
San Xanh	1.9%
San Tau	0.6%
GiongNgheAn	0.6%
KM94	0.3%
Giong Cao Bang	0.3%
San launam	0.3%
san Moc Chau	0.3%
San Mot Than	0.3%
San nguoikinh	0.3%


Weeds, weeding and herbicide
95 % farmers think that weed are a problem & limit productivity
Only 27 % use herbicide to control weeds
98.8 % farmers conducts manual weeding to control weed

%HHs think they will still be growing cassava in coming 5 years

	Bo Muoi	Chieng Chan	Na Ot	Pung Tra	Average
Yes	80.0%	71.9%	70.3%	82.8%	76.3%
No	7.7%	3.1%	17.2%	4.7%	8.2%
Unsure	12.3%	25.0%	12.5%	12.5%	15.6%

Cassava use

- Most farmers (80%) of farmers in all communes, except PungTra sold fresh cassava roots
- 37% of farmers also used cassava for livestock production
- Dried chip production and sales also occurred in Bo Muoi and Na Ot

	Bo Muoi	Chieng Chan	Na Ot	Pung Tra	Total
Eat	0.0%	0.0%	0.0%	3.1%	0.8%
Use for own livestock	15.4%	42.2%	3.1%	87.5%	37.0%
Cassava Leaf	1.5%	1.6%	0.0%	0.0%	0.8%
Sell fresh cassava	92.3%	84.4%	85.9%	57.8%	80.2%
Sell Dried cassava	10.8%	0.0%	21.9%	1.6%	8.6%

Relationships of HHs with traders

	With fresh roots traders					With dried trips traders				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
very strong	13.7%	12.0%	17.4%	28.8%	18.0%	14.4%	0.0%	0.0%	0.0%	4.7%
strong	29.4%	32.0%	40.4%	21.2%	30.7%	14.4%	29.9%	100.0%	33.3%	31.4%
moderate	35.3%	38.0%	19.2%	32.7%	31.2%	56.8%	50.0%	0.0%	33.3%	45.3%
weak	3.9%	8.1%	13.4%	11.6%	9.3%	14.4%	0.0%	0.0%	0.0%	4.7%
very weak	17.7%	10.0%	9.6%	5.8%	10.8%	0.0%	20.1%	0.0%	33.3%	14.0%

Implications for the project's interventions

- Mechanised land preparation could save labour costs but land is generally too steep
- Increased herbicide use for weed control could reduce labour costs but it is difficult to carry liquid herbicide up steep slopes
- Higher yields could be gained through more appropriate fertilizer formulation and moderate increases in application rates
- Higher yielding varieties are likely to have the most potential for increasing yields and improving farmer livelihoods and present the least challenges for adoption
- Declining yields and cassava prices, and the fact that cassava only accounts for a small proportion of farmer livelihoods means that benefits of new technologies must be very significant in order to encourage any widespread adoption

Partners for disseminating innovations

- Fertilizer companies have an incentive to develop more appropriate fertilizer formulations for cassava production and disseminate these formulations through networks of input supply shops
- The Mai Son Starch factory has an incentive to support the dissemination of higher yielding varieties of cassava in order to potentially increase throughput of their factory. However, the starch factory has few direct links to smallholder farmers.
- Traders and collectors have more direct links to farmers but only have an incentive to disseminate improved varieties of cassava if (a) they are able to profitably sell planting material; and (b) they are able to collect increased quantities of cassava roots or chips from farmers using improved varieties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