

## **MANGO VC KEY INFORMANT INTERVIEW SYNTHESIS**

Access to Modernizing Value Chains by Small Farmers in Indonesia  
USAID AMA CRSP Project

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### **1. Introduction**

This report is a major revised version of First Draft of VC Key Informant Interview Synthesis submitted in March 22, 2009. After several comment, the last draft was submitted in April 22, 2009. Substantial revision to the draft has been made after additional interview with actors in the consumption zone during August to September 2009, specifically traditional wholesale markets, specialized supermarket supplier, and modern retailers in Surabaya area, Jabotabek area, and Bandung.

All together, we made four trips to the study areas since 2008; the first three trips were Dec 4, 2008 (7 days), Jan 5, 2009 (7 days), and Feb 3, 2009 (5 days) with 11 field researchers working on the field, including two supervisors. The last field survey was in August 26 to September 7, 2009 (11 days) by 2 researchers, mostly in the main consumption zones of East Java and West Java. Total number of Key Informant (KI) interviewed during the mango survey was 113 persons, 60 from West Java and 53 from East Java (Table 1). There were additional 25 persons interviewed for data confirmation or cross reference on particular issue, but was not considered as KI. So, the total KI interviewed were 138 persons, but only 113 considered as case studies. Detail list of key informants interviewed and their status on the chain is available in Table 2. The nterview guide used during the survey is available in the Appendix 1.

The complete set of interviews was written and collected as case studies. Its synthesis is organized in this report as a stylized fact that lead to a hypothesis for the farm survey and trader surveys on the next phase. However, the earlier report version was written started with the production zone and then move on to the consumption zone, following the chain flow to downstream. In this report, it has changed to start from the consumption zone which hypothesized as the main driver of fruit production restructuring, going on to impact on dynamic change in the production zone.

## **2. Dynamic Change in Consumption Area**

### **2.1. Increase in Income and Urban Population**

Despite of the global financial crisis and international economic down turn, in the period of 2003-2008, Indonesian economic growth still increasing steadily at about 5-6% per year (Figure 1). The growth has directly linked to an improvement in social welfare and decline of poverty. The BPS data show that income per capita has been increasing by an average of 4% annually. In the last ten years, the Highest (20%) income group has been rising by amazing 6% annually, and the poorest (40%) has been drop by 3% (Figure 2). The data here have signaled an increasing buying power of consumers. However, unlike the Indonesian economic growth in the 80s, the recent growth was spread beyond the greater Jakarta (Jabotabek) since government decentralization has been implemented for 9 years now (since 2000). Those increasing of the highest income group spread to every capital city of province and district (kabupaten) in the country. The phenomenon is a sparking engine for an expansion of urbanization spread throughout the country creating new demand for urban life style, more diversified and higher food quality.

In line with the above, the urban population has been doubled in the last 10 years. By 2004, urban population is already 43% compare to rural population, which is 57% of total population (Figure 3). The population growth by province (Table 3) shows that in the last 5 years, annually, urban population grows very fast (3%) and rural population is declining (-1%). Since the Java Island is already over populated, we can see that the fastest urban population growth is happening outside Java. Urban population growth in Island of Sumatera (5.6%), Bali and NTT (7.1%), and Sulawesi (4%) are faster than urban population in the Island of Java (3.9%). This phenomenon can be translated into expected demand increase of seasonal and high quality fruit from other island inducing an intra island trade.

However, ACNielsen (2009) still considered the key cities in Indonesia that used as the barometer of consumption demand are greater Jakarta area (Jabotabek), Surabaya, and Bandung, because of their population concentration area (Table 4). Total population of Jabotabek is 18.93 million people (Jakarta: 8.87 million, Bogor: 4.42 million, Tangerang: 3.57 million, and Bekasi: 2.08 million), population of Surabaya is 2.8 million (greater Surabaya is almost 5 million), and Bandung is 2.3 million (greater Bandung is around 3.5 million). The next important cities will be Medan (2.27 million), Palembang (1.50 million) and Makasar (1.38 million). City with the highest population growth in the country are Tangerang, Palembang, and Bogor ranging between 2.6% to 3.0% annually. That urban concentration with rapid population growth and increasing income is powerful driver for rapid expansion demand of high quality fruit in large quantity all year around. Hence those data consistent with the main focus of this study to concentrate the observation on the main consumption zone of West Java and East Java as the drivers of dynamic change in fruit consumption demand.

## 2.2. Increase Demand for Fresh Fruit

Increase in income of urban population causes higher demand for fruits and vegetables. The ratio of urban expenditure spend on fruit and vegetables (FFV) compare to expenditure on cereals in 1999 was only 0.62 (Figure 4). In 2005, the ratio had increased to 0.94, which mean the amount of money spend on FFV was almost equal to what spend on the staple food. However, in 2008 because of high price of food, consumers retained spending on the staple food and spend less on FFV. The increasing trend toward higher proportion of FFV is expected to continue when the food price is back on normal track.

Consistently, the National Survey and Census (Susenas) conducted every 4 years by BPS (Central of Statistical Bureau) show an average annual increase of per capita fruit consumption (kg/capita) by 13% from 1987 to 2003 (Table 5). Even though, the table also basically demonstrated that Indonesian consumers still preferred tropical fruit more than imported fruits, the trend show that the preference moved from most common and cheapest fruit such as banana, into more expensive, seasonal such as mangoes, rambutan, durian, and new kind fruits. Apples and melons are the new kind of fruits that were consumed very little in 1987 (0.10 kg/cap/year). Their demands have increase dramatically by 30-32% annually. However, apple and melon are still consumed in small quantity, only 0.5 kg per capita/year for apples and 1.56 kg per capita/year for melons. Mangoes consumption increased by 20% annually, was only 0.99 kg/capita/year in 1987 became 3.12 kg/capita/year in 2003.

It appears from our interview with the key informants that the most change happening in consumer demand of modern sector. The fresh manager of Carrefour Store in Surabaya, Sartono said that 75% of the store fruit sales is imported and 25% local. Fast moving item in the fruit section is oranges/tangerines (almost 60% of sales) which imported from China as well as local from Medan and Pontianak. From the local fruit sales, 20% is mango which dominated by harumanis (80%) and only 20% other kind of mango (manalagi, kweni, etc). He said that demand for harumanis mango, is increasing by about 10% annually. The Surabaya store now has 4 fruit suppliers, 1 from Gresik and 3 from Malang area. Three years ago, only 2 fruit suppliers to the store. Most of mango sold in the store came directly from East Java main production zone, such Probolinggo and Situbondo. Generally, there was no mango from Central and West Java appears to be sold in the store. The Surabaya store sale on a special mango "gedong gincu" from West Java was not very good. It was sold at Rp 25,000 per kg, much more expensive than other mangos from East Java. The store only sold about 10-12 kg per day. However, since Gedong gincu is on the regular mango assortment list. The store has to have it on the display whenever possible. It is usually supplied by the DC in Jakarta.

Different from Carrefour store in Surabaya, Carrefour fresh manager at Kiaracondong store Bandung, Endang Sumirat, said that gedong gincu mango

sales was about 10% from total of mango sales in the store, the other 40% was for Harumanis , and the remaining 50% is a mix mango variety, such as golek, manalagi, kweni, etc. Price of Harumanis mango in Bandung was about Rp 9.000-16.000 per kg, contrast to the price of gedong gincu mango at at Rp 16.9000-25,000. Apparently, gedong gincu mango is more popular in Bandung and Jakarta areas but not in Surabaya. Endang was quite sure about that, but he was not sure whether it is because different in consumer's taste or because consumer in Surabaya was not familiar with the flavor of Gedong Gincu.

While urban demand for fruits generally increasing, the upper segment of the consumer even wanted to have fruits with best quality and variety which shift the market segmentation further. Urban upper segment like to have an access to a high quality fruit at any time, suitable for any occasion needed. So, they need a store that sells good quality fruits with a lot of selection, any time. In the last five years, we noticed some modern specialty fruit stores like Total, Hoky, Prima and many others appear in major cities like Jakarta, Bandung and Surabaya. The store is specializing in fruit retail, imported and local fruits, and display very much like a fruit section at a supermarket. For convenient, the store also provides a selection of packaging, like for a gift, traveling, party display, etc.

For example, Total Rumah Buah (TRB) which was founded the first store in 1994 in Jakarta, now has 8 stores in Jakarta, 1 stores in Bandung and Surabaya. Similar to what we found in supermarket, Total store manager in Bandung, Ade, said that 80% of fruit in the store is imported fruit. All of imported fruits is supplied by the DC in Jakarta. Mango, mangosteen and orange/tangerine are among the favorite local fruit sold in the store. For local fruits, the store has 3-4 regular suppliers. Mangos in the store mostly procured from West Java production zone, such as Majalengka, Kuningan, and Cirebon, especially during peak season (Oct-Dec). During an off season, the store also sells mango from Central and East Java, or even from other Islands. Ade also confirmed that the sales of mango, especially harumanis and gedong gincu increased by 10-20% annually in the last 5 years. He procured harumanis with grade A (about 2-3 mango per kg) and 80% ripe. Sembiring who supply Hoky and Prima fruit stores in Surabaya said that basically the procurement requirement of fruit store and supermarket are the same, in quality and handling.

### **2.3. Wholesale Markets and Mango Distribution to Consumption Zone**

Rapid increased of fruit and vegetables demand, and in the fast growing of urban population of the large cities has lead to a further structural change on market procurement system and distribution. Realizing the important role of wholesale market in supporting the urban population, the governments renovate/improved and built some wholesale market surrounding cities with large population concentration. We visit most of the wholesale market in Java Island, mostly located in West Java and East Java. Based on the interview with key informants

on capacity, source of production and market destination, we map out the distributional impact to the whole mango marketing system and presented in Table 8.

From 1.8 million tons of mango produced in 2008, mostly (85%) traded and consumed in Java Island (Table 8). The table show that from the whole mango traded, 5,999 tons (0.4%) was coming from outside Java Island, either through Jakarta port or Surabaya port (in flow). However, 302,774 tons (19.9%) of mango from the production in Java Island was traded out to the other islands. Some of those traded also goes to export which included in the mango traded in Java (17.8%), but we do not know how much of those traded was exported. The percentage goes to modern retails directly through a specialized supplier was about 14.7%. Table 8 also show that there was 279,769 ton (18.4%) of mango traded directly from a production zone without going through any of the wholesale markets.

The greater Jakarta area (Jabotabek) which has population nearly 19 million, is supported by three main wholesale markets, Kramatjati (PIKJ), Cibitung in Bekasi, and Tanah Tinggi in Tangerang. Bandung city with population of 2.3 million (Greater Bandung is about 3.5 million) is serviced by Caringin wholesale market, which also support other district area in West Java. On the other hand, greater Surabaya area in East Java (population of about 5 million) has no wholesale market until today which creates a bottle neck for fresh product distribution to the retail markets in the city. The following sub-sections describes and compare wholesale market condition in each provincial area.

### **2.3.1. Wholesaler Markets in Greater Jakarta Area**

Kramatjati Fresh Fruit and Vegetables Wholesale Market (PIKJ) which occupied 14.7 hectares of land, built in 1970s, was renovated in 2004 and completed in 2007. With a direct census on location, we found that the market has 390 fruit wholesalers. Most of them (41%) are mixed fruit traders (several fruits), including mango (Table 6). Only 44 traders (11%) are mango specialized wholesaler, who sell only mango for 6-8 months when it come to season. When there is no mango anywhere, then they sell other fruits. The other 41% is non mango fruit traders.

PIKJ plays very important role in fresh fruit and vegetable marketing in Indonesia (Table 8). About 2.5% of total mango distributed in the Java Island is going through Kramatjati, which was the highest volume physically traded in one location (38,430 tons). PIKJ received mango from all mango production zones in Indonesia, including Aceh, Lampung, West Nusa Tenggara (NTB), and Bali. East Java, the largest mango production, supplies the highest share (40%), then Central Java (30%), West Java (20%) and from other island (10%), usually during off season.

Half of the volume of fresh mango going in to PIKJ is distributed to Jakarta city (traditional retail, supermarket, and fruit store). About 20% distributed to Bogor, Tangerang, and Bekasi (Botabek). The remaining 30% of the total volume traded is going to other islands, such as Padang, Bengkulu, Jambi, Lampung, Palembang, and Medan. As notice here, intra island trade is now growing very fast. The authority said that intra island trade through PIKJ was only 10-15% five years ago. Sumatra Island is becoming the main market for good quality mango from Java marketed through PIKJ.

Two other wholesale markets built around Jabotabek are Cibitung Wholesale Market in Bekasi area and Tanah Tinggi Wholesale Market in Tangerang. Cibitung market were built in 1995 on 6.5 hectares of land. We found 191 fruit wholesalers in the market (Table 6). There were 34 traders (18%) specialized mango wholesalers and 35% mix mango traders (18%). Most other traders (64%) are non mango fruit traders. Tanah Tinggi market were built on 4.5 hectares of land in 2005 and fully operated since 2007 managed by a private investor, Hartono. It has 115 wholesalers on the fruit section (Table 6). The market has almost the same number of mango traders compare to Cibitung market, 33 specialized mango traders (29%) and 39 mix mango traders (34%). There is only 43 general fruit traders (37%). Each wholesale market is serving specifically own area, Bekasi and Tangerang suburban.

Based on the interview with traders, it is estimated that 40% of mango coming to Cibitung is from East Java, 30% from West Java, 20% from Central Java, and 10% from outside Java such as Aceh, Lampung, West Nusa Tenggara, and Bali during off season. Those mangos then distributed mostly (45%) to Bekasi area (Bekasi, Cikarang, Karawang), to neighboring kabupaten in West Java such as Purwakarta, Sukabumi, Bogor, and the remaining 30% is to the island of Sumatera, such as Lampung, Bengkulu, Palembang, and Riau. Similarly, Tanah Tinggi market was also supplied by East Java production zone (40%), West Java (30%), Central Java (15%), and Sumatera (20%), such Aceh, Palembang, and Lampung during off season. Tanah tinggi wholesale market supply mostly (60%) Tangerang area (traditional market and supermarket supplier), 25% to Serang (Banten Prov.), Bogor and Sukabumi, and intra island trade (15%) to Lampung, Palembang, Riau.

Most traders in PIKJ said that in the last 5 years, their sales of mango are increasing about 40% (7-8% per year). For example, Alif (UD Mulus) and H. Nurhadi said that their mango supplies increase from 52 truck to 72 truck per season, and harumanis became the fast moving item on their fruit list. Harumanis share increases from 50% to 60% of their total mango sales. Most of grade A-B supplied to supermarket and fruit stores (through specialized supplier) and lower grade (C-D) to traditional retailers. Gedong gincu is more popular now, but still a small portion (less than 10%) since only supermarket and fruit store procure them. Aris, a traditional retailer, found procuring mango in the market said that a gedong

gincu price is too high for his customers. He cannot make a sale with gedong gincu in the traditional market.

Similar impression came from traders in Cibitung, as well as, Tanah Tinggi market. Some traders in Cibitung are previously traders in PIKJ. For example, Taufik, H Musrikhin, and Farid decided to move to Cibitung since they felt PIKJ already cost them too much for illegal charges and transaction cost (mafia system) which a burden to their business. They still have families and business partner who stay in PIKJ and become part of their market network in case of oversupply or shortage. On the other hand, Tanah Tinggi market still new and have limited spaces available. Yayan, a mango wholesaler in Tanah Tinggi, was an assistant to his uncle, mix mango wholesaler in PIKJ. He said that his sale in Tanah Tinggi market is still low, only about half of he used to sell in PIKJ. But he said that he is happy since now he has his own business that growing fast. He further explained that the competition in Tanah Tinggi market is not as fierce as in PIKJ and there are no big mango traders that dominate market.

### **2.3.2. Wholesaler Markets in Greater Bandung Area**

Caringin wholesale market (PIC) was built in 1985 by private investor, H.D. Sutrisno on 11.7 hectares of land and fully operated in 1987. The PIC market mainly supplies greater Bandung area and other 12 district's capital cities in West Java. PIC has 207 fruit wholesalers which consist of 44 mango specialized wholesalers (21%), mix mango wholesalers (18%) and mostly, 126 wholesalers (61%) are non mango (other fruit) wholesalers (Table 6).

PIC absorb 25,560 tons of mango traded (1.7%) in the Java Island (Table 8). PIC receives mango from East Java (40%), West Java (40%), Central Java (10%) and other islands (10%). The mangoes then distributed to Greater Bandung area (50%), other cities in West Java (35%), and other islands (15%). Thus PIC is not only serving Bandung area only, but also function as the regional main wholesaler market.

Number of wholesaler in PIC is relatively unchanged in the last 5 years, since there is no new stalls were built and the seasonal fruit stall usage is pretty much the same. However, wholesaler in Caringin, Rachmat, said that his sale of mango has been increasing in the last 5 years by about 10% a year, especially sales of harumanis. Other kinds of mango sales were also increased, but not as much as harumanis. Rachmat supplies several cities in West Java, Sumatra and also supermarkets, such as Yogya and Griya (5 stores) in Bandung.

### **2.3.3. Wholesaler Markets in Greater Surabaya Area**

Wholesale markets in Surabaya area were very different from what we found in West Java and Jakarta. Even though, Surabaya has the fourth largest urban

population in Indonesia, there is no market location that designed as a wholesale market to service the city. Since neither the government nor private investor has an initiative to build a wholesale market, the traders take the matter in to their own hand. They created a semi permanent wholesale market on the road side at several locations around Surabaya city. We found 7 block of roadside market in Surabaya city that function as wholesale markets and another wholesale market block found around Malang (1 hour drive) that also supply Surabaya (Table 7). Consequently, without good support of wholesale market, level of trading around the capital city of East Java (Surabaya) is very low compare to West Java (Table 8). Most of mango traded in East Java done outside the wholesale market. The table also shows that only mango produced in East Java traded in the market, demonstrating low market absorption. In the next paragraph, we will describe only several important mango wholesale markets around Surabaya area.

Petean Fruit Market at Surabaya Pier, is the only market among 7 locations that really designed to be a market, at least part of it. The market has the most traders (95) compare to others, but relatively smaller size. The place is known as one of the largest mango wholesaler during mango season (October-January). When off mango season, the trader sells other kind of fruits. Mango delivered to Petean market all coming from East Java main production zone, mostly come from Madura (40%), Situbondo (30%), Probolinggo (20%), and all other areas in East Java (10%). Most mango from Petean market is delivered to retail markets, traditional and modern, at Surabaya city (80%) and to other island, mostly Kalimantan (20%). Petean market mostly supplies traditional retailers.

Paneleh market already started since 70s, located at Paneleh road next to Kalimas river. Historically, the local government tries to clean up the area from traders, but they always come back. The market is considered important for Surabaya for its supply on imported fruits, supported by rented cool storages available around the area. Head count of the traders show that there are 38 wholesalers in the market, among them 15 mango wholesalers during mango season (Table 7). Mango supply to the market coming from East Java production zone only, mostly from Situbondo (25%) Probolinggo (20%), and the remaining 55% spread from different production area in East Java. Paneleh market supply traditional retailer and supermarket suppliers, all in Surabaya.

Widodaren market started just 5 years ago (2005). It was started as roadside fruit retail market then move up into wholesaling. Now, traders do both retailing and wholesaling. During the peak season of mango, traders in the market are all doing mango wholesaling (mix with other fruits). This market is known as a special (good) quality mango wholesale market. There are 32 mix fruit traders in the market. Based on information from key informants in the market, we know that Widodaren market not only supplied by mango collector/wholesaler from East Java main production zone (95%), but also from Bali and West Nusatenggara (NTB). Wholesaler in the market supplies 55% of mango to Surabaya (traditional and modern retail supplier), about 10% to Yogyakarta and Bandung (supermarket

suppliers) and 35% to major cities in Kalimantan island. We hypothesized that the market was created in respond to increasing demand of high quality fruit from inter and intra island trade. Gathered from information from the key informants, the volumes of intra island trade in the market have increased by 35% from when it was started in 2005.

#### **2.4. Mango Production and Export Trend**

From analysis of the consumption zone survey above we clearly see pattern of dramatic shift on mango consumption demand. We identified high increase in the amount consumed, and number of consumer has growing, not only from Java Island but also from other island, such as Sumatera and Kalimantan. From the interview of key informants, we also identified high demand for good quality mango from modern retailer as contrast to demand from traditional market which grow in more linear way (only on quantity). On the other hand, priority program for mango that known to induced production is to increase export. This section will analyze the consistency, pattern, and links between changes in consumer demand, production, and export.

Mango production in Indonesia is clearly increasing by 5% annually in the last 5 years (Table 9). Begin with period of production decline which hit the bottom in 1998, then followed by consistent increased until 2007 (Figure 6). Province with the highest production in Indonesia is still East Java, even though the trend is declining by -3%. On the other hand, the second and third largest production zones are West Java and Central Java with 15% and 9% annual production growth respectively. However, the highest growth is happening outside Java Island (Table 9). Production of mango in South Sulawesi, West Nusa Tenggara, and Aceh provinces are growing with impressive 49%, 41%, and 29% annually respectively.

The impression from production growth in Table 9 is consistent with the information gathered from the largest wholesale markets in Java Island as described in previous sections. We repeatedly found supplies from other islands such Sumatera and West Nusa Tenggara at the traditional wholesale markets and supermarket in recent years. The survey identified that production in flow from outside Java Island to the wholesale markets in PIKJ, Cibitung, Tanah Tinggi and PIC is about 10% happening during off season because of different cycle period.

Table 9 not only demonstrating a consistent production growth through time but also identifying a regional production shift toward the area that has more available and suitable land for tropical fruit trees such West Nusa Tenggara, Sulawesi and Sumatera. However, in term of production level, those new mango production zones are still very small compare to the main zone such as East Java, West Java, and Central Java.

In contrast to the rapid growth of mango production, the growth is not consistent compare to the mango export historical data. Even though mango is an export

priority commodity, and mango production development aims to increase Indonesian mango export, the data show there is no consistent pattern between export volume with production as well as time. Table 9 shows that Indonesian mango export is very small (about 0.1%) compare to the production volume (average 1.5 million tons).

Figure 5 also demonstrated that the export level is very unstable and fluctuate from one year to the other. Further analysis on Figure 6 demonstrates that the mango export level is so spread (higher and lower) without clear relational pattern with the production level. So, mango export volume is not a function of time nor a function of production. At this point, it is clearly impossible to think that export has induced the mango production development in Indonesia.

Based on information from the National Horticultural Board, there are 4 main mango exporters from Indonesia; those are Masari Multifruity, Masindo, Alindo, and Asri Duta. However, Masari Multifruity (MM) considered the highest volume and more experience than others in exporting mango, especially to Singapore and China. Other exporters, Masindo, Alindo, and Asri Duta, export mango to Middle East. There are also some occasional mango exporters; those are large wholesalers who have access to export market such as Suli from Probolinggo, East Java and Hadi from Cirebon, West Java. They occasionally export mango on order basis, to Singapore, Europe, and Middle East, but not regular exporters.

Masari Multifruity (MM) export Gedong Gincu mango to Singapore (from West Java) and Harumanis to China (from Surabaya). Quality requirement for mango to be exported are Super grade (best quality), consistent in shape, smooth skin, and 80% ripe on the tree. According to Tara, the GM of MM, the best time to export mango from Indonesia is only during October-December since the remaining months is the peak of mango harvest of other countries, such as India in Feb-June and Pakistan in June-Sept every year.

MM received mango from collectors and rural wholesaler in the production zones. During the peak season of mango, delivery made twice a day, that is in the morning and at night. Packaging for export using cardboard contained 10 kg of mango per box. There should be around 1-2 tons and minimal 200 kg per export delivery to cover the cost.

Mango which was not satisfy the export requirement sold to supermarket, about 30 box (300 kg) every day in the peak mango season. Selling price is determined by the price at the destination country, MM and suppliers decided on the spot market. Price of mango for export in average is Rp. 10,000, more expensive compare to those for local markets. The difference is needed to cover the marketing cost, about US\$ 3 per kg.

Tara, the GM of MM, further explained about Indonesian mango export instability. She mentioned four factors caused unstable export of mango from Indonesia, those are inconsistent quality standard, difficult to meet some countries sanitation

standard, high competition with other countries, and unstable exchange rates. MM had tried to work out the problem by partnering directly with farmer's group, even though only with little success so far. The main competitors' countries are Thailand, India, and Philippines.

## **2.5. Modern Retail Share and Procurement**

In contrast to the export trend, pattern of mango procured by collector and wholesaler for modern retailers indicate interesting phenomena (Table 10). Volume of mango procured by modern retail was beyond 10% of mango produced coinciding with the beginning of supermarket growth in Indonesia in early 2000, and continually increase every year exponentially (Figure 6). By 2007, mango procured by modern retail already above 20%. On the other hand, volume of mango export was very tiny (under 1%) that was not even noticeably on the graph scale. That description is fit with production distribution by transaction point (Table 8). Direct procurement of modern retail to production zone in 2008 was estimated about 15% of total mango traded in Java Island. Not including modern retail procurement through wholesale markets.

Modern retail in Indonesia has been growing very rapidly since the removal of restriction on Foreign Direct Investment (FDI) at the retail sector in 1998 (Natawidjaja et. al., 2007). Modern retail is growing a lot faster than traditional retailers (Table 11). The highest growth was on hypermarket (23%) and minimarkets (19%), on the other hand the traditional stores grow by only 3%. The modern retail growth has been consistent with a steady increased on modern retail's mango procurement such as demonstrated by Figure 6. Modern retail procure only good quality mango, the same or little bit below export grade (super, A-B), but higher than what is sold at traditional market (C-D).

Ronald Panggabean, the fresh manager of Carrefour in Surabaya, argued that at the peak season of mango he can sell as much as 6 tons/week/store in average. Giant's fresh manager in Pastur, Bandung similarly estimated that his store capacity to sell mango at about 4-5 tons/week/store. However, a fruit store such as Hokky, Prima and Total can sell only at about 2 tons/week/store, less than a half of a hypermarket. Those demonstrated high selling capacity of modern retailer.

From the KI interview with suppliers and modern retailers, we have general impression that modern stores in Bandung and Jabotabek are more rely on specialized mango suppliers compare to modern stores in Surabaya. Almost 85% of mango procurement to modern stores in Bandung and Jabotabek was from a specialized supplier, only about 15% from a wholesale market. The supplier procured directly to the production zone in East Java, Central Java and West Java. On the other hand, modern store in Surabaya rely only 65% to specialized supplier and the remaining (35%) to wholesale markets. Endang Sutisna, fresh manager of Carrefour at Kiaracondong, Bandung, said that he preferred to deal

with a specialized supplier since the quality assurance is better, in term of consistency and continuity. He felt that his consumers demanding very best mango quality, something that he obligated to provide. However, he could not deny that since East Java is the main mango production, there was a lot more mango available at the traditional wholesale markets.

Specialized supplier for mango to supermarket such as Sembiring from Surabaya, procure mango directly from the production zones in large amount, about 1-2 truck (5 ton) a day for about 3 months at the peak of harvest season. He procure mango from Probolinggo, Situbondo, Pasuruan, and Gresik, main production zone in East Java. Sembiring supply mango to 14 modern store in Surabaya, including Hypermart, Giant, Hero, Superindo, and 2 modern fruit stores, Hoky and Prima. He bought mango through his collector or direct from farmer with minimum of 0.5 ton per transaction. He also act as “a sprayer trader”, rent a tree/buy before harvest from farmers. Sembiring is a fruit specialized wholesaler resides and has his own packing house in Surabaya (off market). He also procure other fruit inter and intra island such as guava, star fruit and tangerine from Medan, pineapple from Subang, mangosteen from Tasik, Lampung, and Bogor.

However, a supplier who is not main suppliers of mango (as a mix) and supply in small amount to supermarket prefer to procure mango from the traditional wholesale markets to connect to inter and intra island traders. For example, Agus from CV Bagus Buah, main mango wholesaler at Kramatjati market said that demand for high quality mango (grade A Super) mainly come from a supermarket supplier (2-3 mango per kg) and the trend is increasing since supplier to supermarket is now double compare to 5 years ago. In the low season, almost all best quality of Harumanis both by the modern suppliers. Traders to traditional retailer mostly buy Grade BC or even D (smallest). Traditional market customers like to buy smaller size of mango so that has more piece of mango per kilogram (4-5 mango per kg). Additionally, he said that gedong gincu mango is starting to be popular and in high demand by the supplier especially in West Java since 3 years ago. He received regular supply of gedong gincu mango from his collector in Majalengka about 5-10 ton a week during the harvest season.

### **3. The Role of Processing Industry**

Mango in Indonesia mostly marketed as a fresh fruit. The role of processor in mango market is still very small compare to the total mango produced. However, the role of processor in West Java is already higher than in East Java (Table 21). In 2002, mango was only processed traditionally as home industry (3%). Mango puree (pulp) was founded in Cirebon in 2004, which processed mango into puree (pulp) for beverages industry. By 2007, the percentage of mango processed was jump to 14% creating higher value added. The processor supplies 60% of its production to Berri Juice (juice drink beverages company from Australia) and the

remaining 40% to Sunfresh, Indosweet and other companies located in Jakarta, Bandung, Bekasi, Purwokerto, and Solo.

Mango puree processor needs 1 ton of mango per day, from which the company produce 500 liters of puree. Mango variety needed for puree is Harumanis (Grade B-C), the off-grade quality of supermarket. Mango is procured by the processor from nearby collectors as much as 16 tons per month. For one season, the processor needs about 64 tons of mangoes. The processor usually buys more volume of mango during the peak season and puts it as stock in cold storage. Other than from collectors, the processor also secure the supply chain by working with a farmer group and giving them capital to purchase mango from members.

Ultra Jaya, Berri, Sunfresh, and Indosweet are processing companies in West Java that are not only process mango but also other fruits. In processing mango they mainly transform it into mango juice. These companies use mango puree as their main input which is procured from puree processors in Cirebon. Output volume of these companies tends to increase in the past five years, for instance, average output volume PT Ultra Jaya (the largest processing company) increase 14% in the past five years (14,096,000 liters). This condition shift derived demand for mango in farm gate upward. Processors buy half processed mango mainly from Cirebon. Products produced by processors in Bandung marketed to various supermarkets within Java Island.

#### **4. Production Restructuring**

East Java and West Java provinces play major role and contributing a total of 61% to the national mango production and becoming the most concentrated production zones, therefore those two provinces become the main focus of this study. The secondary data (from BPS) and field study indicate very consistent pattern that the production zone already responding to the growing mango demand and in the process of restructuring.

East Java province which contributes 45% to the national production in 2003, has been in production consolidation to become a more commercialized zone. Mango production in this province by 2003 mostly concentrated in Kabupaten Probolinggo and the remaining spread to all other kabupatens (district) with relatively very small shares (Table 12). From the Table 12, it is clearly indicated that in the last five years, the total production of East Java has been sharply declining to only 33% of the national production by the end of 2007, but now spread more equally to other district, where District of Kediri, Pasuruan, Tuban, and Gresik have quickly gained their share.

Table 14 shows how production consolidation has been happening in the area. In 2002, mango production in East Java mainly produced by small farmers (84%) who owned mango trees in their yard as a traditional custom, which grown mixed with other crops. The trees did not get enough production inputs and receive

intensive care. There were only 16% of medium and large farmers managing monoculture intensive garden who owned 21-200 trees and more than 200 trees respectively. In the last 5 years 16% of those small farmers in East Java lost their mango trees because they changed to other crops or sold their land. The whole Probolinggo area, which was the main mango production zone in East Java, had lost 2.8 million trees (61%) of mango (Table 6). Other problems that indentified from the key informants as the cause of production decline in the area were insect attack (white butterfly) and taifun. On the other hand, the medium and large farmers in East Java increase their numbers and production share driven by higher demand for better mango quality (Table 14).

The study show very interesting mango production expansion process, where consolidation of tree management is first, than land consolidation is the next. For example, Joko who is now considered medium mango farmer from Probolinggo, he used to be a construction worker in mid 90s. He got a 0.5 ha land with 30 mango trees from his father in law in 1999. Even though he has no prior training, He then started to educate himself to understand mango cultivation from other farmers. With proper input and maintenance he can get 600 kg per tree per season from 10-15 years old mango tree. Exited with his success, he then rent other farmer's mango tree, from 1 to 3 years. The rent cost is depending on the tree age, for example when the tree rent is paid cash in advanced rent cost could be around Rp 50.000-100.000 per tree per season for 5-7 years old tree.

Last year, Joko already rented 700 mango trees in 35 Ha of land, from about 25-30 tree owners spread in 2 sub districts. His total harvest was 350 ton with gross value worth about Rp 900 million. He sells the harvest to a wholesaler and also directly sends to a wholesaler market through agent. In a period of almost 10 year, he now own 7 ha of land, 2 ha for rice and 5 ha of mango. We here almost similar stories in the area of study, where mango farmer have an ability to expand production by renting trees then re-capitalized his own production by buying more land from the profit he gain from tree renting.

West Java province which contributes only 18% to the national mango production in 2003, it is now has share of 25% (Table 9). In five years, Kabupaten Kuningan, Majalengka, and Garut increased their production more than twice (Table 12). This high production increased partly may be induced by the Project of Integrated Horticulture Development in Upland Area (IHDUA) during 1998-2002 which was funded by OECF 477 LOAN and Japan Bank International. West Java was part of the mangoes development zone which focused in Kabupaten Indramayu, Cirebon, and Majalengka for development of Gedong Gincu variety production. Table 13 show that number of mango trees in West Java was increased by 3.5 million (87%), and most expanded area were Majalengka, Kuningan, and Garut.

The head of West Java Agricultural Office, Ir. Helmi Anwar argued that the number of additional mango tree planted during the IHDUA project is nothing compare to the number of tree already planted by farmers. However, the project had increased

farmer's confident on mango which now demonstrated to give real good income to the farmer. That what creates high waves of moving in to mango planting and creates second degree impact which a lot higher magnitude then what the project actually done physically.

West Java province has more equitable farm size distribution, which is contrast to East Java which was dominated by small farmers (Table 14). In 2002, even though West Java contributed only 18% to the national production, most of them produced by medium and large farmers which are already more market (commercially) oriented. With the increase of consumer's demand and local government intervention on new seed planting, number of farmers has been increased more than doubled in five years. Medium and large farmers in West Java contributed to 82% of the production share and have been the source of very rapid production growth.

The study also found farmer who change crop from mix fruit garden and rice land that attracted to mango because of its profit opportunity. For example, Abdullah from Majalengka, who got free seedling from IHDUA project, as much as 20 Gedong Gincu mango which he planted as side crop on his sawah rice land (1,5 ha). Now, he changed his rice land all into mango (Gedong Gincu) and also planted Harumanis mango on his dry land. He is now earn his income mainly from mango farming; he has 3 hectares of intensive mango garden with a population about 320 mango trees.

East Java is the highest production zone in the nation, in 2002 is already dominated by Harumanis mango (60%) which mostly favord by domestic consumption (Table 15). On the other hand, West Java produced mango already in composition for domestic and international market. Only 38% of mango produced in West Java is Harumanis, 28% is Gedong Gincu variety which has high potential for international market. Other types of mango, like Manalagi, Cengkir, Golek, Podang, and Kweni are produced in smaller percentages and only potential for local and domestic market (25% in east Java and 34% in West Java). In 2007, East Java and West Java production already shifted to more commercial variety such as Harumanis, become 75% in East Java and 48% in West Java. On the other hand, popular special variety such as Gedung Gincu is much more demanded and increased to 28% share in West Java.

The key informant interview again indicated that the variety fast expansion in West Java and East Java was partly by the tree contracting and other slower but long run expansion by new planting. For example, Andaya from Kuningan prefer to contract Harumanis and Gedong Gincu tree rather than other variety even though the rent is higher. For Gedong Gincu the rent could be as much as Rp 500,000 to 1,000,000 per tree per season, where other variety like manalagi could only Rp 200,000 per tree per season. By specializing in Harumanis and Gedong Gincu, Andaya now maintain 450 mango trees, 135 trees of Gedong Gincu and the remaining is Harumanis. Before, about 2 years ago, Andaya only have 150 trees

of Gedong Gincu and Harumanis and about 100 trees other kind of mangoes. He rented mango trees covering 3 sub-districts in Kuningan from about 21 owners. Andaya has 2 hectares of Gedong Gincu mango tree of his own.

Consistently, Table 23 describes where those mangoes are marketed geographically. Mango from East Java which in 2002 was mostly for domestic market and mainly within Java island (87%), has now moving toward supplying other island (23%) such as Sumatera and Kalimantan, outside the province within the island of Java (26%) most likely to Jakarta, Bandung, and other big cities in the Island of Java, and within the province (40%) mostly goes to Surabaya. In 2007, there was even mango exported to Singapore, China, and Middle East though still very small compare to the mango production.

Table 23 basically a projection of production based on market geographical destination from the two provinces based on the interview with key informants at the production zones. When the information was combined with the info from key informant from consumption zone, the projection was describe in Table 8. The table is a comprehensive distribution of mango volume traded in Java Island, it's one of the kind map that never available before for mango or any fruit marketing in Indonesia.

Farmer in East Java mostly sold their mango on the tree while green (Table 20). The key informant' interviewed said that farmer like to sell on the tree since it always paid cash in advanced (before harvest). Doing that, farmer transferred the risk involved before harvest to a trader, could be a collector or wholesaler. This practice is mostly done by a small farmer for the mango tree on the yard which acts like a household saving. After planting and fruiting (4 years), the farmer withdraws cash every year without hassled (by selling on the tree). There was no change on the selling practice in the last five years (78% in 2002 and 72% in 2007), even though the production zone in East Java is undergoing a consolidation process.

Large number of farmers in West Java traditionally also sells a mango to a trader on the tree while green (56% in 2002 and 71% in 2007). With the increasing number of mango farmers, number of farmers who sell mango after harvest is also increasing. However, in percentage, there's still more farmers who sell on the tree attracted by an easy cash advantage. It seems that selling mango on the tree will remain popular as long as farmer considers income from mango as not too important part of his household income. The preference will change when farmer already thinking to get more profit from his mango tree and focus on value adding activity.

From interview with key informant farmers we understand that collectors play very dominant role in buying and collecting mango from many small farmers in the production zones (Tables 22). Its role in East Java was declining since some of small backyard mango farmers has lose their land, change to other crop or already contracted their tree to a sprayer trader. In West Java, since small farmer was

growing, the role of collector also getting more important. Thus, generally, collectors in both areas still considered as the main buyer for farmer's mango. Collector sells to a wholesaler, supermarket supplier, local retail market, or a processor. In declining trend of mango production in East Java, what was growing only the quantity of mango sold to supermarket supplier (38 thousand tons). Additionally, in East Java there was an emerging trend of direct selling from farmer groups to a processor (456 tons) and exporter (7 tons) in 2007. Similarly also happen in West Java, but only on export channel (6 thousand tons). The procurement to processor was done through local collectors.

Most small mango farmers like to work individually rather than joining a coop or working in a group. Table 19 clearly describes that condition in the last five years, both in East Java and West Java. Even though the trend was increasing, but it changes very slowly. In East Java, farmers joining coop or farmer group was increased from 36.7 thousand farmers (8%) in 2002 to 48.5 thousand farmers (11%) in 2007. Similarly, in West Java, mango farmers working in a group or joining a coop was increased from 26 thousand farmers (27%) to 83.8 thousand farmers (33%).

## **5. Technological Change and The Role of Sprayer Trader**

Rapid growth of domestic mango demand will not be able to be responded as fast as we can see in Indonesia (Table 9, 10 and 12) without a unique role of a tree contractor whom we generally called a *sprayer trader* who is not only integrate contracted mango trees under one efficient manager but also apply technology that increase production very rapidly in relatively short period of time, without a need to plant a new tree and wait for fruiting. Thus, the sprayer trader practice can be classified as institutional and technological innovations.

Sprayer trader (ST) basically integrates mango three production processes with different ownership (rented tree) with marketing arrangement. There are 3 renting systems that generally used: full cash payment in advanced called "gadai" system, partial payment in several installments or paid full after harvest called "contract system", and crop sharing system. Tree renting partnership also includes the right to market the harvest by those who managed production (act as a trader for the harvest). What makes an ST found in East Java and West Java unique compare to a common tree renting contract is the technology application by the that enables tto double mango tree production.

ST actually uses a simple technology to improve mango production, but requires experienced operators. Hudaya, an ST from Majalengka rented 150 trees from 20 backyard farmers in the area. To maintain the tree, he has 2 set of manual power sprayers, 2 pieces of ladder, water house (20 meters), 6 pieces of porog (harvester), 50 baskets, ropes (40 meters), 4 buckets, 1 push cart, and 1 motor cycle. With those equipments, ST fertilized the tree and applies growth hormone

and sticker. Hormone is use to induce flowering, and sticker is use to hold pesticides, and to hold flower so becomes fruit bud.

For overall areas, Table 18 describes an estimate of mango farmers who managed production through sprayer traders and those who managed own trees. Production marketing integration practice has begun to appear in East Java (1%) and none in West Java in 2002. It was most likely small farmers who participated in the integrated production arrangement since they were lack of technology as well as capital to buy chemical inputs. Even though the mango production in East Java was declining in 2007, integrated production management by marketers was increasing (6%).

With the use of growth hormones and some physical treatment, farmers in Pemalang, Central Java, have been able to induce flowering and harvest earlier from the mango season (off-season mango). The off season mango treatment is now spreading very quickly to East Java and West Java production zones. Table 17 describes production volume based on the modern input usage intensity. Five years ago (2002), even though East Java produced the highest quantity of mango (832 thousand tons) in Indonesia, 75% of them were produced without modern inputs. Hence, the production was not sustainable since high volume of low quality product pushed the price at the production zones to the very low. Farmers lose their incentives to continue growing mango. In West Java the arrangement just appeared in 2007 with off-season mango wide spread to the production zones.

Water is needed during chemical application. Thus a water reserve or irrigation is an important factor in assuring good quality mango production. Despite East Java large contribution to the national mango production, there is still very small percentage of farmers have water reserved and surprisingly, very small improvement in the last five years (Table 16). In 2002, only 8% of mango farmers in East Java have an irrigation system. It was increased to 10% in 2007. In contrast, in 2002, 25% of mango farmers in West Java already have water reserve system. By 2007, already 45% of farmers in West Java have water reserve. The level of investment made by farmers in West Java described their concerned on the production quality, since it has been oriented more toward modern market and export of fresh fruit.

The production of mango in East Java was dropped by almost 30% in 2007, mostly from the production of non-intensive low quality mango (55%). More commercial mango farming operation improved their modern inputs and increased their production (25% fertilizer only and 7% fertilizer and insecticides plus used of hormones). On the other hand, West Java with higher percentages of more commercialized mango farm operations intensified their modern input usage. In 2002, already 47% of production coming from intensive operation, including 18% already used growth hormones. In 2007, only 33% of production coming from non-intensive farming (no input), the remaining was the production of already intensified farming, including 35% of very intensive operation. Description above

illustrates that only few farmers have the technology to produce good quality mango, especially outside the season (off-season mango).

## **6. Conclusion**

Recent decentralized economic growths in Indonesia have induced rapid urban population and accelerate an increase in domestic demand for fruit and vegetables. Demand increase not only in term of quantity, but also in term of better quality. The study noted that consumption of fruit has been shifting from cheap all year round fruit like banana, to seasonal fruit like mango or mangosteen and new kind of fruit like apple and melon.

Wholesale market still plays important role in channeling high surge demand for mango to the production zones. Now demand for mango not only coming from large urban area in Java Island but also from Sumatera and Kalimantan. Domestic demand for high quality mango such as harumanis is exponentially growing, and demand for special quality mango such as Gedong Gincu from West Java is also increasing tremendously. Demand for high quality mango especially coming from modern retail market. There has been a trend that modern channel preferred a specialized procurement system that directly sourced to production zones which guarantee for quality and its freshness.

On the other hand, responding to the growing demand, mango production zone is also under major restructuring toward more commercial operation. National production of mango has been increasing by 5% annually in the last five years. East Java stills the largest production zone though the trend is declining. West Java and Central Java is on its production expansion. Further, mango production is now also spread to other island and start entering Java market during off season. This is clearly an indication exciting new growth of intra island trade. In parallel, mango production going through modern channel has been continually increasing.

Despite of high rate of the production growth, export level of mango from Indonesia has been in consistent. Level of export has been very small percentage, less than 1% of the production and it is unstable. The export section is clearly not part of the drivers of dynamic growth of mango market in Indonesia. It is the growing domestic demand that truly highly potential market which have induced dynamic production growth in Indonesia.

The study also found institutional and technological innovations through a “sprayer trader” (ST) operation that facilitates exponential growth of mango production in Indonesia in such very short period. ST whose vertically integrate production by mango tree renting and marketing, also introduce more intensive production technology that can doubled the level of production compare to the conventional one. It is interesting to analyze further the ST behavior on market coordination and technology investment on the next phase of the study.

Table 1. Number of Key Informants Interviewed for Mango Value Chain

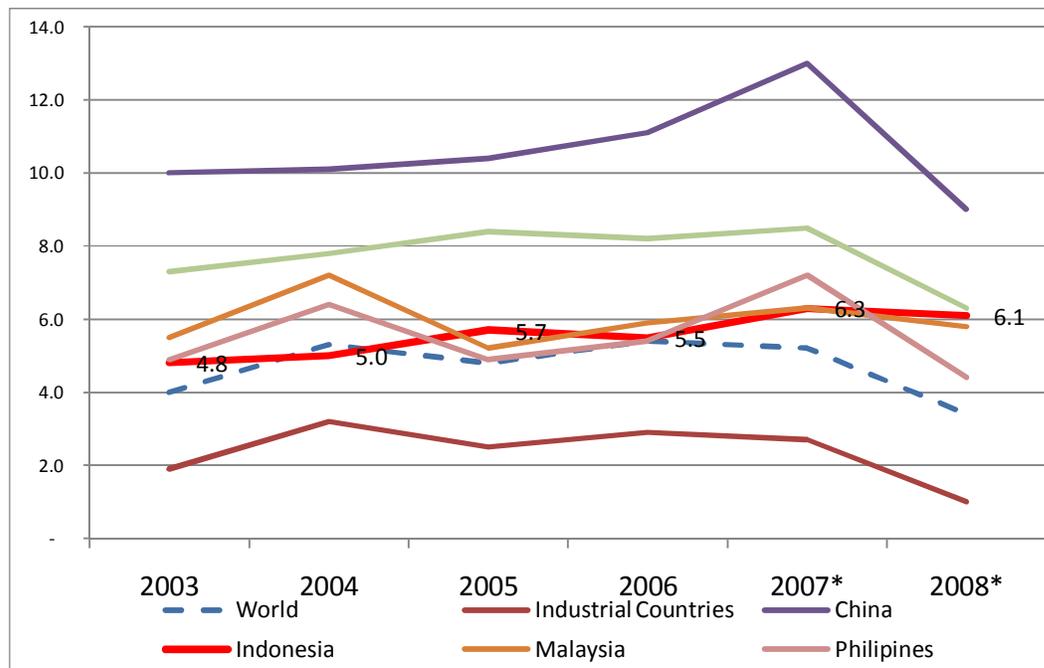
No.	Value Chain Actor	West Java	East Java	Total
<b>Production Area</b>				
1	Input Supplier	5	6	11
2	Farmer	5	9	14
3	Brokers	1	1	2
4	Transporter	3	2	5
5	Rural Processor	5	4	9
6	Wholesale Market (on market)	6	1	7
7	Off Market Wholesaler	10	6	16
<b>Consumption Area</b>				
8	Wholesale Market (on market)	5	8	13
9	Off Market Wholesaler	7	3	10
10	Modern End User	2	3	5
11	Traditional End User	7	8	15
12	Transporter	4	2	6
	<b>TOTAL</b>	<b>59</b>	<b>52</b>	<b>113</b>

Tabel 2. Complete List of Field Researchers and Key Informant Interviewed

No	VC Actor	West Java			East Java			Total #KI
		Field Researcher	Key Informant		Field Researcher	Key Informant		
			#KI	Name of KI		#KI	Name of KI	
<b>A</b>	<b>Mango Production Zone</b>							
1	Input Supplier	Ate, Zumi	5	Tatang Suhedi(Certified), Yosi (Certified),oman (non Certified), anang ( Certiied), Citra niaga (Certified)	Dea, Ais	6	Jiman (Small), Sriwijaya (Large), Supriyadi (Certified), mustajib (Small), UD tunas Arifin jaya (Certified), toko/kios Pertanian (Small)	11
2	Farmer	Ate, Zumi	5	Anda (Non Intensive), Haerudin (Intensive Large n Supplier/Farmer group), Abdullah (Intensive small), Ir H dodi (Intensive Large),klpk tani mekar jaya (Intensive Large)	Dea, Ais	9	Sunarmo (Non Intensive), Abdurrahman (Non Intensive),Sata Harum(intensive Large), Jemu Intensive small), Kardi (intensive Small), Marjan (Intensive Small), Suli(Intensive Small), Solihin (Non Intensive), Slamet (Non Intensive)	14
3	Broker	Ate, Zumi	1	Ading	Dea, Ais	1	Ada	2
4	Transporter	Ate, Zumi	3	Olis Nurjanah (Small n Specialized), Sutarsa (Small n Non Specialized) Surata (Small n Non Specialised)	Dea, Ais	2	Rahman (Large non Specialized n Rural Wholesaler), Edi M (Small Non Specialized)	5
5	Processor	Ate, Zumi	5	Popon (small), CV Promindo (Large), Tabrani (Large) , Andrawati (small), Opik (Large)	Dea, Ais	4	Rudi (Small), KT Sumber Mulya (Small), Mulya Kurniawan (Large), Lidya Maksindo (large)	9
6	Wholesale Market (on market)	Ate, Zumi	6	Rosidin (Small take possession), Ajud (Large no possession), Jeje (Large take possession), yudi (Large no posesssion), Rudi (large take possession), Taswen (small take possession )	Dea, Ais	1	Toto Tanjung (Large take possession)	7

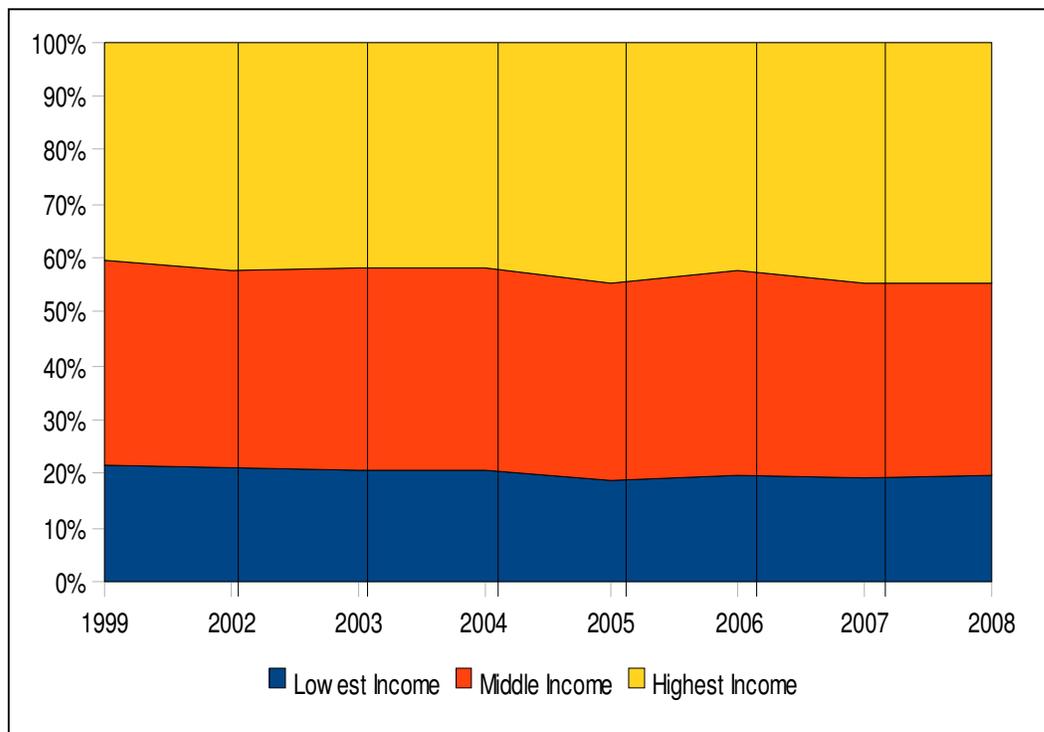
No	VC Actor	West Java			East Java			Total #KI
		Field Researcher	Key Informant		Field Researcher	Key Informant		
			#KI	Name of KI		#KI	Name of KI	
7	Off Market Wholesaler	Ate, Zumi.	10	Eye Asida (suplier eksportir), Sahril Sidik (supplier eksportir), Darka (colector), Raska (colector), Sebon (colector), Ento (rural Wholesaler Large), Usmadi (retailer), Abd Rohim (Rural Wholesaler-Large), Hasanudin (Spesialised-large), Momo (Rural Wholesaler Small)	Dea, Ais, Haris	6	Kadir (colector), Siram (Colector), Parno (Rural wholesaler large), Herman (Rural Wholesaler-Small), Tukul (Rural wholesaler-inter island), Trigatra Rajasa (Supplier).	16
<b>B</b>	<b>Consumption Zone</b>							
8	Wholesale Market (on market)	Ais, Adi, Ronnie	5	UD.Jembar Sari, UD Ibrahim (take possion -Inter Island), Sutrisna (Take possion-Inter Island), H.Asrori, Iman (Intra Island)	Haris, Ais, Ronnie	8	Ahsan, Made, Ahmad, Rusdi, Khudori (take possession -Intra and Inter Island), Mat Tarip, Rundu (take possiesion-Inter island)	13
9	Off Market Wholesaler n Exporter	Ais, Adi, Ronnie	7	Bimandiri, Rahmat, Masari Multifruti ((Tara), Agus, Taufik, Musrikhin, Farid	Haris, Ais, Ronnie	3	Lili, CV Momenta, Sembiring	10
10	Modern End Retailer	Ais, Adi, Ronnie	2	Carrefour (Endang Sumirat), Total Buah (Ade)	Haris, Ais, Ronnie	3	Carrefour (Roland, Sartono), Toko buah Hoki	5
11	Traditional Retailer	Ais, Adi	7	Ata, Iyem, Pa Haji, Udin, Ujang, Asep, Rachmat	Haris	8	Pasar peneleh: Darma, Wangsa, Tardi, : Fariq, Abdul, Hafid, Kedungdoro: Azis, Petean: Achmad	15
12	Transporter	Ais, Adi	4	Rohim, Hasan, Amir, Ade	Haris	2	Sarman, Nico	6
		<b>Sub Total</b>	<b>60</b>		<b>Sub Total</b>	<b>53</b>	<b>Total #KI</b>	<b>113</b>

Figure 1. Indonesian Economic Growth 2003-2008



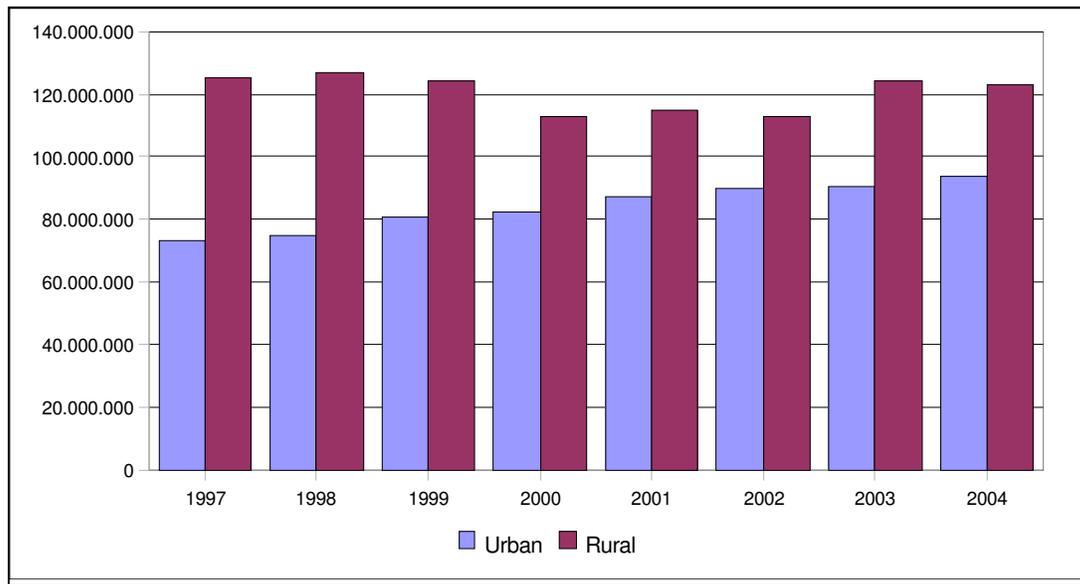
Source: World Bank, 2009

Figure 2. Income Distribution 1999-2008



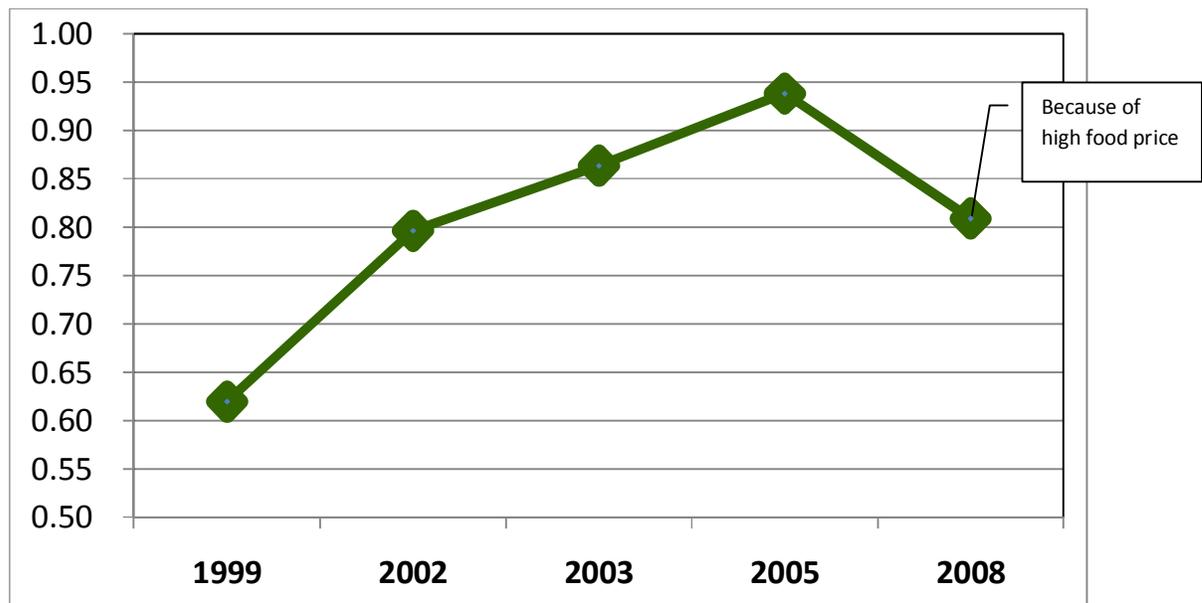
Source: BPS, 2009

Figure 3. Rural and Urban Population in Indonesia



Source: BPS, 2006

Figure 4. Ratio of Urban Expenditure on Fruit and Vegetable compare to Cereal



Source: BPS, 2009

Table 3. Population Growth of Urban and Rural 2000-2006

Provinsi	2000		2006		Annual Growth	
	Urban	Rural	Urban	Rural	Urban	Rural
North Sumatera	4.964.357	6.678.131	5.604.996	6.906.324	2,15%	0,57%
West Sumatera	1.229.095	3.019.420	1.598.922	2.986.949	5,01%	-0,18%
Riau	1.351.695	2.556.068	1.550.169	3.705.986	2,45%	7,50%
Jambi	681.709	1.725.457	896.416	1.808.125	5,25%	0,80%
South Sumatera	2.098.008	4.112.792	2.899.764	4.681.552	6,37%	2,30%
Bengkulu	412.343	1.043.157	761.688	1.142.443	14,12%	1,59%
Lampung	1.429.612	5.301.139	1.854.988	5.366.744	4,96%	0,21%
Bangka Belitung Islands	387.346	512.622	494.132	558.376	4,59%	1,49%
<b>Island of Sumatera</b>					<b>5,61%</b>	<b>1,78%</b>
DKI Jakarta	8.361.079	-	8.695.165	-	0,67%	-
West Java	17.972.791	17.751.302	22.701.049	16.970.120	4,38%	-0,73%
Central Java	12.548.627	18.674.631	15.545.263	17.328.696	3,98%	-1,20%
DI Yogyakarta	1.798.970	1.322.075	2.246.228	1.195.194	4,14%	-1,60%
East Java	14.212.338	20.553.655	17.625.032	19.008.175	4,00%	-1,25%
Banten	4.224.871	3.873.406	5.907.601	3.672.967	6,64%	-0,86%
<b>Island of Java</b>					<b>3,97%</b>	<b>-1,13%</b>
Bali	1.566.838	1.583.219	2.101.930	1.316.610	5,69%	-2,81%
West Nusa Tenggara	1.406.217	2.602.384	1.978.792	2.453.324	6,79%	-0,95%
East Nusa Tenggara	591.060	3.232.094	913.734	3.425.949	9,10%	1,00%
<b>Island of Bali and NTT</b>					<b>7,19%</b>	<b>-0,92%</b>
West Kalimantan	1.060.317	2.956.036	1.065.097	3.427.102	0,08%	2,66%
Central Kalimantan	522.130	1.333.343	673.345	1.474.853	4,83%	1,77%
South Kalimantan	1.080.516	1.903.510	1.396.567	1.956.764	4,88%	0,47%
East Kalimantan	1.415.969	1.035.926	1.644.925	1.236.268	2,69%	3,22%
<b>Island of Kalimantan</b>					<b>3,12%</b>	<b>2,03%</b>
South Sulawesi Utara	733.520	1.267.352	999.153	1.261.611	6,04%	-0,08%
Central Sulawesi	431.282	1.744.711	473.545	1.990.644	1,63%	2,35%
South Sulawesi	2.224.354	4.934.816	2.654.258	6.298.888	3,22%	4,61%
South East Sulawesi	382.462	1.437.917	461.230	1.659.335	3,43%	2,57%
Gorontalo	<b>212.875</b>	<b>620.621</b>	291.133	651.742	6,13%	0,84%
<b>Island of Sulawesi</b>					<b>4,09%</b>	<b>2,06%</b>
<b>INDONESIA</b>	86.442.818	118.689.640	<b>103.035.120</b>	<b>112.484.736</b>	<b>3,20%</b>	<b>-0,87%</b>

Source : BPS and estimate of urban and rural pop growth rate

Table 4. Population Growth of the Largest City in Indonesia

City	Population				Annual Growth
	1995	2000	2005	2008	
Jakarta	8.259.165	8.385.639	8.699.600	8.872.900	0,6%
Bogor	3.286.312	3.489.746	4.100.934	4.415.195	2,6%
Tangerang	2.581.428	2.810.972	3.219.754	3.574.048	3,0%
Surabaya	2.196.784	2.436.789	2.698.972	2.801.562	2,1%
Bandung	1.814.979	2.139.630	2.315.895	2.311.740	2,1%
Medan	1.890.278	1.904.273	2.021.962	2.270.915	1,5%
Palembang	1.097.521	1.201.672	1.338.793	1.500.872	2,8%
Makasar	1.027.785	1.109.765	1.193.451	1.378.420	2,6%

Source: BPS, 2009

Table 5. Per Capita Consumption of Some Important Fruits

Fruit	Year (kg/capita)						Annual Increase (%)
	1987	1990	1993	1996	1999	2003	
Banana	12,95	13,83	12,58	9,05	8,27	7,96	-3%
Rambutan	2,96	4,78	3,48	2,44	1,98	5,72	11%
Mangoes	0,99	0,42	0,52	2,13	2,60	3,12	20%
Oranges	0,73	0,88	0,94	1,30	1,20	2,44	10%
Melon	0,10	0,31	0,47	0,78	0,47	1,56	32%
Pineapples	0,99	1,09	1,04	0,94	0,68	1,56	6%
Salacca	0,31	0,42	0,62	1,20	0,73	1,04	11%
Durian	1,46	1,25	0,52	0,52	0,16	0,73	13%
Apple	0,10	0,10	0,21	0,68	0,16	0,52	30%
Other fruits	6,70	6,86	5,62	5,47	2,40	5,06	2%
Total	27,29	29,94	26,00	24,51	18,65	29,71	13%

Source: Susenas, BPS various years

Table 6. Fruit Traders Distribution at the Wholesale Market in Jakarta and West Java

Block Location	Number of Wholesaler	Mango Specialized	Mix Mango				Non manggo	
			Large	Medium	Small	Total		
<b>Kramatjati (PIKJ)</b>								
A	99	12	6	5	31	42	45	
B	97	6	8	9	35	52	39	
C	98	8	6	8	34	48	42	
D	96	18	4	5	35	44	34	
<b>Total</b>	<b>390</b>	44	24	27	135	186	160	
Share		11%					48%	41%
<b>Cibitung Bekasi</b>								
A6	29	8	0	1	3	4	17	
A7	27	6	0	2	4	6	15	
A8	28	6	2	0	5	7	15	
B6	26	2	2	2	3	7	17	
B7	26	4	1	2	4	7	15	
B8	28	5	0	2	2	4	19	
Inpres	27	3	0	0	0	0	24	
<b>Total</b>	<b>191</b>	34	5	9	21	35	122	
Share		18%					18%	64%
<b>Tanah Tinggi Tangerang</b>								
C	93	15	0	24	15	39	39	
Ruko	22	18	0	0	0	0	4	
<b>Total</b>	<b>115</b>	33	0	24	15	39	43	
Share		29%					34%	37%
<b>Caringin Bandung</b>								
B	20	17	0	2	0	2	1	
D	48	8	0	1	0	1	39	
E4	29	0	0	0	2	2	27	
E5	26	0	4	3	2	9	17	
E6	23	6	3	0	4	7	10	
E7	20	2	0	5	1	6	12	
E8	18	1	0	1	5	6	11	
E9	16	8	0	1	2	3	5	
E10	7	2	0	0	1	1	4	
<b>Total</b>	<b>207</b>	44	7	13	17	37	126	
Share		21%					18%	61%

Source: Direct census and interview with key informants at each market location, 2008-2009

Table 7. Fruit Trader Distribution at the Street Wholesale Market in Surabaya Area

Location	Number of Wholesaler	Mango Specialized	Mix Mango				Non manggo
			Large	Medium	Small	Total	
<b>Surabaya City</b>							
Peneleh	38	15	3	0	0	3	20
Widodaren	32	0	5	12	15	32	0
Petean	95	0	0	42	53	95	0
Koblen	26	10	0	0	0	0	16
Penggirian	9	0	9	0	0	9	0
Semarang	27	5	0	0	0	0	22
Cepu	25	7	0	0	0	0	18
<b>Total</b>	<b>252</b>	<b>37</b>	<b>17</b>	<b>54</b>	<b>68</b>	<b>139</b>	<b>76</b>
Share		15%				55%	30%
<b>Malang Area</b>							
Induk Gadang	32	6	0	6	8	14	12
Pasar Batu	14	7	0	2	0	2	5
Mangga kulon	17	0	7	10	0	17	0
<b>Total</b>	<b>63</b>	<b>13</b>	<b>7</b>	<b>18</b>	<b>8</b>	<b>33</b>	<b>17</b>
Share		21%				52%	27%

Source: Direct census and interview with key informants at each market location, 2009

Table 8. Wholesale Market Volume Shares in the Island of Java, based on Mango Production in 2008

Source/ Production Zone	Unit	Wholesale Market in West Java, Banten, and Jakarta					Wholesale Market in East Java			Modern Retail <sup>1)</sup>	Intra Island Trade <sup>1)</sup> (out flow)	Inter Island Trade in Java Outside Wholesale Markets <sup>2)</sup>	Total Product Volume Traded in Java
		Kramat Jati	Cibitung	Tanah Tinggi	Caringin	Others	Surabaya	Malang	Others				
West Java	Ton	9.608	5.625	2.993	8.946	279.769	-	-	-	46.994	53.708	67.135	474.777
	%	2,0%	1,2%	0,6%	1,9%	58,9%	-	-	-	9,9%	11,3%	14,1%	100,0%
Central Java	Ton	11.529	4.688	855	3.834	-	-	-	-	69.762	85.336	172.804	348.808
	%	3,3%	1,3%	0,2%	1,1%	-	-	-	-	20,0%	24,5%	49,5%	100,0%
East Java	Ton	15.372	6.563	3.848	12.780	-	25.593	13.680	312.660	106.179	163.730	31.500	691.904
	%	2,2%	0,9%	0,6%	1,8%	-	3,7%	2,0%	45,2%	15,3%	23,7%	4,6%	100,0%
From Outside Java (in flow)	Ton	1.922	1.875	855	-	-	1.347	-	-	-	-	-	5.999
	%	32,0%	31,3%	14,3%	-	-	22,5%	-	-	-	-	-	100,0%
<b>Total</b>	Ton	<b>38.430</b>	<b>18.750</b>	<b>8.550</b>	<b>25.560</b>	<b>279.769</b>	<b>26.940</b>	<b>13.680</b>	<b>312.660</b>	<b>222.935</b>	<b>302.774</b>	<b>271.439</b>	<b>1.521.487</b>
	%	2,5%	1,2%	0,6%	1,7%	18,4%	1,8%	0,9%	20,5%	14,7%	19,9%	17,8%	100,0%

Source: BPS, 2009. The table is calculated using a projection of share (percentages) inflow and outflow from each wholesale market based on observation and interview with wholesalers and triangulation with officials at each wholesale market. and production based on BPS 2009 and result of interview with key informant from production zones in the study. Note: <sup>1)</sup> Estimated amount of transaction directly at the production zones, inclusive procurement at the wholesale markets; <sup>2)</sup> Including export, directly send from production zones

Table 9. Mango Production in Indonesia by Province (2003-2007)

PROVINCE	Production (Ton)					Average	Annual Increase (%)
	2003	2004	2005	2006	2007		
South Sulawesi	32.608	50.929	55.904	46.874	96.198	56.503	49%
West Nusa Tenggara	39.010	50.376	66.012	68.869	103.015	65.456	41%
Nanggro Aceh Darussalam	11.701	12.796	12.911	32.677	25.347	19.086	29%
East Nusa Tenggara	33.429	27.383	21.337	42.066	60.275	36.898	20%
West Java	279.197	271.297	271.158	371.800	447.565	328.203	15%
North Sumatera	24.950	13.567	13.293	31.473	34.349	23.526	9%
Central Java	195.046	247.292	193.687	206.672	263.507	221.241	9%
DI Yogyakarta	28.242	32.193	26.332	29.364	33.006	29.827	4%
Lampung	17.618	16.556	11.682	16.971	17.140	15.993	-1%
Others	70.160	56.207	60.267	63.670	64.138	62.888	-2%
East Java	688.272	553.086	604.952	627.911	593.824	613.609	-3%
Bali	55.980	54.179	45.613	45.759	47.828	49.872	-4%
North Sulawesi	16.780	14.029	13.542	12.123	12.989	13.893	-6%
Banten	17.662	18.031	10.605	14.405	12.020	14.545	-8%
South Sumatera	15.819	10.523	5.589	11.363	7.418	10.142	-13%
INDONESIA	1.526.474	1.401.061	1.412.884	1.621.997	1.818.619	1.556.207	5%
Growth (%)		-8%	1%	15%	12%	5%	

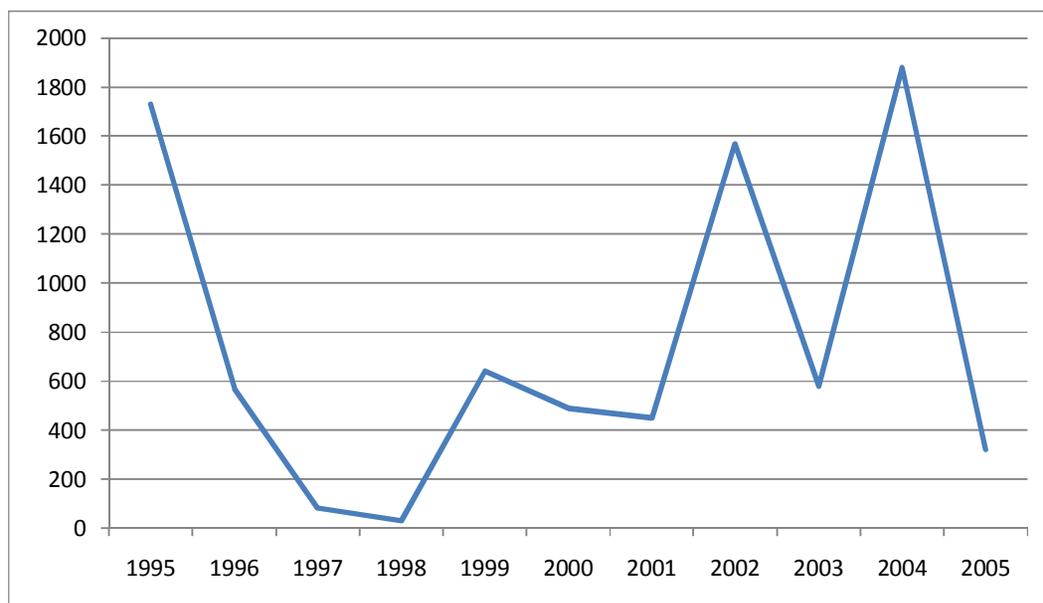
Source: BPS, 2008

Table 10. Mango Production, Modern Retail Chain, and Export (Tons)

Variable	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Production	888.960	782.937	1.087.692	600.059	827.066	876.027	923.294	1.402.906	1.526.474	1.401.061	1.412.884	1.621.997	1.818.619
Growth (%)		-11,9%	38,9%	-44,8%	37,8%	5,9%	5,4%	51,9%	8,8%	-8,2%	0,8%	14,8%	12,1%
Export	1.730	570	80	30	640	490	450	1.570	580	1.880	320	na	na
	0,19%	0,07%	0,01%	0,00%	0,08%	0,06%	0,05%	0,11%	0,04%	0,13%	0,02%		
Modern Retail	50.671	48.542	78.314	67.819	91.107	112.642	136.082	254.921	283.715	270.125	300.520	351.860	429.740
	5,7%	6,2%	7,2%	11,3%	11,0%	12,9%	14,7%	18,2%	18,6%	19,3%	21,3%	21,7%	23,6%

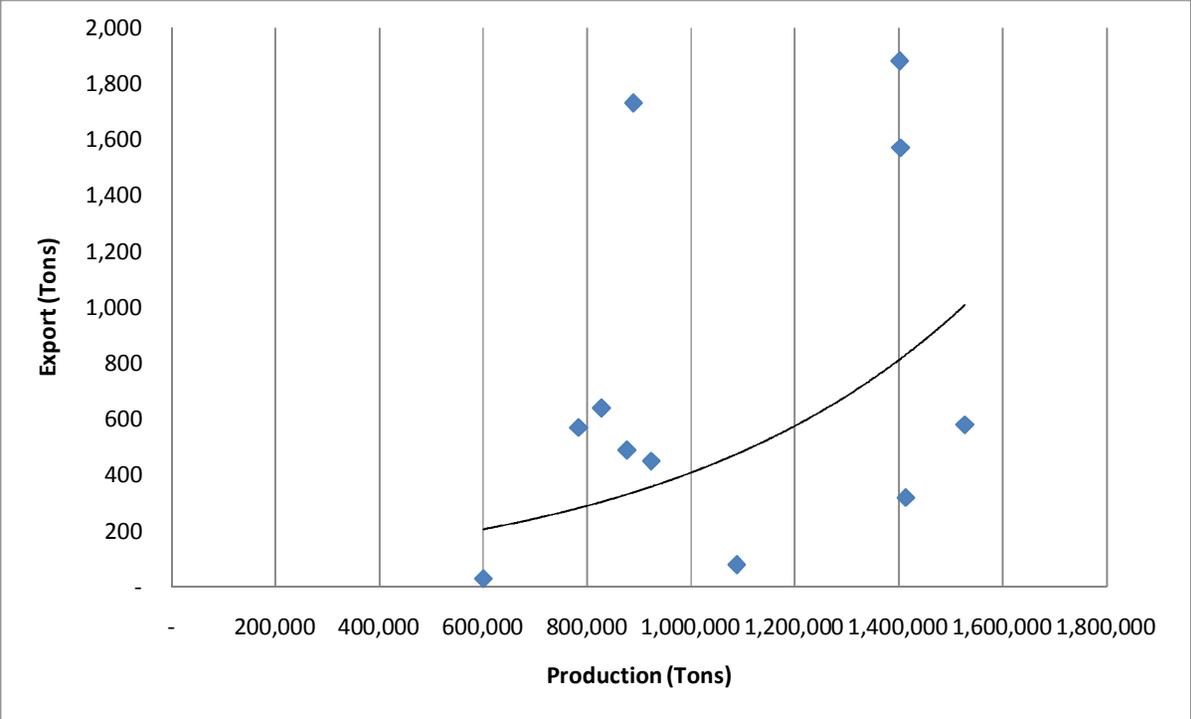
Source: Ministry of Agriculture (Production and Export), various years, Volume of mango going to modern retail channel was estimated based on interview with the suppliers

Figure 4. Mango Export of Indonesia (1995-2005)



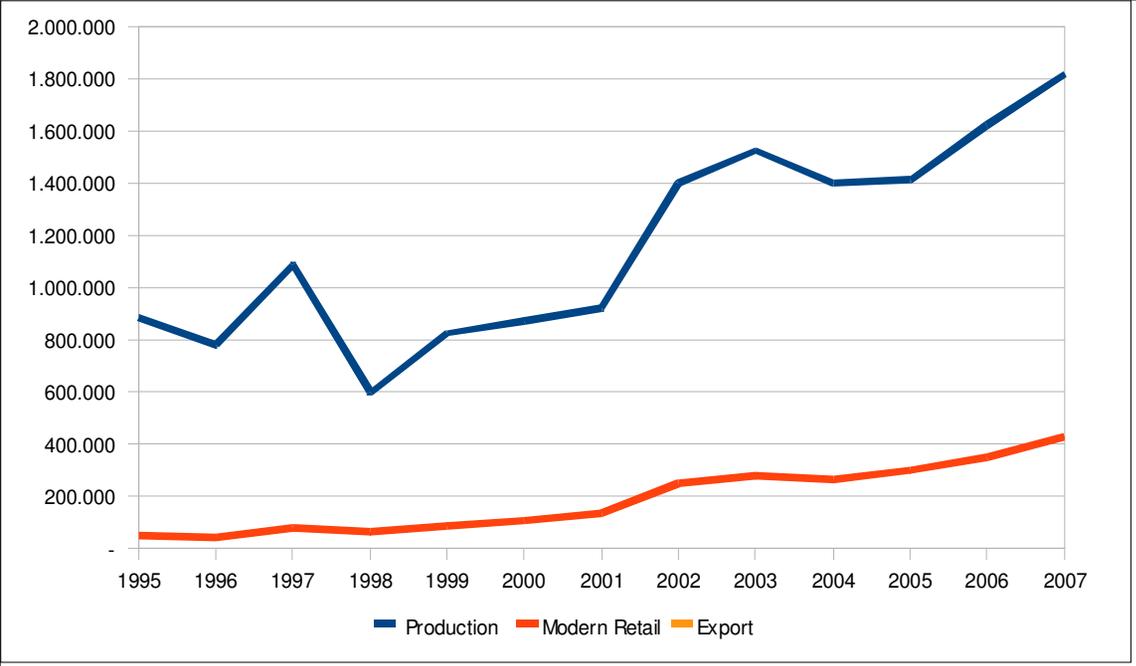
Source: MOA

Figure 5. Mango Production and Export



Source: BPS, analyzed

Figure 6. Mango Production, Modern Retail, and Export



Source: BPS

Figure 7. Map of Mango Production in West Java

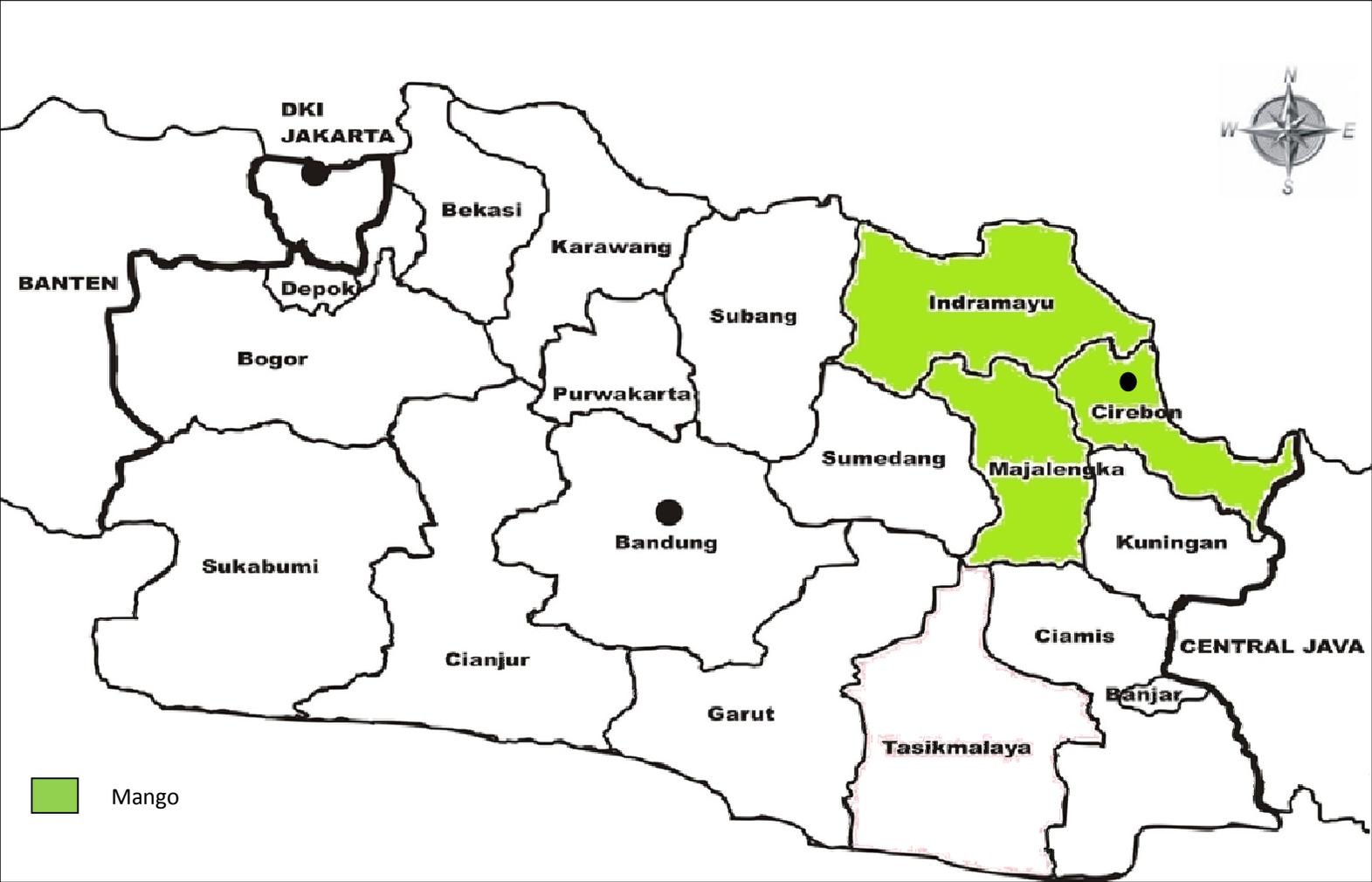
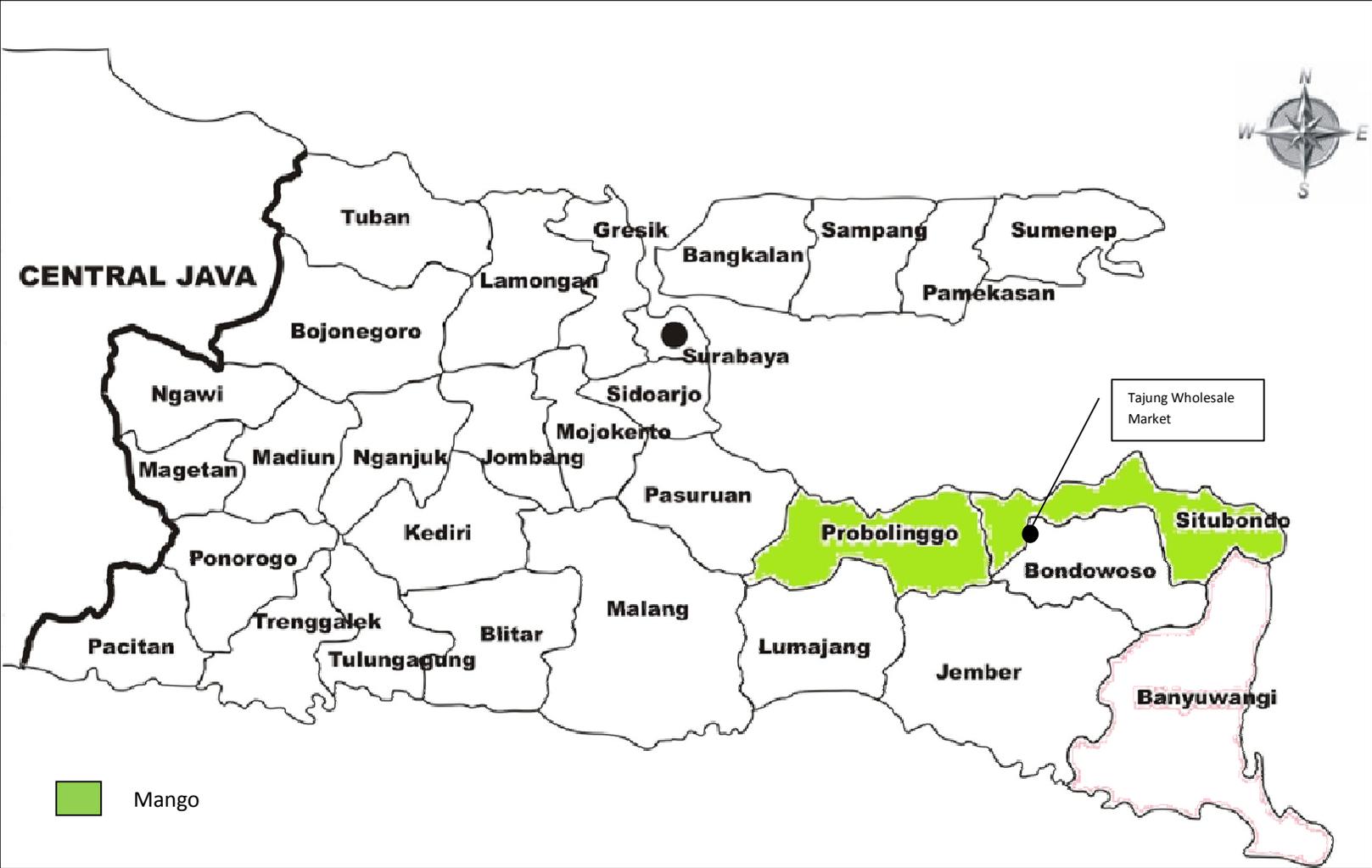


Figure 8. Map of Mango Production in East Java



**Table 11. Retail Industry Structure in Indonesia**

<b>Store Format</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>Annual Growth (%)</b>
Hypermarket	83	105	121	23%
Warehouse Club	24	26	26	4%
Supermarket	1,141	1,311	1,379	10%
Minimarket	6,465	7,356	8,889	19%
Convenience Store	115	120	148	14%
Traditional Retail Market	1,787,897	1,846,752	1,900,332	3%

Source: ACNielsen, 2008

**Table 12. Mango Production of West Java and East Java Provinces**

Prov/Kab	2002		2007		Increase/Decrease	
	Ton	Percent	Ton	Percent	Ton	Percent
<b>West Java</b>						
Indramayu	30,241	16%	49,935	11%	19,694	65%
Majalengka	35,618	18%	89,681	20%	54,063	152%
Cirebon	28,426	15%	49,593	11%	21,167	74%
Kuningan	20,542	11%	94,476	21%	73,934	360%
Garut	33,544	17%	70,063	16%	36,519	109%
Others	44,390	23%	93,818	21%	49,428	111%
Total	192,761	100%	447,565	100%	254,804	132%
<b>East Java</b>						
Kediri	78,855	9%	83,443	14%	4,588	6%
Probolinggo	253,955	31%	91,000	15%	(162,955)	-64%
Pasuruan	30,884	4%	57,242	10%	26,358	85%
Tuban	14,754	2%	50,483	9%	35,729	242%
Gresik	7,041	1%	45,763	8%	38,722	550%
Others	446,736	54%	265,893	45%	(180,843)	-40%
Total	832,225	100%	593,824	100%	(238,401)	-29%

Source: BPS, 2004, 2008; Dinas Pertanian of West Java and East Java, 2008

**Table 13. Number of Mango Trees at the Production Zone**

Province/Kabupaten	2002		2007		Increase/Decrease	
	#Trees	Percent	#Trees	Percent	#Trees	Percent
<b>West Java</b>						
Indramayu	902,565	22%	850,242	11%	(52,323)	-6%
Majalengka	423,645	10%	1,527,010	20%	1,103,365	260%
Cirebon	675,715	17%	844,415	11%	168,700	25%
Kuningan	446,800	11%	1,608,648	21%	1,161,848	260%
Garut	308,820	8%	1,192,961	16%	884,141	286%
Others	1,315,328	32%	1,597,451	21%	282,123	21%
<b>Total</b>	<b>4,072,873</b>	<b>100%</b>	<b>7,620,727</b>	<b>100%</b>	<b>3,547,854</b>	<b>87%</b>
<b>East Java</b>						
Kediri	1,467,413	9%	1,707,798	14%	240,385	16%
Probolinggo	4,725,851	31%	1,862,464	15%	(2,863,386)	-61%
Pasuruan	573,976	4%	1,171,551	10%	597,575	104%
Tuban	274,557	2%	1,033,217	9%	758,660	276%
Gresik	131,026	1%	936,615	8%	805,589	615%
Other	8,313,314	54%	5,441,936	45%	(2,871,377)	-35%
<b>Total</b>	<b>15,486,137</b>	<b>100%</b>	<b>12,153,582</b>	<b>100%</b>	<b>(3,332,555)</b>	<b>-22%</b>

Source: BPS, 2004, 2008. The table was calculated using production data from 2004 and 2008 divided by an average mango production per tree.

**Table 14. Number of Mango Producers by Farm Size**

Province/Kabupaten	2002		2007		Increase/Decrease	
	#Farmer	Percent	#Farmer	Percent	#Farmer	Percent
<b>West Java</b>						
Small	22,745	23%	46,944	19%	24,199	106%
Medium	42,240	43%	120,712	48%	78,472	186%
Large	32,492	33%	83,828	33%	51,336	158%
Total	97,477	100%	251,484	100%	154,007	158%
<b>East Java</b>						
Small	385,915	84%	273,711	62%	(52,479)	-16%
Medium	65,764	14%	114,782	26%	32,086	39%
Large	7,743	2%	52,976	12%	2,440	5%
Total	459,422	100%	441,469	100%	(17,953)	-4%

Source: BPS, Prov of West Java and East Java. Note: Small Farmer <= 20 trees; Medium Farmer=21 to 200 trees; Large Farmer > 200 trees; . The table was calculated using production data from 2004 and 2008 divided by an average mango production per tree.

**Table 15. Production by Type of Mango in 2007**

Manggo Type	2002		2007		Increase/Decrease	
	Ton	Percent	Ton	Percent	Ton	Percent
<b>West Java</b>						
Harumanis	82,887	43%	214,831	48%	131,944	159%
Manalagi	5,783	3%	11,189	3%	5,406	93%
Gedong Gincu	38,552	20%	125,318	28%	86,766	225%
Others (Golek, Madu, Cengkir*, Kweni, Erwin)	65,539	34%	98,4643	22%	32,9253	50%
<b>Total</b>	<b>192,761</b>	<b>100%</b>	<b>447,565</b>	<b>100%</b>	<b>254,804</b>	<b>132%</b>
<b>East Java</b>						
Arumanis	499,335	60%	445,368	75%	-53,967	-11%
Manalagi	49,934	6%	47,506	8%	-2,43	-5%
Podang	74,9	9%	59,382	10%	-15,52	-21%
Others (Golek, Madu, Cengkir, Kopyor)	208,056	25%	41,568	7%	-166,49	-80%
<b>Total</b>	<b>832,225</b>	<b>100%</b>	<b>593,824</b>	<b>100%</b>	<b>-238,4</b>	<b>-29%</b>

Source BPS 2004, 2008.. The table was estimated using the information from farmer and wholesale traders, about type of mango they produce and percentage share each. The result has been confirmed with local dinas.

**Table 16. Mango Production by Irrigation**

Irrigation	2002		2007		Increase/Decrease	
	#Farmer	Percent	#Farmer	Percent	#Farmer	Percent
West Java						
Non Irrigation	73,108	75%	138,316	55%	65,208	89%
Irrigation	24,369	25%	113,168	45%	88,798	364%
Total	97,477	100%	251,484	100%	154,007	158%
East Java						
Non Irrigation	424,965	93%	397,322	90%	(27,643)	-7%
Irrigation	34,457	8%	44,147	10%	9,690	28%
Total	459,422	100%	441,469	100%	(17,953)	-4%

Source BPS 2004, 2008.. The table was estimated using the information from farmer about type of irrigation and share each. The result has been confirmed with local dinas.

**Table 17. Mango Farmer by Input Technology Used**

Input Technology	2002		2007		Increase/Decrease	
	Ton	Percent	Ton	Percent	Ton	Percent
<b>West Java</b>						
Insecticide, Fertilizer, and Hormone	33,733	18%	156,648	35%	122,915	364%
Insecticide and Fertilizer only	36,625	19%	100,702	23%	64,078	175%
Fertilizer only	21,204	11%	44,757	10%	23,553	111%
No input	101,200	53%	145,459	33%	44,259	44%
<b>Total</b>	<b>192,761</b>	<b>100%</b>	<b>447,565</b>	<b>100%</b>	<b>254,804</b>	<b>132%</b>
<b>East Java</b>						
Insecticide, Fertilizer, and Hormone	24,967	3%	41,568	7%	16,601	66%
Insecticide and Fertilizer only	83,223	10%	77,197	13%	(6,025)	-7%
Fertilizer only	99,867	12%	145,487	25%	45,620	46%
No input	624,169	75%	326,603	55%	(297,566)	-48%
<b>Total</b>	<b>832,225</b>	<b>100%</b>	<b>593,824</b>	<b>100%</b>	<b>(238,401)</b>	<b>-29%</b>

Source BPS 2004, 2008.. The table was estimated using the information from farmer and sprayer trader about type of input they use and percentage share each. The result has been confirmed with farm leader.

**Table 18. Mango Production by Management**

Tree Maintenance	2002		2007		Increase/Decrease	
	#Farmer	Percent	#Farmer	Percent	#Farmer	Percent
<b>West Java</b>						
Integrated management by Sprayer Traders	-	0%	1,257	0.5%	1,257	0
Managed by Owner/Share cropper	97,477	100%	250,227	99.5%	152,749	157%
Total	97,477	100%	251,484	100%	154,007	158%
<b>East Java</b>						
Integrated management by Sprayer Trader	4,594	1%	26,488	6%	21,894	477%
Managed by Owner/Share cropper	454,828	99%	414,981	94%	(39,847)	-9%
Total	459,422	100%	441,469	100%	(17,953)	-4%

Source BPS 2004, 2008.. The table was estimated using the information from farmer and sprayer trader, about mango they maintained. .

**Table 19. Mango Farmer by Membership of Coop/Farmer Group**

Farm Coop/Group	2002		2007		Increase/Decrease	
	#Farmer	Percent	#Farmer	Percent	#Farmer	Percent
<b>West Java</b>						
Farm Coop/Group	26,319	27%	83,828	33%	57,509	219%
Individual Farmer	71,159	73%	167,656	67%	96,497	136%
<b>Total</b>	<b>97,477</b>	<b>100%</b>	<b>251,484</b>	<b>100%</b>	<b>154,007</b>	<b>158%</b>
<b>East Java</b>						
Farm Coop/Group	36,754	8%	48,562	11%	11,808	32%
Individual Farmer	422,668	92%	392,907	89%	(29,761)	-7%
<b>Total</b>	<b>459,422</b>	<b>100%</b>	<b>441,469</b>	<b>100%</b>	<b>(17,953)</b>	<b>-4%</b>

Source BPS 2004, 2008.. The table was estimated using the information from farmer and farmer group, and local leader about mango they produce and percentage share each and institution that supported. The result has been confirmed with local coop dinas.

**Table 20. Mango Production by Selling Method**

Method of Selling	2002		2007		Increase/Decrease	
	Ton	Percent	Ton	Percent	Ton	Percent
<b>West Java</b>						
On the tree (green)	106,982	56%	315,534	71%	208,551	195%
After harvest	85,779	45%	132,032	30%	46,253	54%
Total	192,761	100%	447,565	100%	254,804	132%
<b>East Java</b>						
On the tree (green)	644,974	78%	427,553	72%	(194,929)	-30%
After harvest	187,251	22%	166,271	28%	(12,233)	-7%
Total	832,225	100%	593,824	100%	(207,162)	-25%

Source BPS 2004, 2008.. The table was estimated using the information from farmer and wholesale traders, about type of mango they produce and percentage share of harvest method..

**Table 21. Mango Production by Value Adding Process**

Value Added	2002		2007		Increase/Decrease	
	Ton	Percent	Ton	Percent	Ton	Percent
<b>West Java</b>						
To Fresh Final Market	186,043	97%	384,906	86%	198,863	107%
To Processor	5,754	3%	62,659	14%	56,905	989%
<b>Total</b>	<b>191,797</b>	<b>100%</b>	<b>447,565</b>	<b>100%</b>	<b>255,768</b>	<b>133%</b>
<b>East Java</b>						
To Fresh Final Market	832,225	100%	564,133	95%	(238,415)	-29%
To Processor	-	0%	29,691	5%	31,253	0%
<b>Total</b>	<b>832,225</b>	<b>100%</b>	<b>593,824</b>	<b>100%</b>	<b>(207,162)</b>	<b>-25%</b>

Source BPS 2004, 2008.. The table was estimated using the information from farmer and wholesale traders, about type of mango they produce and percentage share each. The result has been confirmed with local dinas.

**Table 22. Mango Production by First Buyer**

First Buyer	2002		2007		Increase/Decrease	
	Ton	Percent	Ton	Percent	Ton	Percent
<b>West Java</b>						
Collector	132,041	69%	243,923	55%	111,882	85%
Traditional wholesaler	52,045	27%	149,934	34%	97,889	188%
Supplier to supermarket	6,747	4%	33,567	8%	26,821	398%
Supermarket	1,928	1%	13,427	3%	11,499	597%
Processor	-	0%	-	0%	-	0%
Exporter	-	0%	6,713	2%	6,713	0%
<b>Total</b>	<b>192,761</b>	<b>100%</b>	<b>447,565</b>	<b>100%</b>	<b>254,804</b>	<b>132%</b>
<b>East Java</b>						
Collector	644,974	78%	421,166	71%	(201,653)	-31%
Traditional wholesaler	83,223	10%	74,228	13%	(5,090)	-6%
Supplier to supermarket	20,806	3%	38,599	7%	19,823	95%
Supermarket	83,223	10%	59,369	10%	(20,730)	-25%
Processor	-	0%	456	0.1%	480	0%
Exporter	-	0%	7	0%	7	0%
<b>Total</b>	<b>832,225</b>	<b>100%</b>	<b>593,824</b>	<b>100%</b>	<b>(207,162)</b>	<b>-25%</b>

Source BPS 2004, 2008.. The table is estimated using the information from farmer and wholesale traders, about type of mango they produce and percentage share each. The result has been confirmed with local dinas.

**Table 23. Mango Production by Market Destination**

Market Geo Destination	2002		2007		Increase/Decrease	
	Ton	Percent	Ton	Percent	Ton	Percent
<b>West Java</b>						
Within Kabupaten	23,131	12%	67,135	15%	44,003	190%
Outside Kabupaten but Wthin Province	113,729	59%	299,869	67%	186,140	164%
Outside Province but Within Island	15,421	8%	22,378	5%	6,957	45%
Outside Island	38,552	20%	53,708	12%	15,156	39%
Export	1,928	1%	4,476	1%	2,548	132%
<b>Total</b>	<b>192,761</b>	<b>100%</b>	<b>447,565</b>	<b>100%</b>	<b>254,804</b>	<b>132%</b>
<b>East Java</b>						
Within Kabupaten	312,084	38%	65,324	11%	(243,327)	-78%
Outside Kabupaten but Within Province	241,345	29%	237,377	40%	8,508	4%
Outside Province but Within Island	174,767	21%	154,336	26%	(12,319)	-7%
Outside Island	104,028	13%	136,553	23%	39,702	38%
Export	-	0%	235	0%	247	0%
<b>Total</b>	<b>832,224</b>	<b>100%</b>	<b>593,824</b>	<b>100%</b>	<b>(207,189)</b>	<b>-25%</b>

Source BPS 2004, 2008.. The table was estimated using the information from farmer and wholesale traders, about type of mango they produce and percentage share each.

**APPENDIX 1**  
**INTERVIEW GUIDE**  
**ACCESS TO MODERNIZING VALUE CHAINS BY SMALL FARMERS**  
**IN INDONESIA**

**A. Case study should cover/describes:**

1. Description of respondent's activities in production, marketing (selling, buying, distribution, storage, standardization, grading, funding, risk taking, market information), and processing whenever relevant.
2. Size, quality, quantity, and product standardization.
3. Technology used in cultivation, processing, and other aspect.
4. Linking/relationship between actors (cooperative, contract, individual/group, joint venture/vertical integration, all other forms of linking between actors and their partner).
5. Changes that happen in last 5-10 years.

**B. Comparison between today and 5-10 years ago, in order to understand changes happening in:**

1. Volume of selling or buying
2. Information flow
3. Knowledge flow
4. Capital flow
5. Number of market actors
6. Price mechanism (actor who has power to determine price, and information about bargaining position)
7. Technology (new technology used).
8. Fruits harvest season
9. Market segmentation, traditional, modern, or export (from traditional market to ..?)
10. Changes in output form/product produced (fresh fruit/processed, fresh fruit and processed)

## RESPONDENT IDENTIFICATION

Full name :  
Nick name :  
Age :  
Status :  
Home Address :  
Office address :

**Every question need to be adjusted according to actual respondent activities. Please use the questions below only as pointer in interview session based on respondent role and position.**

### 1. Input Trader

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Definition: Input trader is someone who provide/sell production input such as fertilizer, pesticides, tools and agriculture machinery either owned by individual or group ownership, in permanent place (kiosk, store) or without permanent place (personal marketing, door to door marketing).

#### a. Activities :

- Purchasing activities (volume, periodicity, process).
- Selling activities (volume, periodicity).
- Competition between input traders.
- Other activities besides as input trader.

#### b. Capital and Assets

- Capital source (personal, bank, farmer's group, cooperation,...) and capital amount.
- Types of production input and brand (fertilizer/pesticides/agriculture tools/machinery/seed).
- How to access price information, new product, and product specification information.
- Transportation utilities ownership (quantity, type of ownership).
- Revenue per one season.
- Company legal status.
- Kiosk size.

### **c. Relationship/Linkage with other actors**

- Relationship's status and payment system with input supplier-input trader and input trader-buyer (cash, credit, requisite loan or consignment).
- How's the profit sharing system if it is in a group form.
- Availability of government's support.

### **d. Location**

- Business location, size, and the reason in choosing business place.
- Availability of branches in other places. If branches are available; where, how many, and whom runs the establishment (family/non-family member).
- Trade/marketing area.

### **e. Changes in the Past 5-10 years and its effect to the business development**

## **2. Farmer**

Definition: Farmer is a person who owns or grows the plant, takes benefits from it, and has possession on its yield. Farmer case study could cover:

1. Farm owner and operator.
2. Farmer who sells the green fruit before harvest (owns and grows the plant but losing ownership of the harvest).
3. Farmer who buys the green fruit from other farmer and sell the harvest together with his own.
4. Farmer who rents or runs the land/farm with fixed fee to land owner.
5. Farmer who sharecropping with the farm/tree owner.

### **a. Activities**

#### **INPUT**

- Activities that are usually done to the plants and the frequency to do those treatments (before flowering period, in flowering period, in harvest period, and after harvest period):
  - 1) Land preparation
  - 2) Fertilizing
  - 3) Watering
  - 4) Spraying/pest treatment

- 5) Growth nutrient nourishing
- 6) Moss scrapping from the trunk
- 7) Harvesting
- Time and frequency of treatment (in one season, when and how many times each treatment is given?)
- Number of days required for each treatment:
  - 1) Land preparation
  - 2) Fertilizing
  - 3) Watering
  - 4) Spraying
  - 5) Growth nutrient nourishing
  - 6) Moss scrapping of the trunk
  - 7) Harvest
- Number of workers needed for each treatment.
- Identity of workers:
  - 1) Family member or not family member (give approximate percentage ratio).
  - 2) Man or woman (give approximate percentage ratio).
  - 3) Skilled or unskilled (give approximate percentage ratio).
- Average input cost per season or per year.

#### OUTPUT

- Quantity of MM (in kilogram) that produced per tree per season.
- The percentage of product (MM) which is self-consumed, sold to traditional market, supermarket, and export market.
- Age of the tree on its first yield and the optimal age of the tree productivity.
- Selling method:
  - Fresh fruit selling (counted per kg on harvest time).
  - *Tebasan* selling (sold before time of harvest).
  - Renting (tree rented for a number of years).
 (If it's a mix, what is the percentage from each system used? and to whom is the fruits sold?)
- From all MM trees owned, how many are sold while green on the tree, rented, and sold to market?
- Marketing/distribution system:
  - 1) Own distribution/selling:
    - Type of transportation used.

- Ownership of transportation used (owner/renting).
  - Number of transportation used for every type.
  - Distribution frequency in a day.
  - Average distribution cost.
- 2) Picked up by collector/wholesaler (how, why, when).
- Selling frequency (daily/weekly at time of harvest or depend on collector arrival time?).
  - Marketing aspects (buying, delivering, storing, selecting + grading, funding, risk taking, market info gathering).
  - Average income per season.
  - Problems and solutions/anticipations.

**b. Capital and Asset**

- Quantity of Mango/Mangosteen trees that is owned.
- Average age of trees owned.
- Other type of plantations owned and the quantity.
- Percentage of Mango/Mangosteen compared to other types of trees and plantations in one location.
- Capital source.
- Seed rehabilitations or seed variety changes in a certain time limit (annual, monthly).
- Ownership of special storage.
- Source of information regarding tree handling, and market price changes.

**c. Relationship/Linkage with other actors**

- Procurement of input:
  - Source of input goods.
  - Volume and periodicity.
  - Purchasing system (given/cash/credit/loan).
- Seed purchasing system (replanted plants).
- If rented or pre-sold (to whom, where, how many people), and why is it being rented/pre-sold?
- Cooperation system between renter/pre-buyer and owner, and the existence of written contract.
- Duration of the cooperation.
- Rights and obligations.
- Penalties if contract is violated.

- Buyers that come directly to location, frequent buyers (name and origin).
- The positive and negative factors of each trading systems.
- Payment system from wholesaler.
- Price decision making.
- Capital return mechanism.
- Government aid (subsidy, credit, etc).

**d. Location**

- Location of trees/areas of field that is owned or rented. (concentrated or scattered in one or many villages, districts, cities, provinces).
- Quantity of trees/area of fields that is owned or rented.
- Trading location (front porch of a house, market, whole seller place)

**e. Changes in the Past 5-10 years and its effect to farming development**

**3. Wholesaler (Collector/Traditional Wholesaler/Modern Wholesaler)**

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Definition: A person who buys on a large scale from farmers or wholesaler, and sells them to other buyers or markets or even exports.

1. Small and big wholesaler, intercity or inter island trader.
2. Identity of wholesaler.

**a. Activities**

- Type of commodities. (mango/mangosteen variety).
- Other commodities that are worked on and quantity.
- Best seller variety.
- Volume and periodicity of trading goods (selling and buying).
- Reasons behind best selling/buying variety.
- Where to get the commodities from, how and where to get the source information (from extension agents/among traders/exporter/supermarket supplier/main market/ or other).

- Reason for purchasing commodities from that source (because it's near/easy to reach/low price/good quality/quantity supplied fits quantity needed/or else).
- Taking part in tree treatment (yes/no). If took part in treatment, what types of treatment given and done in these activities below:
  - 1) Fertilizing
  - 2) Watering
  - 3) Spraying/pest treatment
  - 4) Growth nutrient nourishing
  - 5) Moss scrapping from the trunk
  - 6) Picking
- Type of treatment that done to commodities purchased and where to market:
  - 1) Cleaning
    - Where to market.
    - How to market (in own place/carrying to buyer's place).
  - 2) Sorting
    - Where to market.
    - How to market (in own place/carrying to buyer's place)
  - 3) Grading
    - Is different grades goes to different buyer?
    - If it is, where to sell for each grades?
  - 4) Labeling
    - What is the name of the label?
    - Where is it sold? (as an identification of supermarket supplier).
  - 5) Packing (kind of packing used: big carton box/small carton box/wood container/plastic container/small net/or else)
    - If using small carton box, where is it sold? (As exporter identification)
  - 6) Transporting
  - 7) Further processing (chips/sweets/paste/or else)
  - 8) Where is the marketplace? (local place/local market/other city/supermarket)
- The biggest marketplace's proportion
  - 1) Within local district in local city/different district in local city/different city within province/different province within island/inter island/international

2) Big wholesaler/trader intercity/trader inter island/exporter.

- Trade volume (%) and its variety
- Trade frequency
- Volume based on quality/grade
- Are there any differences in buying price based on quantity of Mangos/Mangosteen purchased?
- Are there any differences in selling price based on quantity MM sold?
- Problems and its anticipation.

**b. Capital and Assets**

- Capital ownership/source (own capital/family/others).
- The amount of capital.
- Revenue (money flow/rotation estimation).
- Specific warehouse ownership to store purchased commodities temporarily
- Source of market price information (extension agents/among trader/exporter/supermarket supplier/channel in main market/else).
- Type of transportation used (motorcycle/pickup/truck/*fuso*) and transportation ownership status (own/rent).
- Type of packaging (wood box/plastic box/carton box).
- Market destination for every type of packaging.
- Ownership status for cleaning, grading, packaging, and labeling devices.

**c. Relationship between Actors**

- Number of labor used
  - 1) Percentage of family vs. non family.
  - 2) Percentage of man vs. woman.
  - 3) Percentage of skilled vs. unskilled labor.
- Wages system and rate per day.
- Purchasing system in gaining the product (MM) (buying while green/rent/direct buying/else).
  - 1) If buying while green:
    - Why (what is the reason in doing this?)
    - When (before flowering/after flowering/or else).
    - Number of tree that you bought while green.

- The person who you bought green fruit and the reason why this person is chosen.
- 2) If renting:
  - Duration of renting period.
  - Owner identity (who).
  - Number of tree rented.
  - Rent system (contract/or else).
- 3) If direct buying:
  - Source identity (who, where).
  - Volume of MM purchased.
  - Specification of MM purchased (size/shape/or else).
- Person/actors who provide MM needed (farmer/small trader/large trader/local market/or else) and location where they are (within same district in the same city/different district in the same city/different city in the same province/within province in the same island/inter island/international).
- Number of actors who can provide MM for each type of actors (farmer/small trader/large trader/local market/or else), type of contract, advantage and disadvantage for each type of contract (good price/credit payment/consignment/ or else).
- Type of relation which is made with every type of buyer (cash and carry/credit/ consignment/ or else) and the existence of written contract.
- Availability of capital given to seller (e.g. giving loan to collector).
- Availability of capital loan from another (bigger) wholesaler.
- Capital loan pay of system.
- Price buying and price selling determination.
- Availability of rights and obligations in written or unwritten contract.
- Payment system for farmer and for buyer (cash/credit).
- Availability of competition among trader (available or not, in what term, how to anticipate it in order to survive).
- Availability of government support (available or not, in what term).

**d. Location**

- Selling destination.
- Number of other wholesaler in the same region.

**e. Changes in the Past 5-10 years and its effect to the business development**

#### **4. Processing Industries using Mango or Mangosteen as Raw Materials**

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##### **a. Activities**

- Type of product, price and the amount of MM needed for every product.
- Processed product type/standard/categorization/classification.
- Processing industry categorization (small/medium/big scale industry).
- Variety of MM used and purchasing system.
- Production frequency.
- Production capacity per one production.
- Selling destination, target market, and selling volume for every product produced.
- Type of marketing aspect done:
  - 1) Buying system
  - 2) Transportation/carrying system
  - 3) Storage system
  - 4) Standardization and grading system
  - 5) Funding system
  - 6) Risk taking system
  - 7) Market information system
- Packing and labeling process.
- Percentage of product produced which is sold to different market channel.
- Selling method (self marketing or picked up by collector).
- Selling frequency.
- Problems faced and it's anticipation.

##### **b. Capital and Assets**

- Capital ownership.
- Technology used (traditional/modern) and type of devices used from getting raw material, production to marketing stage.
- Cold storage availability.

##### **c. Relationship between Actors**

- Payment system from buyer.
- Form of relationship with supplier and the reason why choosing that form.

- Supplier selection.
- Price determination between company and collector.
- Differences in selling price based on amount (huge and little amount) of product bought by buyer/consumer.
- Availability of capital loaned to collector in order to get raw material, the amount of capital loaned, number of collector whom get the capital loan, and capital loan return system.
- Availability of competitor based on type of product, capacity, and market segmentation.
- Effect of competitor on company performance (selling, purchasing, etc).
- Strategy to win the competition.
- Availability of government support and its term.

#### **d. Location**

- Market range/scope

#### **e. Changes in the Past 5-10 years and its effect to the business development**

### **5. Exporter**

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#### **a. Activities**

- Type of commodities:
  - 1) Variety of MM used.
  - 2) Product standardization/category/classification.
- Purchasing system:
  - 1) Channel
  - 2) Capacity
  - 3) Technology
  - 4) Transportation
  - 5) Product treatment required before arrive in exporter's place
- How exporters do their export? (history, procedures)
- Destination countries and product specification or requirement for each country.
- Selling volume and selling frequency for each country.
- Marketing function which is done (buying, delivering, storage, standardization and grading, funding, risk taking, market information).

- Return policy for products which are rejected by exporter or importer.
- Availability of other product besides MM which is exported.
- Problems faced and its anticipation.

#### **b. Capital and Assets**

- Strategy in handling MM's characteristics.
- Technology used (from cleaning to delivering).

#### **c. Relation between Actors**

- Relationship form with supplier.
- Requirements and mechanism to be a supplier.
- Availability of capital loan from exporter to its supplier and the capital loan return system.
- Payment system (from importer).
- Price determination between exporter and importer.
- Price differences based on destination country and the reason why it is different from one another.
- Availability of government support.

#### **d. Location**

- Reason in choosing head office, warehouse, etc.

#### **e. Changes in the Past 5-10 years and its effect to the business development**

### **6. Modern Retail (Supermarket, Hypermarket, Specialty Store)**

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#### **a. Activities**

- Selling and procurement strategy in fresh and processed products:
  - Selling volume per day, per year, for fresh MM (1998-2007).
  - Percentage of MM sold compare to other fresh fruit.
  - Consumer segmentation.
  - Variety of MM that is referred by consumer (for each market segmentation).
  - Price condition for MM in the last 5 years based on quality and variety.
  - Selling volume per day, per year, for processed product that uses MM as basic material (1998-2007).

- Product standardization which has to be fulfilled by supplier and the reason why it is changed (if there are changes).
- Handling process for MM, reason why they do these, and process changes within past 5 years.
- Specific handling/treatment for MM (especially for fresh MM) compared to other products, and the reason why they do it.
- Number of labor based on gender which is needed to work on each process.

#### **b. Capital and Assets**

- Technology used in order to overcome the perishable fresh fruits product (especially MM).
- Packing and non packing treatment or handling.
- Knowledge in cool chain .
- Knowledge in procurement shed (buying area, type of supplier).
- Problems faced and its anticipation:
  - Problems in purchasing and selling (distribution) for fresh and processed commodities.
  - The effect of competition among modern retailers to purchasing and selling (distribution) strategy for fresh and processed commodities.
  - The effect of high increasing number of modern retailer.
- 

#### **c. Relationship between Actors**

- Number of supplier and its location (production zones/address).
- Contract type between modern retail and their supplier (requirement, profit sharing, loss risk sharing, target selling, supervising/advising supplier, reward and punishment system, etc).
- Modern retail commitment to develop direct supply chain to producer (farmer).
- Comparison between traditional and modern market procurement.
- Is there any vertical integration? If so, what, why, and how.
- Impact of government policy

#### **d. Location**

- Reason in choosing location.
- Supplier location and reason in choosing specific supplier in specific location.

#### **e. Changes in the Past 5-10 years and its effect to the business development**

- Changes on channel structure within last 20 years.
- Changes in modern procurement system (focused/integrated, regional, specific supplier, contract, selected supplier)
- Conditions and boundaries which are affecting modern retail growth.