

# MAIZE PRODUCTION AND SELLING MAIZE IN SON LA

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## **1. Research objectives**

Over the past several years, in Vietnam, in conjunction with the development of a processed animal feed industry, the production of source plants, including maize, has also been increasingly expanding. Maize production has shifted from production primarily for household use to production for use in highly market-oriented products.

Among the Northern provinces that plant maize, Son La province is one where maize production is well developed. Maize in Son La is planted in swidden fields and in alluvial land near river and stream banks. Recently, it has also been planted in fields during the spring. Son La maize is sold in many markets such as Ha Tay, Thanh Hoa, Nam Dinh, Vinh, etc. This shows that maize in Son La has become a highly market-oriented product. However, in subsequent years, when Vietnam integrates into Asian economy, it is impossible to avoid competition with agricultural products from other countries. Hence, it is necessary to determine the constraints on maize production in Son La, in order to strengthen its competitive abilities. Based on this understanding, the aim of this study, “Maize Production and Maize Sales in Son La” is to define the potentials for and constraints upon maize production and sales in this area. Based on the results of this research, policy makers can put forward appropriate policies to help Son La become a successful maize production area.

## **2. Research methods**

### **2.1 Data collection**

#### *2.1.2 Primary data*

Primary data was collected through structured interviews with households, using a prepared questionnaire regarding their investment in maize as well as their maize productivity, yields, and sales. We interviewed 100 households in two districts of Son La province: Moc Chau and Mai Chau.

#### *2.1.1 Secondary data*

We collected secondary data from published documents, magazines, and reports. These sources contained data on the growing areas, yield, productivity, and amount of maize sold each year.

### **2.2 Method of Analysis**

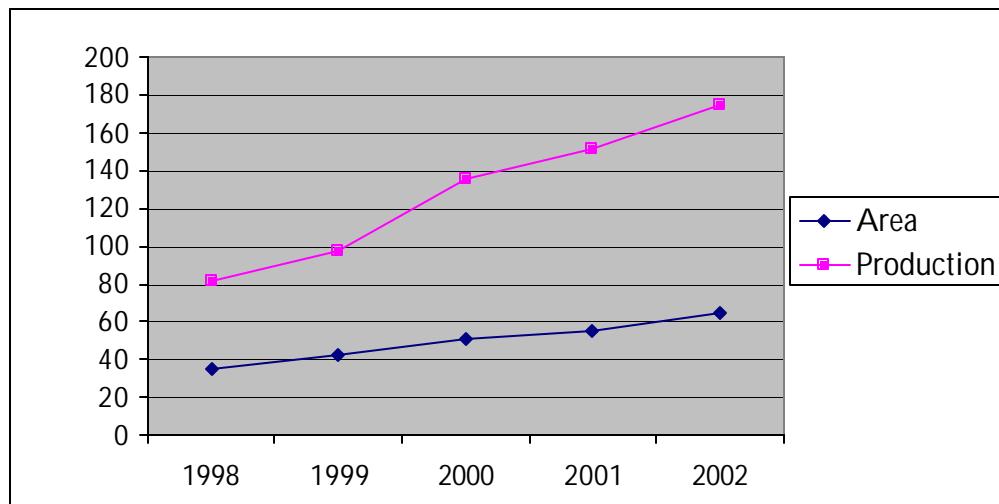
The following methods were used for analyzing the data:

- a. The production cost and effectiveness accounting method
- b. The comparison method

### 3. Research results

#### 3.1 The Situation of Maize Production in Son La

From our research we learned that maize is planted in Son La in two main seasons. In the Summer season maize is planted in swidden fields (farmers plant maize in April and harvest it in July) and in the Winter season maize is planted in alluvial lands near rivers or streams. Recently, farmers have tried to plant spring maize in their fields after harvesting their winter crops. Thanks to its advantageous geography and climate, maize production in Son La has increasingly developed in recent years. Maize area and production have increased significantly and now occupy a large part of the total maize production area of the entire country of Vietnam.



**Graph 1. Son La Maize Area and Production for the Period of 1998-2002**

From graph 1, one can see that maize area in Son La has increased by a large amount. The Son La maize area in 1998 was only 35.5 thousand hectares but in 2002, that number has grown to 64.9 thousand hectares.

Along with the recent increase in growing area, the total amount of maize produced in Son La has developed continuously as well. Son La maize production in 1998 and 2002 are 82.3 and 175.1 thousand tons, respectively.

So far, we have seen a big increase in Son La maize area and production in recent years. That also means that maize is becoming one of the main crops playing an important role in Son La's crop structure.

Base on our survey data, we can identify the position of maize in Son La cropping rotation as follows:

- \* Swidden fields:
  - Rice - Summer maize
- \* Alluvial land:
  - Rice - Winter maize
- \* Fields
  - Rice – Rice – Spring maize

### 3.2. Maize production Among Interviewed Households.

#### 3.2.1 Production Costs for Maize in Interviewed Households.

As with any production process, it is important to evaluate the production costs.. This evaluation provides the producer with an overview of his investment process and allows him/her to define a more reasonable level of investment. In agriculture, a reasonable level of investment helps producers to increase their crop productivity, limit wasted inputs, and improve production efficiency.

In our research, we assessed farmers' production costs for maize in different seasons to find out during which seasons producers can decrease their production costs.

**Table 1. Production Costs for Maize Among Interviewed Households in Son La**

*(Calculated based on an average of one ton produced)*

Items	Unit	Summer season	Winter season	Spring season	Comparative Ratios (times)	
					2/1	3/1
1. Materials Cost	1000 VND	441.94	513.87	518.67	1.16	1.17
2. Fees	1000 VND	346.31	301.46	334.41	0.87	0.97
<b>Total</b>	1000 VND	<b>788.25</b>	<b>815.33</b>	<b>853.08</b>	<b>1.03</b>	<b>1.08</b>

*Source: Household Survey*

The survey data show that the production costs for 1 ton of maize is lowest in the Summer season and is highest in the Spring season – at a cost of 853.08 thousand VND/ ton. The reason for this seasonal cost difference is that in the Summer season, maize is planted in swidden fields which are very fertile, making the cost of manure and other materials low . On the other hand, Winter and Spring maize is planted in fields or alluvial land nearby streams and rivers. These lands are often rotated so their fertility is quite low. Therefore, material and manure costs are high, leading to high production costs.

**Table 2. Production Costs for maize Among Interviewed Households in Son La**

*(Calculated based on an average of 1 hectare of cultivated land)*

Items	Unit	Large size (1)	Medium size (2)	Small size (3)	Comparative Ratios (times)	
					2/1	3/1
1. Materials Cost	1000 VND	2385.84	2668.9	3073.28	1.12	1.29
2. Fees	1000 VND	2505.38	1901.25	1330.87	0.76	0.53
<b>Total</b>	1000 VND	<b>4891.22</b>	<b>4570.15</b>	<b>4404.15</b>	<b>0.93</b>	<b>0.90</b>

*Source: Survey data*

*Note: Large size households are those greater than 1 hectare*

*Medium size households are those between 0.5 to 1 hectare*

*Small size households are those smaller than 0.5 hectare*

Thus, it can be said that the production cost per ton of maize in the Summer season in Son La is lowest. In the other words, the Summer season creates a greater advantage than other seasons for reducing maize production expenses.

Besides evaluating household investments across the seasons, we also assessed household production costs depending on their size (large, medium, or small) with the aim of defining which size households have the most advantage in reducing their maize production expenses.

The data in table 2 shows that production costs for large households are highest while costs for small households are the smallest. However, if the cost of each item is considered individually, one can see that material costs for small households are higher than others. From this point of view, large-scale production needs less input.

If we examine hiring fees (mainly those spent on labor) we can see that small households have much lower hiring fees compared to large households. This is explained by the fact that large households have larger area, meaning they have to hire labor more regularly. Thus, large households plant more market-oriented maize than other size households. Besides, due to their large labor demands, large size households contribute to providing jobs for local people.

### 3.2.2 The Economic Results of Maize Production of Interviewed Households.

In addition to evaluating the production costs of households during different seasons, we also assessed the socio-economic result from maize production of interviewed households in different seasons to identify which times of the year will bring farmers a higher profit.

**Table 3. Productivity and Economic Results of Maize Production in Different Seasons**

*(Calculated based on an average of 1 cultivated hectare)*

Norm	Unit	Spring Season (1)	Winter Season (2)	Summer-Autumn Season (3)	Comparative Ratios (times)	
					3/1	3/2
Productivity	Ton/ha	5.40	5.50	6.10	1.13	1.11
Gross Output (GO)	1000 VND	8937.54	9213.05	10401.11	1.16	1.13
Intermediate Cost (IC)	1000 VND	2800.81	2826.30	2695.86	0.96	0.95
Value Added (VA)	1000 VND	6136.73	6386.75	7705.25	1.26	1.21
Mixed Income (MI)	1000 VND	4330.93	4728.75	5592.75	1.29	1.18
Family Labor	Labor	169.80	161.47	145.85	0.86	0.90
IC/ ton of Product	1000 VND	518.67	513.87	441.94	0.85	0.86
VA/ ton of Product	1000 VND	1136.43	1161.23	1263.16	1.11	1.09
GO/IC	Times	3.19	3.26	3.86	-	-
VA/IC	Times	2.19	2.26	2.86	-	-
MI/IC	Times	1.55	1.67	2.07	-	-
GO/ family labor	1000 VND	52.64	57.06	71.31	1.35	1.25
VA/family labor	1000 VND	36.14	39.55	52.83	1.46	1.34
MI/ family labor	1000 VND	25.51	29.29	38.35	1.50	1.31

*Source: Survey data*

Survey data show that productivity and efficiency norms for maize production in the Summer season are both higher than those of other seasons. Data in Table 3 shows that maize production in Son La during the Summer season is 6.1 tons per hectare, which is 1.13 times higher than for Spring season and Winter season. Added value generated from one ton of maize in the Summer season is 1236.16 thousand VND, which is 1.11 times higher than that of Spring season and 1.09 times higher than that of Winter season. Similarly, income generated from one day of work in maize production during the Summer season is 38.35 thousand VND, which is 1.5 times greater than that generated during the Spring season and 1.31 times greater than that generated during Winter season respectively. This is because of the low material costs in the Summer season.

In short, we can conclude that in Son La, maize is more effectively produced when it is planted in the Summer season than when it is planted in the Winter and Spring seasons. The Summer season is the main maize production season in Son La, so we should enlarge maize areas in this period.

Besides evaluating the socio-economic effects of maize production in different seasons, we also examine households of different scales to define which scale is most suitable for maize production.

**Table 4. Productivity and Economic Information for Maize Production Among Groups of Households**

*(Calculated per Cultivated Hectare)*

Norm	Unit	Groups of Households			Comparative Ratios (times)	
		Large Scale (1)	Medium Scale (2)	Small Scale (3)	3/1	3/2
Productivity	Ton/ha	6.05	6.10	6.25	0.97	0.98
Gross Output (GO)	1000 VND	10315.90	10401.10	10656.90	0.97	0.98
Intermediate Cost (IC)	1000 VND	2385.84	2668.90	3073.28	0.78	0.87
Value Added (VA)	1000 VND	7930.02	7732.21	7583.60	1.05	1.02
Mix Income (MI)	1000 VND	4824.64	5830.96	6252.73	0.77	0.93
Family Labor	Labor	105.01	144.39	188.15	0.56	0.77
IC/ ton of Product	1000 VND	394.35	437.52	491.72	0.80	0.89
VA/ ton of Product	1000 VND	1310.75	1267.58	1213.38	1.08	1.04
GO/IC	times	4.32	3.90	3.47	-	-
VA/IC	times	3.32	2.90	2.47	-	-
MI/IC	times	2.02	2.18	2.03	-	-
GO/ family labor	1000 VND	98.24	72.03	56.64	1.73	1.27
VA/family labor	1000 VND	75.52	53.55	40.31	1.87	1.33
MI/ family labor	1000 VND	45.94	40.38	33.23	1.38	1.22

*Source: Survey data*

From our research we found that because the small-scale households (Group 3) have a chance to invest more and work their fields more intensively than large-scale households, (Group 1) the average productivity per hectare for small-scale households is higher than the large-scale households. Data in Table 4 also shows that maize productivity for Group 3 is 6.25 tons - which is 1.03 times greater than Group 1.

However, because Group 3 invests more than Group 1, their material costs for maize production is higher than Group 1. The production costs for Group 3 is 3073.28 thousand VND/hectare, which is 1.29 times higher than that of Group 1. Thus, the added value generated from 1 hectare of maize in Group 3 is only 7583.6 thousand VND, which is 0.96 times the added value of Group 1. If we calculate the material costs of producing one ton of maize, then the production cost of Group 1 is the lowest - only 394.35 thousand VND compared to 491.72 thousand VND of Group 3. For this reason, we can say that Group 1 (Large scale) has an advantage over Group 3 in reducing the production cost of maize.

If we examine the efficiency of labor, the income generated from one day of work of Group 3 is much lower than that of Group 1. As can be seen in Table 4, one day of work for households in Group 3 creates 33.23 thousand VND, while, laborers in Group 1 can receive 45.94 thousand VND.

Moreover, if social efficiency is taken into account, then large-scale production of maize not only heightens the income brought by family labor, but also creates jobs for leisured labor in the area thanks to its large hired labor requirements.

From examining all of the factors above, we can conclude that the large-scale production of maize will produce more socio-economics benefits than small-scale production. Hence, the government should issue land policies designed to encourage households engaged in large-scale cultivation so that maize production can be more effective.

**Table 5. Comparison Between Maize and Other Cultivated Plants in Son La**

*(Calculated per Cultivated Hectare)*

Norm	Unit	Maize (1)	Soybean (2)	Upland rice (3)	Comparative Ratios (times)	
					3/1	3/2
Gross Output (GO)	1000 VND	10401.11	6660.00	2207.48	1.56	4.71
Intermediate Cost (IC)	1000 VND	2695.86	2142.90	287.50	1.26	9.38
Value Added (VA)	1000 VND	7705.25	4517.10	1919.98	1.71	4.01
Mix Income (MI)	1000 VND	5592.75	2715.97	1919.98	2.06	2.91
Family Labor	Labor	145.85	148.60	135.20	0.98	1.08
GO/IC	times	3.86	3.11	7.68	-	-
VA/IC	times	2.86	2.11	6.68	-	-
MI/IC	times	2.07	1.27	6.68	-	-
GO/ Family Labor	1000 VND	71.31	44.82	16.33	1.59	4.37
VA/Family Labor	1000 VND	52.83	30.40	14.20	1.74	3.72
MI/ Family Labor	1000 VND	38.35	18.28	14.20	2.10	2.70

*Source: Survey data*

At the same time, by evaluating maize production among households of different scales, we can also compare the effects of maize -planting with the effects of some other kind of plants grown in the same season and soil quality, in order to see whether or not maize brings more economics results than others.

Data in Table 5 represents our survey results for maize, soybean, and upland rice production in Son La. All of these plants are cultivated in swidden fields during the Summer season. Data shows that, despite its higher production costs than soybean and upland rice, maize production in Son La is still more effective than these other crops during the same season.

From Table 5, we see that the material cost of maize production is 2695.86 thousand VND/ha, which is 1.26 times than soybean and 9.38 times higher than upland rice. However, added value generated from maize production is considerably higher at 10401.11 thousand VND/ha, while soybean only generates 6660 thousand VND/ha and upland rice only generates 1919.98 thousand VND/ha. In addition, averages reflect that the efficiency of maize production is higher than that of either soybean or upland rice.

For instance, one family's labor in maize production can earn 38.35 thousand VND of mixed income per day. This number is 2.7 times and 2.1 times greater than that of upland rice and soybean, respectively. From the above statistics, we can see that maize production in Son La plays an important role in enhancing households' income as well as eliminate hunger and reducing poverty

In conclusion, maize is the plant that brings more benefits to Son La than any other food plants. Hence, households should begin to replace less effective plants like upland rice with maize to increase their family incomes.

In short, by analyzing and assessing maize production in Son La, we emerge with the following findings:

- \* Maize production costs in the Summer season in Son La are lower than those of other seasons. In other words, the Summer season has advantages over other seasons for reducing maize production costs.

- \* Maize production in Son La in the Summer season brings more productivity compared with others. Although it is already the main season for maize production in Son La, the area for maize production in the Summer season should be widened.

- \* Small-scale households have higher material costs compared with medium and large scale households. Large -scale households have higher hired labor cost than others.

- \* Maize productivity of small-scale households is higher than that of medium and large scale households. However, large-scale production has higher socio-economic benefits than others. For this reason, the government should issue appropriate policies to encourage households involved in large-scale production.

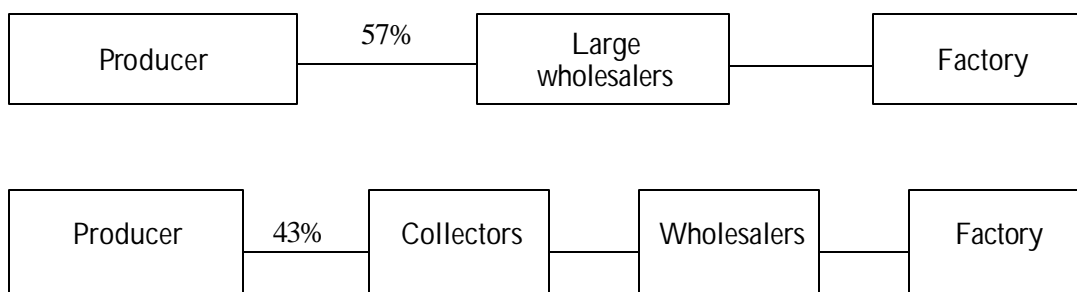
- \* Large scale production has advantages over other scale households in reducing production costs. Besides, large scale production also enhances family income and creates jobs for leisured laborers in the area.

\* Maize production brings more benefits compare with soybean and upland rice production. Therefore, in order to both increase family income, eliminate hunger and reduce property, households should replace less effective plants with maize (if possible).

### 3.3 Maize Sales for Interviewed Households

#### 3.3.1 Maize Supply Chain of Interviewed Households

From our survey, we found out the supply chain for maize of households in Son La is as follows:



#### 3.3.2 Maize Sales for Interviewed Households

Selling products is the last stage in a production cycle. It has a large influence on capital recovery and re-investment. In agriculture, in order to define the commercial crops, it is very important to asses the selling process. From that we can make the appropriate investment and production expansion.

We analyze the maize-selling process for households of different scales in order to determine which types of household have produced maize as a commercial crop.

**Table 6. The Ratio of Maize Sold in Differe nt Households**

Household Type	Percentage of Commercial Maize (%)
Large -scale Households	95.39
Medium -scale Households	86.01
Small-scale Households	84.09

*Source: Survey data*

As can be seen in Table 6, maize in Son La is highly commercialized. Large-scale households sell 95.39 % of their total products while medium and small-scale households sell 86.01 % and 84.09 % of their total products, respectively. If we compare the ratios of maize sold among households we can see that large -scale households have the highest rates, while the lowest rates belong to small-scale households. So one can say that maize production in large-scale households is more commercialized than in small-scale households.

Besides defining the ratios of maize sales, we also study maize sales for different periods because in different times maize will be sold at different prices. For example, if maize is sold at the right times, the price can be high etc..

**Table 7. Maize Selling in Different Times**

<b>Items</b>	<b>Ratio of selling</b>	<b>Price (VND/ kg)</b>	<b>Time</b>
First sale period	1.08	1560	8
Second sale period	22.62	1520	9
Third sale periodg	48.96	1780	10
Fourth sale period	27.34	1730	11
<b>Total</b>	<b>100.00</b>	<b>-</b>	<b>-</b>

*Source: Survey data*

From our research we know that households have to make different decisions in order to determine the time for selling products. Data in Table 7 shows that in Son La, the ratio of maize sales in the first sale period (right after harvesting) is extremely low at 1.08%. This ratio reaches its peak in the third sale period (October) with 48.96% of total households maize and the second highest one is in the fourth period (27.34%). The reason for this phenomenon is that October and November are the months between Summer and Winter season in Son La, therefore the prices are higher. Households consequently sell most of their maize in this time. On the other hand, August is the harvesting time for Summer season. There is a lot of maize, so the price is lower than during the between-crop period. Hence, households should have ways of storing their products until October so that they can obtain higher prices. However, their storage methods are still very simple, so that maize has undergone quite a loss. For this reason, it is very important for Son La to find out the suitable methods for storing maize.

Along with identifying the ratio of maize sales in different time periods, we also take into account who their buyers are in order to understand the advantages and difficulties in selling maize products. From our survey we know that buyers are mostly collectors and big wholesalers. They are the two main actors who buy most agricultural products and maize in particular. Big wholesalers in Moc Chau use cars to transport maize.

**Table 8. Ratio of Maize Selling by Buyers**

<b>Items</b>	<b>Ratio (%)</b>
<b>1. Maize for Selling</b>	<b>94.32</b>
Collectors	44.70
Wholesalers	55.30
<b>2. Maize for Fodder</b>	<b>5.68</b>
<b>Total</b>	<b>100.00</b>

*Source: Survey data*

Table 8 shows that households in Son La sell most of their maize (99.32%) to two main buyers: local collectors and big wholesalers, at 44.7% and 55.3% respectively. Therefore, we can say that maize in Son La is highly commercialized. However, because they only sell their products to those two buyers, sometimes buyers try to lower prices to maximize their profits. For this reason, it is very important for Son La to disseminate information, particularly that related to price -to producers. Maize for fodder makes up 5.68% of the total

products, which indicates that most of their products are for selling and only a small amount is stored at home.

The sales price has a big effect to producers' income. If they can sell at a high price, then they will gain high profits and vice versa. During our research, we also survey the selling price with different buyers and selling times in order to identify which buyer farmers can sell maize at high or low prices, and at what time of year can they get high prices. Based on that, farmers can make the right choices when selling maize at maximum efficiency.

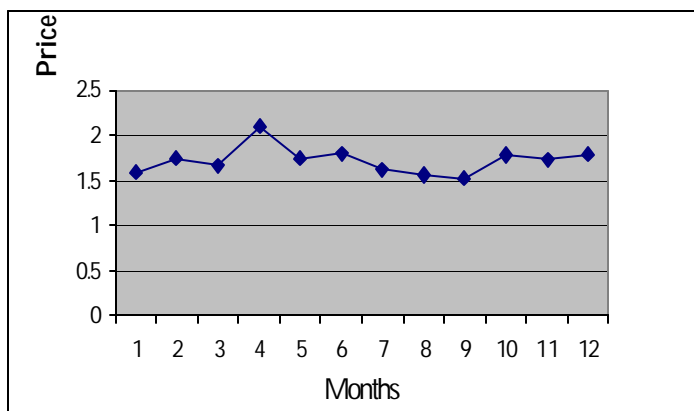
**Table 9. The Average Selling Price for Different Buyers**

Buyers	Selling price (1000 VND/kg)
Collectors	1.60
Wholesalers	1.76

*Source: Survey data*

As can be seen in Table 9, purchase price for wholesalers is higher than that of collectors. However, the gap between these two prices is fairly small. Wholesalers buy maize at the price of 1.76 thousand VND/ kg, while collectors pay the price of 1.6 thousand VND/kg. The reason for this phenomenon is: on one hand, collectors are mainly local people - they have close relations with producers and are therefore normally offered favorable prices. On the other hand, collectors buy maize more regularly, so they are given priority. Wholesalers are people from other areas and only come to buy maize when they want it, which is why they pay higher prices.

We analyzed maize sales prices for different months in order to identify price variation. From that, we can provide farmers information about prices - hence, farmers can make plans to sell and plant maize accordingly.



**Graph 2. Changes in Average Prices During the Year**

The graph above describes the variation in maize sales prices in late 2002 and early 2003. Survey data shows that in Son La, the average price reaches its peak in April at 2100 VND/ kg. April is the time when the spring maize crop is harvested. However, as far as we know, spring maize is newly planted in fields, so it is not as effective. For this reason, on average, maize can be sold at the highest prices in April.

August and September is the time when the large Summer maize crop is harvested in Son La. In this period, there is a lot of maize so the prices are extremely low - i.e. in August it is about 1.56 thousand VND/kg, and in September it is 1.52 thousand VND/ kg (lowest of the year). For this reason, farmers need to be helped with developing storage methods to keep maize for a long time to sell later with higher prices.

**In short**: By analyzing maize sales in Son La, we come up with the following findings:

- \* Maize in Son La is **highly commercialized**, evidenced by the fact that households sell most of their products (greater than 80%).

- \* Large-scale household maize producers are **more commercialized** than small-scale household producers, shown by the fact that they have the highest ratio of maize sales.

- \* Maize buyers are mainly **collectors** and **wholesalers**.

- \* The Maize selling price during the between-crop period is **higher** than in the main crop period.

### **3.4. Advantages and Disadvantages in Producing and Selling Maize in Son La**

#### **3.4.1 Advantages**

From our research, we see that producing and selling maize in Son La has some advantages as follows:

- \* Land in Son La is plentiful and high fertile, so it is suitable for widening maize areas, as well as enhancing the productivity.

- \* Because maize production brings high benefits, farmers are willing to widen their cultivation areas and to develop production in large scale.

- \* There is a larger demand for maize at the moment so farmers have advantages in selling their products.

#### **3.4.2 Disadvantages**

There are still some difficulties in producing and selling maize in Son La. These include:

- \* Lack of suitable varieties with long ear-husks (capable of sustaining drought).

- \* Households in Son La are mainly ethnic minority so they still use very simple technology for cultivation. It is fairly difficult for them to adapt to new technologies. Their crops therefore depend on nature; hence crop productivity is low compared to its potential.

- \* In remote areas, infrastructures such as roads and irrigation works are not well-developed. For this reason, households face difficulties when attempting to access the market. Besides, inputs prices and transportation cost are high. All of these things create great obstacles for farmers producing and selling maize.

- \* Post-harvest technology is still simple and not well-developed, so products undergo a substantial loss. Consequently, it is necessary for large -scale production areas like Son La to develop suitable methods of storing maize in order to reduce the loss.

\* There are still pest and insects affecting crops - especially rats and brown worm. They cause considerable financial damage to producers.

\* Because of its geographic location in a mountainous area, land for maize planting is mainly in hilly land with high slopes. However, the cultivation level in these regions is not highly developed. Besides, there is no timely method to oppose erosion -thus cultivated land is eroded and degraded quickly.

#### **4. Some method for promoting maize production in Sonla**

\* There should be some policies to stimulate research and to create suitable maize varieties, such as those capable of sustaining drought, hybrids with high productivity, and those with high ear-husks to limit damage caused by the weather.

\* Appropriate maize production procedures should be determined to heighten maize productivity, while at the same time, procedures to limit land erosion and degradation should also be developed.

\* Invest in infrastructure to create favorable conditions for farmers to access the market so that they can enhance their production efficiency.

\* Improve post-harvest technology to reduce loss after harvesting.

#### **IV. Conclusion**

From our research about maize production and selling in Son La, we come up with some conclusions as follows:

\* Maize production in Son La is strongly developed; maize area and maize productivity have continuously increased in recent years.

\* Maize in Son La is highly commercialized because most of the products are sold in the market. The ratio of maize stored in households is fairly low. Son La has become an area for maize production.

\* Maize production in Son La brings much higher results than other crops such as soybean, canna and upland rice.

\* However, there are still some difficulties in producing and selling maize in Son La - such as the low level of cultivation, poor infrastructure, underdeveloped storage methods, high input costs, and high speed of land erosion and degradation. These factors hinder production ability as well as the maize sales process for households in Son La.