Ministry of Agriculture and Forestry

National Agriculture and Forestry Research Institute (NAFRI)

Workshop Proceedings on

Corn Production and Market Chains: Building Framework for Border Trade and Cooperation

9-11 August 2006, Oudomxay Province

Socio-Economic Research Component
Lao-Swedish Upland Agriculture and Forestry research Program
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Foreword

On behalf of the National Agriculture and Forestry Research Institute (NAFRI) I am pleased to present the results from the the Workshop on Corn Production and Market Chain held in Oudomxay during 9th to 11th of August 2006.

The workshop was the culmination of a longer-term study carried out by the Socio-economic Unit of NAFRI on corn production and markets in Oudomxay province. The study is one of the many that NAFRI is carrying out to better understand how to improve production and farming systems in the Uplands of Laos.

In this sense the study and the workshop itself are a good example of how NAFRI works at different levels and has moved beyond just an agronomic focus but also to look at social, technical and institutional issues. It also demonstrates NAFRI's commitment to ensuring the results of its research are returned to key stakeholders and so they can be used in their own decision making processes.

The workshop highlights some key issues that are central to the government's new strategy for the Agriculture and Forestry Sector. The first relates to the need to develop farmer production groups to improve production, processing and marketing. Without viable organizations, farmers will be at a disadvantage when negotiating prices with traders. The second relates to the need to improve farmers' access to quality inputs and credit. Finally, as emphasized in the new government strategy there is a need to improve communication and transportation systems to facilitate the movement of agriculture products to facilitate regional trade.

The proceeding summarizes the presentations and, issues identified during the field visits, as well as discussions during the three-day workshop The workshop was jointly held by NAFRI, the Provincial Agriculture and Forestry Office and Commerce Office of Oudomxay province supported by Lao-Swedish Upland Agriculture and Forestry Research Programme (LSUAFRP).

The workshop brought together different stakeholders involved in the corn production and market chain in both northern Laos and in China to share technical information on production and trade. The workshop particularly invited local policy makers and traders of both China and Laos to present the current situation and discuss on strength and constraints of the current system

On behalf of NAFRI, I would like to express a sincere thanks to the Provincial Government Office, Provincial Agriculture and Forestry Office, Provincial Commerce Office and Chinese participants for their cooperation in organizing this workshop. I would also like to show my gratitude to LSUAFRP for its financial and technical support in making this workshop a successful one.

Dr. Bounthong Bouahom
Director General
NAFRI

Executive summary

Increased commercialization of agriculture is rapidly transforming the rural landscape and livelihoods in northern region of Lao People's Democratic Republic (hereafter Lao PDR or Laos). In Oudomxay province, located close to the Chinese border in mountainous northern Laos, corn production has rapidly expanded and become one of the key export commodities not only for the province, but for the northern region.

This workshop was a culmination of a process to better understand the corn value chain in Oudomxay and China. In 2005, The Socio-economic research component of the Lao Swedish Upland Agricultural Research Programme (LSUARP) carried out a study on maize production in Oudomxay.

The study indicated that while corn production was introduced as part of the government policy to find viable substitutes for opium cultivation, the growing demand for corn in China had opened a new opportunity for local farmers and traders alike[1]. However, a lack of understanding about the market chain often meant that local farmers and traders were uncertain about the market price and the quality of products needed in China and elsewhere. The lack of understanding regarding the market chain also made it difficult for the local policy makers to support both production and trade of key agricultural commodities such as corn.

In July 2006, a joint study tour in key border points in China[2] was organized by LSUAFRP in collaboration with the Regional Centre for Rural Development of Yunnan University in China. The study trip provided a better picture of the market chain on the Chinese side, and highlighted key problems with regards to border trade policies, and post-harvest processing and grading system.

This three-day workshop was held as a way to return the results to key actors involved in Maize production and provide a platform for participants to discuss the issues generated. The workshop was the first time that key stakeholders from Laos and China came together to discuss cross-boundary trade. As such, the workshop provided a unique platform for exchanging information and ideas on production and trade of corn amongst the key stakeholders in Laos and China. It is hoped that issues and recommendations raised during the workshop are only the beginning of new dialogue to improve the current situation with regards to production and trade of corn. The series of research activities and the current workshop is also only an entry point in developing a better understanding on commercialization and trade of agricultural commodities across the border.

The key recommendations of the workshop included:

Recommendation 1: Support development of farmers' groups

There is a need to support the development of organized group of farmers for production and sales of corn. Extension services as well as institutional credits can be provided on group basis. Having a production group can also support farmers

[1] Phouyyavong, K. and D. Talije (2006). Case Study on Production and Market Conditions for Corn in Namor District, Oudomxay Province. Vientiane, Lao-Swedish Upland Agriculture and Forestry Research Programme.

[2] Socio-economic research comoponent (2006). Study tour on maize production and market chain in Xishuangbanna, Yunnan province of China. Vientiane, LSUAFRP, NAFRI.

collectively to control the quality of products, and gain a stronger bargaining power against traders in negotiating better price for their products.

Recommendation 2: Further research and extension needed on new maize production technologies

Research and extension need to introduce new technologies to sustain/improve yields as well as retain soil fertility. The majority of farmers in Oudomxay are using their land intensively for commercial corn production with little agricultural inputs such as fertilizer. While many suspect that the soil is still relatively fertile in upland areas of Laos, intensive use of land without soil management will have an impact on loss of fertility and declining yield. This will require not only further research and trials of different varieties, but also experimenting with different cropping systems and soil control techniques that can avert economic and environmental risks for small-scale farmers.

Recommendation 3: Improve post-harvesting processing and grading

Local government officers and traders need to be more active to establish a system to for post-harvest processing and grading in order to improve the quality of product, and find ways to add-value. There are different levels of intervention that can be introduced. For example, drying of corn can be improved not only by introducing large-scale driers but also finding ways to improve drying the farm-level. Simple and cost effective drying techniques need to be developed and introduced by agricultural extension workers, while at the same time information on grading system should be widely disseminated.

Recommendation 4: Improve trade relations between local governments on both sides of the border

The final recommendation concerns the need for further negotiations between local governments to remove existing barriers to trade. Continued efforts to negotiate increased import quota in China is only a part of the solution. Administrative and tax procedures for border trade need to be revised to increase transparency, and to facilitate smooth trade flow. Furthermore, as foreign investment is an important part of commercialization of agricultural product in provinces such as Oudomxay, local governments will need to guarantee foreign investor's interest and at the same time devise a clear system to monitor the investment activities and their performances.

1. Background

Driven by a strong demand in the neighboring countries -China, Vietnam and Thailand- corn has become one of the most important cash crops in Oudomxay province. Production has increased from 3,000 tons per year in 1980s and 1990s to 73,000 tons in 2005. The expected total production in 2006 is more than 100,000 tons. The current export earning from corn is the highest in Oudomxay accounting for approximately 4 million USD in 2005 (66 percent of total export revenue). In 2005, 90 percent of the total corn production in Oudomxay was exported to China while only 10 percent was exported to Vietnam and less than 1 percent to Thailand.

Introduction of corn in the upland areas has provided farmers with alternative source of income. However, farmers and traders in Laos alike are facing a number of problems that prevent them from fully exploiting the potentials of higher productivity and market opportunities. The main problems faced by Lao farmers pertain to lack of access to market information and agricultural technology, as well as a lack of awareness on trade policies.

In order to address these problems and suggest improvements to upland land use practices, the Lao-Swedish Upland Agriculture and Forestry Research Program (LSUAFRP) of NAFRI has conducted a case study during late 2005 focusing on production and market conditions for corn in Oudomxay province. This was further followed by a study tour in Xishuangbanna prefecture of Yunnan province during the late June 2006 to learn about the market chain of corn in China.

1.1 Objectives and outputs of the workshop

The workshop aimed to bring together different stakeholders involved in the corn production and market chain in both northern Laos and in China to share technical information on production and trade. Studies conducted by NAFRI, in collaboration with a group of Chinese researchers from Yunnan University, highlighted the trends of both formal and informal trade between China and Laos and key problems in regional trade. Local policy makers and traders of both countries were asked to comment on the situation and discuss the strengths and constraints of the current system. The workshop was thus, aimed not only to raise key problems in the current production and trade of corn, but also to develop foundations for future policy dialogue among the policy makers, traders, extension workers and researchers in the two countries.

Through this workshop, the following outputs were expected:

1. Prioritizing production and border trade issues, and developing a platform for policy dialogue that facilitate agricultural export from Laos
2. Developing an action plan on ways to improve monitoring and feedback system for farmers, and provision of market information in Laos
3. Developing action plan to improve post-harvest techniques and add value to corn production
4. Building consensus and linkage between stakeholders in Laos and in China, and developing action plans for coordination between government agencies to facilitate export activities between two countries

1.2 Schedule

The workshop was organized for three days in Oudomxay Province and was attended by more than 50 people (see Annex 1 and 2 for list of participants and agenda). The first day focused on exchanging general information on corn production and market in both northern Laos and in China. On day two, field visits were organized to Baeng district, and also to local processing factories. On the last day, the participants were divided into groups to discuss in more details the issues, problems and opportunities in corn production (see Annex 3 for outputs of working group discussions).

2. Summary of opening speeches

2.1 Dr. Bounpone Buttanavong, Provincial governor of Oudomxay

It is a great honor to participate in the current workshop jointly hosted workshop by Provincial Agriculture and Forestry Office, Provincial Commerce Office and National Agriculture and Forestry Research (NAFRI) Institute.

During the workshop, we will not only hear the results of the study undertaken by NAFRI but also have an opportunity to learn about different government policies, market conditions of neighboring countries and the current constraint of corn trade, as well as technology issues with regards to improving the yield and quality of production.

Cash crop production has become an important part of Oudomxay's economy, and corn is one of the major crops that are currently produced by farmers in our province. Corn production has significantly increased in the last four years, providing economic opportunities for farmers in the rural areas. This increase in rural farmers' participation to the market economy is in accordance with the government policy that aims to alleviate rural poverty. I would like to congratulate those of you that contributed in supporting this common goal.

However, there are still many challenges that we need to tackle. First is a continued effort to negotiate smooth export and trade with regional countries. Secondly, we also need to consider improving post-harvest processing techniques. It is particularly important to improve the quality of products exported from Laos, as well as to add-value to the products in order to maximize the profit. Thirdly, there are technological challenges to improve the yield of corn and to develop hybrid varieties that are suited to the agro-ecological conditions of Oudomxay. The latter is deemed particularly important for local farmers, as many of them are dependent on using imported varieties every year.

I strongly believe that the current workshop will address some of the key problem as addressed here, and will provide a direction for future policy development.

Using this opportunity, I would like sincerely thank NAFRI and Sida in supporting this workshop together with other stakeholders including government agencies, companies and participants from China. I hope that these stakeholders will continue to address key issues on commercialization of agricultural products and trade in Oudomxay.

2.2 Dr. Bounthong Bouahom, Director General of NAFRI

I am highly honored to participate in the current workshop which aims to bring together regional stakeholders in Oudomxay province to discuss about the key issue with regards to corn production and trade.

Corn is one of the major agricultural products that Laos is producing to export to regional countries. Oudomxay has become the number two corn producer in all of Laos in 2002 after Xayabouli province, which is also located in northern Laos. Since 2002, the area of corn has increased from 4,000 ha to over 20,000 ha.

Despite the success, there are numbers of problem that still need to be considered. These problems include 1) loss of soil fertility under the pressure to cultivate cash crop intensively, 2) lack of post-harvest processing technology, 3) development of domestic market and development of related industries, and 4) regional trade of corn.

Corn production has not only brought increased revenue from trade to the province, but also to local farmers that produce corn. However, many of the farmers still have limited understanding on the market chain of their agricultural products across the border. They also lack access to market information, as well as access to agricultural technique. Local traders are unaware of trade policies.

Using this opportunity, I would like to share with you a small piece of information that I recently came across through the internet. According to a source, the Thai government has decided to support private investors and companies to promote contract farming of corn in regional countries including Laos. The situation surrounding export of agricultural commodities is dynamically changing.

Socio-economic research component of the LSUAFRP at NAFRI has conducted a study on corn production and its market opportunities in Namo district since 2005. The results of the study will be shared during the workshop. I hope that the workshop will generate important ideas to solve some of the emerging problems with regards to corn production and its trade. I also hope that the discussion that takes place during the workshop will lead to constructive development of government policies on agricultural development and trade in Oudomxay province.

Finally, I would like to use this opportunity to thank the Provincial Agriculture and Forestry Office (PAFO) and the Provincial Commerce Office of Oudomxay in co-hosting the current workshop under the supervision of the provincial governor. I also would like to thank the Lao-Swedish Upland Agriculture and Forestry Programme in providing financial support for the workshop. Last but not the least, I would like to thank all participants that have gathered here, a sincerely hope that everyone will have an opportunity to exchange their views and experiences during the three day workshop to jointly achieve a fruitful result.

Again, It is a great honor to welcome all of participants and I do believe that participants will share experiences, idea and provide good comments to achieve the goal of the workshop and I whish you all success with your work.

3. Presentations

3.1 Production of corn in Oudomxay

By Houmphan Bouphakham, Vice Director of Provincial Agricultural and Forestry Office (PAFO)

Oudomxay is the second largest producer of maize in Laos (after Xayabouli Province). Corn production has become economically important for farmers in Oudomxay, and also for the province as more than 90 percent of the production is exported to China. The high demand for corn in regional countries such as China provides economic opportunity for local farmers and an alternative to pioneer shifting cultivation. Increased corn production also has potential to promote development of post-harvesting processing industries including production of animal feed. This also leads to a potential of promoting livestock production.

According to provincial statistics, the production of corn in Oudomxay has grown significantly in the last four years. Table 1 indicates the growth of corn production in terms of area and volume between 2002 and 2006.

Table 1: Production of corn in Oudomxay province

Year	Area (ha)	Production (ton)
2002	4,000	16,500
2003	6,500	26,000
2004	11,500	46,000
2005	16,000	80,000
2006	20,000	100,000

Source: PAFO Oudomxay (2006)

Initially, PAFO first introduced maize production to farmers in Houn, Baeng and Xay districts particularly as part of a programme supported by the Vietnamese government on promoting staple crop production. The Vietnamese government continues to support the distribution of hybrid corn seeds and to providing credit to farmers. Increased production in other areas has been primarily through private investors that provide credits and agricultural inputs to farmers.

Of the total agricultural land area in Oudomxay (130,000 ha), corn is produced in approximately 20,000 ha. Farmers in Oudomxay generally produce corn during the rainy season using most all of 20,000 ha. Dry season corn is cultivated only in 3,000 ha of land, with production of up to 12,000 tons. Most of the corn is produced in three districts including Houn, Baeng and Xay districts (Figure 1).

The majority of the farmers use hybrid varieties. Ninety-five percent of the hybrid corn varieties used by farmers originate in Vietnam (LVN 10). There are few farmers that use hybrid varieties introduced from China and from Thailand. According to the provincial statistic, total of 250 ton of hybrid corn variety was used in Oudomxay in 2005. This has increased to 300 ton in 2006.

PAFO is also experimenting with development of its own hybrid variety. In 2005, they started to experiment in Houn district (1 ha), and now is being tested in other two districts (total of 10 ha) including Baeng and Namo. The development of a local hybrid variety is very important in order to cut down the cost of seeds for local farmers.

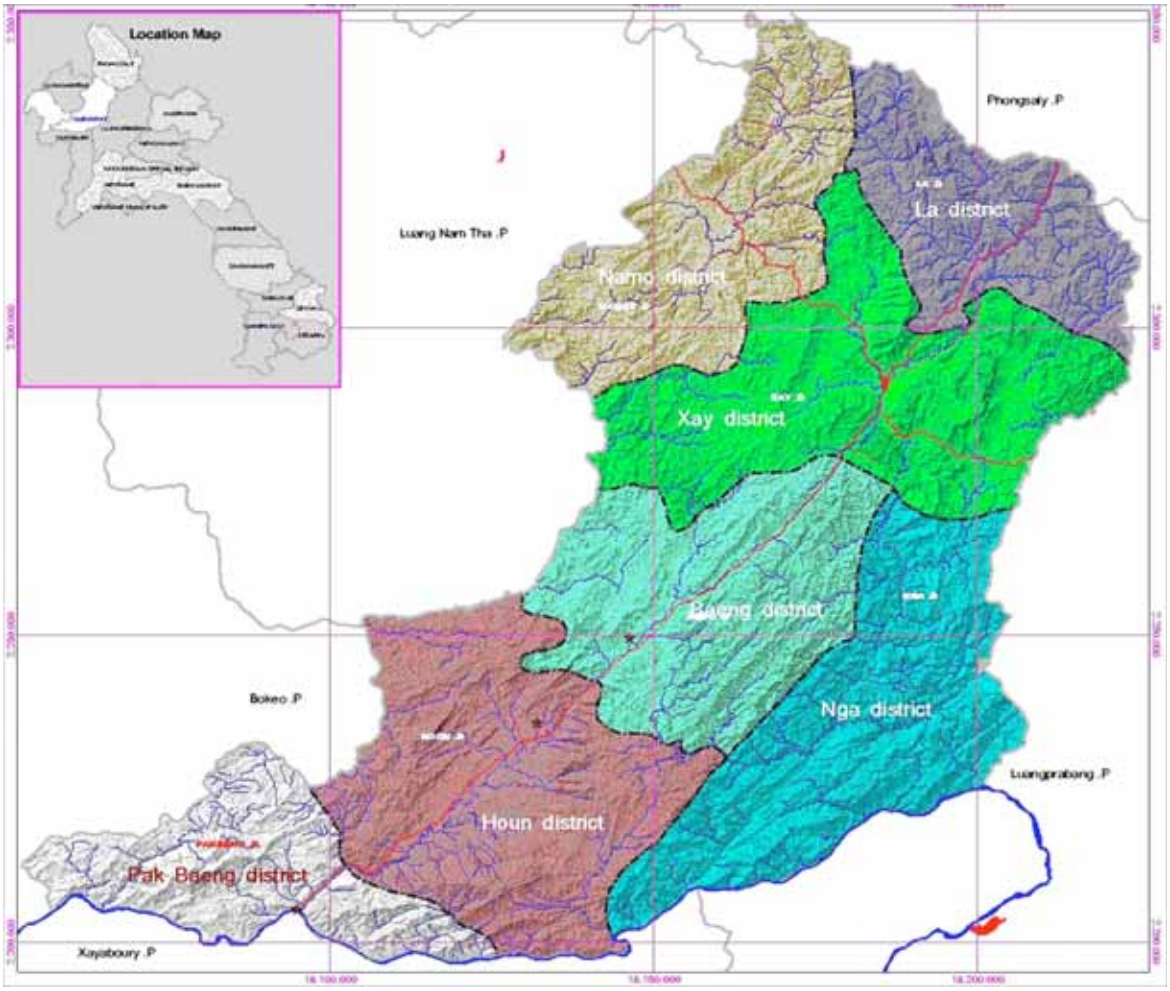

Figure 1. Map of Oudomxay province

3.2 Economic importance and production of corn in Oudomxay

By Mr. Houmpheng Minboupha, Head of the Provincial Commerce Office, Oudomxay

Production of corn in Oudomxay reached 80,000 tons in 2005. The total trade was worth 4 million USD, and accounts for 66 percent of total export revenue of the province. Corn produced in Oudomxay is exported to China, Vietnam and Thailand. Table 2 indicates the regional borders where Oudomxay's corn is exported.

Table 2: Regional borders in Oudomxay

Countries	Regional border
China	(1) Meochai (Oudomxay province) (2) Phangthong (Luang Namtha province)
Thailand	Houayxay (Bokeo province)
Vietnam	Muang Mai (Phongsaly province)

Nearly 70 percent of the corn export is to China (Xishuangbanna prefecture in southern Yunnan province) and is used for animal feed processing, while remaining 30 percent is used for alcohol production and human consumption.

The price of corn in Oudomxay has been increasing over the last four years from 500-600 kip/kg (approximately between 0.05 and 0.06 USD/kg) in 2002 to 800-950 kip/kg (approximately 0.09 USD/kg) in 2005. This price range did not differ with the

market price of corn in China which ranged between 1,000 - 1,200 kip/kg (approximately between 0.09 and 0.11 USD/kg) in 2005 the price may change between season, year and difference location.

While corn is one the prominent cash crops in Oudomxay today, farmers are still dependent on imported varieties for the production. In order to reduce the cost of agricultural input for local farmers, the local government needs to develop hybrid varieties that are cheaper and higher in quality. It is also important to introduce rotational cropping and other techniques to retain soil fertility, and sustain the level of corn production for the local farmers as they use their land intensively for cash crop production. Furthermore, we also need to improve the quality of post-harvest processing in order to avoid loss. By improving the post-harvest drying, farmers will also be able to negotiate for a higher price during the sale of their products.

Government agencies in Laos must continue to negotiate with its neighboring countries in terms of trade and removal of barriers to trade. Furthermore, different government agencies also need to coordinate and exchange information on market and new agricultural technology to local extension workers, traders and farmers in order for them to quickly respond and adapt to the market demands.

3.3 Case study on Production and Market Conditions for Corn in Namo District, Oudomxay Province

By Daniel Talje and Khamphou Phouyyavong, LSUAFRP/NAFRI

The main objective of the presentation is to highlight the results of LSUAFRP's study on production and market chain of corn in Oudomxay.

The research was led by the Socio-economic Unit of NAFRI, and was conducted during 2005 and 2006. The main aim of the research was to identify main factors that drive production and market performance for corn based on experiences of farmers in seven LSUAFRP target villages in Namo district. The study also examined the existing constraints and potentials for corn production and trade in Oudomxay, in order to make recommendations to local authorities and extension workers on further improvements.

For the study, stakeholders in Oudomxay were interviewed including farmers, extension workers, local government staffs and traders. This was followed by a study tour in Xishuanngbanna prefecture in Yunnan province between late June and early July 2006. This study tour provided an opportunity for researchers of the Socio-economic Unit, as well as local authorities from Oudomxay to understand the market chain of corn in China and where corns produced in Laos were being consumed in China.

In Oudomxay, corn production was initially promoted by the government as a potential alternative to opium cultivation. The production increased by nearly five times from 16,000 ton to 80,000 tons between 2001 and 2005. The majority of the products are exported to neighbouring countries of which 90 percent goes to China.

Based on interviews during the study tour and other secondary references, most of the corn export from Laos is currently used as animal feed in China (i.e. directly consumed by small farm owners, and also consumed by processing factories). Thus far, we see that corn production in Oudomxay is driven by the increasing trade opportunities with China, and also the Lao government policy that promotes alternative to opium cultivation by introducing cash crops in upland areas.

Currently, almost all households in LSUAFRP target villages grow corn for export. Corn seeds were provided to farmers through the District Agriculture and Forestry Extension Office (DAFEO) in Namo district. Those farmers that borrowed the seeds returned the amount they borrowed after the harvest. In addition to the corn seeds from the project, many farmers in the target villages also purchase seeds from local traders.

In 2005, farm gate price of corn ranged between 900 and 1,000 kip/kg. Our study shows that a successful farmer can earn up to 1.2 million kip during a season.

One of the main production constraints faced by local farmers was that farmers often lacked access to information as well as technical services in time of needs (i.e. pest management, etc.). Farmers felt that extension staff did not monitor the growth of corn frequently, which made it difficult for them to solve their problems. With regards to trade and market, farmers also felt that they did not have access to accurate market information including the price and market demand of corn.

More importantly, farmers were often unaware when the traders arrive and purchase the corn in their village. Lack of clear grading system, as well as information and technology transfer on post-harvest drying and storing, meant that local farmers were disadvantaged in terms of negotiating a higher price for their product.

Another constraint to the current corn trade in Oudomxay was the Chinese import quota. In 2005, the Chinese government suddenly imposed a quota on corn export from Laos. The volume of quota was set at 20,000 tons, which is far below the supply of corn currently produced in Oudomxay. This requires further negotiations between local and national government levels to increase the Chinese import quota.

Based on the study, we recommend following sets of actions for each problem.

Inefficient monitoring and feedback system: Farmers in each village should nominate a representative who will take responsibility in contacting DAFEO and LSUAFRP staff. At the same time, the project as well as PAFO needs to encourage field staff to visit villages more frequently.

Underdeveloped post-harvest drying and storing: LSUAFRP should develop and support a simple drying technique together with PAFO and PAFEO to be introduced at the village level. Another way is to improve the linkage with private dryers in Oudomxay town. At the same time, PAFEO and DAFEO should also encourage development of simple storage system at village level. Also at the provincial level, they can introduce a warehouse to store dried corn.

Farmers' lack of access to market information: Information on Chinese and other major markets for agricultural commodities (i.e. price and standards required in each market), and information on grading need to be transmitted to local farmers.

Lack of grading system: Develop a standard grading system and transmit the information to local traders and farmers. This will also require the development of simple techniques to measure moisture and other aspects of the corn product as well as a way to certify the quality of the product.

Chinese government restriction of corn import from Laos: Continued negotiation is necessary at local and national levels to increase the volume of quota and ways to facilitate smooth trade. Policy makers also need to think about diversification of commercial crops. Furthermore, local policy makers should also investigate opportunities to expand their trade with Vietnam and Thailand.

3.4 Production of corn in Xishuangbanna and the Chinese crop substitution programme

By Mr. Han Wenrong, Vice director of Xishuangbanna Agricultural Bureau

1. Corn production in Xishuangbanna

Xishuangbanna has a long history of corn production. Types of corns are distinguished by the time of planting. Summer corn is planted during May and June and winter corn is planted from October and December.

Ninety five percent of corn production is used to produce animal feed. The remainder is used for human consumption (i.e. sticky corn and super sweet corn). In Xishuangbanna, the summer corn area occupies approximately 75 percent of the total production area. Corn production is expanding annually from 315,000 mu (21,000ha) in 2002 to 370,000 mu[3] (24,667 ha) in 2005. In the meantime, the output increased from 58,000 ton to 70,000 ton. Hybrid corn varieties that are popular in China include Zengda 615, Zhengda 819, and Huidan 4.

Most of the summer corn is planted on mountain areas. Over the years, the productivity of summer corn production increased from 140-160 kg/mu (2.1-2.4 ton/ha) to 350-380 kg/mu (5.3-5.7 ton/ha). Winter corn, on the other hand is planted in the lowland area and yield ranges between 400 and 450 kg/mu (6-6.8 ton/ha).

At present there are only two feed factories in Xishuangbanna and their production can not meet the local demand. Each year Xishuangbanna purchase 350,000-400,000 tons of livestock feed from other places. Most of the locally produced corn in the prefecture is transferred to Kunming first, and then is processed and resold in Xishuangbanna. Only some locally produced corn is used for food and brewery, as well as for animal feed.

2. Opium substitution and corn production

In 2004 the Xishuangbanna Seed Company, a state company under the Agricultural Bureau, initiated a program to aid Laos. They chose Namo district in Oudomxay province to substitute opium with corn. They planted total of 3,000 mu (200 ha) out of which 880 mu (59 ha) was used to plant hybrid corn. The company also introduced soil erosion control techniques during the planting.

3. Corn export and problems in Laos

In Laos, despite the expansion of corn, the yield remains relatively low. This is due to the use of poor varieties, as well as the current use of technology that may not be suitable for the agro-ecological environment in Laos. Another problem is the lack of dedication among farmers and extension workers to increase the yield and agricultural productivity. Currently, corn exporters in Laos also face another significant problem: poor quality of post-harvest processing. The Lao corn exported to China is often below the market standard in China. Lao corn is high in moisture, and low in protein. Furthermore, the Chinese government's import quota on corn also limits the volume of Lao corn exported to China.

[3] 1 mu=0.06 ha or 1 ha=15 mu

4. Suggestions for future development of Lao corn production

Government agencies such as the PAFO should further collaborate with Chinese agencies and companies to introduce new technology and varieties in Laos. Two sides will need to continue exchanging information about agriculture. Introduction of new technology can allow farmers in Laos to explore the potentials of producing winter corn. In the meantime, the government needs to pay careful attention to environmental protection. It is not always good to replace secondary forest or old fallow with cash crops. However, the use of wastelands can be intensified for higher output. Finally, agricultural extension services need to be improved providing training for farmers and raising their awareness on new technology.

3.5 Overview of corn production in China

By Ms. Jin Yaling, MA student at Yunnan University

The corn has an important economic status in China as it ranks second after the US in terms of areas under corn production. Between 2005 and 2006, China produced 1.3 billion tons of corn, accounting for approximately 25 percent of the total foodstuff production. The total land area used for cultivating corn is about 3 billion mu (20 million ha), which accounts for approximately 22 percent of the total agricultural land in China.

Figure 2 indicates corn production zones in China. Northern spring corn production zone (Zone I) accounts for nearly 35 percent of the total corn production in China. This is followed by the Yellow River plains summer corn production zone (Zone II), which accounts more than 34 percent, and the southwest mountainous corn production area (Zone III) which accounts more than 18 percent of total corn production. Yunnan province is included in Zone III.

Surplus production in Zone I is generally exported to countries like Korea and Japan. Meanwhile, Zone II is self-sufficient. However, Zone III and IV fall short of meeting its internal demand, which calls for import from other regions and countries.

The shortage of corn in Zone III and IV was traditionally covered by transfering from the north. In the last few years, consumers in the south show higher preference towards import corn from the US and

Figure 1 Corn production zones in China

Source: Agriculture Natural Resource and Agricultural Layout Book

neighbouring countries in Southeast Asia. The import from neighbouring countries in Southeast Asia is particularly growing due to the proximity and cheaper transportation cost compared to the shipment from the northern part of China. Therefore, we observe a changing trend of corn production and trade in China. While the northern states concentrate on exporting their surplus, the southern states import their corn from neighbouring countries further south of China.

China is not only a corn producing country but also a large consumer of corn. Every year, China consumes approximately 0.12 billion tons of corn. Table 3 indicates the changing demand for corn in China. During the last two decades, consumption of corn for livestock feed production has increased significantly from 48 percent to 74 percent. Share of industrial food processing has also increased from 3 percent during the 1980s to 13 percent by the mid 2000s.

Table 3: Percentage of corn consumption

Periods	Household Consumption	Livestock feed consumption	Industrial consumption
1980s	38	48	3
1990s	19	68	5
Mid 2000s	13	74	13

In 1999 China and the US signed an agreement to reduce tariffs on agricultural commodities. According to this agreement, China will lower tariffs but will continue to regulate the trade flow of key agricultural commodities by imposing import quota. According to the agreement, the Chinese government will retain its import quota after 2004 at the order of 7.2 million tons per year. Table 4 indicates the changes in government quota on corn import and shares of quota allocated between the state and private companies. Both state and private companies with an import quota have a reduced tariff rate between 1-10 percent. Any import of corn beyond the volume regulated by quota requires payment of 65-71 percent tariff. After the fifth World Trade Organization meeting, the import tariff on corn will be further reduced.

Table 4: Import quota for corn

Year	Quota (million ton)	Share of quota for state companies (percent)	Share of quota for private companies (percent)
2002	580	68	32
2003	653	64	36
2004	720	60	40
2005	720	60	40
2006	720	60	40

Source: Tuan and Hsu (2001)

In Xishuangbanna, corn has been one of the staple crops of the upland population and was traditionally consumed within households. Local farmers can produce both spring and summer corn in Xishuangbanna. It is not only grown in the upland areas but also in the lowland plains. Many of the farmers in Xishuangbanna apply rotational cropping. Figure 3 shows corn production in Jinhong, Menghai county and Mengla counties in Xishuangbanna between 2000 and 2005. Between 2000 and 2005, production of corn in Xishuangbanna increased. However, productivity remains generally low between 150 and 200 kg/ mu (2.3 - 3 ton/ha). This is due to relatively low agricultural input in this area.

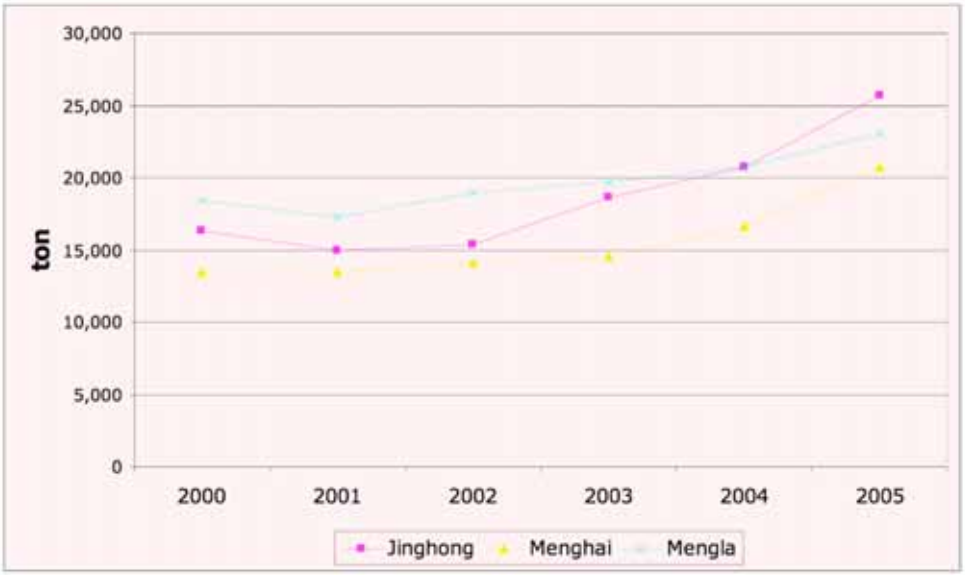

Figure 2 Corn production in Xishuangbanna
Source: Xishuangbanna Agriculture Bureau

3.6 Experience of Jingu Border Trade Company

By Mr. Yao Yiwu, Managing director of Mengla Jingu Border Trade Company

Mr. Yao began to provide technical advice on agricultural technology in Laos since 1994. Up to 1999 he and his company has been a part of bilateral exchange programme on agricultural technology. Between 1999 and 2005, Mr. Yao initiated agricultural development activities in northern Laos as part of the opium substitution programme supported by the Chinese government. In July 2005, Mr. Yao established Mengla Jingu Border Trade Company Limited in a border town of Meng Mang and began to operate border trade between Laos and China.

There are a number of obstacles with regards to corn production and trade in Laos. First of all, the market for corn in Laos is limited. This is also related to the second problem, namely the lack of development in livestock production, which limits the domestic consumption of corn in Laos. Thirdly, corn production in Laos faces technical problems including pest management and post-harvest processing. Lastly, farmers in Laos produce corn once a year due to lack of experience and knowledge on agricultural technology. While there is a market for winter corn in China, Lao farmers have not yet tapped into this opportunity.

The company has invested a total of 3,800,000 yuan (approximately 475,000 USD) to establish a drying facility on the border of China and Laos in Meng Mang township in 2005. The facility sorts, dries and treats corn before packaging. The drier can be also used for cereals other than corn including rice, soybeans, and sesame. After packaging, corn is transported to Kunming, Yuxi, and Simao within in Yunnan province for further processing (i.e. animal feed production, alcohol production, etc.).

Mr. Yao thinks that corn from Laos has high potential, particularly as it uses less chemical inputs for production. This is important because low chemical input means that it is safe for human consumption, and corn for human consumption are sold at a

better price compared to those used for animal feed. Mr. Yao's company does not have any problem with regards to trade of corn. The only problem is the import that restricts his company's supply of corn from Laos. He also noted that the administrative procedures in Laos is often time consuming and does not facilitate smooth trade between Laos and China, The process can be simplified so that the volume of trade can increase Mr. Yao also feels the need to develop stronger ties between Lao and Chinese companies to facilitate the border trade.

3.7 Standard of corn in China

By Ms. Gao Lihong, Xishuangbanna Science and Technology Information Centre

In Xishuangbanna corn is used for three main purposes: human consumption, animal feed and industrial products (i.e. paper production, processed food, textile, medicine, alcohol production, etc.). Out of the total corn production, 13 percent is used for human consumption, while 74 percent is used for animal feed production. The remaining share of corn is used for industrial purposes.

There are two general categories to distinguish types of corn. In China and US, corn is distinguished by colour including; yellow, white and mixed colours. Corn is also distinguished by its quality and contents. For instance, there are sweet corn, sticky corn and popcorn. There are other types of corns with high protein, fat, and starch content. These are all considered as high-value corns.

In China, there are generally three grading systems applied to corn, which includes: standard grading, grading for animal feed and grading for industrial use. The first grading system is applied by storing, distribution and processing industries (Table 5).

Table 5 Standard grading

Grade	Weight (gram/ litre)	Impurity (%)	Moisture (%)	Incomplete granule (%)		Others (colour, smell, etc.)
				Total weight	Mildew granule	
1	≥710	≤1.0	≤14.0	≤5.0	≤2.0	normal
2	≥685					
3	≥660					

*Source: from **www.eastmoney.com** downloaded on 13 June 2006*

Animal feed and industrial production applies other grading systems depending on protein and starch contents (Table 6, 7). What is common in all three grading systems are moisture content, mix of debris, wholeness of grain, and occurrence of mould. In all these aspects the current quality of Lao exports corn falls short. In addition to the above qualities, animal feed requires higher protein content, while industrial corn requires higher starch content.

Table 6 Grading for animal feed

Grade	Weight (gram/ litre)	Albumen or protein (%)	Incomplete granule (%)		Moisture (%)	Impurity (%)	Others (colour, smell)
			Total weight	Mildew granule			
1	≥710	≥10.0	≤5.0	≤2.0	≤14.0	≤1.0	normal
2	≥685	≥9.0	≤6.5				
3	≥660	≥8.0	≤8.0				

*Source: from **www.eastmoney.com** downloaded on 13 June 2006*

Table 7 Grading for industrial use

Grade	Amylum or starch (%)	Impurity (%)	Moisture (%)	Incomplete granule (%)		Others (colour, smell)
				Total weight	Mildew granule	
1	≥75	≤1.0	≤14.0	≤5.0	≤1.0	normal
2	≥72					
3	≥69					

*Source: from **www.eastmoney.com** downloaded on 13 June 2006*

4. Field visits

On the second day of the workshop, two field visits were organized. The first was to Baeng district to meet with local farmers and talk with traders. The second was to local dryers located near the Oudomxay city centre and to a Vietnamese trading company.

4.1 Visit to Baeng district (Samkang, Phoukham, Yor village)

Baeng district is the second largest area of corn production in Oudomxay after the Houn district. The group first visited Samkang village to see farmers' corn fields. After the visit to the corn field, a discussion was held with the village leader.

In Samkang and Phoukham villages corn is planted twice a year. Farmers often use the same field to produce corn at different seasons. The total area of corn in two villages is 410 ha each season. Average yield is higher during the wet season than dry season. The average yield of corn during the wet season is 5 tons per ha while in dry season it is only 3 tons per ha. Farmers only grow corn on their field and do not intercrop. On average, household has 3.5 ha for corn production. While some households were able to produce maximum of 70 tons per year, other households were only able to produce 3 tons per year.

After Samkang village, the group visited Yor village, which is located along the National Route 2 and had a meeting with the head of District Planning Office, village leader of Yor village and a local trader.

Farmers in Yor village started to expand their corn field in 2001. Corn was first introduced as a cash crop as an alternative to opium poppy production. In the first year, farmers only cultivated total of 30 ha for corn production. However, the area of cultivation has increased in the last two years. Some farmers converted paddy fields into corn field as they had insufficient water for rice production.

Today, 50 percent of household income in Yor village accrues from corn, while the remaining source of income are other cash crops such as sesame and job's tear. Wildlife and NTFPs, as well as sales of handicrafts are also important source of household income. Despite the growing economic importance of corn, farmers were concerned that the yield of corn was decreasing every year. When the corn was first cultivated, they were able to produce 6 tons per ha on average. Today, the average yield is down to 4.5 tons per ha. This is particularly because of the intensive use of land without soil management.

In all three villages, villagers have not yet organized themselves into a group. Instead, friends and relatives that cultivate in fields nearby exchange labour in times of need. Most farmers in three villages predominantly grew rice before they started to cultivate corn. Farmers continue to grow rice; however, more farmers are converting unused paddy fields into corn fields.

Farmers in three villages had access to corn seeds through Oudomxay's PAFO, private investors and traders. PAFO provided corn seeds at a subsidized price. In the meantime, private investors contracted with farmers and provided seeds on credit. Other farmers who had capital directly purchased seeds from local traders. The most common variety that is used by farmers in three villages was LVN 10 (18,000 kip/kg or 1.80 USD/ kg) from Vietnam. Some farmers also tried using CP 888 (60 Baht/kg or approximately 1.54 USD/kg) from Thailand.

With regards to production, farmers also raised following problems:

- Declining corn yield and loss of soil fertility (no soil improving technology is applied to retain soil fertility and improve yield)
- Flooding, drought and pest management
- Unstable price of corn
- Controlling quality of the corn

After the harvest, farmers store corn in aerated storage house or by hanging corn in open air (Figure 4). No drying equipment is used in village. Some farmers even dry their corn in the sun on the stalk. There are four threshing machines in the village. A fee for using the thresher is 25,000 kip per ton. Corn kernels are further dried after threshing.

Local traders usually come and purchase corn from the villagers. The group also interviewed one of the local traders, who have been trading agricultural products in the area for more than 10 years. Before he started to purchase corn from the villagers, he traded rice. According to the local trader, expansion of corn production was driven by government promotion to stop opium production.

Figure 4 Local storage of corn after harvest

There were total of 51 tons planted in 2006 covering 34,000 ha. Out of 51 tons of corn seeds, DAFEO provided 10 tons, while PAFO provided 15 tons. Under contract farming, traders also provided total of 21 tons to farmers on credit. The remaining 5

tons were purchased by local farmers. (Report of Mr. Thidkeo, local trader in Baeng district field visit 10th August 2006)

For contract farming, investors (sometimes who are also traders) guaranteed to purchase products after harvest at the minimum price of 500 kip per kg (0.05 USD/kg). However, prices fluctuate depending on the market supply in China. The highest price in 2005 was 900 kip per kg (0.09 USD/kg), while the lowest was 700 kip per kg (0.07 USD/kg).

According to the local trader, one of the main problems was the low quality of products. Farmers were often unable to meet the requirement of the buyers. This resulted in low farm gate price. Another problem for local traders in Baeng district was the poor road condition and the redundant fees paid to district and provincial offices prior to the export. This resulted in higher cost of export. At the same time, local traders were often unaware of trade policies between China and Laos. For instance, they were uninformed about the closing of Chinese border in 2005.

4.2 Visit to processing facilities in Oudomxay and a Vietnamese trader

The first stop was a visit to a new drying facility being constructed by Chinese investor, Hengxin Company based in Xishuangbanna. The company has signed a contract with the Oudomxay provincial government earlier in 2006 to rent 4 ha of land for 30 years which includes the former feed processing facility developed by the PAFO with the Japanese official government aid. In the contract, the company has also agreed to purchase 30,000 tons of maize per year from local farmers.

In the current contract, the company will operate on trial basis for three years. After this, the two parties will renegotiate the terms of concession. According to the investment plan, the company will transfer the facility to provincial government after 30 years.

The company plans to buy corn from local farmers and sell their products to China. However, in future they also plan to develop feed processing facility to produce animal feed. The total investment of the company is 3 million USD.

The Chinese investors are namely worried about the supply of corn. They are worried that the supplies will be uncertain throughout the season to operate the facility efficiently. Furthermore, they are also worried about the operation cost (i.e. electricity and other energy) of the facility and the poor road conditions as the only access road to the site is an existing dirt road that stretches from the center of oudomxay. The distance from Oudomxay's town center and other major corn producing districts also can inhibit traders and farmers from sending their products to the drier.

The second site that we visited was a dryer installed by the Ministry of Commerce (Figure 5). A dryer was newly installed and is under the management of the state company. The drier was initially provided by the Thai government as a bilateral aid and was set up in Kammounae Province for the purpose of drying rice. However, as the drier remained unused, the Ministry decided to reinstall the drier in Oudomxay given the request of the Provincial Commerce Office. The plant has a capacity to dry 3 tons of corn per day. It plans to use electricity but will also use rice stalks and corn cobs to fuel the equipment. The total cost of the plant is 40,000 USD, and it will be in operation by October 2006.

The operation and management of the drier was transferred from the Provincial Commerce Office to the state company under the Office. However, they have not yet

decided on the operation costs. There has not been any feasibility study for installing the facility, which is more appropriate for drying rice and other small grain cereals[4].

Figure 5 Drier introduced by the Provincial Commerce Office of Oudomxay

The Provincial Commerce Office is also providing small driers to local farmers on experimental basis. 20 units of small scale dryers will be distributed for free in Houn district. The cost of one unit is only 100 USD, but this does not include a generator to run the unit, which has to be provided by the users. Small driers can be operated by an individual or a group of farmers at the village level. The Ministry of Commerce had offered short-term training for farmers that requested to use the small dryers. However, it is not clear whether this initiative was promoted widely through PAFEO and DAFEO. Equipment like this can also be introduced using community funds supported by organizations such as International Fund for Agriuclture and Development (IFAD). However, it will require ability of the community or a group of farmers to organize themselves into a group or an association.

Finally, the group also visited a Vietnamese investor based in Oudomxay (Kouang Ving Agricultural Development Export-Import Co.). The company originally started as a furniture company, but is now involved in import-export trade including import of corn seeds from Vietnam and export of sun-dried corn from Laos. The manager of the company explained to the group about the grading system of corn in Vietnam, and noted that most of the corn in Laos was still not dried appropriately. He was also concerned with the bad road linking Vietnam with Oudomxay through Phongsaly Province and pointed out the need to improve the road conditions in order to increase trade with Vietnam.

[4] One of the Chinese participants raised the corn that the drier was suited for small grains such as rice, and sesame. For corn it will require more drying time which will increase the operation cost.

5. Group discussions and policy recommendations

On the final day of the workshop, participants were divided into four stakeholder groups (i.e. policy makers, traders, agricultural extension workers, and researchers) to discuss ways to improve the current problems on production and trade. Main points of discussion in each group are summarized in Annex 3.

Based on the group discussions four major issues were identified. These issues are cross-cutting, and linked with one another. Key constraints and ways to improve the constraints are summarized as follows:

1. Unorganized small-scale production and trade

A common problem identified was the lack of organization of small-scale production by farmers who are scattered in different villages. This hindered agricultural extension workers since they cannot provide adequate technical services and training to groups of farmers. This has hindered findings ways to multiply the impact of training and demonstration on how to improve yield and access technical agricultural information.

Lack of local organizations also make it difficult for farmers to apply for institutional credit, and made individual farmers more dependent on contract farming arrangements with traders and investors from outside. Another drawback of not having a farmers' group was lack of access to information, and ability to negotiate better price with traders.

In order to overcome these problems, discussion groups suggested formation of farmers' production groups at village or village cluster level. Farmers' production groups can then act as a node for information exchange on agricultural technology as well as market and trade information. Organized production groups can also contribute in improving post-harvest processing and storage systems, as well as ensure quality of products in order to gain a better bargaining power against traders from outside of the village. Development of a stronger production group can possibly regulate traders and private investors that violate contracts and agreements. Local government agencies can also work with and through production units to assess demands for agricultural land, and develop plans for land use zoning in communities.

2. Agricultural production technology

Another cross-cutting issue identified concerned agricultural technology that allowed sustainable use of land, and minimized future economic and environmental risks for rural households. In particular, there was a high concern on land use intensification without soil management. Already, farmers in Oudomxay are reporting declining yield. This is largely due to intensive cropping without adequate soil management. It is therefore essential to introduce techniques to protect and improve soil fertility in areas under intensive agricultural use.

Another concern was dependency on import varieties. As majority of farmers are purchasing hybrid varieties from China, Vietnam, and Thailand, development of a local hybrid which is cheaper and better in quality is also raised as an important challenge.

Finally, as the majority of farmers in Oudomxay grow corn without intercropping or rotating crops, it is also important for both extension and research agencies to continue experimenting not only with different varieties but also with different cropping techniques to sustain high yield and soil fertility.

3. Post-harvest

Another important issue is the need to improve post-harvest processing and developing a grading system to monitor the quality of product. Policy makers find the need to support post-harvest processing facilities (especially drying facilities) and storage systems. In the meantime, researchers and local policy makers will need to consider cost-effectiveness of different options for post-harvest processing (i.e. sun-dried, small-scale drier, large-scale drier).

Both traders and agricultural extension workers suggest the importance of developing a grading system, and disseminating the information to local traders and farmers. It is also considered important to link this to systems already in place. As the Chinese market already has grading system, this information can be translated into Lao language and disseminated to local farmers and traders in Laos.

4. Barriers to trade

Finally, the last issue is the trans-border trade. A key barrier to trade which is commonly mentioned is the import quota imposed by the Chinese central government. However, there are different levels of negotiation that can take place to improve the situation.

During the workshop, the representative of Mengla Jingu Border Trade Company pointed out the possibility of increasing the trade through opium substitution programme.

In the meantime, many traders in Laos and in China alike felt that the border trade system needs to be more transparent. In particularly, they requested that information on new rules on border trade should be disseminated regularly. Furthermore, traders raised the problem of complex tax structure, particularly on Lao side. Export from Laos requires prior arrangement of administrative documents signed by different government agencies and payment of fees. This not only delays shipment of product but also adds to the cost of export for local traders and discourages good business practices. Thus, there is a need to streamline export and tax procedures so that it is less complex and more transparent.

Annex 1: Workshop Agenda

Day1 (9 August, Wednesday)

Time	Activities	Person in charge
08:00-08:30	Registration	
08:30-08:50	Workshop objective	Dr. Linkham Douangsavanh (NAFRI)
08:50-09:20	Opening of the workshop	Dr. Bunpone Buttanavong (Provincial governor of Oudomxay)
09:20-09:35	Introduction to the workshop	Dr. Bounthong Bouahom (NAFRI)
09:35-09:45	Programme of the workshop	Dr. Linkham Douangsavanh
	Group photograph	
09:30-10:45	Presentation on Oudomxay's production and trade of corn	Mr. Houmphan Bouphakham (Provincial Agriculture and Forestry Office of Oudomxay) Mr. Houmpheng Mingboupha (Provincial Commerce Office of Oudomxay)
10:45-11:30	Presentation of production and market chain of corn	Mr. Daniel Talje (LSUAFRP) Mr. Khamphou Phouyyavong (NAFRI)
11:30-12:00	Discussion	Moderated by Dr. Linkham Douangsavanh
12:00-13:00	Lunch	
13:00-15:00	Corn production in Xishuangbanna and substitute programme. Overview of China's maize production Experience of Jingu Border Trade Cooperation Co. Market standard information on corn	Mr. Han Wenrong (Xishuangbanna Agricultural Bureau) Ms. Jin Yaling (Yunnan University) Mr. Yao (Manager of Jingu Border Trade Cooperation Co.) Ms. Gao Lihong (Xishuangbanna Science and Technology Information Centre)
15:00-15:30	Discussion	Moderator by Mr. Khamphay Manivong Mr. Houmchitsavath Sodarak
15:30-16:00	Break	

Day 2 (10 August, Thursday)

Time	Activities	Person in charge
08:30-14:00	Participants divided into two groups to visit field in Oudomxay to understand the situation of local production, trade and processing.	
	(Group 1) Beng district - This is the second largest corn producing district in Oudomxay. The group will meet and discuss with local farmers as well as traders that contract them for growing corn.	Mr. Khamphone Phanyakeo, Mr. Houmpheng Phetdala, Mr. Khamphou Phouyyavong
	(Group 2) Xay district – This group will visit the local processing factories and talk with traders and representatives of the company (i.e. drying, livestock feed companies, etc.)	Mr. Sikham Siphakhun, Mr. Bounthavy Xayxomphou

Day 3 (11 August, Friday)

Time	Activities	Person in charge
08:30-09:00	Debriefing of field visits by group representatives	Representatives of each group
09:00-09:15	Explanation on group discussions	Mr. Khamphou Phouyyavong
09:15-12:00	Working group discussions and development of action plans	Facilitators from NAFRI
	(Group 1) Policy making	Mr. Houmchitsavath Sodarak, Dr. Yayoi Fujita
	(Group 2) Trade and market	Mr. Khamphou Phouyyavong, Mr. Daniel Talje
	(Group 3) Extension and development	Mr. Bandith Ramangkoun, Mr. Sikham Siphakhun
	(Group 4) Research	Mr. Sengpaseuth Lasbandit, Mr. Phanxay Ingxay
12:00-13:30	Lunch	
13:30-14:30	Presentation by groups	Representatives of each working group
14:30-15:00	Break	
15:00-15:40	Summary of the workshop	Dr. Linkham Douangsavanh
15:40-16:00	Closing words from the distinguished guests	Dr. Bounthong Bouahom Mr. Houmpheng Mingboupha Mr. Houmphan Bouphakham
16:00-16:30	Closing of the workshop	Dr. Bounthong Bouahom
19:00-	Closing dinner	

Annex 2: List of participants

Lao PDR

Name	Position	Organization
Dr. Bounthong Bouahom	Director general	NAFRI
Houmpheng Mingboupha	Director	Commerce Office of Oudomsay Province
Houmphan Bouphakham	Deputy Director	Forestry and Agriculture Office of Oudomsay Province
Sompaeng Phaiyavong	Deputy Head	Provincial Governor Office
SomNuek Thilasak	Deputy	NAFES
Khamphay Manivong	Head	Information Management Division, NAFRI
Phoumy Inthapanya	Head	Agriculture Research Center, NAFRI
Manivong Thephavanh	Head	Research Management Division, NAFRI
Sisongkham Mahathilath	Coordinator	LSUAFRP, NAFRI
Houmchitsavath Sodarak	Head	NAFReC, NAFRI
Boun Nguem Sayvong	Head	PAFO office, Oudomsay
Xaysongkham Phimmasone	Director	PAFO, Luangnamtha
Phousone	Staff	Finance office, NAFRI
Vanthieng	Staff	NAFRI
Daovone	Staff	NAFRI
Thiphavong	Staff	CIAT
Hatsadong	Staff	SIDA
Saengpaseuth	Staff	ARC, NAFRI
Khampha Chanthilath	Head	FSRC, LSUAFRP, NAFRI
Bandith Ramangkoun	Head	IS, LSUAFRP, NAFRI
Sikham Siphakhoun	Head	PAFEC, Oudomsay
Bounhin Boutsavong	Deputy Head	Olaning and cooperation office
Thongla OngLuesay	Head	Tax division, Finance Office, Luangnamtha
Khamlek Xaidala	Director	Commerce Office, Luangnamtha
Khamphen Phanavanh	Head	PAFEC, Luangnamtha
Linkham Douangsavanh	Head	Socio-Economic Research Component, LSUAFRP, NAFRI
Khamphan	Staff	DAFEO, Baeng district
Khamla	Staff	Socio-economics Unit
Veokham	Staff	Socio-economics Unit
Amphone	Staff	Socio-economics Unit
Kanchana	Staff	Socio-economics Unit
Phonpasueth	Staff	Socio-economics Unit
Phanxay	Staff	Socio-economics Unit
Khamphou	Staff	Socio-economics Unit
Malaphet	Staff	DAFEO, Pakbaeng district
Somnuek Phongsavanh	Staff	PAFO
Bounxou Daungphasit	Head	DAFEO, Namo
Somsavath Panyavong	Head	GAA
Chantai Inthakone	Head	Tax division, Provincial Finance Office
Khankeo Koulavong	Head	Office, Provincial Commerce Office
Khamphao Boundala	Staff	Office PAFO, Oudomsay
Vanxay Mekasin	Manager	Sounilan Company
Chankham Homdarak	Head	Field office, LSUAFRP, Namo
Khamphiew	Staff	Foreign Affair Office, Laungnamtha
Bounkueth	Head	Office, PAFO, GAA
Somchay	Manager	

Houmphaeng Phetdala	Deputy Head	PAFEC, Oudomsay
Khamsy Chaluen	Head	Office, NAFReC, NAFRI
Kongmy Simoukda	Staff	NAFReC, NAFRI
Vongxay Phommasy	Staff	NAReC, NAFRI
Yim Kaung Tou	Manager	Kaungty Company
Xomlo	Staff	Upland Friend Farmers
Robert Ferraris	Consultant	Sada
Daniel Talje	Associate Advisor	LSUAFRP, NAFRI
Carl Mossberg	Team leader	LSUAFRP, NAFRI
Yayoi Fujita	Regional Advisor	LSUAFRP, NAFRI
Hans Hedland	Consultant	Sida
John Connell	Researcher	CIAT
Keith Fehrney	Researcher	CIAT

PR China

Name	Position	Organization
Mr. Han Wenrong	Vice Director	Xishaungbanna Prefecture Agriculture Bureau
Mr. Li Jianshe	Vice Director	Xishaungbanna Prefecture Commerce Bureau
Mr. Yang Jianwu	Vice Director	Xishuangbanna Prefecture Grain Bureau
Mr. Zhou Guangrong	Senior Official	Xiahuangbanna Prefecture Commence Bureau
Mr. Li Shaoyun	Division Head	Xiahuangbanna Prefecture Commence Bureau
Mr. Dao Junghua	Division Head	Xishaungbanna Prefecture Agriculture Bureau
Mr. Zhou Qi	Vice Director	Mengla County Economic and Trade Bureau
Ms Sa Rui	Chair	Xishaungbanna Import & Export Chambers of Commerce
Mr. Yao Yiwu	General Manager	Mengla Jingu Border Trade Company
Mr. Dao Mingzheng	Staff	Mengla Jingu Border Trade Company
Mr. Dao Shihua	General Manager	Xishuangbanna Xigu Company
Mr. Li Jian	Manager	Xishuangbanna Seed Company
Mr. Wang Jun	Manager	Xishuangbanna Yinong Company
Mr. Peng Yi	Manager	Xishuangbanna Hengxin Company
Mr. Lu Xing	Associate Professor	Regional Development Research Center, Yunnan University
Ms. Gao Lihong	Researcher	Xishuangbanna Science and Technology Information Centre
Ms. Jin Yaling	Student	Yunnan University

Annex 3: Summary of group discussions

Policy making

Main issues	Possible solutions	Responsible agencies
Production		
Lack of integrated regulations and policies on land use	Developing clear policy guidelines	Land management and development authority, Ministry of Finance, Ministry of Agriculture
Lack of clear regulations on foreign investment (and monitoring of policy implementation)	Examining policies supporting investment, and securing benefits for investors	Foreign Investment and Planning Committee, Provincial Industry and Commerce Office, PAFO
Scattered and unorganized production by small scale farmers	Developing sustainable production group and coordinate with traders	PAFO, Provincial Commerce Office, Banks and District authorities
Lack of systematic extension and support services	Developing sustainable production group to build confidence of investors	PAFO, PAFEO
Lack of quality standards on export commodity	Developing export standards for production	MAF
Lack of institutional credit system that support small-scale farmers	Facilitating different sources of credit to support production unit	All agencies
Lack of government support for post-harvest processing and storage	Improving post-harvest processing quality for domestic and export market	Line agencies under Ministry of Industry and Commerce, MAF's line agencies
Market		
Lack of formal trade relationship	Promoting formal bilateral trade relationship and negotiating for increased quota and removing trade barriers	Ministry of Foreign Affairs, Ministry of Industry and Commerce
Lack of government support for local traders	Improving tax policies on importing industrial equipments	Ministry of Finance, Ministry of Industry and Commerce
Lack of monitoring investment and trading practices	Promoting local trade and businesses, as well as contract farming	Ministry of Finance, Ministry of Industry and Commerce
Lack of regulations on concession lands and on commodity prices	Developing a floor price for agricultural commodity and monitoring the contract between producers and traders	Ministry Industry and Commerce, MAF, and other agencies
Lack of market survey and efforts to develop strategy	Ministries and related agencies need to examine local market potential and strategize its trade	Ministry of Foreign Affairs
Lack of quality control system for export products	Monitoring the quality of export	Production unit, trade companies

Market and trade

Main issues	Possible solutions	Responsible agencies
Investment and production model		
There are four models including 1) supported by agricultural promotion bank, 2) supported by companies, 3) supported by external agencies, and 4) farmers own financial resources. There is a general difficulty in making profitable investment. Profits margin are low for most investors and traders due to persisting competition among small traders.	Producers should form a unit or a group while traders should also form an association.	Provincial Commerce Office, PAFO
Government support on trade		
Informal trades are uncertain because there is no formal agreement or contract between traders under the informal trade.	Trading companies in both countries should be officially registered.	Trading companies, Provincial Commerce Office
Administrative process is still very time-consuming. There are many competing traders exporting the same commodities. Transportation network is still very poor.	Administrative process should be simplified to facilitate smooth export and trade of goods across the border. Road and other basic infrastructure also need to be improved. Trade policies as well as detail on trade process need to be explained to the wider public.	Companies, as well as Provincial Transportation Office, Provincial Industry and Commerce Office, Provincial Finance Office
Quality of corn		
There is no quality control, and the information on market standards is not clear for producers and traders.	Drying facility should be introduced to improve the quality of export products. It is also necessary to select climatically and ecologically appropriate hybrid varieties.	Trade companies, agricultural extension workers
Post-harvesting and processing		
Farmers are not using the new post-harvest processing techniques. People have limited experience in terms of post-harvesting technique.	Disseminate information on harvest, post-harvest processing, and storage.	PAFEO, DAFEO and trading companies
Securing price for producers		
Price fluctuation every year and season. While there is high demand for corn produced in Laos, there is a sense of uncertainty about how much China can purchase	A quota and trade barrier needs to be discussed at the national levels. Every year, there should be an early announcement on the government quota to	Central and local authorities, and trading companies

corn products from Laos.	import corn from Laos. Traders also need to sign contract. There should also be a list of price according to the standard of products.	
Access to market information		
Producers usually do not have good access to market information (i.e. price, quality, demand, etc.). Traders in China are also not sure about the quality of products from Laos, and when it was processed.	Different agencies need to exchange information on the market and technology. An information centre can be developed to facilitate dissemination of market information.	Ministry of Industry and Commerce, trading companies, PAFO and Provincial Commerce Office

Agricultural extension

Main issues	Possible solutions	Responsible agencies
Extension service		
Low productivity due to planting on inappropriate soil, and application of appropriate agricultural technology. This has led to loss of soil fertility, and erosion in some places.	Rotational cropping should be introduced to improve the soil quality. Areas for planting corn should be zoned. Different agricultural technology should be selected to suit the ecological conditions. More training on different agricultural techniques needs to be provided to local farmers.	NAFRI, NAFES, PAFO, PAFEC and development units within villages
Corn seed		
There is no system of checking the quality of hybrid varieties that are imported from other countries. Farmers are currently dependent on imported varieties, and must buy them every season.	Need to develop a system to check and control the quality of imported varieties. Extension staffs need to introduce appropriate varieties considering ecological conditions of each area. Introducing open-pollination variety so that local farmers can experiment breeding their own varieties.	NAFES, PAFO, PAFEC, development units within villages
Processing and adding value		
No knowledge or limited knowledge, capacity and experience on post-harvest processing. Lack of equipments and facilities. Lack of financial resources to establish own processing plants.	Establishing production and processing group at village levels, and providing information on processing techniques. Provide training to farmers on post-harvest processing. Developing processing plants.	Government agencies

Credit		
Local producers often have difficulty managing credit, and are often hesitant to borrow.	Form groups of farmers to access credit and provide more information on credit system to local farmers.	NAFES, PAFEC, PAFO, Agricultural Promotion Bank, village development units

Research

Main issues	Possible solutions	Responsible agencies
Land use		
Mono-cropping and intensive use of land without improving soil fertility.	Conducting researches on cultivating maize and different ways of improving soil fertility (i.e. rotational cropping).	PAFO, DAFEC, local farmers, NAFRI, NAFES
Hybrid varieties		
High cost of imported varieties, and lack of inappropriate use of varieties. There is a general lack of information on the potential of different varieties.	Conducting researches on hybrid varieties.	PAFO, DAFEC, local farmers, NAFRI, NAFES, private investors
Improving quality of products		
Loss of product due to low post-harvest processing (i.e. mould, mix of debris, etc.)	Study on effective techniques for drying, grading, cleaning, packaging and transporting.	PAFO, DAFEC, local farmers, NAFRI, NAFES, private investors