

Farm Economy and Land Use Analysis
of the Mountainous Border Region
with Free Trade
- A case study in the Yunnan-Laos border region

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Outline

1. Introduction
2. Trade of agricultural products between Yunnan and Laos
3. Analysis of farm economy
4. Conclusions

1. Introduction

- **China-ASEAN FTA**

- Zero tariffs on agricultural products of Laos have been implemented since 2009.

- **Long borderlines**

- China shares long border lines (4061 km) with ASEAN countries of Vietnam, Laos and Myanmar, and trading in the border regions is active.

- **Low income level**

- The net income per capita in rural Yunnan was only 386 USD, ranking the province as the 29th among all the 31 provinces and being merely 64 percent of the national average. There exist a large number of poverty-stricken people in rural Yunnan.

Hypothesis:

- There will emerge divisions in agricultural production along the border lines so that **cheap rice and corn produced in Laos will be imported to Yunnan, and farmers in Yunnan will choose to pursue agricultural activities** that can lead to higher economic returns instead of producing the same grains. **If so, this will result in the change of land use and lead to the increase of farmers' income and improvement of their social welfares.**
- Our focus: The reality of farm economy and land use in the border regions.

2. Trade of Agricultural Products between Yunnan and Laos

- Yunnan imports agricultural products from Laos, such as rice, corn, rubber, vegetables, etc.
- In 2008, Laos became China's second largest import nation for rice, and the first for corn.
- Among the trade of agricultural products with Laos, border trading takes a leading role, and with more than 70% share of the total import value and 66% share of the total trade value (Table 1).

Table 1 Agricultural trade between Yunnan and Laos
 Unit: 10,000US\$, %

	Total Value		Export		Import	
	2005	2007	2005	2007	2005	2007
Yunnan's Total	473,822	877,975	264,158	473,612	209,664	404,363
By Laos	4,144	8,339	2,877	3,591	1,267	4,748
Border trade	2,251	5,476	1,186	1,993	1,065	3,483
Laos' share in Yunnan's agricultural product trade						
	0.9	0.9	1.1	0.8	0.6	1.2
Share of border trade in Yunnan and Lao's agricultural product trade						
	54.3	65.7	41.2	55.5	84.1	73.4

Sources: Customs Statistics.

Situation of Target Area

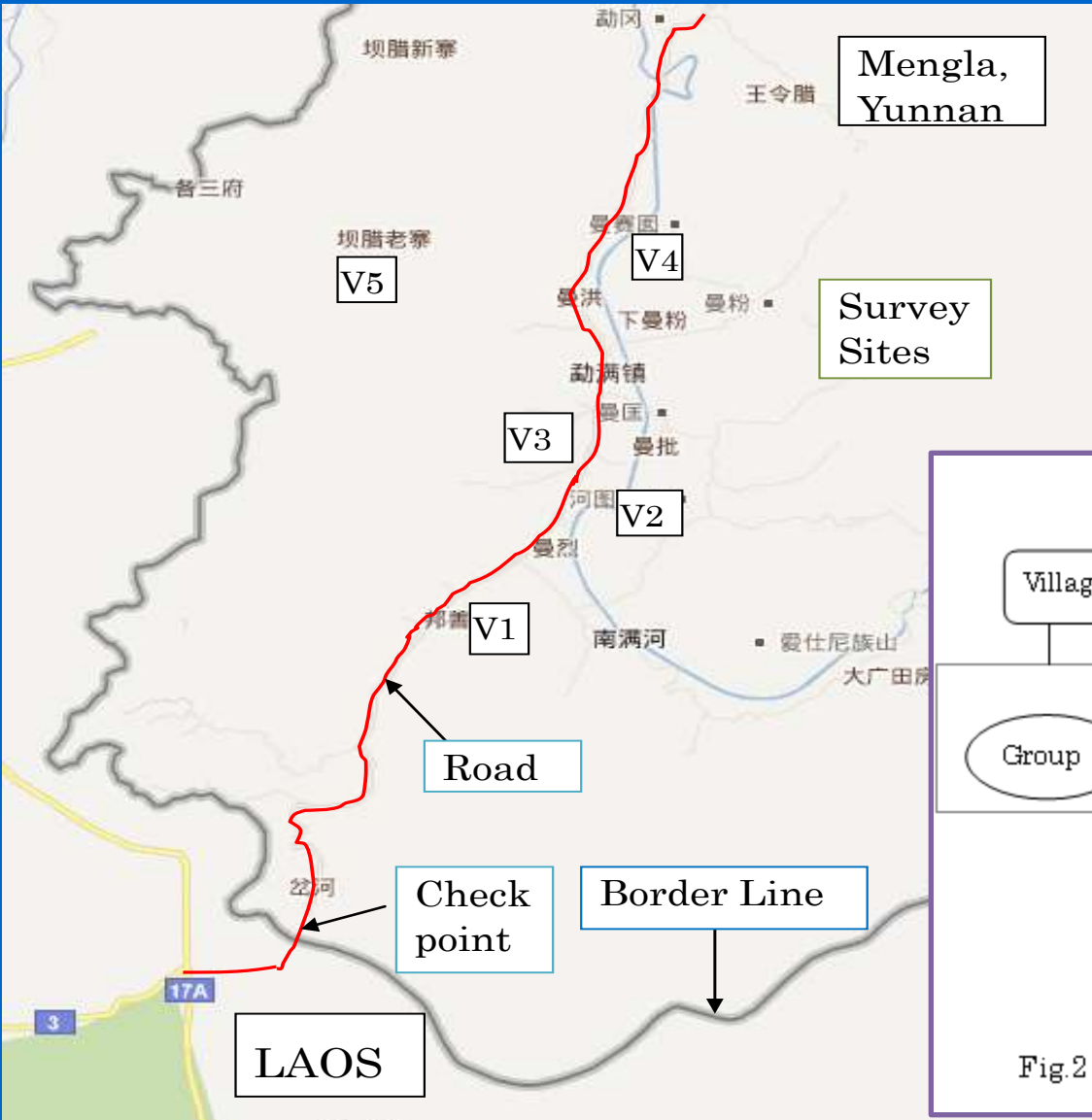
- Mengla county: 740.8 km borderline with Laos.
- 66% of population are farmers.
- 12 ethnic minorities; ratio of minority: 74%
- The poorest county in Xishuangbanna region
- The net income per farmer was 3,663 Yuan in 2010, lower than the Yunnan average of 3,952 Yuan and the national average of 4,250 Yuan.

3. Analysis of Farm Economy

- Selection of survey sites
- Outline of object households
- On land use
- Farmers' income
- Influence factors on farmers' income

Selection of Survey Sites

Figure 1 Distribution map of survey sites



We have chosen five groups as our survey sites, which are located on both sides of the road that runs through the border.

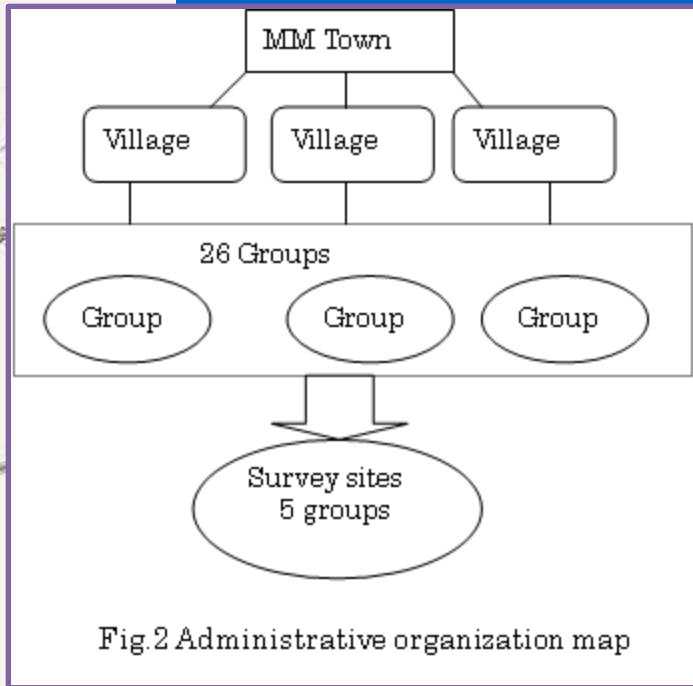


Fig.2 Administrative organization map

Outline of object households

- Average household size: 4 to 5 people; Group V3 is closest to the town and has the smallest household size.
- Most farm lands are forestlands, and the rest are lowlands and uplands.
- The scale of arable lands in each group varies wildly.
- The feature of this region is of large forestlands and little uplands.
- Half of the households have Laotian relatives. In 2010, 54 households visited Laos, but with little exchange of agricultural products.

Table 2 Outline of object households

	V1	V2	V3	V4	V5	Total(or Average)
Households	25	15	31	5	45	121
Population	112	72	129	23	196	532
Household size	4.48	4.80	4.16	4.60	4.36	4.40
Per household land(mu)	9.7	9.3	11.3	21.7	4.5	8.6
Per household forestland(mu)	27.4	67.1	29.3	39.0	19.8	30.5

Note: Land=upland+lowland

Source: Survey data.

- ✓ The ratio of labor force to total population varies from 71% to 84%.
- ✓ More than 60% of the labor force engage in agricultural activities.
- ✓ Only a few migrant workers in general.
- ✓ Most of the migrant workers and people of other trades are found in group V5, which has the smallest arable land.

Table3 Labor force composition						
	V1	V2	V3	V4	V5	Total
population	112	72	129	23	196	532
agricultural labor	80	50	82	15	128	355
Trader	0	1	0	0	4	5
Migrant worker	2	0	6	0	11	19
Farmer with side job	4	0	2	1	3	10
Student or minor	23	16	32	5	40	116
Senior (non labor)	1	5	1	2	4	13
Non agricultural job	1	0	0	0	2	3
Unclear	1	0	6	0	4	11

On land use

- Most of the households in the survey sites obtained their lands in the 1980s or 1990s.
- The average scale of arable lands per capita is only 1.9 mu, and group V4 has the highest scale of 4.9 mu.
- The highest possession scale is 15 mu per capita, and the lowest is less than 6 mu.

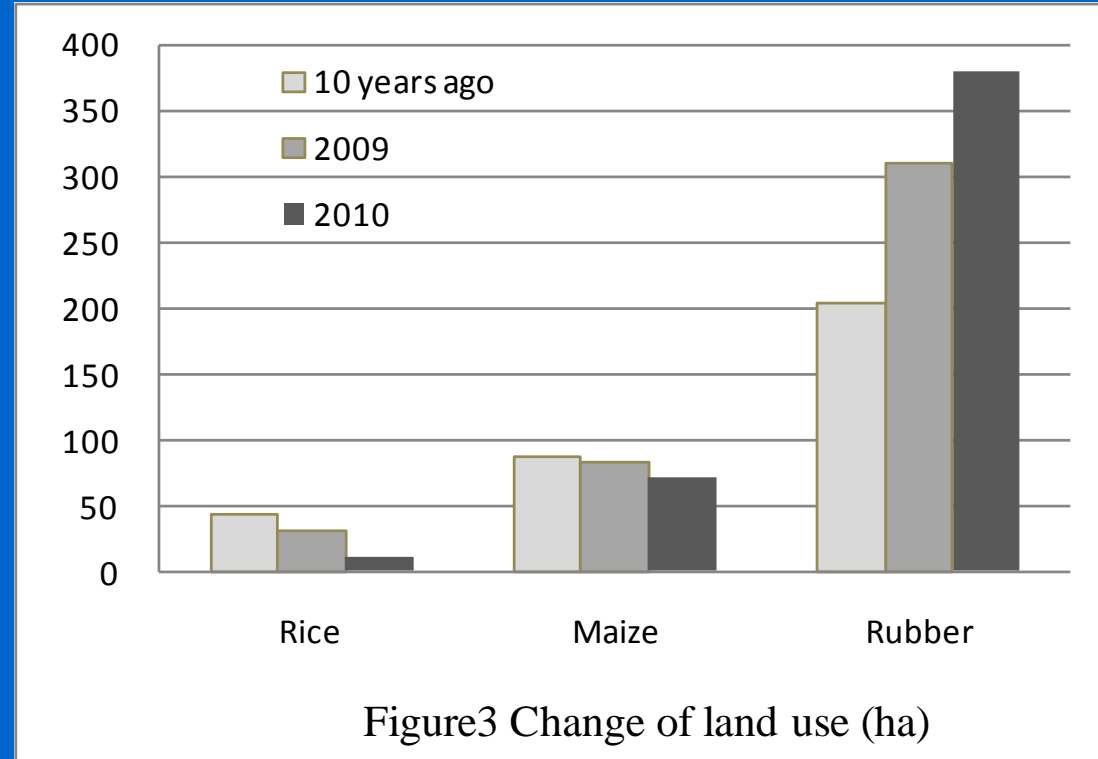
Table4 Land resources of farmers

	V1	V2	V3	V4	V5	Average
Lowland (mu/per capita)	2.1	1.4	2.6	1.8	1.1	1.7
Upland (mu/per capita)	0.0	0.3	0.1	3.1	0.0	0.2
Forestry (mu/per capita)	6.1	13.6	7.0	9.0	4.6	7.0
Total	8.3	15.3	9.8	13.9	5.7	8.9

◆ Areas of land for rice and corn are rapidly decreasing, but for rubber it is expanding.

◆ From 2009 to 2010, the areas of land for planting rice and corn are both decreasing, with the range of decrease for rice being largest, exceeding the total reduction of the past ten years.

◆ 83 of surveyed households have actually bought grains (rice and corn) from markets, representing nearly 70% of the total households.



◆ These changes reveal the fact that rice has become easily obtainable. Rice imported from Laos can be bought from markets.

◆ Thanks to this transition in land use farmers get higher incomes, but due to disappearance of the self-supply system for staple foods, they also become susceptible to market upheavals.

Farmers' income

- ✓ Land lease as a way for farmland use is a new trend. This is made possible by migrant workers from other regions who borrow arable lands from the locals, and the local farmers engage in rubber cultivation and land lease to sustain household economy.
- ✓ Stimulated by motorization in China since the late 1990s the needs for natural rubber have increased, and the price for rubber has been rising steadily. Especially since 2000, many households started to grow rubber trees which require seven years of growth to mature, implying the entering of the harvest seasons in recent years.
- ✓ Among the gross income, rubber production brings in 59% of the total, which is followed by the land lease at 21%, and the migrant income at 10%.
- ✓ Among the 121 households, there are only 12 households who obtain income from selling their agricultural products. 53 households who raise pigs and other livestock get income by selling them.

Table 5 Composition of farmer income (per household gross income)

	Rubber	Other Agricultural activities	Livestock	Migrant income	Business	Land lease	Subside & others	Total
Amount (yuan)	22,737	601	1,581	4,030	1,056	8,272	477	38,753
Share(%)	58.7	1.6	4.1	10.4	2.7	21.3	1.2	100

On each group

- ✓ Land lease by farmers in group V2 is rare, with only one household leasing land. Instead, their income relies on rubber production, because they own large forestlands. The scale of forestland area in this group is more than twice of those in other groups.
- ✓ Groups V1 and V3 have easy access to the road and the town, their agricultural activities are more diverse and balanced; they obtain a large income not only from rubber production but also from land lease, migrant work, etc.
- ✓ For all the groups, rubber production is the main source of their incomes.

Table 6 Number of households and average income based on income categories

		Income unit: per household yuan									
		Land Lease		Rubber		Agriculture		Livestock		Non-agriculture	
		N	average	N	average	N	average	N	average	N	average
V1		19	10,836	23	23,922	1	9,000	11	1,202	7	12,286
V2		1	6,600	11	116,364	0	0	2	2,500	0	0
V3		26	9,960	14	28,107	9	2,934	24	3,386	8	25,783
V4		4	3,325	5	52,600	0	0	4	5,225	1	30,000
V5		36	3,586	34	25,654	2	650	12	1,777	15	8,076

Source: survey data.

Influence factors on farmers' income

- In this area few farmers actually visit mutual trading markets, and there are no trading activities by farmers. The incomes of farm households come from cash income by selling rubber and land lease.
- A correlation analysis is conducted to obtain correlation coefficients between rough income and land lease (Table 7).
- Multiple regression analysis is carried out on rubber income and land lease, both having strong influence on farmers' income (Table 8).

Table 7 Correlation coefficients with household gross income

	Wetland	Forest-land	Rubber income	Land lease	Agricultural income	Non-agricultural income	Household population
Gross income	0.242*	0.635**	0.983**	0.318**	0.678*	0.637**	0.186*
N	105	114	87	82	12	31	114
* . Correlation coefficients are valid at 5% (both sides).							
** . Correlation coefficients are valid at 1% (both sides).							

Table 8 Influence factors on land lease and rubber income

	Standardized regression coefficient	t -value	coefficient of determination	Adjusted R ²	D.W.
Land lease			0.554	0.533	1.581
<u>Dependent variable</u>					
Household population	0.056	0.780			
Area of wetland	0.598**	7.515			
Dummy1	0.122	1.825			
Dummy2	-0.069	-0.777			
Dummy3	0.238*	2.512			
Rubber income			0.456	0.430	2.298
<u>Dependent variable</u>					
Household population	0.001	0.012			
Area of forestland	0.642**	7.782			
Male labor	0.154	1.704			
Female labor	0.044	0.452			

Note: D1 is the dummy coefficient of occupation for labor force: 1 = non-agricultural labor; 0 = agricultural labor.

D2 is the dummy coefficient of distance to town center: 1 = V3(close to town center); 0 = rest.

D3 is the dummy coefficient of distance to road: 1 = V1, V3 (close to road); 0 = rest.

Computation is carried out using the OLS method.

* valid at 5%, ** valid at 1%.

- The highest correlation coefficient goes to rubber income (0.98), which is followed by agricultural income (0.68), non-agricultural income (0.64), and forestland income (0.64).
- As an influence factor on land lease the coefficient of wetland area is 0.598, which is high and is consistent with the survey results which show that most of the wetland have been leased. This allows farmers to get income from land lease.
- The dummy coefficient with road is 0.238, and this positive relationship reflects the fact that wetlands near the road tend to be released more often.
- On rubber income, a high regression coefficient of 0.642 is obtained for forestland area, showing that an increase in the area of forestland will generate more rubber income. Therefore, the size of forestland area strongly affects rubber income.
- The agricultural activities of surveyed households have been much simplified, and their household economy has become specialized into rubber production.
- The traditional farm economy that emphasized self-sufficiency of agricultural production has undergone great change.

Conclusion

- ✓ Trade of agricultural products by farmers does not exist.
- ✓ Local farmers have become passive beneficiaries of grain import.
- ✓ Local farmers have given up rice self-sufficiency.
- ✓ The imported rice from Laos has enriched local rice markets and made the purchase of rice possible.
- ✓ This structural change of production in certain sense represents the division of labor on both sides of the border line.
- ✓ According to our initial assumption, this division of labor has indeed helped to raise the economic welfare of local farmers.

END

Thank you for your attention!