Moc chau plum value chain development for the poor in the North-West highlands of Vietnam

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Abstract

Within the framework of the project "Improved market engagement for sustainable upland production systems in the north-western highlands of Vietnam – AGB/2008/002"[1] phase 2009-2-13; researcher teams from CASRAD have been undertaking research activities and interventions towards the plum value chain in Moc Chau. In order to identify appropriate interventions toward selected products, the following research phases were carried out: (1) a diagnotic phase to identify products and their value chains, (2) rapid analysis of the selected value chains, (3) consumer research and (4) trials on high quality marketing channels. The aim was to create more value for plum products starting from postharvest stages, (grading, transporting, packaging, selling) in which all actors of the chain fully participated, with a focus on delivering to the consumer Moc Chau plums of high quality. Furthermore, it was intended that value created from the improved plum value chain would be shared equitably amongst all actors. This would help to achieve the project's objectives of improving market engagement for small scale households to reduce poverty in a sustainable manner. In addition, these research activities play a great role in developing a suitable methodology and practice in analyzing and improving value chains, especially for underdeveloped highland products.

[1] *The ACIAR project implemented in a collaboration of main partners, being The University of Quensland, Northen Moutainous Agricultura and Forestry Science Insntitute, Centre for Agrarian Systems Research and Development, Plant Protection Research Institute, Hanoi University of Agriculture and Tay Bac University.*

INTRODUCTION

The project focuses on research activities in farming systems located in Mai Son and Moc Chau Districts in Son La Province, and Tam Duong and Sin Ho Districts in Lai Chau Province. The aim of the project is to increase smallholder engagement in competitive value chains associated with maize and temperate fruit based farming systems. Market engagement will be used to improve land and crop management in these rapidly transforming sectors, for the development of sustainable and profitable farming systems. In order to achieve the overall objectives of the project, research activities and market development strategies (led by CASRAD and supported by the project's co- partners) are divided into phases as follows:

- ***1. Diagnostic phase to identify potential products (2009):*** Maize and Moc Chau plums were identified as two potential products for sustainable farming on sloping land.
- ***2. Rapid Value chain analysis (2009-2010)***

Rapid value chain analysis activities for Moc Chau plums were implemented with the involvement of all main actors along the chain (Mộc Châu, Hà Nội and China), including consumer research activities.

- ***3. Value chain intervention trial (2011)***

The trial value chain was conducted based on the principle of a value chain being focused on meeting the needs of consumers, in this case the specific needs of consumers of quality plums. A trial plum chain was designed to meet these demands.

- ***4.Dissemination, replication and transfer to local partners (2012-2013)***

Methodology

General approach

In the frame of this paper, there is an emphasis on Moc Chau Plum value chain research and development, as follows:

- ***Qualitative method***

Moc Chau plum Value chain appraisal (2009) was based on a qualitative survey using semi-structured questionnaires with key stakeholders of the value chain (farmers, local collectors, whosalers, retailers) and a stakeholders'meeting (2010).

- ***Quantitative method***

- Moc Chau plum degustation (2010): understanding consumers' preferences for the same variety of plum from different places in the North of Vietnam (Moc Chau, Lang Son, and Bac Ha).
- Survey by questionnaire with consumers in Hanoi to identify consumers' preferences towards Moc Chau quality plums (using pictures of plums in different retail locations (2011).
- The degustation panel (2011) was conducted with 27 consumers in Hanoi chosen on the basis of 4 criteria. Plum Brix and hardness were measured before the testing (in order to understand their relation with consumers' preferences .
- Survey consumers' response to the higher quality plums in the trial (2011).

Main research questions

The idea of Moc Chau plum value chain development is to create an alternative value chain through which plums are sold in high-end markets. So far, the main research questions are:

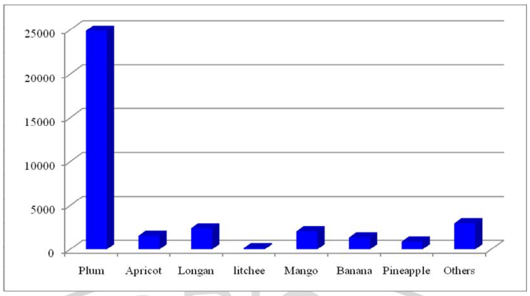
- Is there any opportunity to create an alternative value chain for fresh plums to position them in high-end markets with a higher value or higher price?
- How to add value to fresh plums? By whom and using what process?
- How do consumer segments evaluate the quality of the plums and are they willing to pay more for higher quality?

MAIN RESULTS

- ***Rapid value chain analysis (2009-2010)***

As regards fruit structure, plums occupy the biggest area, accounting for over 50% of the total area of fruit production, with longans being the second largest fruit occupying only 17%.

Chart 1. Fruit area in Moc Chau

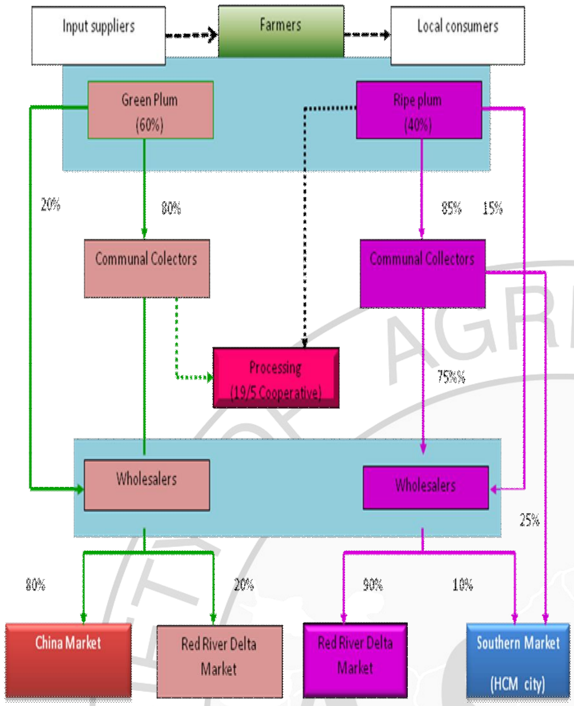


Source: Moc Chau Office for agricultural and rural development- 2009.

The Consumption market for plums is unstable and divided into 3 segments : green, ripe and processed plums. Green plums have been sold since 2006, when some traders found Chinese markets to sell to. In 2009, the farm gate price for green plums was 1200 VND/kg compared with 2500 VND/kg for ripe plums, while some high quality ripe plums could be sold at 3000 VND/kg. In 2009, green plums could be sold in greater volumes than ripe plums. The consumpsion market for green plums was China, which purchased up to 80% of the total volume. However, in 2010 and 2011 the Chinese market demand dropped significantly. Consequently, plums were sold mainly domestically (in Long Bien market). During the harvest, prices of ripe plums declined from 25.000 VND/kg for early season ripe plums to 10.000 VND/kg. at the main season price.

In fact, there is only a viable market for fresh plums across a consumption period of 40-45 days. Processed plums only account for a small proportionof the total production - approximately 1000 tons (4% of 2009 harvest). The rate of loss of fresh plums during transportation is normally quite high at 15% for ripe plums. This is a main constraint for farmers in deciding when to sell plums.

Chart 1: Plum supply chain in 2009



Source: Dao at all, 2009

Plums play an important role in a farmer's household income. In 2009, when plum prices were quite low, income from plums made up 20% of the average household's total income.

Fig 1: Households' income from Plums (n =40)

Unit: Thousand VND

Rank of households	**Income/household/year (1000 VND)**	**Income/capita/year (1000 VND)**	**% Total income**
Poor	2430	405	17.02%
Medium	2650	530	19.13%
Rich	5500	1100	21.82%
Average	**3900**	**780**	**20.29%**

Source: Dao at all, 2009

However, actors' practices in the chain can be a challenge to ensuring high quality products reach the consumer:

- Packaging for large quantities: Each package weighs 20-30kg and has no ventilation holes. This can increase losses from bruising, so farmers typically do not harvest plums at an appropriate ripeness (Brix> 11), but earlier while they are less mature.
- Grading plums is currently done according to the size but not to the ripeness.
- Plums can only be graded at collecting stages so price payed by collectors to farmers is not based on plums' quality (Dao et all, 2010).
- In general, consumers' demands can not be met according to these current practices. In responding to that fact, in 2011 we conducted a trial on a high quality product channel in which the chain's actors attempted to create more value for Moc Chau plums. These high quality plums were sold in luxury retail shops in Hanoi.

- ***Value chain trial model (2011)***

Trials were carried out to address consumers' needs (from comsumer research in 2010 and results from rapid value chain analysis (2009), sensory workshop and value chain's actor workshop (2010)). Criteria used to evaluate the trial channel are presented in the following table.

Fig 2: Criteria for high quality plums (n = 90)

Indicator	Very important	Important	Normal	Not important
Redish flesh and skin	24%	44%	24%	8%
Sweet, neither bitter nor sour	51%	37%	11%	1%
Crispy texture	24%	64%	9%	3%
Big size	10%	43%	38%	9%
Consistent size	9%	44%	39%	8%
No fruit fly marks	45%	33%	15%	7%
Food safety and hygiene certificate	31%	23%	26%	20%
Packaging (net bag, tray and film overwrap)	3%	14%	43%	40%
Label	10%	51%	25%	14%
Selling place	4%	26%	40%	30%
Price	10%	32%	47%	11%

Source: Dao et all, 2010

Consumers' knowledge about Moc Chau plums is very low although this product is quite popular in the market. Many respondents (39%) had heard about Tam Hoa plums but do not find it easy to recognize them when purchasing. Moc Chau (Son La) is a district where plum trees make up a large area thanks to its favourable conditions which are suitable for temperate fruits including plums. However, only 51% of respondents knew that Tam Hoa plum is grown in Moc Chau.

Fig 3.Trial on high quality Moc Chau plum channel

(Interventions were taken during the postharvest period in 2011)

Consumers' demand for Moc Chau high quality plums (*Value identified by customers)*	**Deployment impact (2011)**
Sweetness	• Harvest when ripe (>=11 degrees Brix) → Change farmers' practice.
Reddish flesh and skin	• Harvest at ripe stage → Change farmers' practice.
No bruises, consistent in size	• Harvest at ripe stage → Change farmers' practice. • Grading plums with consistent ripeness levels (>=11 Brix) but not too ripe (>14 Brix) → Change farmers' and collectors' practices. • Select plums with consistent ripeness → Change collectors' practice. • Use appropriate boxes for transporting: Small boxes which contain 3 to 5 kg of plums. Ventilation holes are created around the boxes. • Shorten post harvest time from harvesting to transport to Hanoi's market.

Well-known plum origins	• Information about Moc Chau plums is written on labels on boxes, packages and trays in shops.

Guided by customers' needs, intervention processes were implemented ain three steps:Step 1: Inform all the chain's actors (retailers, local collectors and farmers) about the trial channel.

Step 2: Design interventions which will help to create value for the plums. The method of distribution was also identified through this step.

Step 3: Support all the actors in changing their practices. Organise to sell plums through high quality channels.

Monitoring activities were conducted in parallel with organising the trial channel:

- Consumers' reactions
- Actors' pratices
- Plum prices within and outside the trial channel
- Profit shared amongst all the actors

The Intervention process was divided into three phases so that CASRAD's role decreased over time.

Some main results from conducting the trial marketing channel

- New practices applied by farmers and collectors in order to harvest plums at the right time for ripeness, helped to create more value for plums compared with traditional practices. Also, losses through transportation were reduced significantly with the new packing system.
- High quality products were accepted by customers. This was expressed through their satisfaction and willingness to pay higher prices than usual. The rate of satisfaction for plum quality was high (94.03% for consistency, 91.04% for colour, 87.88% for crispness and 45.45% for sweetness). Consumers' satisfation rate on labels was also quite high at 53.7%; similarly, 56.72% of consumers expressed that they prefer to purchase plums in packaging.

Phase I The first 2 plum deliveries are conducted under CASRAD's direct coordination:

Give instructions to farmers and collect selections

- Coordinate transport
- Pick up plums in Hanoi bus station
- Deliver plums to retailers at Hanoi Bus station

Phase II – the next 4 plum deliveries under CASRAD's indirect coordination:

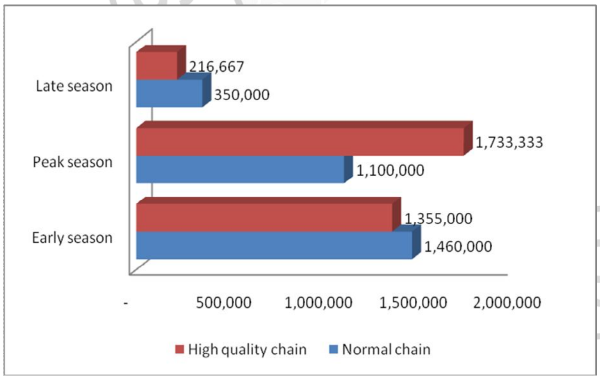
- Select plums
- Gather plums at a retail shop
- Deliver plums to other retail shops

Phase III – For the last 2 plum deliveries CASRAD was not involved in the process. One actor in this chain took the role of both a wholesaler and retailer and coordinator of all the chain's activities.

- In terms of sweetness, only 45.45% of interviewed consumers were satisfied because the plums still tasted a little sour. To test this criterion more precisely, more comparisions are needed between plums from this channel and plums from outside this channel.
- In the high quality plum channel, farmers received more profit from changing their traditional practices in harvesting and grading plums. This extra profit was paid by consumers through a higher than normal price.

Chart 2. Profit/labourer at different stages

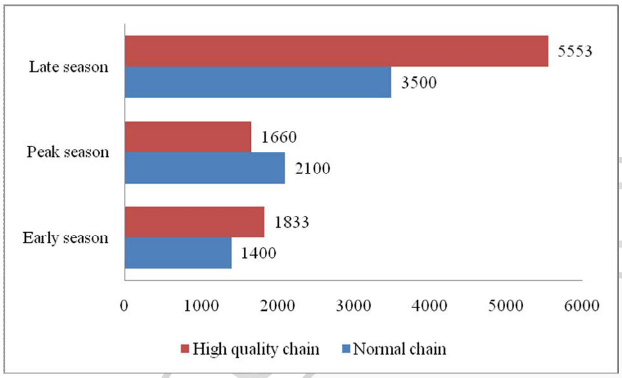
Unit: VND/kg



Source: Dao et all, 2011

- In comparision with other channels, profit created per kg of plums during the early season and end-of- season for wholesalers in the high quality chain were higher. Especially during the end of season, postharvest plum losses were high, yet wholesalers in the high quality channel still made 5.553 VND/ kg versus 3.500VND/kg earned by wholesalers from other channels.

Chart 3. Profit /kg made by wholesalers from two channels

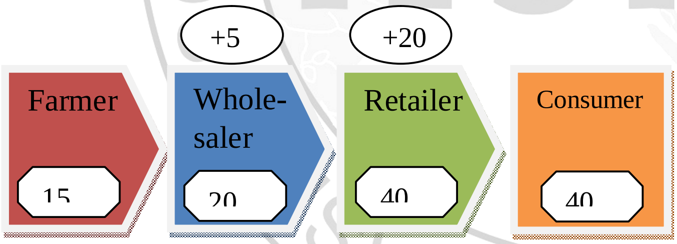


Source: Dao et all, 2011

Selling price and purchasing price which fluctuated amongst actors in the high quality plum chain, occurred during the plum season as follows:

Chart 4. Extra value created for the product

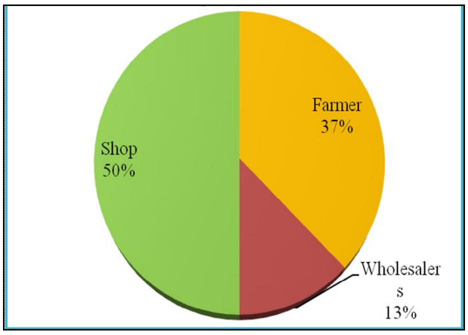
Unit: 1000 VND/kg



Source: Dao et all, 2011

- Product value was shared amongst actors of the chain including farmers and retailers. There is potential to further develop this chain at a larger scale in the next phases.

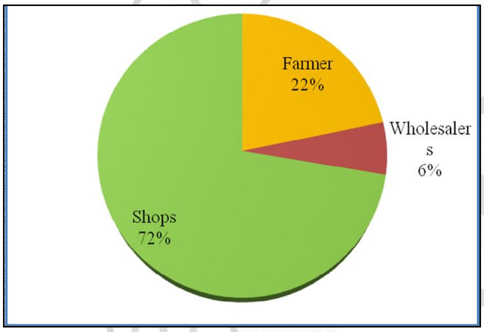
Chart 5. Value sharing among stakeholders in the higher quality chain



Source: Dao et all, 2011

In the high quality chain, farmers had a 37% share of the product value compared to just 22% for farmers in the traditional chain.

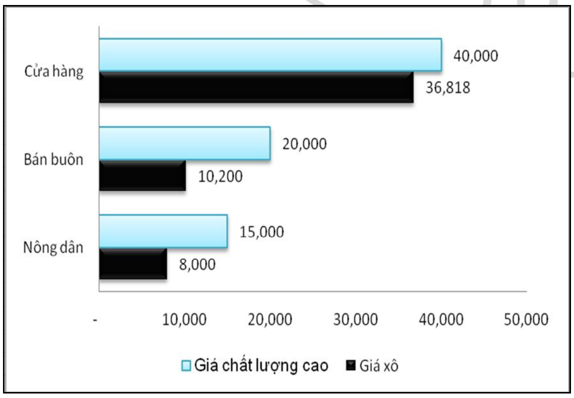
Chart 6. Value sharing among stakeholders in the traditional chain



Source: Dao et all, 2011

- In the high quality plum channel, farmers could sell plums for 15.000VND/kg on average for the whole season; however, they can only sell it at 8.000 VND/kg in other chains.

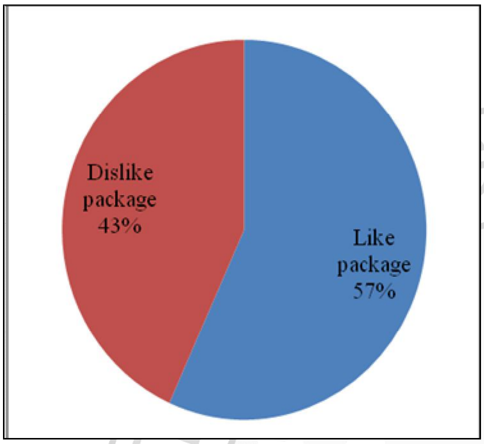
Chart 7. Different prices between two channels



Source: Dao et all, 2011

- Research activities to understand consumer reactions to higher quality plums have provided a baseline for designing the next phase's activities.

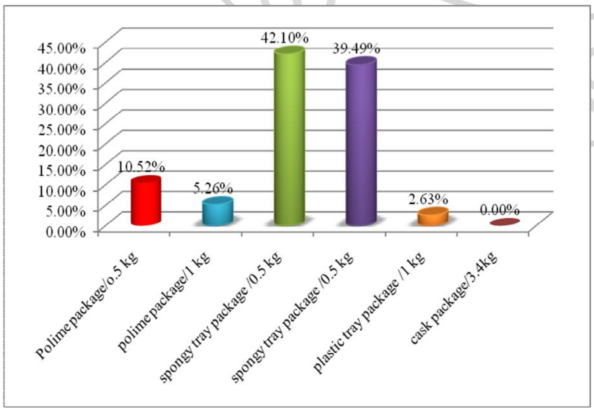
Chart 8. Customers' preferences for packaging products



Source: Dao et all, 2011

Plum were sold in five different forms of packaging: (1) 1 kg plastic bag, (2) 0.5-0.7 kg tray, (3) 1-1.3 kg tray, (4) 1kg plastic tray and (5) no package. In general, more people preferred packaged plums (56.72% of responses). Others preferred no packages as they do not trust the quality of packaged plums and preferred to choose plums themselves.

Chart 9. Rate consumers' preferences for packaged plums



Source: Dao et all, 2011

Fig 4. Consumers' evaluation of types of packaging

Indicator	Plastic bag 0,5kg	Plastic bag 1kg	Tray 0,5kg	Tray 1kg	Plastic tray 1kg
Convenient	25.0%	0.0%	25.0%	40.0%	0.0%
Clean + less time consuming	50.0%	0.0%	0.0%	0.0%	0.0%
Beautiful+ convenient	0.0%	0.0%	31.3%	6.7%	0.0%
Beautiful + well preserved	0.0%	0.0%	0.0%	6.7%	100.0%
Beautiful + well preserved + less time consuming	0.0%	0.0%	6.3%	6.7%	0.0%
Convenient, beautiful, well preserved + others	0.0%	50.0%	0.0%	0.0%	0.0%
Vừa BQ+ tiện lợi	0.0%	0.0%	6.3%	0.0%	0.0%
Convenient+ Clean, less time consuming	25.0%	50.0%	6.3%	26.7%	0.0%
Beautiful + Convenient + clean, less time consuming	0.0%	0.0%	25.0%	13.3%	0.0%
Total	100%	100%	100%	100%	100%

Source: Dao et all, 2011

Amongst all interviewed consumers who preferred packaged plums, the preference for the 0.5-0.7kg tray was greatest at 42.1%. Customers said it was both convenient, nice looking, clean, and suitable for giving as a gift.

CONCLUSION

Identifying Moc Chau plum as a potential product for improving market engagement for sustainable upland production systems was a successful step within the framework of our project. This is due to these following reasons (deduced from reality and research interventions):

+ Plum production area is the largest in the region. Plum production is also suitable for all households include poor households.

+ Although plum in this region is not as sweet as in the other places, it is still a potential product for high end market.

+ Plum products have a lot of opportunities to reduce its risks in the market. In addition, through developing prosessing techniques, plum products will be diversified more and more.

+ Trial chain actors now can coordinate all chain's activities. More profit was also created then shared amongst them; thus, encouraging their participation in the future.

Casrad team's capacity and undrstanding about value chain approach has been built considerably during rerseach and intervention process on a protential mountainous product:

+ Rule "customer focus" worked efficiently in this trial research.

+ Relationships between all actors in this chain have been strenghthened due to the fact that more value has been created and shared equitably amongst all the actors.

+ Although all the intervention activities originated from researchers and their research activities, this whole process was implemented with the participation of the value chain's actors.

However, there are many points to take into consideration in the future:

+ Product value was created only in postharvest stages (grading, packaging, transporting, selling, labelling...), thus it will be beneficial to trial technical pre-harvest interventions such as applying fertilizer and pruning to improve internal fruit attributes.

+ In retail shops which aim to sell safe and hygienic products, the plum's value increases greatly. Therefore, more technical interventions need to be taken to improve plum quality as a safe product to meet the needs of these retailers. By creating a trustworthy brand name, customers may be willing to pay higher prices for such a product.

RECOMMENDATIONS

+ Continue developing this high quality chain based on well established relationships among retailers and producers.

+ Improve plum production through pre-harvest technical interventions (fertilizer application, pruning, fruit thinning).

+ Achieve certification for plums which meet food safe and hygiene standards and use this to create a brand name for Moc Chau plum.

+ Continue applying value chain approaches on other local products to further develop the methodology and draw lessons learnt for other research applications.

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