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IMPROVED MARKET ENGAGEMENT FOR SUSTAINABLE UPLAND PRODUCTION SYTEMS IN THE NORTH WEST HIGHLANDS OF VIETNAM

Summary Report of Findings from Plum Value Chain Activities 2010

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1. Introduction & Background

The project: ***"Improved market engagement for sustainable upland production systems in the North West Highlands of Vietnam - AGB/2008/002"*** began in May 2009 and has an implementation timeframe of 4 years (2009 – 2013). The project is funded by the Australian Centre for International Agricultural Research (ACIAR), with the University of Queensland acting as the commissioned Australian organisation in partnership with four Vietnamese research institutions: the Northern Mountainous Agriculture and Forestry Science Institute (NOMAFSI), Plant Protection Research Institute (PPRI), Centre for Agrarian Systems Research and Development (CASRAD) and Hanoi Agricultural University (HAU). The overall aim of the project is to increase smallholder engagement in competitive value chains associated with maize and temperate fruit based farming systems, while improving land and crop management practices for the development of sustainable and profitable systems.

In order to achieve this aim, implementation is guided by a strong systems approach underpinned by transdisciplinary and participatory processes. The project focuses on research for development and covers several researchable areas related to the maize and fruit-based farming systems that include soil erosion management, integrated crop management and practice change models. Value chain analysis and development is another key research area that strongly contributes to project implementation by identifying and validating product chains within the maize and temperate fruit based farming systems that have market potential; and developing strategies for these chains to improve smallholder engagement. For this research component, CASRAD acts as the lead Vietnamese research institution with technical support provided by the University of Queensland partners.

According to the project design, the targeted beneficiaries of the project are smallholder farmers in the Northwest Highlands of Vietnam. 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 of Lai Chau Province. While maize production has increased rapidly in the North West Highlands, temperate fruit production still makes a significant contribution to smallholders' annual income. However in this region, fruit production is characterised by low yields, high post-harvest losses, relatively poor market engagement and low profitability which has resulted in low levels of investment by farmers in improved production and marketing practices.

According to the project diagnostic study, the main areas of temperate fruit production are in Phien Luong and Muong Sang Commune of Moc Chau Districts in Son La Province. In these areas Tam Hoa variety plums were introduced in the 1990s (as well as apricots in Muong Sang which have largely been replaced by maize plantings in recent years). However the study also identified that farmers in Giang Ma Commune of Tam Dung District and Lang Mo Commune of Sin Ho District in Lai Chau Province, have also had some level of experience with temperate fruit cultivation in the past, and are interested in introducing early peach, nectarine and plum varieties with high chill factor requirements that cannot be grown elsewhere.

Under the project design, there are four main sub-objectives which all involve value chain research components lead by the team from CASRAD:

- **Objective 1.1** *Profiling of market mechanisms, constraints and opportunities for more profitable farming systems for smallholders*
- **Objective 2.1** *Identification and prioritisation of market opportunities for improved smallholder profitability with associated market information requirements;*
- **Objective 3.1** *Development of 4 competitive value chains through implementation of strategies that effectively engage smallholders in the fruit and maize based systems and overcome current value chain constraints*
- **Objective 4.1** *Identification, design and piloting of effective mechanisms of value chain engagement that improve stakeholder profitability* (i.e. analysis of smallholder and chain member impact of intervention in the four chains identified in 3.1)

During the first 18-months of project implementation, value chain research activities have largely focused on Objective 1.1 and 2.1. The annual report from June 2009-May 31st, 2010 provides detail on the progress made in activities related to these objectives. During the first 12-months of the project, much emphasis was placed on training in value chain principles and practices for project staff and introduction to the Rapid Value Chain Appraisal (RVCA) method. This was a new approach for several CASRAD staff members, who had significant prior experience with the implementation of quantitative surveys, yet limited direct experience with other agribusiness research methods such as semi-structured interviewing, focus group discussions, case studies and consumer research methods. Towards the end of the first year of project implementation, CASRAD project staff had begun to practice these methods through the conduct of RVCA scoping studies for maize and pig value chains in Lai Chau Province, and for maize and plums in Son La Province.

Findings from the RVCA scoping study for maize concluded that the maize value chain is well developed and improvements will not significantly contribute to erosion prevention, thus the focus of the second year of the project would be on alternatives to maize. Based on this decision, another round of scoping studies have recently been completed to assess the market potential for alternative products such as persimmons, peanuts and soybeans produced in Lai Chau. However in relation to temperate fruit, project partners identified that plum grown in Moc Chau District (Tam Hoa variety) of Son La Province, has potential for developing and generating important income for producers and chain members.

Based on this initial assessment, during the second year of the project from May-July 2010, more detailed research was undertaken in order to further verify the potential for plum produced in Moc Chau to generate value for chain members and consumers (Activity 2.1.1, 2.1.1). Value chain intervention activities were originally planned for the 2010 plum season in order to trial the supply of high quality, packaged and branded plums from the ICM experiment plots to supermarkets and specialty retail stores in Hanoi. The objective of this intervention was to assess the willingness of consumers to pay a sufficiently high premium for good quality packed plums with indication of origin, and if successful, to begin the process of building a value chain from production to retailing that focuses on quality.

However, it was decided not to pursue this option this season as the team did not have sufficient understanding of consumer requirements for plum or how the existing supply chain for plum in Hanoi was operating. Therefore further research activities were pursued and this report presents a summary of the key findings from activities undertaken during 2010. The findings from the Son La plum RVCA scoping study completed in 2009, and findings related to plum production from the community based diagnostic study have also been incorporated into this report to provide a holistic overview of the current project knowledge base related to plum production and marketing.

As mentioned above, an additional objective of this study was to expose CASRAD staff to a learning-by-doing process and an adaptive methodology that encourages reflection on how the quality of the research could be improved. For this reason, limitations of the study have also been clearly identified in an attempt to draw out some lessons learned for the next round of rapid VCAs to be undertaken by the project, and to encourage a cycle of continuous improvement and adaptation of the methodology employed.

2. Value Chain Activities, Methodological Approach & Limitations

During the first year of the project, two training workshops were held for project staff:

- Value Chain Management Principles and Practices Workshop (Activity 1.1.3, May 2009)
- Training workshop for Rapid Value Chain Appraisal (Activity 1.1.5, September 2009)

Details of these workshops and the methodological approach employed are provided in the annexes of the Annual Report. Outputs from these training activities included the RVCA Workbook and later the development of a conference paper titled "Guidelines for value chain development and linking farmers to markets in the uplands of Vietnam" that was presented in Malaysia in July 2010 at the "International Symposium on Improving the Performance of Supply Chains in Transitional Economies".

The RVCA methodology adopted was strongly informed by the VCA analytical framework from the M4P (Making Markets Work Better For the Poor) Program, and was designed to be an integrated approach that: linked into the farming and business communities in the project target areas; made use of the information gathered in the community profiling and needs analysis diagnostic study; and could be seen as contributing to the overall processes of capacity building for project partners through collaborative research activities. The steps involved in the RVCA process included:

1. Analysis of community profile results.
    - The production information, cropping calendar and basic description of the marketing activities were made available from the community profile and needs analysis. Other relevant information including trader interviews was also included.

2. District level investigations

- Priority setting with district staff and business community to create a list of potential products/chains. Selection of products for development potential in Moc Chau District by participants occurred during the RVCA training workshop. Participants included representatives of CASRAD, HUA, Tay Bac University, PPRI, NOMAFSI, Plant Protection Sub Department, Provincial and District staff, the 19th May Cooperative and a market trader from Moc Chau.
- Developing selection criteria, ratings for criteria and a selection matrix. During the workshop participants created a list of selection criteria and a range of products by open debate. Weightings were also assigned to each of the selection criteria. Individual participants rated each product according to the assigned weightings and facilitators calculated the scores.
- Initial wholesale, trader and retail interviews were conducted in order to better understand seasonal supply and demand and trends over time and purchase conditions (timing, contracts, cash, packaging and processing requirements)
- Mapping product chains

3. Commune and village activities
   - Process as described above yet conducted at a commune and village level:
   - Priority setting with communities and product selection activity (selection matrix)
   - Mapping
   - Scoping for local products and ideas

4. Analysis and validation of RVCA data collected (confirmatory activities as required)

5. Short listing of chains according to agreed criteria

6. Presenting ideas back to the communities (business and farming) for discussion

As part of the process described above, learning case studies were conducted during the RVCA workshop and further improved after the workshop in response to Activity 1.16: Rapid Value Chain Appraisal (RVCA) within provincial locations through to market.

Based on the findings of RVCA studies undertaken in Year 1, in the second year of the project, a number of more detailed VCA research activities were undertaken from May-July 2010 to improve project team understanding of the Tam Hoa plum value chain and to begin to identify practical intervention points for change. Both domestic and export (China) plum supply chain members were identified and research undertaken to identify production and marketing constraints and opportunities for improvement. The following activities were completed:

- Finalisation of RVCA scoping study for temperate fruit and maize in Son La Province
- Moc Chau Plum Stakeholders Meeting held in Moc Chau (May 4th)
- China Plum Market Scoping Study (May 7-12th)
- Moc Chau Plum Degustation Conference held in Hanoi (May 14th), included focus group discussions and sensory evaluation of Moc Chau plums

- Supermarket observation visits and interviews with category managers at Big C and Metro (June 4-18th)
- Long Bien Wholesale market interviews (June 10-11th and July)
- Speciality fruit retailer interviews Hanoi (June/July)
- Plum Consumer survey (July 2010)

A summary of the key findings from each of these research activities will be presented in the body of this report with some full reports (e.g. China Market Scoping Report, Consumer Survey Report) provided as appendices. Unfortunately, due to late planning and a turn-over of staff both within CASRAD and the Australian project team, implementation of some of these activities were not as timely as they could have been. For example, when the wholesale interviews and consumer surveys were conducted, the plum season for Tam Hoa variety plum had already ended, thus stakeholders were asked to recall market information such as prices and quality from the season just past. In this instance no observation of fruit quality, prices or consumer buying behaviour was able to be observed to support the interview and survey data. Better planning for next season will be required in order to gather further market information to support the proposed interventions and to monitor the progress of these interventions.

The issue of seasonality was also overlooked by the research team to some extent during the planning stages. The Tam Hoa plum marketing season is short (6-8weeks from April to early June) and therefore research activities need to be planned at intervals during this time period. Ideally, for a seasonal product such as plum, it would be far better to conduct VCA research activities with chain actors at well defined intervals during the production and marketing cycle such as during early season, peak season and late-season to get an appreciation of the seasonality factors and how these influence product price, quality and consumption patterns. While chain actors were asked about these factors, only one-round of research activities were undertaken with each set of actors towards the end of the season or after the season had already ended.

Due to staff turnover at CASRAD and the recruitment of new staff, more senior staff members were also overcommitted during this time period which meant that plum VCA activities were not conducted in a continuous manner (e.g. over 10 days/2weeks) in order to build a strong analytical snapshot of the value chain at a particular point in time. Different team members were also responsible for conducting different VCA activities at certain times, which meant that while this information was shared amongst the team, there was a general weakness in the overall analysis of information collected from a whole-of-chain perspective. It is anticipated that bringing together all of this information into a summary report will help team members to obtain a more holistic understanding of the plum value chain and stimulate greater discussion and analytical thinking about the recommendations for strategic interventions in the chain over the coming year.

3. Plum Production & Marketing in Moc Chau District, Son La Province

This section presents the findings related to plum production from the RVCA scoping study conducted in Son La in 2009 (Appendix 1) and from the Community Based Diagnostic study. The RVCA study interviewed 20 plum producers living in Pieng Sang Village, Phien Luong Commune, Moc Chau District, and 10 traders and collectors working in Moc Chau town. The diagnostic study also interviewed 15 households in Pieng Sang Village and in La Nga Village, Muong Sang Commune. In La Nga Village temperate fruit was planted in 1994, yet was mainly apricot trees with some plum. While apricot production was very profitable in 1990s, price dropped dramatically in early 2000's and since 2005 many apricot orchards have been replaced with maize fields. Findings for plum production will therefore focus on Pieng Sang Village.

Plum Production & Harvesting– Pieng Sang Village, Phien Luong Commune

Production:

- Pieng Sang Village is located 25km from Moc Chau town and 170km from Hanoi
- Phien Luong Commune has good climatic conditions for temperate fruit production yet a lack of water can be a problem during the dry season
- Tam Hoa variety plum was introduced in the early 1990s.
- Plum is currently the major fruit crop in the district which accounts for 50% of total fruit production with an area of ~1800ha.
- According to Moc Chau DARD statistics, yield in 2009 was ~ 25 000 tons (or ~14t/ha)
- According to the RVCA, average farm sizes and yields are as follows:
    - Poorer farmers (22%): 1000m^2 yield 1350kg
    - Average farmers (58%):1500m^2 yield 2100kg
    - Wealthier farmers (20%): 3175m^2 yield 3850kg
- For all three groups of farmers, plum production contributed ~20% to annual income
- According to the diagnostic study, plum production accounts for 9% of total farm area (~1260m^2 of ave 1.4ha) in Pieng Sang, with 77% of land allocated to maize production (monocrop & intercropped)
- Majority of plum production areas are old (trees 10 years +) with low productivity.
- Poor orchard maintenance is common with little investment in improved practices– trees are not pruned and trained and use of fertilizer and pesticides is very low.
- Farmers reported a low level of interest in plum production due to a high level of price fluctuation from year to year which makes investing in plum production a high risk option.
- Low quality of fruit is a major constraint to more profitable marketing of plums
- The estimated gross income for plum in 2009 is given below:

	Trees > 5 years	Trees 4- years
Yield/tree (kg) (avg ±SE)	56.57 (9.07)	29.06 (6.28)
(med)	50.00	30.86
Yield/ha (t) (avg±SE)	20.72 (2.90)	13.58 (4.81)
(med)	20.00	13.71
Income (VND) (avg±SE)	29,092,000	22,065,000
(med)	28,000,000	19,672,000

- The above findings can be compared with maize production. Maize yield in Pieng Sang is between 4-6 T/ha with price between 2-4,000 VND = 8-24,000,000 VND/ha

Harvesting:

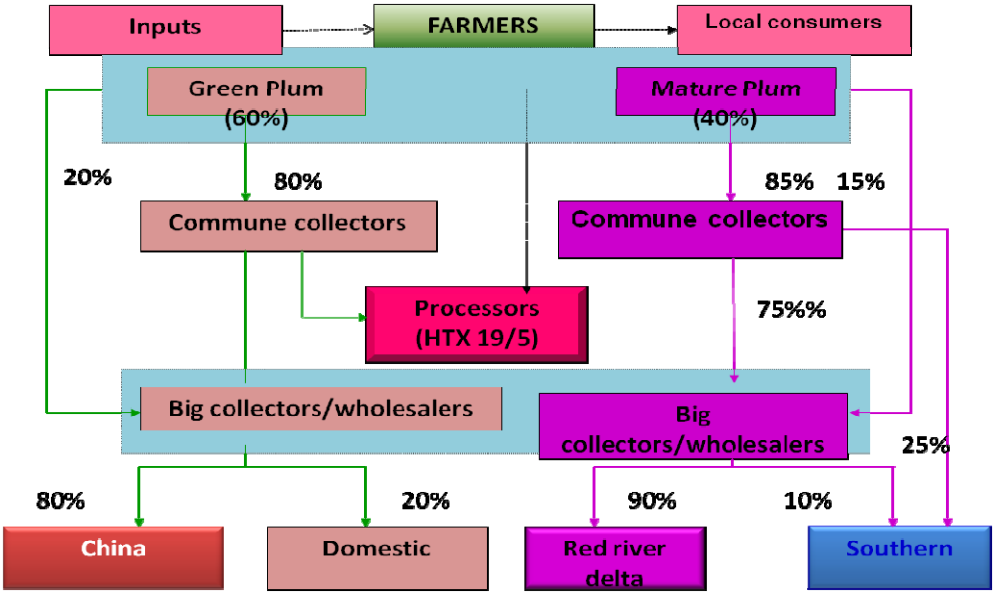
- Harvesting season begins in early April to May with plums harvested green or semi-ripe
- Labour shortage at the time of harvesting is a major constraint to careful hand-picking. During the harvesting period the majority of labour is already allocated to maize production which contributes more to household income.
- Producers generally harvest the plums themselves or collectors will hire labourers. Labour cost is 70

000VND/day.

- Ripe-plums are harvested by hand yet green plums are usually beaten from the trees with a stick and collected from the ground
- Poor harvesting practices are thought to contribute to the overall poor quality of fruit and high post harvest losses during transport

Plum Supply Chain Moc Chau District 2009

- Farmers can sell plums at two stages of maturity – green or semi-ripe
- Most producers sell at the farm gate to collectors yet farmers can also take plums into Moc Chau town to sell directly to larger collectors or wholesalers. No grading of fruit by producers occurs.
- Sale of green plum to China has been occurring since 2006 when some traders in Moc Chau found out that the Chinese market would purchase green plum for processing
- In 2009 the price for green plum was 1050VND/kg at farm gate (1200VND/kg if delivered to market) compared to 2500VND/kg for ripe plum or up to 3000VND/kg for good quality plum.
- Despite the higher price for ripe plum, producers interviewed expressed a preference for selling green plum as the risk is considered to be lower than ripe plum and less time is required for harvesting.
- In 2009, good yield was reported and nearly 60% of the total plum production was harvested green, of which over 80% was sold to China.
- The volume of fruit harvested green and sold to China varies from year to year according to demand from China and domestic price for both green and ripe fruit.
- In 2010, due to low yields and high domestic prices for ripe fruit (farmgate price ~ 4600-5000VND/kg), no green fruit was sold to China.
- During the RVCA scoping study, the supply chain from Moc Chau plums from Pieng Sang Village was mapped with estimations of quantities of product flow to various actors. This chain is presented below:



- The red river delta is the largest consumer of Moc Chau plums with plums transported and sold in Hanoi, Hai Duong and Hai Phong.
- Collectors and wholesalers and responsible for grading fruit with classifications mainly based on consistent size and colour. Class 1 and 2 plums are sent to wholesale markets in HCMC and Hanoi and lower class fruit is either sold in the rural area or to processors.
- The major plum processor in Moc Chau is the 19th of May Cooperative. This cooperative produces plum brandy and has been supported by the French NGO ASODIA which helped the cooperative to import an alembic distillation apparatus in 2006 to distil plum brandy in order to diversify use of plums that are produced in the area and which at the time had very low price. The second alembic distillation apparatus has just been imported.

- The ASODIA project is also working with producers to improve plum cultivation practice. The cooperative currently buys ripe plums from producers at a price slightly higher (2-500VND/kg) than the market price. While no data on volumes sold to 19/5 were collected during the RVCA, quantities are considered to be low at this stage. Currently more maize alcohol (wine) than plum brandy is being produced and sold, however the cooperative aims to improve the quality of plum brandy and expand production, marketing and promotion in coming years. The 19/5 cooperative has also been granted a loan to install equipment for drying of plums that will partly use solar energy.
- There is also another processing company in Hai Duong that buys green plums to produce jam, candy and uses plum as an input for other products. This is an important channel to investigate further as it provides producers with alternatives for selling both ripe and green plums.
- Based on the interviews with producers, collectors and wholesalers, an estimation of margins and average profit generated by stakeholders during the 2009 season for green and ripe plum was estimated as below.
- The selling prices quoted by collectors and traders, and the net margins calculated for both green and ripe plums appear to be very low for these actors. These findings may need further verification and should be compared with those collected from the 2010 season.

Indicator	Green Plum			Ripe plum		
	Farmer	Collector	Wholesaler	Farmer	Collector	Wholesaler
Purchasing price(đ/kg)		1050	1,250		2150	2350
Selling price (*) (đ/kg)	1050	1250	1,400	2150	2350	2650
Cost (đ/kg)	120	120	80	450	120	200
Benefit (đ/kg)	930	80	70	1700	80	1 0
Average quantity purchased/sold during season(kg)	2516	270000	350,000	918	130000	650000
Benefit/year (đ)	2,339,880	21,600,000	24,500,000	1,560,600	10,400,000	65,000,000

Based on the findings from the RVCA, the following recommendations were made:

- Given the low level of interest shown by producers in plum production at present, it is unlikely that recommending the development of new plum orchards will be well received unless benefits can firstly be demonstrated from revitalizing the old orchards.
- Firstly, technical staff should select potential plum orchards in Pieng Sang Village that present a good opportunity for demonstration to other farmers. They should gain support from farmers to begin technical interventions to improve the productivity of the orchards. Attention should also be given to improving the harvesting practices for plum.
- Secondly, fruit produced from these trial orchards could be sold to selected market outlets that are part of a higher quality chain in Ha Noi and Hai Phong and consumer response tested.
- Thirdly, the project can compare the effectiveness of the improved orchard to those that have not been supported by technical interventions to prove that reinvigorating old orchards can help increase incomes for farmers.
- Finally, expansion of this model will need to occur to other orchards in Pieng Sang Village and then other villages. As for planting new plum areas, as suggested above,

this is not recommended because the land area is limited and the local authorities do not want to expand plum production area in this area, however new plantings of other temperate fruit such as early peach in La Nga village are an option.

- There is also potential to support the establishment of farmer business schools for plum as this model allows farmers to both produce plum and sell it into a higher value, higher quality chain. Farmer business schools would help farmers to not only focus on the technical aspects but also on marketing issues, so this would help producers to develop a better understanding of the kind of plum that the market demands and how they could deliver this.

During the 2009 and 2010 season, technical interventions to improve plum productivity did occur in Pieng Sang Village. As part of the Temperate Fruit ICM component of the project, trials were undertaken to improve the sweetness of the fruit and to test the use of fertiliser to improve productivity. Findings from these trials are being collected and will continue to be monitored over the coming season. As mentioned under Section 1, the team decided not to pursue the market-testing exercise of providing high quality fruit to retailers in Hanoi during the 2010 season, due to a lack of good quality fruit and limited market information. Using the VCA research findings from the 2010 season, this activity will be redesigned and implemented in 2011. Further investigation into the option of selling good quality ripe fruit for brandy and green fruit for processing in Hai Duong will also be explored.

4. Moc Chau Plum Stakeholders Meeting

On May 4th, 2010 a plum stakeholders meeting was held in Moc Chau. The purpose of this meeting was to present the findings of the RVCA Son La scoping study back to plum stakeholders for discussion, and also to achieve two objectives:

1. To identify stakeholders' demand for plum in Moc Chau (quality, quantity requirements, packaging and labelling preferences etc) for various markets (e.g. China, Hanoi market, local market etc).
2. Collect information about potential stakeholders who are willing to cooperate with farmers to further develop the plum value chain and build the Moc Chau plum brand

The meeting was well attended with representatives including project partners (CASRAD, HUA, PPRI, NOMAFSI), local staff, farmers and traders not only from Phieng Luong Commune where the diagnostic study and RVCA was conducted, but also from other communes such as Co Do (about 10km away from Phieng Luong) which is known for production of good quality plums and could be considered as a demonstration area for Pieng Sang Village. Representatives from the 19th of May cooperative also attended and a reporter from the Moc Chau Television and Radio Broadcasting Station was there to promote the development of Moc Chau plums.

CASRAD staff briefed participants on the findings from the RVCA scoping study and then lead a discussion on issues affecting production and marketing of Moc Chau plums. The main points arising from the discussion were as follows:

- Farmers were happy with the higher price for ripe fruit this year when compared to last year even though yield was approximately 60% lower than in 2009. No farmers sold green fruit to China this year.
- Farm gate price in Pieng Sang Village was 4600VND/kg and up to 5000VND/kg for better quality fruit (double the price compared to 2009). In Co Do the price is 5000VND/kg and 5600VND/kg respectively.
- Collectors and wholesalers accept that the quality of plums in Co Do is better (sweeter) than in Pieng Sang and for this reason they are willing to buy plum in Co Do for 500-1000VND/kg higher price than in Pieng Sang as the fruit is easier to sell to their customers.
- In general, wholesalers classify plum into four grades depending on the market (no clear specification for grades were given but understood to be based mainly on size, colour and lack of blemishes or damage):
    - Grade 1 and some Grade 2 plums are sold to big city markets such as Hanoi and HCMC
    - Grade 2 and Grade 3 will be sold to rural provinces and in the local area
    - Lowest grade fruit is sold to processing companies
- All grading is done by collectors and wholesalers with no classification done by farmers
- Collectors and wholesalers stated that they want to buy good quality plum (sweet, consistent size and shape, good colour, free from pest and disease damage) and are willing to pay more for better quality fruit.
- They advised farmers to pay more attention to harvesting – farmers should not use a stick for harvesting and then collect from the ground, but should harvest by hand and should pick ripe plum or nearly ripe plum.
- The May 15th Cooperative reported that they would purchase 500 tons of ripe plum this year to test the new equipment they have acquired, however they will not be producing larger quantities of plum wine for commercial sale this year.

Participants visited the project experiment plot and control plot in Pieng Sang and also some farms in Co Do. While plums in the experiment plot were found to be larger, all participants agreed that plums grown in Co Do were sweeter. Some problems with insect damage were also observed in the experiment plot. An explanation was later given by the ICM team for the lower sugar content of the plums in the experiment plot. Apparently fertilizer was used in this plot which means that fruit will be larger, but due to the longer development phase, sugar content starts to increase later. Brix levels of fully ripe fruit were to be recorded and then compared with the control plots.

The CASRAD team also discussed with participants the proposed “Degustation Conference” in Hanoi to promote Moc Chau (Tam Hoa variety) plums to consumers in Hanoi. All

stakeholders fully agreed that this was a worthwhile idea and said that they would be willing to provide the best quality plums for the conference. They also discussed the potential for market testing of premium, packaged plums in high quality outlets such as supermarkets or speciality fruit retailers. Wholesalers at the meeting believed that the preferred packaging for these outlets would be a 1kg net bag, with logo and clear indication of plum production origin.

Overall, the stakeholder meeting was considered a success. Findings from the RVCA were further verified in a participatory manner, and it was thought to be a good opportunity for farmers to meet directly with traders and processors. It was also useful for the project team to discuss with stakeholders potential intervention strategies for the future. The fact that collectors and wholesalers are willing to pay a premium for improved fruit quality (as seen in Co Do) should act as an incentive to plum producers in other areas of Moc Chau to begin to implement improved production techniques as they are demonstrated by the ICM team.

Given that the Moc Chau plum season had already commenced, in hindsight this type of stakeholder meeting should have been held prior to the commencement of the season. If this had occurred, collectors and wholesalers could have encouraged producers to make changes to harvesting practices in order to better meet market requirements for ripe plum and could have rewarded them for these changes. The issue of clear grading classifications for plums still remains unclear, as does the benefit to collectors and traders for different grades and costs associated with product losses etc. These issues will need to be further explored next season with collectors and traders in Moc Chau and also during the wholesaler and retailer market surveys in Hanoi.

5. Moc Chau Plum Degustation Conference

On May 14th, 2010, the CASRAD team organised a "Moc Chau Plum Degustation Conference" to be held at the Dong Nam Viet Company Headquarters (speciality fruit wholesaler) in Hanoi. The objective of this conference was to introduce consumers to Tam Hoa variety plums produced in Moc Chau, and for consumers to evaluate the quality of plums from Moc Chau when compared to plums from other production origins. The reasoning behind this assessment is based on an assumption that plums from different production origins produce different quality fruit; and that Vietnamese consumers would likely place value on high quality plums from a specific production origin as they currently do for other domestically produced fruits such as Litchi, mango, orange and pomelo. Therefore, if the plums produced in Moc Chau can meet consumer expectations for quality, then a "Moc Chau Brand" will be able to be developed in the future.

It was also expected that findings from the degustation conference would help to provide insight into the general characteristics that consumers value most about the Tam Hoa variety. These findings could then help to inform the ICM component of the project (e.g. variety trials, improved cultivation techniques) over the coming years to focus on improving fruit quality in Moc Chau based on what consumers value. Approximately 50 participants attended the conference including project partner staff, representatives from the Hanoi Consumers Association (including the President) and other potential consumers.

A brief introduction to the project and "Moc Chau Plum" was given, followed by a sensory evaluation exercise. Participants were given six samples of plums from different production origins to taste and evaluate. Four of the six samples were from Moc Chau District, with two samples from Cu Do Commune, (a non-project commune known for good quality plums), two samples for Phieng Luong Commune where the project has an experimental site, and one sample from Lang Son and Bac Ha Provinces. All samples were considered to be Class 1 fruit and were collected from the production sites by CASRAD staff. The production origins of the samples were not disclosed to consumers. Consumers were then asked to assess each sample against the criteria of colour, sweetness, sourness, acridity, firmness (crunch) and size. Finally they were asked to rank the above criteria in priority order when making decisions to purchase plums, and then rank their overall preferences for each sample from favourite to least favourite. Full details from the evaluation are provided in Appendix 2.

Based on the findings from the survey, the most important criteria for plums according to the participants present were sweetness and colour, followed by firmness and size. Consistent with this finding, the plums from Co Do hills (Moc Chau District) were most appreciated by consumers as they were evaluated highest for both of these factors. The plums from Bac Ha Province were ranked second. For the plums from the ACIAR project commune, consumers ranked the sample positively in terms of size and a low level of acridity (extreme sour and/or bitter), yet there were several negative evaluations in relation to colour, sour taste and not very crunchy.

If the two most important criteria for consumers when buying plums are sweetness and colour, then these points should be taken into consideration by the project when planning further ICM trials. Possible options may be to adjust the time of harvest, or to trial new varieties that have a proven track record for sweetness and colour. Given that Co Do commune is located only 10km from the project experimental orchard in Phieng Luong Commune, the project should test samples from orchards in this commune next season to verify if plums from this area are in fact sweeter and of better colour than those produced in the project target areas. The ICM team could then try to identify why the same variety of plums can be produced with better quality in this area and determine if this is replicable to other areas in Moc Chau.

However, at this stage, the abovementioned results need to be considered primarily as controlled observations that still require further verification. There were several limitations associated with the sensory evaluation that need to be taken into account and should be learned from, particularly if this kind of testing is to be repeated next season. Firstly, the greatest limitation was a lack of objective measurements for the plum samples on all attributes, but particularly those such as sweetness, firmness, and size.

Unfortunately at the time of survey implementation, there was a lack of coordination between CASRAD and PPRI who have the necessary simple equipment (e.g. refractometer and penetrometers) to take these measures. In the absence of objective measures, it is difficult to understand exactly what consumers considered to be "Sweet" vs. "Very Sweet", "A bit sour" vs. "Very sour" or "Crunchy" vs. "A little bit crunchy". Understanding the relationship between acidity (sourness) and sweetness is often key for understanding consumer preferences for stone fruit, as this balance influences overall perception of sweet vs. sour and

can differ greatly between consumer groups (e.g. Peaches exported from Australia to the Taiwanese market are firm ripe, low acid variety based on consumer preferences). This understanding cannot be achieved without objective measurements to cross-check with consumer perceptions.

Another key challenge reported was the variations in maturity levels both within and across plum samples. Project staff present at the degustation conference reported that many of the samples were not sufficiently ripe at the time of testing and therefore would have scored low in terms of sweetness as not yet fully developed. Heterogeneity within samples poses a particular problem if the objective is to test for quality differences based on production origins. Therefore, if the sensory evaluation is to be repeated next season, it will be important to take into account the timing of the event in relation to the maturity of the fruit available.

After the sensory evaluation a small focus group discussion was facilitated by CASRAD project staff with 10 participants including project partners from PPRI and HAU, a representative from the Hanoi consumers' association, a fruit retailer and some general consumers. Participants were asked to share their opinions on the following topics:

- What criteria do they consider when purchasing plums?
- Are they interested in buying packaging plums and if so how would they like them to be packaged?
- How often do they buy plums and where from?
- Are they interested in knowing the production origin of the plums?
- For what purpose do they buy plums? E.g. eating at home, gift-giving etc.

Similarly to the findings from the sensory evaluation, the focus group discussion identified sweetness as the most important criteria when purchasing plums followed by colour, firm and crispy texture and convenience of purchase outlet. Participants were not particularly concerned about packaging but wanted something that was easy to carry. Given the small number of participants in the focus group discussion, these findings were considered as the basis for further assessment. These discussion topics and others that were not included (e.g. food safety) were then used to form the basis of the more extensive consumer survey that was conducted by CASRAD in July with approximately 90 consumers.

6. China Plum Market Scoping Study

As highlighted in the findings from the RVCA study conducted in Moc Chau in 2009, sale of green plums to China during the 2009 plum season was the most significant market channel for plums produced in this area. On this basis, it was decided that a scoping study to the major Chinese markets for Vietnamese plums would be undertaken in 2010 to improve project team and plum stakeholder understanding of the potential of this export market for Moc Chau plums.

From May 7-12th, 2010, two CASRAD project team members and one UQ representative travelled to China to investigate the market for Vietnamese plums. Two days were spent in Pingxiang to interview plum traders at a wholesale market close to the border between Vietnam and China (25km), followed by two days in Nanning to visit the wholesale market

and supermarkets. Prior to visiting Pingxiang, an interview guide for wholesalers was prepared and a CASRAD staff member firstly interviewed a Vietnamese trader in Lang Son city who provided details of Chinese importers that could be contacted in Pingxiang. Nine plum traders were interviewed in Pingxiang and three wholesalers in Nanning. Interviews were mainly conducted by the UQ representative who is fluent in Chinese, or in Vietnamese by the CASRAD project team members with those traders who could speak Vietnamese. While the interviews were recorded, transcriptions from these recordings were not made and therefore no raw data from this research activity has been made available in English to the project team. However, a trip report of key findings was written by the CASRAD staff members and is provided in Appendix 3.

Key findings can be summarised as follows:

Demand for Vietnamese Plums
• This year (2010) lower quantities of both green and ripe plums from Vietnam have been sold into China. The reason for this is twofold – plum yield has been much lower than last year and therefore domestic price for ripe plum is much higher; and demand for plums for processing in China has fallen this year compared to last year when Chinese domestic production was reduced. • Several Vietnamese traders reported that they did not wish to sell to China this year due to low price when compared to the domestic market, yet wanted to maintain their contacts for the future. • Overall, it was found that the demand for plum is highly unpredictable even to the Chinese government and exporters. Demand from year-to-year depends on Chinese domestic production which is large scale and difficult to forecast as it can be strongly affected by climate and disease; and the international market demand for processed plum (i.e. demand largely comes from Japan, Korea, Hong Kong, Singapore and Thailand) is also unpredictable as it is influenced by the economic conditions of these countries as well as the world. For this reason plum prices from one year to the next can be seen to fluctuate widely. • In 2007 plum prices hit a peak at 8 yuan/kg(~ 22 500VND/kg). Since then prices have continued to decline. While the official price reported for plums in 2010 is 1 yuan/kg (~2800VND/kg), during the market scoping study conducted in May, the wholesale price for Vietnamese plums was 3.5-4yuan/kg (9800-11200 VND/kg) which was lower than the current domestic price of 11-12000VND/kg in the Long Bien wholesale market.
Export Process for Vietnamese Plums
• Currently 10-12 traders are reportedly exporting plums to China from Moc Chau • 2-3 trucks per day of 20-30 tonnes may be sent every day for a period of 1-2 weeks depending on market demand (i.e. for two weeks average total of 840tonnes/trader sent to China) • Plums are sorted into cardboard boxes in Moc Chau with any damaged fruit removed. No other grading is done with only one grade provided which is a mix of ripe and less ripe fruit. • Vietnamese traders are responsible for the transport cost to Pingxiang market at a cost of 50-100VND/kg or 1.5-3million VND per 30 ton truck. • Trucks carrying 20-30 tons travel to Tan Thanh border where they are unloaded and reloaded into smaller trucks carrying consignments of 1.8ton which then travel directly to Piengxiang market • Vietnamese traders employ Chinese agents to take care of the customs paperwork for them at a cost of 1.5million VND/30 ton truck • In Pingxang market an open-bidding, auction process occurs for plum consignments. One box per consignment is opened and quality is inspected and tested by Chinese traders. A price is offered and if accepted, the entire consignment is sold. During the scoping visit the average price range was equivalent to 9800-11 200VND/kg. • Plums are then re-sorted by employees hired by the Chinese traders into two classes – ripe and unripe. Any damaged fruit are removed. Ripe fruit can be sold for a higher price of 0.5-1 yuan/kg (1400-2800VND/kg) more than green fruit which is usually sold to processors. No information about the % breakdown of ripe vs. green fruit from one consignment was obtained. Bloom on the fruit was also reported as key quality attribute that can attract a price premium. Traders estimate that 10-15%

of plums from Vietnam are damaged during the transportation process. • Quality is considered a key issue for Vietnamese plums as Chinese consumers are becoming more discerning – even low priced plums will remain unsold if the quality is poor. • Plums are repacked into 25kg plastic bags and transported to Nanning wholesale market which acts as the major wholesale market for redistribution to the rest of China.
Chinese Plums for Domestic Consumption
• The main plum variety produced in China is the "man com" variety • The main season is from April 15th -June 30th. • Prior to sale into the Pingxiang wholesale market, plums are sorted into two grades (ripe and green) are packed into 25kg clear plastic sacks. Ripe plums receive a price premium of 0.5-1yuan higher than green fruit. • Wholesalers estimate that only 2-3% of plums are damaged during transit due to good road conditions and packaging • For supply into supermarkets in Nanning, only the highest quality plums are selected and packaged into net bags or onto trays with clear plastic covering. Retail prices are 3.5-4 times higher than the wholesale market price.
Seasonality Factors & Potential Market Opportunity
• The Chinese plum season begins in mid-April and finishes at the end of June • The Vietnamese plum season begins mid-March for green fruit or early April for ripe fruit and ends during mid-May • Once Chinese plums come onto the market, the competition with Vietnamese fruit is strong, with Vietnamese plums reportedly of lower quality and therefore attracting a lower price • There appears to be a window of opportunity prior to April 15th for Vietnamese producers and traders to sell plums into the Chinese market, however good prices would still be largely dependent on capacity to meet quality requirements and must also take into account the opportunity cost of missing out on early season price premiums in Vietnam.

Findings from this research activity are relatively inconclusive at this stage. While the trip report provides some preliminary information about the Chinese wholesale markets, export process for Vietnamese plums and potential market opportunity for early season fruit, it lacks depth of information and analysis required to make strong recommendations. For example, during the scoping study, Chinese plums were also available for sale and were competing with Vietnamese plums, yet no detailed information is provided about differences in quality attributes or prices between the two varieties. Also, insufficient financial data has been collected from exporters in relation to purchase prices from producers, sorting and packaging costs etc, in order to be able to calculate margins and potential returns to exporters for consignments, and similarly for wholesalers on-selling Vietnamese plums. While quality is raised as a key issue for Vietnamese plums in order to effectively compete in the Chinese market, no detail is given about the specific quality attributes that wholesalers are looking for – e.g. sugar content, firmness, colour etc.

For both green plum for processing and fresh ripe plum, it appears that Vietnam does have some competitive advantage in terms of early season supply, yet this would only likely be realised if plum quality can meet the requirements of wholesalers and processors, and if prices are high enough to offset the cost of transport and customs procedures when compared with domestic early-season price premiums. Further investigation would be required at the start of the Vietnamese plum season to see whether this would be a worthwhile option for building value chain linkages between Vietnamese producers, collectors, traders and Chinese importers to specifically target this time period.

One key finding is that a clear opportunity exists for Vietnamese traders to reduce post-harvest losses associated with transport damage. If Chinese importers are prepared to pay more for improved quality (not sure if this is the real situation or not), then Vietnamese plum traders should pay more attention to grading fruit prior to transport and using more appropriate packaging materials that reduce the potential for damage (e.g. plastic crates) and therefore discounting on overall price/kg due to common knowledge of high % losses of damaged fruit (i.e.12-15%). Given that the price for plums can fluctuate so much from day-to-day, it is also important that Vietnamese traders have good lines of communication with Chinese wholesalers on the ground, so that the situation witnessed during the scoping visit (where a Vietnamese trader decided to take his consignment back to sell in Hanoi where prices were higher) does not occur. This is a difficult challenge to overcome given that the open auction system effectively discourages the potential for trust-based relationships to develop as anyone can bid on consignments. The open auction system and the challenges associated with predicting demand, appears to make export of Vietnamese plums to China a potentially high risk activity for traders.

If this type of research activity was to be repeated, in order to improve the quality of the information collected, greater planning and training would be required in relation to data collection and analysis methods. While a detailed semi-structured interview checklist for wholesalers was developed prior to the trip, it is difficult to see how/if this checklist was implemented based on the trip report. Also, as an oversight of the project team, no information was collected from traders about the reverse process – i.e. export of Chinese plums into Vietnam. This information would also be useful given the large quantities of Chinese plums that are sold domestically in Vietnam and the potential for competition with domestically produced plums. In addition, the project team did not have sufficient time to visit any plum processing factories in China. The potential for processed products from plum such as plum brandy, is slowly being recognised in Vietnam through cooperatives such as the May 19th Cooperative in Moc Chau and the support offered by the ASODIA project. Given the large domestic market in Vietnam, it seems likely that market potential exists to further develop other processed products such as dried plum snacks. On this basis, much could be learned from visiting plum processors in China.

A meeting with the CASRAD team was held after the draft trip report was produced and the abovementioned issues have been discussed. It will be up to the team to decide if they intend to pursue the potential linkage to the China market next season, however preliminary information from the China Market scoping study still needs to be shared with other project partners and plum value chain stakeholders in Moc Chau.

7. Findings from Interviews with Hanoi Plum Chain Actors

Supermarkets – Big C and Metro Cash & Carry

The rise in the number of supermarkets in Hanoi in recent years suggests that modern retailing outlets are becoming more popular as purchase destinations for Vietnamese consumers. Given that project stakeholders expressed an interest in trialling high quality, packaged plums for sale through modern retail outlets such as supermarkets and/or specialty fruit retailers, it was decided that conducting interviews with the two largest supermarket retailers in Hanoi would provide additional insight into this market segment. Even though it was anticipated that the volume of plums sold through both outlets would be small, understanding the issues faced by category managers associated with stocking (or choosing not to stock) plums in supermarket outlets (e.g. how suppliers are selected, prices paid, quality issues etc) would be useful information when designing marketing/promotion activities for next year.

Big C and Metro are currently the largest supermarket chains operating in Hanoi. Several donor-funded fruit and vegetable projects have worked with both of these companies to build high quality value chains that link producers to consumers. Big C currently has two stores in Hanoi and is in the process of expanding their network of supermarkets. They have stores in Hai Phong, Da Nang and Hue and two new outlets will soon be opened in the Red River Delta region: one in Vinh Phuc and another in Nam Dinh. There is also a store planned for Vinh city. Their second store in My Dinh District of Hanoi (a new development area with expensive apartments) opened in January 2010, and has a strict focus on higher-quality fresh produce targeted towards higher-income customers. In Northern Vietnam, Metro has two stores in Hanoi and one in Hai Phong. They are planning on opening 2-3 more stores next year (2011).

A semi-structured interview guide (checklist) was prepared prior to conducting the interviews (Appendix 4). Observation visits were made on May 21st, 2010 to the Big C and Metro stores to physically assess the quality of the plums and observe consumer purchasing behaviour prior to interviewing category managers. Interviews were conducted with the fresh produce Quality Manager from Big C and the Category Manager for fresh produce in Northern Vietnam for Metro on June 4th, and June 18th respectively. Findings from the observation visits and interviews are given below.

Observations

Big C Hanoi store locations:

Big C Cau Giay – 2222 Tran Duy Hung, Trung Hoa, Cau Giay
Big C My Dinh – The Garden Trade Centre, Me Tri, Tu Liem District (Opened Jan 19th, 2010)

Big C in Cau Giay were selling plums of one type simply called “man hau”, with no indication of production origin given. These were Tam Hoa variety plums. The amount on display was limited and the quality was poor which suggests that low volumes of plums are sold. The maturity levels and fruit sizes were mixed and there were a lot of defects (even rots) mixed in – see Figure 1. Price was 15 900VND/kg. During the time we were in the store, the

fresh produce section was quite busy, however we didn't see anyone select plums for purchase. Plums were positioned next to peaches from Sapa. There were no packaged plums for sale at Big C, in fact the only packaged fruit was imported fruit. All local fruit was sold unpackaged on a per kg basis.

Figure 1 Sample of Tam Hoa plums for sale in Big C

Metro Hanoi store locations:

Metro 1 – Pham Van Dong st, Co Nhue, Tu Liem
Metro 2 – 126 Tam Trinh Rd, Yen So, Hong Mai

We only visited main the Metro store in Tu Liem. At Metro they had a larger quantity of plums on display and in general the maturity and overall quality was more consistent (i.e. no very mature fruit or those with rots mixed in like at Big C). However there was also some very immature fruit (see Figure 2). Price was similar to Big C– 16 000VND/kg. It doesn't appear that any fruit grading has occurred at either store and if quality specifications for maturity and defect levels do exist, then it doesn't look like they are being met by suppliers. There were no packaged plums for sale at Metro, in fact the only packaged fruit was imported fruit. All local fruit was sold unpackaged on a per kg basis.

Figure 2 Sample of Tam Hoa plums for sale at Metro

Findings from Interviews

1. **Product Sales & Product Quality:**

Big C: Sales data for the week of the 18th -25th of May, 2010 was provided by the quality manager and confirmed what we already knew from direct observation: Big C sells very negligible volumes of Tam Hoa plum. During that week the Cau Giay outlet sold 110 kg. Plum ranked 31st in terms of fruit sales, despite the fact that the week in question fell within the peak marketing period for Tam Hoa plum.

Poor fruit quality is certainly one of the reasons why sales at Big C are so low. When asked why the quality of the fruit on display was so poor, the quality manager highlighted the difficulties of finding high-quality plums in the market. According to the informant, Tam Hoa plums are not grown "professionally". Big C therefore has to rely on the quality available to its suppliers and this is generally very poor. Difficulties associated with getting a homogenous product were highlighted, as even suppliers often supply mixed quality fruit. The other reason given for poor quality fruit in-store was poor QA management – not enough staff or skilled staff to ensure good quality fruit only is sold. Shelf life is also reported as not very long - 3-5days, therefore Big C buys small quantities and sells all within this time period.

While it may be difficult to find good-quality Tam Hoa plums in the market, the quality on display at the Cau Giay outlet was much poorer than that found in fruit shops outside Long Bien. So it is possible to find better plums than those retailed at the Cau Giay outlet. Given the low sales volumes of plums, it seems that the supermarket is not particularly concerned with quality and is willing to purchase very marginal volumes of whatever quality suppliers can deliver. According to the Quality Manager, plum is a cheap fruit that can be bought anywhere in Hanoi and therefore is not much in demand at supermarkets. It is included in the product range at Big C to complete diversity of the category, but is not considered a strong performing product.

Interestingly, Tam Hoa plums are sold at the Cau Giay store but not at the My Dinh store. The reason given for this is that the new My Dinh store has a strict focus on higher-quality fresh produce targeted towards higher-income customers, and plums currently cannot meet this standard.

Metro: Metro sells both imported and domestically produced plum. Imported plums come from the US and Australia. They also sell Chinese plums (green Ta Ly variety and dark purple skin) and Vietnamese plums (Tam Hoa and Man Com varieties). In terms of product sales within the fruit category, plums rank very low. Of all plum varieties, they would sell the most Tam Hoa plum, but still in low volumes. Vietnamese plums have a short-season (2-3mths) and are sour which is why the category manager believes not many people like to buy. He believes that students and young people like plums as they are cheap and therefore most sales occur on the street.

Metro only sells plums to provide a full range of products to customers. They do not have any specific quality standards for plums, only that they be "fresh". Quantities sold are low – no more than 40kg/day during main season (i.e. ~200kg/wk). Due to average quality, plums are sold at a low price (15-20 000VND/kg), therefore income generated from plum sales for

Metro is negligible – say 800 000VND/day. Metro can sell 100 million VND/day in sales so contribution from plum very low. The category manager believes plum sales from Metro are direct to consumers – volumes purchased are too low to be used for restaurants.

When asked about potential for quality improvement, the Metro category manager believes that the most important quality attributes for plum are sweetness, firmness and freshness. The category manager believes that consumers are also interested in knowing where products come from and for plum there could be the potential to increase sales through increasing consumer awareness of Tam Hoa plums from Moc Chau through in-store promotion. Main factor though is quality – if quality of product is good then sales are generally good.

Metro has a policy of support for new varieties of products (e.g. Kiwi fruit, pears from South Africa etc). They run in-store promotion programs and have found that even after promotions have ended, product sales remain higher than before. The AusAID funded CARD food safety (MetroGAP) project for cabbage and watermelon from Vinh has seen increased sales - volumes of watermelon sold are now much higher than before the project.

Off season fruit is always of interest to Metro – they are currently looking to source tomatoes that can be produced at a different time to those produced in Da Lat. Category manager asked if tomatoes could be produced in Moc Chau? Food safety for vegetables is still a key issue yet not considered as important for fruit at this stage.

2. Suppliers

Big C: Big C has some ten fruit suppliers. As expected, these must be able to provide a red invoice (be formally registered as a company) and supply a range of fruits all year round. There are no single suppliers for products. Due to the restriction of requiring a red certificate, Big C does not buy directly from farmers or farmer groups.

Since May 17th, 2010, Big C has a platform for fresh produce in Hanoi. Suppliers deliver the fruit to a central warehouse rather than one of the two supermarket outlets. A list of Big C fruit suppliers was provided by the Quality Manager for follow-up during the wholesale interviews.

Metro: Metro does not currently have a centralised warehouse platform in Hanoi. They currently buy plums from 2-3 main suppliers who also supply other products (did not provide details of suppliers). The category manager was unsure where they source the plums from, most likely from Long Bien market but also potentially from farmers. No food safety standards required yet for fruit – only have standards for watermelon developed with Metro from the CARD project. No quality standards for plum.

In terms of seasonality, Metro buys Tam Hoa plums from April until early June. Sales of Tam Hoa plums finished about two weeks ago (June 3rd). They would buy 20-30kg/day (140-210kg/wk) for each store from collectors. They buy plums every day (phone order) when in season and sell all in one day due to low volumes purchased. Losses are considered to be very low. The reason given for buying daily is that product quality for plums is considered to be low, therefore better to buy small amounts regularly to ensure freshness. If the quality was

better, they would consider buying every 2-3 days. Average price paid for plums during main season this year is 13k VND/kg and sell for 16k VND/kg. This season the price of Tam Hoa plums has been higher than before.

Metro buys Ta Ly variety plums (they call them Sapa plums) in July and August. They also buy Man Com plums which are in season earlier in the year than Tam Hoa (around Tet).

Unlike Big C, Metro can buy directly from farmers/farmer groups if they can meet the quantity and quality requirements and are happy to do so if this is a viable option.

3. **Packaging**

Big C: When discussing packaging, the informant was of the opinion that net bags are superior to trays with film. Net bags cannot be broken and are better for product preservation. Consumers cannot pick any fruit from the bag and damage the packaging like they can with the plastic covered trays, however trays with plastic film are very convenient when customers purchase fruit to eat at the office (i.e. use trays to cut fruit on). Big C uses the trays with plastic film to package some of its fruit. Almost all of the imported fruit is sold packaged. The main reason given for packaging fruit is product preservation.

Metro: Metro is very interested in good quality packaging. If good quality plums could be sold in net bags of 1kg, they would be interested to trial the sale. They would still buy loose plums as well as packaged, as they like to offer consumers a choice, but they would still be interested to trial packaged plums.

4. **Intervention Ideas**

Big C: The My Dinh supermarket would be an interesting location for consumer surveys and could be targeted in the context of a marketing pilot focused on market testing and market promotion for high-quality plums that have indication of origin. However the quality of the plums would need to be consistently high in order to be accepted by the fresh produce managers.

Metro: Potential to trial bagged fruit direct from Moc Chau farmers to Metro? Or better to work through established suppliers? Metro is willing to trial new product types and presentations. Sales volumes are however likely to be initially low, so would need to see if potential for increased returns would warrant effort.

Conclusions from Supermarket Research

- Tam Hoa plums are considered a low-quality fruit that are offered by the supermarket outlets to complete the range of fruits available to consumers
- Sales volumes are very low: 100-200kg/wk even during peak season
- Retail prices are comparable to outside ranging from 15-20 000VND/kg with purchase prices reported to be 3-4000VND less than sale price this year.

- Biggest challenges according to category managers is obtaining consistent quality fruit – quality of fruit supplied is often very heterogeneous – mixed maturity levels, defects etc provided by suppliers
- No quality standards for plums currently exist for either retailer yet both believe that consumers would value sweet, firm and fresh plums
- 1kg net bags of good quality fruit is the preferred form of packaging
- No dedicated plum suppliers – both retailers source plums from suppliers who provide other products also. Given the small volume of supply and low price, it could be assumed that sourcing consistent quality plums is not of high priority to suppliers as it represents a minor component of their business to the retailers.

Wholesaler Interviews – Dong Nam Viet Company & Long Bien Market

In June the project team conducted interviews with fruit wholesalers operating out of the Long Bien wholesale market in Hanoi, as well as with a speciality fruit wholesaler (Donavi).

Dong Nam Viet Company (Donavi)

On Friday June 4th, 2010 an interview was conducted with the Director of the Company Mrs Hoang at their retail shop in Cau Giay District. This is where the Moc Chau Plum Degustation Conference was held.

Donavi is a specialty fruit wholesaling company. The company has been operating for four years. As suggested by CASRAD, the company should be considered as a potential partner in a future plum marketing pilot. The company has a clear focus on quality and product differentiation. It works with specific fruits of particular varieties from particular production origins. The fruit is sold under the Donavi brand, with clear indication of production origin. This is an interesting innovation in the context of fruit markets in northern Vietnam.

1. Customers

Donavi targets the modern retailing segment, i.e. fruit shops, mini-marts and supermarkets. It sells to some 40 retail fruit shops in Hanoi and about 5 or 6 supermarkets/mini-mart chains. Supermarket/mini-mart chains include Intimex, Hapromart, IniMart, Unimart, Star supermarket and Saigon Co-op Mart. For HaproMart they deliver to one centralised HaproMart store that then delivers to their own smaller stores. Donavi also sells direct to consumers through its two retail shops – one retail shop is located in Cau Giay district which opened last year (also has a small cafe attached that specialises in fresh fruit drinks), the other shop is located within FC Mart over the Long Bien Bridge. Sales to retail shops account for 60 percent of the company's fruit sales, supermarkets for 30 percent, and direct-to-consumers accounts for 10 percent.

Interestingly, Big C and Metro are not clients of Donavi. The reason given for this is that these two supermarkets do not sell high-quality fruit but rather focus on sourcing cheaper or medium quality fruit. Donavi believes that Metro and Big C are mainly interested in products that can be stored for a long time, not in high quality, seasonal fruit. Donavi specifically targets the high-quality market segment. This information is consistent with direct observation from the Metro store visited and also the Big C store in Cau Giay (i.e. fruit

quality was low-medium), however it is not consistent with direct observation at the My Dinh outlet of Big C, where the quality of fruit on display was very high. However the Big C store in My Dinh is new – it only opened earlier this year (2010) and is specifically targeting higher value consumers.

Supplying to retail shops also has some clear advantages over supermarkets: stores buy a wider range of products, they pay promptly and do not require red invoice. In addition, supermarkets require documentation showing that the produce is safe, although at the moment this condition only applies to vegetables, not fruits.

In relation to price and product quality delivered to clients, Donavi stated that they charge the same price for both categories (retailers and supermarkets) however the quality supplied to the supermarkets is lower than that supplied to speciality fruit retail shops. The reason given for this was that the costs associated with supplying to supermarkets are higher due to VAT, packaging (supermarkets prefer packaged fruit as they have no staff to take care of the fresh produce sector) and delayed payment period (2months after delivery). This is an interesting but not so surprising finding. It suggests that currently supermarkets do not enjoy a very strong bargaining position and therefore have to pay for the costs they impose on suppliers. The Supermarkets account for a very marginal share of the market. If they try to squeeze suppliers too much at this stage, they will find it difficult to secure supplies.

2. Product range

Donavi supplies a wide-range of fruits depending on the season. Supplies to mini-marts/supermarkets focus on five main products: cherries (imported), strawberries (air freighted from Dalat), two local banana varieties (from the Mekong delta), small coconuts (Ben Tre) and aloe vera. The product range for fruit shops is wider, usually 7-10 products. It includes, for example, oranges from Cao Phong, plums from Moc Chau, root vegetables such as sweet potato, imported fruit such as kiwi, pears, grapes and apples.

The choice of fruits / varieties to supply to retailers is based on a combination of criteria:

- Quality should be high
- No need for ripening or Donavi must master ripening technologies (as in the case of banana – for this reason they do not sell mango as ripening considered too difficult)
- Fruits / varieties should be associated with specific areas / regions
- Competition from other companies and traders should not be too intense
- Retail selling prices should be high enough to allow for attractive margins
- The harvesting season should not be too short
- Demand should be high enough to justify direct procurement from production areas

At the moment Vietnamese plums fail to meet most of these criteria. Fruit quality is low and so are prices (this year prices were much higher than usual). The harvesting season is short and competition at the wholesaling level is high.

3. Suppliers/Procurement strategies

Donavi buys from selected traders in production areas throughout Vietnam. They never buy from Long Bien wholesale market as they believe it is too difficult to guarantee the quality. They have at least one contact person in each district. The company organises and pays for transportation from production areas. Most domestic products are transported by road however high value and highly perishable products such as strawberries from Dalat are air freighted. From the Mekong Delta they mainly source coconut, rambutan, milkfruit, durian and bananas. In the north they source fruit from Hai Duong, Nam Ha and Hoa Binh.

4. Competition

According to Donavi, there is a lot of competition in fruit wholesaling however speciality wholesalers tend to specialise in a product range that is different to each other. For example not many wholesalers sell imported cherries, dalat strawberries, small bananas and xim coconut (small coconut from Ben Tre) like Donavi do. On this basis they can differentiate themselves on product range as well as fruit quality.

5. Plum Quality

In relation to plums, Donavi only interested in sourcing Tam Hoa variety plums from Moc Chau as they believe that plums from this area are the best and their customers prefer plums from this area. At present plum quality is not very homogenous (considered to be similar to persimmons). Early season fruit is not delicious and when in season, the quality is better but season only lasts for 15-20 days and price is cheap. This short season and low price is considered to be a key challenge for Donavi to overcome if they intend to promote the supply of plums to their customers.

For Donavi to be interested in increasing plum sales, plum quality would need to be improved. They suggested bigger fruit, good colour, firm and sweet. They also believe that awareness raising at consumer level would need to occur to improve the knowledge of consumers about the origin of the plums. No comments were made about shelf-life.

6. Packaging

Donavi are of the opinion that net bags are the best packaging for plums in terms of shelf-life, especially in outlets with no refrigeration and no air conditioner, which are the majority.

In their retail shop the plums are sold without any package and also in small trays covered with plastic film. In general, retail shops prefer to buy fruit unpacked as consumers like to select the fruit themselves. Supermarkets prefer the packaged fruit (on trays covered with plastic film) as they often have no staff to manage the fresh produce sections. Consumers often like fruit packed on trays as they can use the tray for cutting the fruit.

7. Product sales of Moc Chau Plums

This year Donavi sold about 200-300 kg of Moc Chau plum per day. They sold plums only to speciality retailers, not to supermarkets. If we extrapolate to the entire season we can assume that the company sold 6 to 9 tons of Moc Chau plum.

Prices this year have been higher than previous years due to low yields this season. Early season plums are sold to retailers for 30 000VND/kg, mid season 12-15 000VND/kg and end of season 20-28 000VND/kg. They have one local collector from Moc Chau who sources fruit for them.

8. Intervention ideas

A significant improvement in plum quality (plus rapid growth in the modern retailing segment) could lead to considerable growth in plum sales through this outlet. A partnership with Donavi is interesting from a piloting perspective for the project, but a large high-value chain for plums can only develop and be sustained if farmers also develop good linkages with other specialty fruit wholesalers.

It would be interesting to pilot (compare the effectiveness and efficiency) two different chain structures: supply of plums through a producer group and supply through a local trader. The question is whether Donavi would be happy to have direct links to farmer groups given that their current strategy strongly relies on trust-based relationships with larger scale collectors based in the districts where the product is produced. On this basis it seems unlikely that producer groups would be able to deliver consistent volumes and quality throughout the whole season, however it would be interesting to investigate this potential.

Conclusions from Interview with Donavi

- Donavi has a clearly defined strategy which revolves around building a reputation (and brand recognition) as a specialised wholesaler of specific varieties of domestically produced fruit with clear connections to production origin
- They clearly have a good understanding of the retail market for fruit and the market channels for targeting higher-value consumers.
- Consistent with the findings from the supermarket interviews, Big C and Metro are not considered to be high-quality retail outlets for fruit and therefore Donavi are not interested in supplying to them as they fall outside of their market segment.
- Similar issues were raised about plum quality as during the supermarket interviews – hard to obtain homogenous product of good quality, short production season and low prices makes wholesaling (and retailing) of plums not considered to be highly profitable
- Sweetness, firmness, colour and consistent size all raised as key areas for product quality improvement.
- They also believe that awareness raising at consumer level would need to occur to improve the knowledge of consumers about varieties and the origin of the plums.
- Consensus with the supermarkets was obtained about preferred packaging – 1kg net bags with clear indication of variety and production origin, yet this would not replace

supply of loose fruit as consumers still show a strong preference for selecting their own fruit

- CASRAD has secured commitment from Donavi to work with the project next season to trial retailer and consumer response to high-quality packaged and unpackaged fruit. The details of this trial and the assessment protocols to be put in place will need to be discussed amongst partners and with stakeholder in Moc Chau well before the plum season begins in 2011.

Long Bien Wholesale Market

The Long Bien wholesale market in Hanoi acts as a major distribution centre for fruit and vegetables for retailers in Hanoi and for other wholesale markets throughout the country. Based on findings from interviews with collectors and wholesalers in Moc Chau during the RVCA scoping study, the Long Bien wholesale market acts as a major market channel for the sale of Tam Hoa plums from Moc Chau. On June 10-11th, the Australian partner value chain specialists and members from the CASRAD team visited the Long Bien Wholesale market and conducted brief interviews with three wholesalers.

The visit took place on the 30th of April of the lunar calendar, just before a *tuan* day, when fruit sales are higher than usual due to strong demand for offerings to the ancestors. For this reason wholesalers were very busy and it was difficult to conduct any in-depth interviews. The marketing season for Tam Hoa plum came to an end in early June (end of the first week) so at the time of the wholesale market visit, no wholesalers were currently selling this variety. However the visit provided an opportunity to check the varieties and volume of other plums available on that day and to observe wholesalers grading the produce. Some key findings from the interviews were as follows:

Seasonality:

- Tam Hoa plums from Moc Chau and Lang Son are the first to come into the market. The season for Tam Hoa plum starts in late April and extends until the first week of June.
- The Tam Hoa plum season does not coincide with the season for varieties imported from China (except for a few days in early June at most). This means that Moc Chau and other Vietnamese growers are not exposed to competition from Chinese plums.
- Wholesalers stated that Tam Hoa variety is the most popular plum variety for consumers (easiest to sell to their retail customers), followed by Man Com variety and then Ta Ly.

Grading:

- Grading is carried out by wholesalers who purchase ungraded fruit. The graded plums are sold to specialty fruit shops in Hanoi and street vendors, whereas the un-graded produce is sold for a small margin to secondary wholesalers in different cities and towns across the Red River delta. Wholesalers in those markets also buy plums directly from traders in production areas.

- During the market visit wholesalers were sorting "Ta Ly" variety plums from China (small yellow) into three grades (see Figure 3). Apparently a similar grading process is followed for all plum varieties. From our observations, grading was based on fruit size, fruit colour, and blemishes or defects. Larger and riper plums with very few or no defects were classified as Grade 1, although some large but still green fruit with no blemishes was also included in this category. Grade 3 consisted of very small and green plums.
- Grade 2 was the most dominant one in terms of volume, followed by Grade 3. A small share of the produce was classified as Grade 1. It would be interesting to have traders' own estimates of the shares accruing to different grades. If combined with purchasing and selling price data, such information would allow us to estimate gross margins.
- During the sorting some fruit was rejected because it was no longer suitable for consumption. The team did not discuss with the traders the extent of product losses at the wholesaling level, which is an important input into the analysis of margins and opportunities for intervention.
- When asked about quality attributes of importance for plums, wholesalers listed sweetness as the number one factor, followed by bloom on the fruit, colour and crunchy/firm texture. Sweetness was considered to be more important than size.

Ungraded Ta Ly Variety

Grade 1 – larger, riper, few defects

Grade 2 – mixed ripeness, some small defects

Grade 3 – very small plums, very unripe

Figure 3 Grading Process for Ta Ly Variety Plums

Volumes:

- One wholesaler claimed to sell 200 to 300 kilograms of the Ta Ly plum per day. Another wholesaler said that she sells about 500 kilograms of plum per day.
- For Tam Hoa variety plum, the wholesaler estimated similar quantities 2-300kg/day, yet during peak season, on a good day they could sell up to 1 tonne.
- For one season they estimated that 30 tonnes of Tam Hoa variety plum would be sold.

Purchasing & Selling Prices

- Ungraded fruit: 18-20 000VND/kg resold other wholesalers at 21 000VND/kg
- Grade 1: 35 000 VND/kg; Grade 2: 25 000VND/kg; Grade 3: 15-20 000VND/kg
- This information is not entirely consistent with that provided by a retailer just outside the market, unless that retailer had purchased third-grade plums. The retailer claimed that she had purchased 45 kilograms of plums for 20,000 VND/kg. She was planning to sell the plums for 25-27,000 VND/kg

Competition and Margins

- While incomplete, the price information collected during the visit suggests that wholesalers are operating with relatively small margins.
- If we assume that the second and third grades accounted for 50 and 30 percent, respectively, of the plums sold by the first wholesaler interviewed, then at the time of the visit that trader was charging a gross margin of 5,500 VND/kg or 22 percent for Ta Ly variety. Such a margin must compensate the trader and her family for the product losses incurred, the time spent grading the produce and other marketing costs.
- Given the low entry barriers to fruit trading and the large number of actors involved with each commanding a very marginal share of the market, one would expect wholesalers (and other traders) to operate with small net margins. Plum wholesalers face strong competition not only from other plum wholesalers but also from wholesalers trading other fruits.
- Further information about prices and marketing costs will allow the value chain team to refine the margin analysis.

In July, 2010 the CASRAD team returned to the Long Bien market to conduct more detailed interviews with wholesalers specifically focused on obtaining information about Tam Hoa variety plums. During this process, they uncovered that there are in fact two different levels of plum wholesalers operating out of the Long Bien wholesale market. The first level (or "big" wholesaler), are those wholesalers who have vertically integrated the transport function into their business activities. These wholesalers own a truck themselves and go to Moc Chau during the plum season to buy directly from wholesalers/traders in Moc Chau city then bring back to the Long Bien Market to sell. It is estimated that there are at least ten of these Level 1 wholesalers operating out of the market.

The second level of wholesalers is made up of the smaller wholesalers, who buy unsorted plums from the Level 1 wholesalers and then classify and sell the graded plums to their

customers. The number of Level 2 wholesalers in the Long Bien Market is unknown yet is thought to be numerous with much competition. This is an interesting finding for Level 1 wholesalers and may explain the small profit margins and high competition witnessed at the Level 2 wholesaling function during the first visit to the Long Bien Market. This finding should be further evaluated during the plum season next year as it has implications for the efficiency of the chain.

Key findings from interviews undertaken by the CASRAD team are as follows:

Level 1 Wholesaler Long Bien Market

Interviewee: Ms. Nga, the owner of the truck 30K-9489

Method of buying plums

- The truck owner receives orders from smaller wholesalers (Level 2) in the Long Bien market and surrounding areas, and also direct from retailers in Hanoi. She then phones plum collectors in Moc Chau to make an order.
- If the collected plum volume is less than the truck capacity, Ms Nga talks with other big wholesalers in Long Bien market so that they can transport a full load of plums together to save costs.

Volumes & Prices

- The plum volume ranges from 5 tons (minimum) up to 16 tons (maximum) per trip. During the season this equates to 7-12 tons/day at the beginning of season, 12-16 tons/day in mid-season and 5-9 tons/day at the end of season.
- Plums are packed in Moc Chau from 4 to 6pm and transported to Long Bien around midnight. The size of boxes vary depending on the market destination. For example 15 to 20kg per box for plums transported to the South; 20-25 kg for the ones sold to the Chinese market; and 40-50 kg for the ones transported to Long Bien market.
- After being unloaded, all plums are sold to other wholesalers without sorting, including smaller wholesalers in Long Bien Market and surrounding areas (such as Hung Yen, Ha Nam, Nam Dinh) and retailers in Hanoi.
- Net profit margins after freight costs and storage cost is estimated at VND 1,000 – 2,000 per kilo. Purchasing and selling prices for plums this season were as follows:

	Purchasing cost in Moc Chau (VND/kg)	**Selling price in Long Bien (VND/kg)**	**Freight cost (VND/kg)**
Beginning of season	12,000	13,500 – 14,000	1,000
Mid-season	9,500 – 10,000	11,000 – 12,000	1,000
End of season	13,500 – 14,000	15,000	1,000

- Freight cost is quoted in "cuoc", one "cuoc" is equivalent to two boxes of 50 kg (i.e. 100kg) at freight cost of VND 100,000 therefore 1000VND/kg. For the truck of more than 10 tons the cost decreases to VND85,000 per “cuoc” or 850VND/kg. Therefore it is preferable for Level 1 wholesalers to transport 10 tons or more if possible as the net margin increases.
- Given the conservative calculation of net margin of 1000VND/kg, the average net profit for each ton of plums is one million VND (~50USD). Based on the information given for volumes purchased during the season, assuming that the marketing season began in mid-April and ends around June 6th (thus ~42 days in the season) with 10 days accounting for early season, 20 for peak season and say 12 days for late season, then a rough estimate of total volume sold during the season would be 450 tons, and therefore an estimated net profit of 450 million VND (~22 500 USD) could be made from one season of wholesaling Tam Hoa plums from Moc Chau (not including investment costs) . For a six week window of time, this appears to be a profitable exercise for Level 1 collectors as they sell sufficient volume to overcome the low margins per kg and do not take responsibility for any waste given that they buy and sell within one day.
- Those Level 2 wholesalers and retailers who often buy plums from Ms Nga are acquaintances who can contact her by phone. They buy from her based on a reputation for good quality fruit and trust.

Level 2 Wholesaler Long Bien Market

Three level 2 wholesalers were interviewed by CASRAD. Findings were as follows:

Interview 1:

Method of buying plums

- They order and buy unsorted plums from Level 1 wholesalers (truck owners) in Long Bien market.

Volumes and buying prices

- During the peak season, this wholesaler buys 5-6 quintal per day (1 quintal = 100kg). See the below table for more details:

	Volumes (in kg)	**Purchasing costs (VND/kg)**	**Unloading expense (50000VND/quintal) or VND/kg**
Beginning of season	1 – 200	13,500 – 14,000	500
Mid-season	5 – 600	11,000 – 12,000	500
End of season	3 – 400	15,000	500

- The wholesaler then sorts plums out into three types. On average, in one quintal (100kg) of plums there is 30% of Grade 1 which are best quality, big, fresh and not damaged; Grade 2 accounts for 50% and Grade 3 20% from which 5-8% are removed as damaged or inedible. During mid-season the % of Grade 3 fruit is estimated to decrease to around 12% with more Grade 2 fruit.

- It takes one labourer 30min-1hour to grade 100kg of plums depending on their skill level. Salary for one day is 100 000VND for 7 hrs work, therefore labour cost for grading 100kg of plums is ≤ 14 300VND.
- According to this wholesaler, there are no fixed criteria for grading plums. It mainly depends on subjective feelings and on market situations to ensure that the wholesaler can make net profit of 150,000 to 200,000 per quintal, or 1500-2000VND/kg.

Selling Prices for retailers

	Grade 1 (VND/kg)	**Grade 2 (VND/kg)**	**Grade 3 (VND/kg)**
Beginning of season	18,000	16,500 – 17,000	13,500 – 14,000
Mid-season	17,000	15,000 – 15,500	9,000 – 11,000
End of season	13,000 – 15,000	10,000 – 12,500	9,000 – 11,000

- Fruit shops normally buy plums of Grade 1 while small retailers and street vendors buy type 2 and 3. Street vendors will also buy ungraded fruit sometimes.
- Further verification of selling prices is required next season as only one complete set of prices for all three grade levels at the three periods during the season were obtained. Price information collected from other wholesalers suggest that the Grade 1 prices quoted above are potentially too low and are more likely to fall in the range of 20-25000VND/kg for early and late season fruit and around 17-18000VND for mid-season. This can also be verified with retailers. The Grade 2 and Grade 3 prices seem more reasonable.

Interview 2:

- Similarly to above, this wholesaler buys ungraded plums from Level 1 wholesalers and then grades the fruit.
- During peak season they sell about 500kg per day, but during the early season the selling volume is only 100-200 kg per day.
- They grade plums into 4 Grades of which Grade 1 accounts for about 30%, Grade 2 – 50%, Grade 3 – 15% and Grade 4 – 5% (type 4 is normally for waste). This breakdown is consistent with those given above.
- They estimate that the gross margin is about 3,000/kg.
- They don't buy plums from one fixed supplier in the market. They buy from any Level 1 wholesalers who sell good quality plums. They estimate that there are about 10 Level 1 wholesalers (truck owners) who operate in the market but they do not know how many 2nd level plum wholesalers there are in Long Bien market as the market is too large.

Interview 3:

- This wholesaler buys Moc Chau plums from Level 1 wholesalers, including from the Level 1 wholesaler interviewed by the project team.

- She doesn't buy plums from one fix provider. She buys from those who sell good quality plums at best price.
- Buying volumes range from 5 to 10 big boxes (1 box = 50kg) per day depending on the orders from her customers and the time during the season.
- At the beginning of the season she would buy 250kg/day, mid-season 500kg/day and late season around 200kg/day.
- Estimated gross margin is from 2,000 to 5,000/kg.
- Purchasing costs for early, mid and late season fruit and for loading expenses were the same as given in Interview 1.
- According to her, Moc Chau plums are cheap and better quality than other plums.

Plum Supplier to Big C

To follow-up on the supermarket interview conducted with Big C, a wholesale fruit provider to Big C was interviewed. This wholesaler is based in the Long Bien market and sells many kinds of fruits to Big C. Fruits provided are mainly imported such as grapes, apples, mangoes and melons. They are mainly imported from Thailand and the USA, very few from China. According to her, Big C doesn't check the quality of the fruit carefully, however it is not a problem as all the imported fruits have quarantine certificates and any damaged fruit will be returned to the supplier by Big C and must be replaced. Consistent with our findings from the interview with the Big C fresh produce Quality Manager, supply of plums only accounts for a very small component of her business with Big C.

For plums:

- She provides man hau (Tam Hoa variety), man tim (purple plums) and man Cau but man hau accounts for a small volume. When Big C calls to order she buys plums from 2nd level wholesalers and the volume normally is 10-20kg per purchase.
- This season she sold only about 200kg of Tam Hoa variety (man hau) to Big C. Big C buys a lot more imported purple plums - the volume is often 20 boxes per purchase (1 box = 5kg) or 100kg.
- Profit from supplying plums to Big C accounts for only 2% overall.
- She used to buy plums to sell to retailers but the profit margin is lower than some other fruits so she stopped buying.

Summary of key results from Long Bien Market Research & areas for follow-up:

This initial round of interviews with plum wholesalers in the Long Bien market has uncovered some important findings that will help project stakeholders to better understand how the current supply chain for Moc Chau plums has been operating:

- Two levels of wholesalers for Moc Chau plums were reported to operate within the Long Bien Market
    - Level 1 wholesalers have vertically integrated the transport function and buy direct from collectors/wholesalers in Moc Chau

    - They sell ungraded fruit to Level 2 wholesalers in the Long Bien Market and also direct to retailers in Hanoi and other wholesalers
    - While the net margin is low (1-2000VND/kg), they operate on volume and this basis can make an estimated profit of ~US 22 500USD per season (~6weeks)
    - Level 2 wholesalers buy from Level 1 wholesalers in the Long Bien market, grade fruit and sell to their customers
    - From 100kg of unsorted plums, wholesalers estimate that 30% can be classified as Grade 1, 50% Grade 2, 15% Grade 3 and ~5% waste.
    - They estimate that gross margin earned is 2-5000VND/kg during the season
- During the interviews with Level 2 wholesalers, significant additional information was collected: breakdown of grades and % losses; volumes purchased during the season and associated costs; selling prices to retailers etc. The VC team should now be able to complete the margin analysis for Level 2 wholesalers and also calculate an estimate of net profit for the 2010 plum season for some Level 2 wholesalers.
- These findings are useful to begin to build a more comprehensive picture of the supply chain for Moc Chau plums and how consumer value is shared by the chain partners. This can help to identify where waste along the chain may be reduced and efficiencies improved.
- These findings should be further verified by the project team during the 2011 plum season. Further information is required about selling prices to retailers during the season.
- It appears that consistent with discussions with collectors and wholesalers in Moc Chau, there is little clarity in grading standards for plums amongst wholesalers in Long Bien.
- Little information was collected about the Level 2 wholesalers' customers – it would be useful to know about extent of relationships, frequencies of orders and what volumes and quality requirements (if any) do they demand from their suppliers. No clear comments were made about preferred quality attributes for plum.

Fruit Retailers

Similarly to the wholesale market interviews, initial interviews were conducted with speciality fruit (shop) retailers by the Australian team and CASRAD staff members in early June, with additional follow-up interviews conducted by CASRAD in June/July. The first set of preliminary interviews was conducted with speciality fruit retailers located opposite the Long Bien wholesale market. Some findings from one in-depth interview were as follows:

Retailer Interviews June 3rd, 2010

Shop Location

- The shop is well located, just opposite the Long Bien market (the source of plums) and along the wide and extremely busy road (Yen Phu). The shop is part of a small cluster of four or five speciality fruit shops, one next to the other.

Profile of customers

- Not much information was obtained about the retailer's clientele, however the vendor described his customer base as relatively well-off given the higher quality fruit available for sale and the higher retail prices charged when compared to a local market.
- It seems likely that given the shop location, there would also be a certain amount of opportunistic buying and selling, whereby people in motorbikes and taxis, on their way home or on their way to visit some friends or relatives, would stop to purchase some fruit. This is different from the typical shop in a residential neighbourhood, which tends to have many regular and known customers who rely on the outlet to meet a significant share of their household needs.

Plum varieties, production origin and seasonality

- The shop was selling two different varieties – Tam Hoa and a much larger plum with red skin and yellow flesh (see Figure 4). The shop vendor did not know the variety name for the yellow flesh plum.
- The retailer could not identify the origin of the plums for sale. He did not believe that production origin was a major determinant for consumer purchases of plum.
- During interviews with other retailers in the same strip, we were able to confirm that a lack of knowledge about the production origin of plums sold was fairly common.
- The larger, yellow flesh plum just came onto the market and will be available until late June or early July. It is believed that this variety comes from China. The Tam Hoa plum season was just coming to an end (early June). Therefore these two varieties compete with each other for approximately one week to ten days in early June.

Grades

- The Tam Hoa plum for sale was reportedly a mixture of Grade 1 and Grade 2. The vendor described Grade 1 as being bigger and less ripe (firmer) than Grade 2. It is unclear why Grade 1 and 2 were mixed.
- According to him, supermarkets only sell Grade 2 and Grade 3 fruit, no Grade 1. This information is consistent with what we could observe at Metro and Big C, where the quality of plums was much lower than what we saw at this speciality fruit shop.
- The shop does not grade the plums themselves because of labour constraints, however some of the retail shops on the street do grade the fruit themselves. In his case they purchase graded fruit (Grade 1 and 2) from wholesalers in Long Bien.

Packaging & uses

- Some yellow-flesh plums were being sold in net bags. The previous week some Tam Hoa plum was also sold in net bags. Given the lack of refrigeration, this type of packaging was considered superior from a product preservation perspective than the trays with film that can be found in refrigerated areas at supermarkets.

- The shop itself packs the fruit. The plums in nets tend to be favoured by consumers purchasing fruit for gift purposes. Interestingly, the plums in netted bags were being sold for the same price as the loose fruit (i.e. no premium for packaging).
- The Tam Hoa plum is not commonly used for offerings or gifts on account of its poor appearance (size, colour). The larger yellow plum is purchased for consumption as well as gifts and offerings.

Quality Issues

- According to the retailer, the best-quality Tam Hoa plums can be found in early to mid-season, towards the second and third weeks of May. This when the fruit is crispy and sweet.
- He believes that firmness is a key quality attribute valued by consumers for Tam Hoa plum. Sweetness is important but the plums must also be a little sour (i.e. good balance between acidity and sugar content.
- For the yellow flesh plum, large size and shiny skin are two attributes that consumers appreciate.

Prices

- At the beginning of the season (early May) the shop was retailing Tam Hoa plum for 70,000 VND/kg. Retail selling prices fell to about 40,000 during the mid-season, and to 35,000 during the first few days of June.
- We were told that, at the beginning of June, Tam Hoa plum was being wholesaled in Long Bien market for 18,000 – 22,000 VDD/kg. This seems consistent with later findings from the wholesale market interviews for Grade 1 and Grade 2 plums.
- The vendor highlighted high product losses as the main justification for such high gross retail margins (around 15,000 VND/kg or 43 percent). He even mentioned product losses of up to 40 percent, which seems highly unlikely given that the shop buys plum every two or three days. At this stage further information would be required from other retails to determine the typical gross margins for retail shops.
- The shop was buying the larger, yellow flesh plum for 35,000 VND/kg and selling it for 50,000 VND/kg (gross retail margin of 15,000 VND/kg or 30 percent).

Sales volumes

- Plum is not one of the big selling fruits for the shop. During the mid-season the shop sold 50-100 kg of Tam Hoa plum per day, or 350 to 700 kg per week. We can assume that the shop will sell 1-2 tons of Tam Hoa plum for this entire season.
- However sales volumes are already much higher than at Big C, where only 110 kg were sold during the whole third week of May (between the 18th and the 25th).
- Plum prices this year were also reported to be much higher than in previous years. For this reason it is also likely that sales this year will be considerably lower than in previous years.

- During the mid-season for the yellow flesh plum the shop sells between 300 and 700 kg per week (i.e. similar volumes to Tam Hoa when in season)

Fruit Retail store opposite Long Bien Market

1kg net bag yellow flesh plums

Tam Hoa Variety plums Grade 1 & 2

Figure 4 Photos from Plum Retail Interview June 3rd, 2010

In July the CASRAD team also conducted three more interviews with fruit retailers located in other parts of Hanoi. Findings were as follows:

Interview 1:

A big fruit shop in Làng Quốc tế Thăng Long, Cầu Giấy District (a residential area known for high-income residents)

Method of purchase

- The owner (Ms Lien) often buys plums of Grade 1 with transparent production origins. This season she was selling Moc Chau plums only. At the beginning of the season she

bought plums at the cost of 16,000 – 18,000 per kilo (transportation expense excluded), in mid-season the cost was 17,000 and at the end of season it was 15,000.

- She buys plums from an acquaintance wholesaler in Long Bien market.

Volumes of selling:

- On average she sells 30kg per day, but in very first days of the season she can sell up to 40-42kg per day.
- This season, selling prices varied among different points of time, such as at the beginning of season the price was 18,000-20,000/kg, in mid-season it was 16,000-18,000/kg and it was 17,000/kg at the end of season. Exceptionally, the price at the end of season was up to 20,000/kg.
- Based on the figures given above, she would earn a gross margin of 2-3000VND/kg or ~19%. This seems more reasonable than the retail margins made by the retailer opposite the Long Bien Market, however it could also have something to do with Central Hanoi versus the suburbs and the fact that the fruit store opposite the market was considered a "speciality" fruit store.
- The shop's customers are normally residents in Lang Quoc te Thang Long and walk-in people. According to our observation these customers are wealthy with high incomes.
- The shop owner always cares about plum origins and so do her customers. Most of them know or have heard about plums from Moc Chau.
- Beside plums, the shop also sells other fruits imported from Thailand, USA and tropical fruit from the South. They sell very little fruits from China.

Interview 2:

A fruit shop in Co Nhue (Owner Ms Loan)

- The shop sells fruits from the south and also from China
- The owner buys plums from Long Bien market with the volume of 40kg of plums of Grade 2 per day.
- Selling prices range from 15,000 to 18,000/kg depends on plum quality of each specific day.
- Ms Loan doesn't really care about plum origins. She knows there are plums from Bac Ha, Lang Son and Son La but can't distinguish one from another.
- Her customers are mainly people with medium incomes, students and pupils.
- According to Ms Loan, plums are easy to sell but buying volumes per consumer are small, mainly 1-2kg each purchase and the maximum volume never exceeds 3kg.
- Ms Loan said that she would be prepared to trail packaged plums to sell in order to build trust in customers about quality.

Interview 3:

The fruit shop at 153 Dinh Cong, Hanoi

- The shop sells 10kg man hau (Tam Hoa variety) per day during the time from March to May (lunar calendar), but this plum season ended earlier.
- The owner doesn't know anything about the plum origins. He/she guessed they are from Yen Bai or Lao Cai. The reason is that he/she buy a small volume so doesn't really care about origins.
- Margin is about 3,000 per kilo. In every 10kg of plums they estimate there are 2kg of damaged plums that will not be sold (i.e. 20%).
- Profit from plums accounts for only 7% of total profit as profits from other fruits like melons, grapes, mangoes, dragonfruit and oranges are higher.

Street Vendors

The CASRAD team also briefly interviewed two street vendors selling plum. Street vendors are known to be a preferred purchase destination for low cost plums. Apparently this year less street vendors were selling plum due to the high purchasing cost.

Street Vendor 1: To Hieu str, Cau Giay

- She said she doesn't know about plum origins and can't tell the difference between Bac Ha, Lang Son, Son La and Chinese plums. However when asked about the origin of the Tam Hoa plums being sold by her she said they were from Lang Son.
- She sells about 10-15kg of plums per day. In addition she also sells guavas, apples, pears and "củ đậu".
- She buys plums of Grade 2 and 3 from Long Bien market and mixes them together and then sells at the price of Grade 2.

Street Vendor 2: Dinh Cong: Ms Phung thi Lien

- This year she bought man hau (Tam Hoa variety) in mid-season with the price of 15,000/kg and sold at 20,000/kg due to high cost at the beginning of season.
- She bought 10kg per purchase due to high cost and because her customers often bought small amounts around 0.5kg per purchase.
- She sold about 30kg of plums per day. This year due to low yields, the price of plums in Long Bien was high, so she did not buy and sell much.
- Gross margin on plums was up to 30% as plums were more costly to buy this year than dragon fruits, pears and melons etc
- According to Ms Lien, plums from Bac Ha have a better appearance and therefore can be sold at a higher cost. She knows that wholesalers often buy plums in Son La (but she doesn't know which specific areas).
- In previous seasons, she could sell out up to 70-80 kg of man hau per day when purchase and retail selling price were lower.

Summary of key results from Retailer and Street Vendor Interviews & areas for follow-up:

- All retailers purchased graded fruit from the Long Bien Market therefore we can assume that they bought plums from Level 2 wholesalers
- Only Grade 1 and Grade 2 fruit is sold by fruit retailers
- Compared to other fruit types, the volume of plums sold per week was considered to be low, on average 250-350kg/week, however this could be due to low yields and high purchase price this season. This volume is still significantly higher than that sold through supermarket outlets.
- Only one of the retailers interviewed had an interest in, and knowledge of production origin. All of the others did not feel that production origin was of importance to consumers when purchasing plum.
- Gross retail margins were estimated at 2-3000VND/kg or approximately 19%. Only the fruit retailer opposite the Long Bien market reported margins of up to 15 000VND/kg or 43%.
- High levels of product losses (20% or more) were reported by two retailers and should be further investigated in the coming season as this represents a significant cost to the business
- Low volumes of plums are purchased by consumers on a one-purchase basis – from 0.5-2kg per purchase. It will be interesting to find out from the consumer survey how regularly consumers purchase plums during the season.
- Plums are not considered by retailers to be a significant income earner as a product category
- Tam Hoa variety plums are not commonly used for offerings or gift-giving due to a perception of low-quality fruit. However some packaging of other varieties of plums in 1kg net bags is already occurring by speciality fruit retailers and is reportedly well received by consumers for gift-giving. No price premium was found to be charged for the bagged fruit at this stage.
- For the street vendors, they also buy graded fruit from the Long Bien market
- They generally sell Grade 2 and Grade 3 fruit mixed together (marketing strategy?)
- This year due to high purchase price and therefore higher selling price to consumers, vendors sold less plums than previous years, on average 70kg/week
- Gross margins were estimated at 5000VND/kg

Based on these initial findings, it appears that retail fruit shops are likely to be the major marketing channel for plums to consumers, possibly followed by street vendors. It will be interesting to find out from the consumer survey if these findings can be validated. Given that only one of the four retailers had any knowledge of, or interest in production origin for plums, this suggests that the assumption made during the Degustation Conference that production origin is of importance to consumers (and therefore used as the basis for the sensory evaluation), is perhaps not valid for plums. The consumer survey should further highlight whether consumers are actually have a level of awareness about production origin for plums or not.

No interviews were conducted with retailers who purchased Moc Chau plums from the Dong Nam Viet Company this season. Given the commitment of Donavi to providing

high quality fruit to their customers, it would be interesting to gain some feedback from these retailers on how the Moc Chau plums were received in the 2010 season and whether they intend to continue selling Moc Chau plums in 2011.

8. Consumer survey

After the Degustation Conference sensory evaluation exercise and focus group discussions, it was decided that in a more in-depth consumer survey would be required in order to better understand consumer perceptions and consumer purchasing behaviour associated with Tam Hoa variety plums. In July 2010, the CASRAD team designed and implemented a consumer survey with a total of 90 consumers from Hanoi. Consumers were selected from both central Hanoi and the suburbs, and were classified into three groups of students, general consumers and high class consumers. A full report outlining the methodological approach of the survey and detailed results can be found in Appendix 5.

The aim of this survey was to:

- Characterise consumption actors in different market segments for plum
- Analyse consumer awareness for plum varieties and production origins
- Analyse quality demands for Tam hoa plum and Moc Chau plum in particular
- Analyse consumer demand for high quality plums
- Suggest impact methods/intervention strategies to meet quality demands of consumers.

In order to achieve the above aims, the consumer survey focused on the following:

1. Consumers' habits of buying and eating plums
2. Consumers' knowledge about plum varieties in general and Tam Hoa variety plum in particular; Knowledge of product origins and awareness of Moc Chau as a production region.
3. Understanding of quality attributes for plum based on consumption experience
4. Consumers' assessment of Tam Hoa plum from Moc Chau in comparison with other Tam Hoa plums
5. Quality demands related to extrinsic elements of the product: packaging, labelling, purchase outlet etc.
6. Price sensitivity/willingness to pay for high quality plums.

A summary of the key findings from the consumer survey were as follows:

Purchase Outlets:

- Fruit retailers were the most popular followed by street hawkers. 79% of consumers had purchased plums from a retail fruit store before and 59% had bought from street vendors. Only 14% had purchased plums from supermarkets. These findings are consistent with what was expected from the interviews conducted with supermarkets, retailers and street vendors.
- 73% of consumers buy plums most frequently from fruit retailers, with 22% reporting that street vendors were their usual providers.

Consumption habits:

- For frequency of consumption, general consumers reported to eat the most plums with 41% having eaten plums 10 times or more in the past season. Plums were also popular with students with over 70% reporting that they had eaten plums more than five times during the past season.
- High class consumers are the lowest frequency consumers of plums with 50% of respondents reporting to have eaten plums less than five times in the last season. The reasoning given for this is that high class (income) consumers have more choices for fruits and plums are considered to be of low-quality when compared to other fruit products, particularly imported fruits.
- In relation to the purchase of packaged plums, only 13% of respondents had bought packaged plums before. Of this group, 77% believed that the quality of packaged plums was higher than those sold loose, while the remaining 33% believed there was little difference in quality of packaged vs. unpackaged plums.

Consumers' understanding of plums:

- When asked to identify plum varieties, the most commonly mentioned by consumers were "Man hau" (54%), "Man com" (53%) and "Tam Hoa" (36%)
- Of these varieties, "Man hau" was considered the most delicious (64%), followed by "Tam hoa" (30%) and lastly "Man Com" (6%)
- However the above results are unlikely to be an accurate assessment by consumers as although many consumers stated that they were familiar with Tam Hoa variety plums, when asked to identify the variety in a photo, many were unable to do so. Only 19% of respondents could correctly identify Tam Hoa variety plums, while 33% mistook them for "Man hau" variety which are grown in Bac Ha and Sa Pa districts of Lao Cai. Additionally, 48% of the interviewed consumers didn't know plum variety names at all or named plums by description (e.g. purple, red etc).
- This is an important finding as it means that at this stage consumer awareness of specific plum varieties is still quite low. Therefore if a Moc Chau Tam Hoa variety plum brand is to be promoted, it will be necessary to firstly enhance the recognition of Tam Hoa plum as the first step towards establishing a brand.
- In line with the above finding, when asked about the production origin of Tam Hoa variety plums, Moc Chau was not identified as the most well known production origin. Respondents selected Lang son (60%), Moc Chau (51%), Lao cai (47%) and China (12%). While Tam Hoa variety plums are not grown in China, the above findings indicate that consumers are not certain where Tam Hoa plums are grown in Vietnam, and Moc Chau is not yet recognised as a speciality production area for this variety of plum .

Quality attributes when purchasing good plums:

- In priority order, the most important quality attribute identified by consumers was sweetness (54%), followed by colour (red/purple) with 36%, crispness/firmness on

almost equal level with colour with 34%, followed by size as the least important attribute. These findings are consistent with those from the degustation conference.

- In addition to Q19 which asked consumers to rank only 4 criterions related to plum quality (i.e. sweetness, colour, crispness and size), in-depth interviews with consumers were also conducted to uncover greater understanding about perceptions of high quality plum products. A set of 10 attributes associated with plum quality were identified and consumers were asked to evaluate these based on such levels as: Very important, Important, Neutral and Not important.
- Very important criteria were: **sweet, little sour and acid** (51%), **no insect damage** (45%) and **food safety certificate** (33%)
- Important were: **Crispy** (64%), **labelled** (51%) and **red colour** (44%). While labelling products was found to be important, packaging was not seen as an important criterion.
- In addition to packaging, other criteria considered not important were: size and evenness of shape; purchase price and name of purchase outlet.

Quality requirements associated with product presentation- packaging and labelling:

- Based on a set of photos shown to consumers with several different combinations of packaging (trays, net bags) vs. unpackaged fruit, clear labelling with variety, production origin and name of store, 31% of consumers selected a preference for no packaging (i.e. fruit available loose for selection), but labels on the fruit indicating plum variety, production origin and name of the retail outlet.
- 27% of respondents selected packaged plums for sale in supermarkets on trays with a covering of plastic film, clearly labelled with variety and production origin.
- 25% of respondents selected plums packaged in net bags with labelling of variety, production origin and price as their preferred presentation.
- 15% selected a preference for no packaging, yet banners above the display providing information about variety and production origin.
- These findings suggest that consumers still value being able to select plums themselves from loose displays, but are also interested in having the choice to be able to purchase plums that are packaged. This is consistent with some of our initial findings from the retailer surveys. Information about variety and production origin were selected by the majority of respondents as preferable, yet in reality it seems that until now consumers have been relatively unconcerned about these factors as indicated through the retailers' lack of knowledge about these issues (i.e. you would expect that if consumers were demanding this information directly, retailers would begin to take an interest in providing it to their customers.

Consumer assessment of Moc Chau Tam Hoa variety plums compared to other production locations

- Of the 46% of respondents who had reportedly eaten Tam Hoa variety plum from Moc Chau before, 87% of respondents felt that the red/purple colour of the plums

from this area was stronger/better than from other areas; 79% believed that the plums were sweeter when compared to other production areas; 63% believed that Moc Chau plums had the same degree of crispness as plums from other areas (32% believed they were crisper); and 53% thought they were the same size.

- It would interesting to see if these findings could be validated with objective measures of samples taken from orchards in Moc Chau and thus form the basis of differentiating Tam Hoa variety plums from Moc Chau with those from other production areas.

Price sensitivity for high quality plums:

- Findings from the survey suggested that in the early season, the majority of consumers were willing to pay a price from 20.000 – 25.000 đ/kg (52%), in the middle of the season, the price level mostly accepted was from 10.000 – 20.000 đ/kg (57%) and in late season, price level from 10.000 – 20.000 đ/kg (59%) was mostly accepted by consumers.
- These prices seem to be fairly consistent with retail prices collected during the retail surveys. The prices are still relatively low when compared to other high quality domestically produced fruit such as pomelo and mango (can be 30k upwards/kg), therefore it is difficult at this stage to estimate how willing consumers would be to pay for higher quality plums.

Conclusions from the consumer survey:

In terms of branding and brand awareness for Tam Hoa plum from Moc Chau, the level of consumer awareness for this variety of plum in general, and for this particular production origin is still low. The reason for this is that consumers are not really concerned about the origin of the product at this stage but are primarily concerned about the fruit quality aspects such as sweetness, colour and firmness. However it was found that product origin is one of the most important pieces of information requested by consumers when considering product labelling/retail presentation.

For consumers, assessments of plum product quality is dependent on internal and external factors. In relation to internal factors, the survey findings show that consumers' clearly demand plums that are sweet, (i.e. less sour/lower acidity), with no pest damage and a good level of firmness/crispness. In relation to external factors, the survey found that consumers want plums with good colour and they prefer to buy these plums in fruit retail shops or from street vendors rather than supermarkets due to the convenience of purchasing from these shops and also the perception that freshness is better than in supermarkets. The most popular retail presentation selected by consumers were unpackaged plums, yet clearly labelled with plum variety names, production origin and the details of the fruit shop from where it was purchased. Consumers were however also interested in plums packaged in net bags and on plastic trays, which suggests that consumers are looking for diversity in product presentation options.

9. Preliminary Conclusions & Recommendations from Plum VCA Research 2010

Based on the findings presented in this report, the project team should have developed a much greater depth of understanding of the major constraints and opportunities throughout the chain that need to be taken into account when considering support strategies to help develop the Moc Chau plum value chain. These findings will need to be further analysed and discussed amongst the CASRAD VCA team and shared with all other project partners, particularly PPRI as the lead institute in the ICM temperate fruit component. They should also be shared with other plum stakeholders involved in the project. It is essential that this is done as soon as possible as planning for the 2011 plum season VCA activities needs to be well under way before the start of the season in April 2011.

While further research in the 2011 plum season will need to be undertaken to verify some of the preliminary findings presented in this report, overall clear messages are emerging from all levels of the chain that plums are currently considered as a fruit of inconsistent quality that are not highly valued by consumers. While the production origin of plums was originally thought to be of a high level of importance to consumers by the project team, findings from the VCA research activities suggest that consumer awareness about plum varieties in general is very low, and that production origin is of little concern (or value) to consumers at this stage. Therefore when considering how to build the "Moc Chau" plum brand, consumer awareness raising about plum varieties and seasonality will firstly need to be addressed.

From the perspective of downstream actors, the plum season is short and the margins made by chain actors was found to be low. Unless large volumes can be sold, wholesaling and retailing of plums is not considered to be highly profitable. Retailers also reported high levels of post-harvest losses that would need to be further verified next season. Supermarkets were found to only stock plums in order to complete the diversity of their fruit range. Low sales volumes, margins and inconsistent quality meant that plums were not considered as a priority fruit for supermarket retailing. In order to increase the volume and value of plum sales through all channels, fruit quality needs to significantly improve and consumer awareness raised before consumers are likely to be willing to pay more for what is currently considered to be a low-quality and cheap seasonal fruit.

The findings from the consumer survey are particularly useful when thinking about intervention activities for next season. Key quality attributes of importance to consumers in relation to Tam Hoa variety plum were identified as firstly sweetness, followed by colour and firmness. While these findings should be verified in 2011 through the repeat of the sensory evaluation survey using objective measures, a certain degree of confidence can be placed in the relevance of these attributes given that they were also the criteria most commonly identified by wholesalers and retailers as determinants of "good quality". On this basis any planned ICM activities should be attempting to take these factors into account. No clear grade standards were found to exist throughout the chain and it is likely that at this stage, this is a reflection of the heterogeneity of the product which does not lend itself well to clearly defined Grade standards.

As suggested during the retail survey and confirmed by the consumer survey, the largest volumes of plum sales to consumers are through fruit retail shops. Therefore targeting these outlets for the marketing trial of high-quality packaged and unpackaged plums from the project target area appears to be a suitable strategy. CASRAD has already gained commitment to these trials in 2011 from the specialty fruit wholesaler Dong Nam Viet Company and their retail clients. Given the good track record of the company as a preferred provider of high quality fruit, and their prior experience in developing speciality fruit value chains, useful findings are likely. These findings will hopefully then be able to be more broadly adopted/adapted to other chains to improve market engagement of smallholder plum producers in Moc Chau. During the planning for this exercise it will be particularly important to take into account findings from the consumer survey in relation to preferences for product packaging and presentation.

Some recommendations for intervention activities and follow-up research to fill existing information gaps are given below. These should be discussed amongst the project team and prioritised for implementation during the 2011 season.

- CASRAD should organise a meeting of all project partners to share findings from the plum VCA activities particularly with PPRI and discuss how consumer needs for sweetness, colour and crispness can be met through variety trials and improved production practices
- At least six weeks prior to the start of the next plum season (say late Feb-early March 2011) , CASRAD and PPRI should organise another plum stakeholder conference in Moc Chau to present the key findings from VCA activities undertaken in 2010 and gain commitment for intervention activities for 2011. Collectors who currently supply to Donavi and a representative from the Donavi company should also attend so that detailed planning for the market testing can occur.
- During the 2011 plum season, in-depth interviews with collectors and wholesalers in Moc Chau town should be conducted similarly to those conducted in the Long Bien in 2010. We currently have little information on this level of the chain and it appears that the margin analysis undertaken during the RVCA in Son La significantly underestimates benefits gained by these actors if the purchasing prices given by the Level 1 wholesalers in the Long Bien are accurate.
- For the experimental plots it would be very useful if the project could do a gross margin analysis to see how profitable plum production really is for producers and if it can be significantly increased by improving fruit quality
- During the 2011 season the CASRAD team need to investigate the plum processing supply chain as an alternative marketing channel for Moc Chau plums. Interviews should be conducted with the company in Hai Duong, and follow-up with the 19/5 cooperative and any other plum wine producers and retailers (e.g. Song Tinh in Hanoi)
- The VCA team need to decide if they want to pursue the linkages to the Chinese market. A potential market opportunity was identified for the export of early season fruit from Moc Cha which could be further evaluated if producers and exporters were

interested. There is also significant potential to work with collectors and exporters to reduce the post-harvest losses associated with transport to China.

- Given that we now have a reasonable set of basic financial information from all levels of the domestic supply chain for Moc Chau plum, the VC team should now be able to review this information and based on some assumptions, further refine the margin analysis along the chain. This should also help to identify areas where costs could be reduced and efficiencies improved
- Perhaps in conjunction with the market testing exercise with Donavi and their retailers, the sensory evaluation survey should be repeated with consumers in 2011 to verify if findings from 2010 are consistent when supported by objective measures for fruit quality attributes.

10. Next steps for Project Value Chain Research Activities

In addition to the findings presented in this report in relation to the plum value chain research component of the project, several other value chain research activities have already begun in relation to other products identified by the project as having market potential. Another round of scoping studies for products in Son La and Lai Chau were completed in November 2010 and the reports from this next round of RVCA studies are in the process of being translated. Appendix 6 provides an example of some of preliminary results from the scoping study undertaken for persimmon, soybean and peanut in Lai Chau Province. Further in-depth research into these chains will occur in 2011.

As means of continuing to build the capacity of project staff in the conduct of value chain research, a value chain "marathon" workshop was also held from November 19th-23rd, 2010. This workshop provided an opportunity for project partners to review the findings from the diagnostic study, ICM and value chain activities thus far, and to provide further practical and theoretical training in value chain analysis for project participants and new project staff from CASRAD, PPRI and NOMAFSI.