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POST-HARVEST HANDLING PRACTICES AND MARKETING SYSTEM OF JASMINE (*Jasminum sambac)* [L.] Aiton IN THE PHILIPPINES

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ABSTRACT

This paper evaluated the post-harvest handling practices for the buds and assessed the current marketing system of jasmine grown in three major production areas. The three major market participants were producers, producer-traders and traders. Total jasmine production in the study sites during lean months was only about 13% of the total production during peak months. Traders were found to have the highest volume of jasmine sold during peak production months. Average peak month prices of jasmine buds were only 15% to 21% of lean month prices however, net revenues during peak months were still much higher than during lean months. The market participants prolonged the freshness of jasmine buds by putting it in a plastic bag and stored in Styrofoam boxes with crushed ice. They did not practice grading of jasmine buds and used different containers during buds harvesting and before selling. Jasmine buds are usually brought from the farm by runners and/or wholesalers/dealers to the assembly market in San Pedro, Laguna where there are some fixers (traders) who set the price depending on the volume unloaded for the day and where other market participants pick them for further distribution to other traders and garland makers. Jasmine garland making and marketing is an industry in itself and a daily activity. The garland making contractors are the key persons in garland marketing as they deliver garlands to wholesaler-retailers in Quiapo, Divisoria and Baclaran in Manila. Production of more garlands to meet the demand, clustering of the small producers and development of improved post-harvest and processing technologies are among the recommendations to improve the quality, value and marketability of jasmine.

Key words: garlands**,** post-harvest and processing technologies, essential oil extraction, assembly markets, marketing system

INTRODUCTION

In the Philippines, jasmine has an all-year round demand for use in garlands, leis, and flower arrangements for churches and adornments in home altars. It is traditionally offered as leis to welcome guests of honor during special occasions. At present, it is marketed locally as fresh flowers but it has high potential for medical, pharmaceutical and other industrial applications. Although the technology for these uses has not yet been fully developed, essential oil extraction is now gaining recognition. The essential oil extracted from jasmine flowers serves as component of perfumes, soaps, air fresheners and many other industrial and medical applications (Gunner, 2000). In Europe, Africa, Asia, China, France and United States of America (USA), jasmine oil is considered highly marketable for essence manufacture (Singh and More, 1983). The major producers of jasmine oil are the USA, European Union, China, India, Indonesia and Brazil (www.nrc.vic.gov.au).

In the Philippines, jasmine farming is increasingly becoming an important source of livelihood but previous studies have shown that the current post-harvest handling practices for the flowers by the farmers result to problem of poor flower quality which affect their marketability (Sanchez, et al., 2003). Owing to its importance as the national flower of the country and its role as a source of livelihood, there is therefore a need to do a study on the current marketing practices performed for this flower.

The main objectives of the study were to evaluate the post-harvest handling practices for the buds and to assess the current jasmine marketing system in three major production areas, namely: Laguna, Quezon and Pampanga.

METHODOLOGY

Data gathering was done mainly through personal interviews. Two sets of interviews were conducted. The first set consisted of interviews with key industry informants such as officers of industry associations and concerned staff of the provincial agricultural offices of the respective study sites to identify macro-level industry concerns and at the same time determine their industry scenario forecasts. The second set included a survey of 237 market participants from the provinces of Laguna, Quezon, and Pampanga using pre-tested questionnaires to gather information on post-harvest handling practices and marketing system for jasmine flower buds. Data collected include production volume, volume traded, marketing outlets/channels, prices paid and received, marketing costs, and problems encountered in the marketing of jasmine flowers. Respondents' characteristics such as age, gender, educational attainment, years of experience in growing/trading jasmine buds, and size of farm cultivated were also gathered. The study was conducted in parallel with the assessments of the cultural management practices, insect pests and diseases management of the jasmine plants and harvesting of buds (Sanchez, et al., 2010). The study areas covered were: Sta. Cruz (35 respondents), Cabuyao/Calamba (56 respondents), and San Pedro (26 respondents) in Laguna for a total of 117 respondents; Mayao, Parada, Silangan, Mayao, Mayao Crossing, and Mayao Castillo in Lucena, Quezon with 41 respondents; and Lubao, Florida, and San Roque II in Pampanga with 79 respondents (Fig. 1). The respondents were classified into three groups, namely: producers, producer-traders and traders.

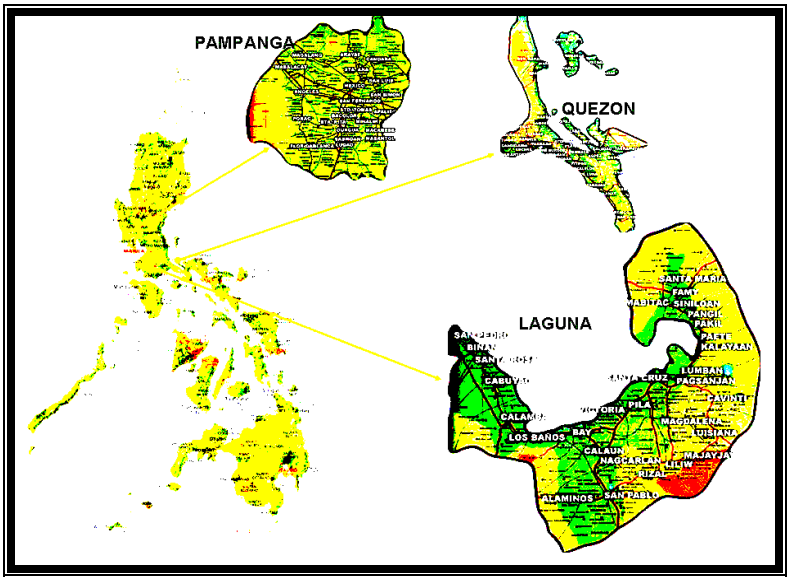

Fig. 1. Map showing the three provinces covered by the benchmark survey

RESULTS AND DISCUSSION

Industry Participants

An earlier study claimed that harvesting is one of the significant stages in jasmine production (Sanchez, et al., 2010). Harvesting is done by jasmine producers and pickers. Producers usually hire pickers when there is large volume of jasmine buds to be harvested. It requires time management so that more buds can be harvested at the shortest time possible before sunrise when the buds tend to open. For small farms, hiring of pickers is no longer necessary because it can be easily done by the producer or members of his/her family.

The three major industry participants included in the study were producers, producer-traders and traders. Producers are individuals who grow and sell jasmine regularly. Producer-traders, on the other hand, cultivate jasmine in their own farm and sell buds together with the supply procured from other growers within and outside their locality. Traders are individuals or groups who are solely involved in buying and selling of buds and are not engaged in jasmine production. These traders are classified as any of the following:

1. Jasmine dealers are middlemen who consolidate the produce before bringing them to wholesalers.
2. Wholesalers are those who procure the jasmine buds from dealers for sale to garland-making contractors or to garland makers. There are cases when some wholesalers also serve as garland-making contractors.
3. Garland-making contractors are those who buy large volume of jasmine buds and then have these stringed or arranged by the garland makers.
4. Garland makers provide the garland making service and are paid on per dozen basis.
5. Runners are characterized by the Pampanga growers and traders as those persons who go from one farm to another to collect the farmers' harvested jasmine and then bring them to wholesalers in the designated drop off point. These traders are differentiated from dealers in the sense that they do not own the product and therefore have no power to make marketing decisions especially on price setting.
6. Retailers or peddlers are the market participants who sell jasmine to consumers.

There are also some traders from San Pedro, Laguna who identify fixers as individuals who set prices for jasmine. Fixers can be dealers, wholesalers, garland making contractors and retailers also. The researchers observed seven major fixers who lead the buying and selling of the product and are strategically positioned in the assembly market in San Pedro, Laguna.

Characteristics of Market Participants

Based on the survey, majority of the market participants consisted of producers (51%), followed by producer-traders (27%) and then traders (22%). The same trend could be observed in Pampanga and Quezon with producers accounting for 67% and 71%, respectively. However, in Laguna, the proportion of producer-traders (35) interviewed was slightly higher than that of the producers and traders. It is interesting to note that within the towns in this province, the distribution of the market participants is uneven. For example, in Sta. Cruz, there were no traders but in San Pedro, majority (62%) of these participants was found (Table 1). This is due to the fact that Sta. Cruz is predominantly a rural area and hence there is less demand for the product. In contrast, San Pedro is an urban area and is very accessible to other demand centers like Makati, Manila and Quezon City. In fact, it has become the assembly market for jasmine.

In terms of age of the market participants, jasmine producers and traders were mostly middle-aged with many of them more than 40 years old. There was almost an equal participation of males and females in jasmine production and trading with the ratio of 1.3 to 1. Their educational attainment was relatively low with only 6.75% of them graduated from college. A larger percentage of them have either reached or finished elementary (44.0%) or high school (36.71%) level.

The respondents were relatively experienced in the jasmine production business, having spent an average of 9.66 years in growing jasmine. Similar to producers, traders have been engaged in marketing jasmine at an average of 9.43 years already. Producer-traders on the other hand, were better experienced as their average number of years in the production cum trading of jasmine was found to be 11.20 years. The longer time of being in the jasmine industry could be one of the contributory factors for the jasmine growers to realize that engaging in both production and trading of jasmine would give them higher income.

Most (50%) of the jasmine producers interviewed did not employ any farm worker. The farm owner and other family members did all the farm activities and hired workers only during the peak harvest months. This is possible since their farms are quite small, that is, more than 50% of the respondents have farm size of 1,000 m^2 and below. San Pedro had the highest average land area of 9,560 m^2 while Cabuyao had the lowest of about 535 m^2. Farm expenses or operational costs incurred by producers and producer-traders include mostly the cost of inputs like fertilizers and pesticides.

Traders gained adequate experiences in the jasmine trading business. A large percentage of producer-traders (34.19%) and traders (32.08%) had 5 to 10 years experience in jasmine buds trading. The average for all the study areas was 6.51 years with the highest recorded in Pampanga at 9.03 years. Quezon traders had the lowest average number of years in jasmine buds trading which was reported to be 3.5 years. This implies that venturing into jasmine buds trading is an offshoot of the growing popularity of jasmine as a source of livelihood.

Table 1. Distribution of the market participants by location in Luzon, Philippines, 2009.

Location	Producer	Producer-Trader	Trader	Total
Laguna	38 (32)	41 (35)	38 (32)	117 (47)
Sta. Cruz	21 (60)	14 (40)	0	35 (74)
Cabuyao	12 (21)	22 (39)	22 (39)	6 (13)
San Pedro	5 (19)	5 (19)	16 (62)	6 (13)
Pampanga	53 (67)	15 (19)	11 (14)	79 (33)
Quezon	29 (71)	9 (22)	3 (7)	41 (17)
Total	120 (51)	65 (27)	52 (22)	237(100)

Note: Numbers in parentheses denote percent of total.

Production Volume

Jasmine production in the study areas during lean months reached 30,675 cans, which accounted only for 13% of the total production during peak months in 2009 (Table 2). During peak months, producers had a total production of 123,287 cans which was 9 % higher than that of producer-traders. On the other hand, during lean months, the difference in jasmine production between producers and producer-traders was only 29 cans.

Among the three areas, Laguna supplied 64% of the total jasmine production of 235,549 cans during the peak period. This share was however reduced to only 49% of the total production during

lean months. Pampanga ranked second contributing 23% to the total jasmine production during peak months and 37% during the leans months. Quezon had the lowest jasmine production in both periods.

Table 2. Jasmine production (cans) by location in Luzon, Philippines, 2009

Location	Producer		Producer-Trader		Total	
	Peak	Lean	Peak	Lean	Peak	Lean
Laguna	65,605	4,457	84,736	10,477	150,341	14,934
Sta. Cruz	16,703	2,781	14,888	2,789	31,591	5,570
Cabuyao	10,425	791	12,255	1,365	22,680	2,156
San Pedro	38,477	885	57,593	6,323	96,070	7,208
Pampanga	40,995	7,968	12,518	3,504	53,513	11,472
Quezon	16,687	2,927	15,008	1,342	31,695	4,269
Total	123,287	15,352	112,262	15,323	235,549	30,675

Volume Traded

During peak months of production, traders were found to have the highest average volume of jasmine traded amounting to 2,565.92 cans per month. Producers had the lowest at 1,027.39 cans per month. This is expected since traders and producer-traders also source jasmine from other farmers or producers while producers sell only what they can produce.

Producer-traders during lean months of jasmine production had an edge over traders in terms of volume traded because they handled an average of 235.74 cans per month as opposed to only 221.15 cans per month by traders (Table 3). The main reason is the fact that during lean months, jasmine supply is low and traders are having a hard time securing the volume they need. In contrast, producer-traders, aside from sourcing jasmine from other producers, have an assured volume of flower buds to trade because they have their own jasmine production.

Considering the area, during the peak period, traders from Quezon had the highest volume handled amounting to an average of 3,458.33 cans per month. The lowest was recorded for Laguna traders at 2,323.18 cans per month (Table 3). This could be attributed to the fact that 38 traders were operating in Laguna while there were only three in Quezon. This implies that there are fewer traders in Quezon who share the total volume of jasmine handled in the province; hence each one can trade higher volume of jasmine. However, during lean months, the Laguna traders handled the highest volume at 242.95 cans per month (Table 3).

Table 3. Average monthly volume traded (cans/month) by type of respondent by location in Luzon, Philippines, 2009

Location	Producer		Producer-Trader		Trader	
	Peak	Lean	Peak	Lean	Peak	Lean
Laguna	1,726.45	117.29	2,066.73	255.54	2,323.18	242.95
Sta. Cruz	795.38	132.43	1,063.43	199.21	-	-
Cabuyao	868.75	65.92	557.05	62.05	-	-
San Pedro	7,695.4	177	2,617.86	287.41	-	-
Pampanga	773.49	150.34	834.53	233.6	3,161.11	167.50
Quezon	575.41	100.93	1,667.56	149.11	3,458.33	141.67
Average	1,027.39	127.93	1,727.11	235.74	2,565.92	221.15

The trading market for jasmine is located in San Pedro, Laguna therefore the Laguna traders incurred the lowest marketing cost thus encouraging them to trade jasmine even during the lean months when the cost per unit of jasmine traded could have increased.

Post-Harvest Handling Practices

Jasmine flower blooms within less than a day on the plant, lasting for about 12 to 20 hours. The buds open within 12 hours after harvest so that post-harvest treatment is necessary to prevent its opening. Based on the information gathered during the surveys, the common practice by farmers is to pluck or harvest the unopened matured flowers from 3 to 5 o'clock in the morning. This is contrary to the report of Rimando (2003) that fully developed buds but not yet open are picked late in the afternoon until sunset.

The method of handling floral buds is largely a response to the qualitative requirements of buyers. In the case of jasmine, the only established qualitative requirement for the product is that it should be in the form of buds. The general appearance of the buds however, is dependent on how these are harvested by pickers. It was observed that there was a marked difference between the harvested floral buds coming from Laguna, Quezon and Pampanga. The floral buds from Laguna and Quezon are bigger, whiter in color and cleaner with only the calyx attached to the buds. On the other hand, floral buds from Pampanga are smaller, off white in color and come with calyx and sepals.

To prevent the buds from opening, post-harvest treatment is seen as necessary since opened buds are not saleable anymore because they are no longer suitable for lei and garland making. The normal practice of farmers from the different production sites to prolong or maintain the freshness of jasmine buds is to put them in a plastic bag and store in Styrofoam boxes with crushed ice. In San Pedro, Laguna, the center of jasmine trading, the practice is to store in ice box the unsold buds for next day selling. They are sold as "cold" buds that are cheaper than the newly harvested buds. However, Bose and Raghava (1975) have demonstrated that medium and large-sized flower buds of Jasmine cv Motia can be stored from 8 to 12 days provided that the flowers are harvested with their stalk. In addition, the stalk should be immersed in water at room temperature for 30 minutes then wrapped in tissue paper and kept at a temperature of 7.2^{o}C. Under this condition, fragrance of large-sized buds is retained for six days. On the other hand, Subramanian (1987) recommended that spraying the buds with 500 ppm SADH (Alar) and 25 ppm GA_3, during the blooming period may enhance their freshness and retain fragrance for a longer period.

There is no standard product handling practice for jasmine. Producers use different containers during buds harvesting and before selling. They either use plastic pails, plastic bags, cloth bags, sacks or can containers. The harvested buds are measured in one-liter can (*tabo*) before placing to any of the above-mentioned containers. The wholesalers/dealers provide the packaging materials in some cases. The containers do not affect the quality of the produce since jasmine buds are not delicate. In the trading area, traders put jasmine buds in plastic basin placed on top of another plastic basin containing iced water. With this practice, jasmine buds stay fresh and cold while being traded. Sold buds are packaged in small plastic bags. The jasmine producers, producer-traders, and traders do not practice grading of any sort. Cold stored buds are considered of lower quality and prices offered by buyers are lower compared to fresh flower buds.

The Marketing System

Marketing of jasmine is one of the important aspects in the business. Jasmine marketing, just like the marketing of other fresh agricultural products is characterized by complexity as it is participated in by a number of market participants who are oftentimes performing multiple and overlapping functions.

Marketing Channels

Producers and producer-traders were found to adopt different marketing schemes but generally, the farm was the starting point and the end-point of marketing jasmine by producers. They sell their produce right in the farm because traders go there to pick up the harvested jasmine buds. On the other hand, producer-traders harvest their produce and bring them to the assembly markets. In another scheme, jasmine buds are collected from the different farms by runners and/or wholesalers/dealers for transport to the assembly markets and distribution to buyers. Wholesalers/dealers who are the most popular market outlet for 88% of the producers and producer-traders as shown in Table 4 also source their buds from the jasmine assembly market located in San Pedro, Laguna. Other marketing participants such as garland making contractors and retailers, locally called "fixers," operate by receiving jasmine brought by traders. They distribute the floral buds to other buyers in the assembly market. Traders from other Laguna municipalities, Pampanga and Quezon sell jasmine to the "fixers" and do not deal with other buyers in San Pedro, Laguna (Figure 2). Trading of jasmine in San Pedro market is done daily starting at 6:30 in the morning until about 2:00 o'clock in the afternoon. The majority of the floral buds harvested from the different study sites were brought to San Pedro, Laguna where the center of jasmine trading is located. A minimal marketable supply of jasmine was sold in Batangas, Manila, and Bulacan, among other places. Retailers/peddlers, the last link in the marketing chain, also directly sell garlands supplied by garland making contractors to consumers.

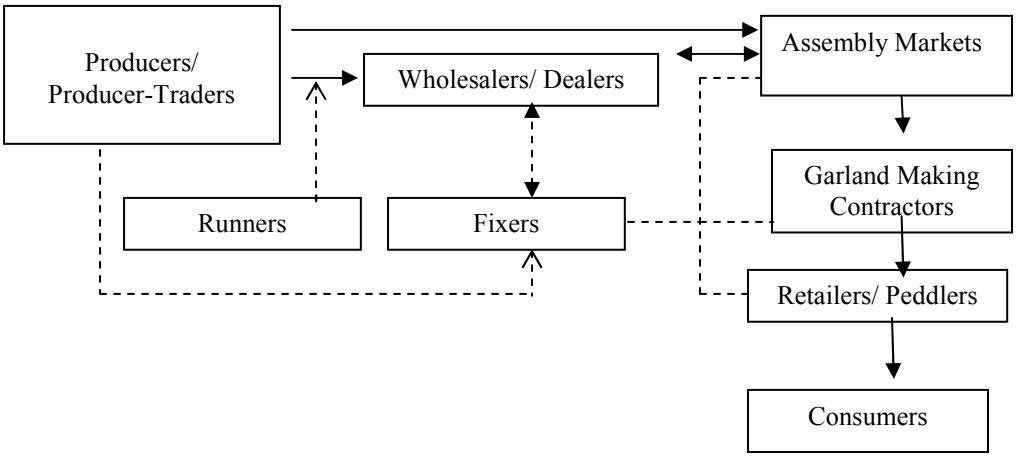

Fig. 2. The major marketing chain for traded jasmine buds in Laguna

Table 4. Distribution of participants by source and by market outlet in Luzon, Philippines, 2009.

Market Outlet	Source					
	Producers			Producer-Traders		
	Laguna	Pampanga	Quezon	Laguna	Pampanga	Quezon
Wholesaler/Dealer	33(87)	45(92)	27(87)	35(88)	8(80)	8(100)
Garland-Making Contractor	2(5)	1(2)	1(3)	0	1(10)	0
Retailer	3(8)	3(6)	3(10)	5(12)	1(10)	0
Total	38(100)	49(100)	31(100)	40(100)	10(100)	8(100)

Prices Received

Prices are generally determined by traders (more popularly called "fixers") in the assembly market in San Pedro, Laguna. Going-rate prices in San Pedro fluctuate during the day depending on the volume of jasmine available in the market and the volume being unloaded by traders from Sta. Cruz and Cabuyao in Laguna, Pampanga and Lucena, Quezon. Generally, the volume received from these areas tends to lower the overall market price. Peak production months of jasmine are from March to July while the lean period is from August to February. As expected, prices during the lean harvest period were high but the highest prices paid for jasmine were in November (PhP 204.49/can) and December (PhP 202.16/can) (Table 5). The high demand in November is due to the celebration of the All Saints' Day and All Souls' Day when majority of the Filipinos go to the cemeteries to offer prayer and fresh flowers. In December, demand for jasmine flowers increases because of Christmas celebrations.

Expectedly, the prices of jasmine buds received by producers were lower than those received by producer-traders and traders. On the average, they were paid PhP 104.62 per can of jasmine buds but during lean production months they received an average of PhP 161.98 per can and on peak months, an average of PhP 24.30 per can (Table 5). Average price received by producer-traders was relatively lower than that received by traders because some of these producer-traders served also as the jasmine suppliers of the traders. The average price they received for the whole year was PhP 113.53 per can but the average price they were paid during peak months was PhP 34.54 and PhP 169.95 per can during lean months (Table 4). Surprisingly, the average trader's price in February was even lower than the average price at the producer and producer-trader levels. This just proves the volatility of jasmine buds prices which according to the traders themselves are highly affected by the volume being supplied in the assembly market.

Table 5. Prices received by type of market participants for jasmine buds by month in Luzon, Philippines, 2009

Month	Producer	Producer-Trader	Trader
		PhP/can	
January	163.11	184.78	194.56
February	181.62	146.74	138.26
March	10.87	25.27	39.84
April	13.04	25.71	25.73
May	11.15	23.91	23.48
June	13.59	19.57	19.39
July	72.85	78.22	91.03
August	144.57	178.17	193.70
September	157.61	165.81	196.66
October	161.96	145.65	171.92
November	159.79	185.87	204.49
December	165.22	182.61	202.16
Average for All	104.62	113.53	125.10
Average for Peak	24.30	34.54	39.89
Average for Lean	161.98	169.95	185.96

Most producers received payments after the traders have sold their floral buds, or after the daily trading hours. Also, there were cases when producers were paid three days to one week after the

pick-up or delivery of the produce. Producers, therefore, are at the mercy of traders when it comes to pricing and payment of their jasmine buds. This practice prevails because outright cash payment or "*kaliwaan*" is considered risky on the part of both the producer and the trader. The producer may be given a price much lower than the prevailing market price or the trader may pay a higher price than the prevailing market price. Jasmine buds market price is very volatile and in effect it would appear that the two market players are sharing the risk of a price change brought about by the supply and demand conditions in the market.

Marketing Costs

The marketing costs incurred by producer-traders and traders depend on the distance between the source and the destination of the products. It is also affected by the volume of jasmine being traded; the higher the volume traded the lower the price of jasmine per can. The Pampanga and Quezon traders incurred the highest marketing cost because they were the farthest from the assembly market located in San Pedro, Laguna. In both areas, the bulk (70%) of marketing cost was spent for transportation cost (PhP1.45/can). The lowest transportation cost of PhP0.22/can (26%) was incurred in San Pedro, Laguna since the assembly market is within the town. Food expenses of traders, however was highest in this area accounting for 64% of the marketing cost. Traders claimed that they need to stay longer in the assembly market while waiting for other traders from the scattered production areas to come hence they would require more food. The lowest share in food expense was incurred by Pampanga and Quezon traders at 26%. The share of the packaging cost was minimal ranging from 4 to 9% because they only use clear polyethylene bags to transfer the buds and some sellers add ice to keep them fresh (Table 6).

Table 6. Marketing costs of jasmine traders during the peak production period by location, Luzon, Philippines, 2009

Location Source	Transportation Cost	% Share	Packaging Cost	% Share	Food Expenses	% Share	Total Cost
	PhP/can		PhP/can		PhP/can		PhP/can
Sta. Cruz	0.73	54	0.08	6	0.54	40	1.35
Cabuyao	0.36	37	0.08	8	0.54	55	0.98
San Pedro	0.22	26	0.08	9	0.54	64	0.84
Pampanga	1.45	70	0.08	4	0.54	26	2.07
Quezon	1.45	70	0.08	4	0.54	26	2.07

The marketing cost per can of jasmine during peak months was generally lower than the marketing cost per can during lean months. The cost incurred by traders during lean months was about 8 times higher than the marketing cost during peak months (Table 7). The main reason for this fact is the increase in the transportation and food costs per unit of buds traded because they are traveling the same distance and yet the product they are transporting for sale in the destination market are much lesser.

Most traders sourced all of floral buds from their own municipalities. Some San Pedro traders procured floral buds and garlands from other production sites for trading. Producer-traders and traders of floral buds in all study sites were found to bring their products to the assembly market in San Pedro. Traders were paid either in cash, or a combination of cash and credit. Except in Pampanga, more than one half of the traders were paid in cash, which they received during purchase or within the day.

Table 7. Comparison of marketing cost (PhP/can) of jasmine traders during peak and lean production months by location, Luzon, Philippines, 2009

Location/Source	Peak Period	Lean Period	Price Difference
Sta. Cruz	1.35	10.05	8.70
Cabuyao	0.98	7.34	6.36
San Pedro	0.84	6.25	5.41
Pampanga	2.07	15.49	13.42
Quezon	2.07	15.49	13.42
All Areas	1.35	10.12	8.77

Gross Revenue, Marketing Cost and Net Revenue

Among the three types of market participants, producers had the lowest average gross revenue of PhP 24,966 per month while traders had the highest at PhP 102,354 per month (Table 8). This is expected since traders handled the largest marketable supply of jasmine buds. During the peak harvest period, the highest gross revenue was obtained by the Quezon traders amounting to PhP 137,953 per month while the lowest was earned by Laguna traders at PhP 92,672 per month. Among producers, the highest gross earners were found in Laguna with PhP 41,953 earned per month and the least gross earners were those found in Quezon with PhP 18,796 per month. Similarly, producer-traders from Laguna had the highest gross revenue of PhP 71,385 per month but those who came from Pampanga registered the least gross earnings at PhP 28,825 per month. The net revenue which was generated by deducting the marketing cost from gross revenue was found to be highest for traders during peak months at an average of PhP 98,890 per month. The least was received by producers at PhP 24,966 per month which even went down to PhP 20,722 during lean months (Table 8). This is despite the fact that producers did not incur any marketing cost for their jasmine buds.

Table 8. Gross revenue, total marketing cost, and net revenue (PhP/can) from jasmine buds production and marketing by type of participants in Luzon, Philippines, 2009.

Location	Producer		Producer-Trader		Trader	
	Peak	Lean	Peak	Lean	Peak	Lean
Laguna						
Gross Revenue	41,953	39,353	71,385	43,429	92,672	45,179
Marketing Cost	0	0	2,087	1,924	2,346	1,829
Net Revenue	41,953	39,353	69,297	41,505	90,325	43,350
Pampanga						
Gross Revenue	40,995	7,968	28,825	39,700	126,097	31,148
Marketing Cost	0	0	1,727	3,618	6,544	2,595
Net Revenue	40,995	7,968	27,097	36,082	119,553	28,554
Quezon						
Gross Revenue	18,796	24,352	57,598	25,341	137,953	26,345
Marketing Cost	0	0	3,452	2,310	7,159	2,194
Net Revenue	18,796	24,352	54,146	23,032	130,794	24,150
All Areas						
Gross Revenue	24,966	20,722	59,654	40,064	102,354	41,125
Marketing Cost	0	0	2,332	2,386	3,464	2,238
Net Revenue	24,966	20,722	57,322	37,678	98,890	38,887

It is interesting to note that among all the market participants, traders suffered the greatest reduction in net revenues during the lean period with the level of shrinkage amounting to almost two-thirds of their peak period revenues. However, considering the type of market participant and their location, producers from Pampanga had the biggest reduction in net revenue with the value during the lean period amounting to almost one-fifth only of its peak period level. It is highly possible that aside from the usual effect of season, production might have been adversely affected by the extreme weather disturbances because Pampanga is among the areas which are frequently visited by typhoons with accompanying heavy flooding. On the other hand, some producer-traders in Pampanga realized high net revenue during lean months because of the high price of jasmine buds during this period. The same is true with jasmine producers in Quezon. Again, this is evident of the high price volatility of jasmine buds.

Garland Production and Marketing

Jasmine garland making and marketing is an industry in itself and a daily activity. The garland making contractors are the key persons in garland marketing. Many of them play dual roles because they act as suppliers of buds and at the same time the sellers of stringed jasmine garlands or leis. In many cases, these garland-making contractors are also in the business of floral bud wholesaling. The system involves a series of activities such as early in the morning, the garland making contractors either obtained their supply of raw materials from the assembly markets of San Pedro in Laguna or in San Roque drop-off point in Pampanga and then distribute jasmine buds for stringing by the garland-makers. In the afternoon, the garland-making contractors pick-up the garlands and deliver these to garland wholesaler-retailers in Quiapo, Divisoria and Baclaran in Manila. These wholesaler-retailers then distribute these garlands to garland peddlers stationed in front of Manila churches. One garland-making contractor reported that at least 10,000 garlands are sold in Baclaran church per day.

An interview with the garland producers revealed that the estimated total garlands produced are 142,755 pieces per month. Pampanga produced and sold the most number of garlands with 97,600 pieces per month while Lucena, Quezon and Sta. Cruz, Laguna had the least with 2,825 and 1,330 pieces per month, respectively. These areas are mainly production and not demand centers hence there is low demand for garlands within them. Despite being the assembly market for jasmine buds, San Pedro garland makers produced only 8,550 pieces per month (Table 9). The main reason is the fact that most of the garlands sold in the San Pedro assembly market were made outside of San Pedro and that jasmine in the form of buds is the product more frequently sold in this market.

Table 9. Garlands produced by location in Luzon, Philippines, 2009.

Location	Total Production (pieces/month)
Laguna	42,330
Sta. Cruz	1,330
Cabuyao	32,450
San Pedro	8,550
Pampanga	97,600
Quezon	2,825
Total	142,755

The respondents cited three types of buyers of garlands: the garland wholesalers, garland retailers/peddlers and consumers. Wholesalers and retailers served as the main buyers of garlands

traded by the garland making contractor. The garland wholesalers sell them to retailers who in turn sell to the consumers (Fig. 3).

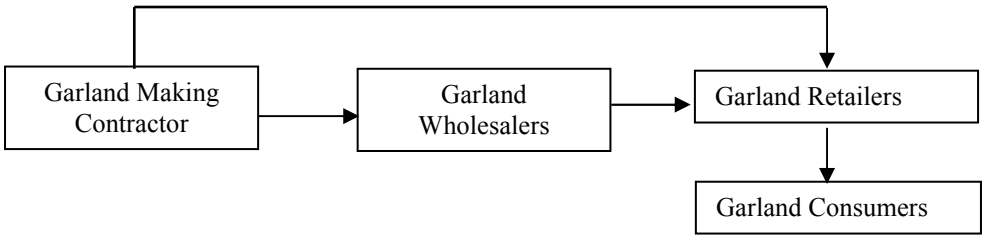

Fig 3. Marketing channel for garlands

Garland prices vary according to how they are strung. The least expensive was the simple garlands consisting of two (*de dos*) to four (*de cuatro*) jasmine buds valued at PhP 1.60/piece. Those with eight (*de ocho*) and twenty (*de beinte)* jasmine buds were sold at PhP 2.50/piece and PhP 4.00/piece, respectively. The most expensive were the Waikiki and Hawaiian types both of which are priced at PhP8.00/piece. Marketing costs for garlands incurred by the garland making contractors include the cost of buds, stringing cost, transportation, and the cost of string. The highest total cost was incurred for Waikiki and Hawaiian types of garlands due mainly to the high cost of buds (P5.00 per garland). Both types require about 50 pieces of buds per garland while *de dos and de cuatro*, with the lowest total marketing cost, needed only 2 to 4 pieces of buds. On the other hand, garland wholesalers had only to spend for the cost of garland and minimal transportation cost. Meanwhile, garland retailers paid only the cost of the garland which was PhP1.00 per simple garland and PhP7.00 for the elaborately designed Waikiki and Hawaiian garlands and the cost of food while retailing. They did not incur any transportation cost since garlands are delivered to them by garland wholesalers in places where they used to roam while peddling. Highest net return amounting to PhP2.17 per garland was achieved by garland retailers for Waikiki and Hawaiian types of garlands while the lowest was earned by garland retailers for *de dos* and *de cuatro* at PhP0.28 per garland (Table 10).

Marketing Margins, Marketing Costs and Net Returns

Garland retailing proves to be a lucrative business with very little investment requirement since all that is needed is a small amount of capital to buy the garlands to be sold for the day. A lot of times they are allowed to pay for their sold garland after three days or up to one week after delivery by the garland wholesalers. Since their garland is sold directly to consumers who purchase small volumes, they also enjoy the advantage of being paid with outright cash upon sale. Such advantage also comes with high net returns reaching as much as 99% of the marketing margin if the more elaborately designed Waikiki and Hawaiian garlands were sold. Even with the simplest garland such as the *de dos* and *de cuatro* , retailers enjoyed substantial net returns accounting for 93% of the marketing margins (Table 11).

In contrast, the garland making contractors earned the least net returns ranging from a minimum of 16% for *de beinte* garland to a maximum of 39% for *de dos – de cuatro* and *de ocho* garlands (Table 11). This is quite low considering that they were the ones who performed most of the marketing functions and therefore paid for their cost. Usually, these intermediaries receive payment after three days or up to one week after delivery to the retailers. As a result, they require higher working capital. However, as a business enterprise, garland making contractors enjoyed the huge accumulated net returns due mainly to the large volume of garlands that they produce and distributed to the garland wholesalers and garland retailers.

Table 10. Jasmine garland retail prices, marketing cost, and net returns in Luzon, Philippines, 2011

Type of Garland	Garland Making Contractor							Garland Wholesaler			Garland Retailer		
	Transport Cost	Cost of Buds	Labor Cost	String	Total Cost	Selling Price	Net Return	Transport Cost	Selling Price	Net Return	Selling Price	Food Cost	Net Return
	PhP/String												
De Dos/ De Cuatro	0.01	0.40	0.15	0.05	0.61	1.00	0.39	0.02	1.30	0.28	1.60	0.02	0.28
De Ocho	0.01	0.80	0.30	0.05	1.16	1.90	0.74	0.02	2.10	0.18	2.50	0.02	0.38
De Beinte	0.01	2.00	0.30	0.05	2.36	2.80	0.44	0.02	3.30	0.48	4.00	0.02	0.68
Waikiki	0.03	5.00	0.30	0.10	5.43	7.00	1.57	0.04	7.80	0.76	10.00	0.03	2.17
Hawaiian	0.03	5.00	0.30	0.10	5.43	7.00	1.57	0.04	7.80	0.76	10.00	0.03	2.17

Table 11. Marketing costs and net return as percent of marketing margin of jasmine garland traders in Luzon, Philippines, 2011.

Type of Intermediary/ Type of Garland	Marketing Margin	Marketing Cost	Net Return	Marketing Cost as Percent of Marketing Margin	Net Return as Percent of Marketing Margin
Garland Making Contractor					
De Dos – De Cuatro	1.00	0.61	0.39	61	39
De Ocho	1.90	1.16	0.74	61	39
De Beinte	2.80	2.36	0.44	84	16
Waikiki	7.00	5.43	1.57	78	22
Hawaiian	7.00	5.43	1.57	78	22
Garland Wholesaler					
De Dos – De Cuatro	0.30	0.02	0.28	7	93
De Ocho	0.20	0.02	0.18	10	90
De Beinte	0.50	0.02	0.48	4	96
Waikiki	0.80	0.04	0.76	5	95
Hawaiian	0.80	0.04	0.79	5	95
Garland Retailer					
De Dos – De Cuatro	0.30	0.02	0.27	7	93
De Ocho	0.40	0.02	0.37	5	95
De Beinte	0.70	0.02	0.63	3	97
Waikiki	2.20	0.03	2.17	1	99
Hawaiian	2.20	0.03	2.17	1	99

Garland wholesaling is also very profitable with the earned net return ranging from 93 to 96% of the marketing margins. Highest profit was obtained for *de* beinte garlands and the lowest was for *de ocho* garlands (Table 11). Garland prices vary according to how they are strung. The least expensive was the simple garlands consisting of two (*de dos*) to four (*de cuatro*) jasmine buds valued at PhP0.50/piece. Those with eight (*de ocho*) and twenty (*de beinte)* jasmine buds at PhP1.80/piece and the most expensive were the Waikiki and Hawaiian types both at PhP5.00/piece. The interviews revealed that the ratio of profit to the cost of production is 1:1. At an average volume for example of 15,000 simple garlands per day, a garland-making contractor could easily earn PhP3,500 daily. Given that five garland-makers strung 15,000 garlands per day, each could get PhP300 daily. Two modes of payment were observed in garland marketing. Garland producer-traders and retailers/peddlers were mostly paid in outright cash within the day. This is because garland is sold directly to consumers who purchase small volumes. On the other hand, garland-making contractors and wholesalers received payment after three days or up to one week after delivery. Because of this payment mode, they require higher working capital.

Problems Encountered in the Marketing of Jasmine

Highly fluctuating prices. It is an industry reality that jasmine supply is very high in summer months and very low during rainy months. Consequently, prices are very low during the former and very high during the latter months. The seasonality of jasmine supply is largely caused by its biological nature of production. According to Sanchez, et al (2010), the volume and quality of the produce is largely determined by the weather condition and other biological external factors such as soil types and pests and diseases, which are mostly uncontrollable by the producers. Meanwhile, this seasonality of jasmine creates pressure not only on the part of the producers but also on the part of the traders because of the difficulty in matching supply and demand, thus the highly unstable prices.

Inability of the producers to independently market their produce. This results from the producers' scale of operations which is generally small at less than 500 m^2 of farm. Small producers lack the volume of production for efficient transportation to the assembly market. They also have limited marketing information for them to be able to bargain for a higher price for their buds. Consequently, they earn a low level of income and therefore have less financial capability to expand their production. As a result also, they tend to be price takers only. As previously mentioned, prices paid to the producer is determined not at the farm gate but at the assembly markets after all the possible suppliers have arrived. The volatility of supply and demand conditions in the assembly market leave the producers always at a losing end because the traders are able to adjust the prices paid to them depending on how much the jasmine buds were sold to the buyers in the assembly markets. In other words, the risk of a market price change is always a burden to jasmine producers due to the practice of traders of paying them after the buds are sold. The presence of "fixers" as price setters is an issue that complicates the price setting of jasmine buds in the industry.

Thick layer of market intermediaries. Several layers of middlemen were involved before floral buds and garlands reach their final destinations. In Laguna and Quezon, the first intermediary level consists of the jasmine dealers or contractors who also perform wholesaling and garland-contracting operations and are considered large marketing players. In Pampanga, on the other hand, there are small marketing players called "runners" who collect smaller volumes of floral buds from the farms and bring these to wholesalers for distribution to other wholesalers and retailers. It is worth noting that these several layers of middlemen were also performing overlapping marketing functions.

Limited use of jasmine as buds. In the Philippines, the major products that could be produced from jasmine are garlands or leis only. These end-products require the use of jasmine buds only and not of opened flowers, thus when buds have fully opened they become useless to the industry and therefore become a loss to producers and traders as well. They are not aware that fully

opened jasmine flowers are a good source of essential oils, a high value product, which they can sell for added income.

Poor collection of payments for sold jasmine buds. Since prices offered to producers are dependent on the result of the day's trading, payment for their sold buds is not immediately given to them. They are lucky if they are paid at the end of the trading day because in most cases, they are paid several days or even up to two weeks after.

CONCLUSIONS AND RECOMMENDATIONS

Jasmine marketing is a profitable business but income of the market participants is highly affected by the seasonal supply of jasmine. The fluctuating income levels of all the market participants are not helping the industry in terms of harnessing its full potential for development because it is very difficult to plan for anything when the product is highly dependent on season. The abruptly changing climatic condition is aggravating the already unstable production cycle and thus, the income cycle also of the market participants. Furthermore, post-harvest handling of the buds still needs a lot of improvement so that their availability in the market can be prolonged hence reducing instability of market price.

During peak production months, the over-supply of buds pulls the price down. However, during lean months, price is at its maximum level because there are few buds to sell hence income of the market participants can be reduced by as much as two-thirds of their peak period level. The current crude post-harvest handling practices of the market participants are not enough to prolong the buds' shelf-life while maintaining their good quality. There is therefore a need for a better technology that can address this post-harvest handling problem in jasmine buds marketing. Meanwhile, selling jasmine as buds only limits the size of the market for the product, thus large volume of production during peak months cannot be absorbed. There is therefore a need to devise ways and means to expand the market for jasmine and promoting the production of more garlands during peak months is seen as a viable solution. Production of garlands is one value-adding activity in the jasmine industry that also has the potential to widen the market for the flower. Jasmine garlands are bought in smaller volume hence they are more affordable. Many Filipino households are accustomed to buying 2 to 3 pieces of garlands everyday for hanging inside their house or as offering in their home altar. Jasmine garlands are also popular adornment and air freshener inside passenger jeepneys and taxis thus drivers are also their frequent buyers. An individual jasmine producer may opt to string the harvested buds instead of just marketing these as buds. One can of buds if strung into four buds per garland will produce 250 garlands, that can be easily sold at PhP 1.00 each thus increasing the earnings of the producers many folds. More innovative garland makers could produce garlands of elaborate designs which can be sold at a higher price especially during the month of May when the traditional *Flores de Mayo* is being celebrated all over the country. A tie-up with flower shops can also be forged so that elaborate designs for jasmine flower arrangements can be promoted and sold.

Aside from the promotion of garland production as a value-adding activity, there is also a need to tap other uses of jasmine. Essential oil extraction is one of the options that will improve the income generated from jasmine. Post-harvest losses from the marketing of jasmine will be lessened because the fully opened flowers can now be utilized as raw material for essential oil extraction instead of being thrown away. It is therefore recommended that the research on the technology for essential oil extraction be fast-tracked. It will be better if village-level oil extraction technology can be developed so that producer-adoption can be enhanced. The technology should be able to address the problem on the level of oil extracted from each flower because the existing technology, which is still on its development stage, requires 8,000 fresh blossoms (members@aol.com.parijata/jasmin) to produce 1 gm of essential oils.

Among the market participants, producers had the least amount of net revenue generated from selling their jasmine buds. The main reason for this is their inability to independently market their own buds. They are just price takers from traders who offer them low prices and longer payment terms. In other words, price risk is fully passed on to them by traders. It is therefore recommended that jasmine producers should form themselves into small groups or cluster to attain the following benefits: (1) reasonable prices due to group marketing; (2) reduction in transportation costs because of shipment of aggregated volume of jasmine buds; (3) better payment terms from buyers; and (4) easy access to government-sponsored training programs on improved production, post-harvest and processing technologies.

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