

ANNEX VI

AGRO-PROCESSING AND
MARKETING SYSTEM

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CHAPTER 1 GENERAL

This Annex describes (1) the present conditions of vegetable marketing system of the villages relating to the Study area (8 model areas), (2) the general plan of improvement of the existing vegetable marketing, and (3) the detailed plan of the improvement of vegetable marketing system.

The present conditions of the vegetable marketing system including marketing volumes, prices, and marketing and post-harvest facilities were surveyed, and the general plan of the improvement of vegetable marketing system was studied in the First Stage Work. The results of the survey and study are presented in Chapter 2 and 3, respectively.

The detailed plan of the improvement of the vegetable marketing system for the selected priority model areas was made in the Second Stage Work, and the result is presented in Chapter 4.

CHAPTER 2 PRESENT MARKETING SYSTEM

2.1 Marketing System

2.1.1 General Situation

The production volume of vegetables and the access road condition are significant factors to development of existing marketing system of vegetables in the survey area. Traders in most villages handle vegetables produced in the village. In villages producing a large volume of vegetables, traders from outside come to buy them, and transport, and sell them to the market. While, in villages producing small quantities of vegetables, farmers transport vegetables by themselves to market nearby for selling since no traders come to the village. Farmers in villages equipped with good access road have an option to select good traders since several traders come to buy vegetables.

2.1.2 Post Harvest-handling System

Usually, traders build collection centers of vegetables in the village where transaction is carried out between farmer producers and traders. Sometime, the transaction is made on roadside in villages that has no facility for collection and shipping. Grading, sorting and packaging are conducted by farmers as post-harvest handling before selling their product. In case of carrot and potato, farmers carry out cleaning and washing.

The type of packaging is different by commodity. Tomato is packaged by wooden crate box of 40 to 45 kg. Potato is packaged by polyethylene bag with small ventilation holes of 35 to 50-kg weight. Welsh onion is bound by bamboo made strips by 30 to 45 kg. Cabbage is traded without packaging. Locally available raw materials are used for packaging materials in many cases. A wooden crate box for tomato costs Rp.2,000 to 3,000/box. Farmers have to buy it each time before selling their product, which is not returnable from the market.

The villages of the Study area are categorized into the following three groups with respect to the post harvest handling system:

Post Harvest Handling System in Study Area

No.	Post-Harvest System	Village
1.	Sorting and grading with collection center:	Mekarjaya, Gekbrong, Cisurupan, Tanjungkarya, and Cisantana
2.	Sorting and grading without collection center:	Langensari, and Tugumukti
3.	No sorting and grading without collection center:	Mekarmukti

2.1.3 Classification of Marketing System

The destination of vegetables varies by distance from the village to urban market and by volume to be delivered. The marketing system in the Study area is classified as three types depending on the distance to market and the trade volume.

Marketing System in Study Area

Urban Marketing System Type-1 : More than 50 % of shipping to Jakarta and the remaining major part to Bandung
 Urban Marketing System Type-II : More than 50 % of shipping to Bandung and the remaining major part to Jakarta
 Local Marketing System Type : Majority of shipping to local markets

The classification of marketing system of the Study area is shown below.

Classification of Marketing System in Study Area

No	Type and Village	Main Market	Distance	Max. volume
1.	Urban market (1)			
	a) Gekbrong	Jakarta, Bekasi 95% Local, Remaining	Jakarta, 135 km Bandung, 25 km	20 tons/day
	b) Langensari	Jakarta, Bekasi 50% Bandung and local, Remaining	Jakarta, 210 km Bandung, 25 km	50 tons/day
	c) Tugumukti	Jakarta, Bekasi 50% Bandung and local, Remaining	Jakarta, 210 km Bandung, 25 km	50 tons/day
2.	Urban market (2)			
	a) Cisurupan	Bandung, 75 % Jakarta, 20 % Local, Remaining	Bandung, 80 km Jakarta, 270 km	50 tons/day
	b) Tanjungkarya	Bandung, 75 % Jakarta, 20 % Local, Remaining	Bandung, 80 km Jakarta, 270 km	50 tons/day
3.	Local market			
	a) Mekarjaya	Bandung, 60 % Jakarta, 40 %	Bandung, 30 km Banjarang, 9 km	4 tons/day
	b) Mekarmukti	Local (Hariaig), 100%	Hariaig, 3 km	Very small
	c) Cisantana	Local, 100 %	Kuningan, 6 km	11 tons/day

The vegetables produced in Lembang Sub-district, where Langensari is located, have acquired the reputation of their good quality. Traders export some vegetables to Singapore, Malaysia, and Burunei, and send them to Pontianak in West Kalimantan.

All products from Cisantana go to Pasar Baru in Kuningan, but that market receives approximately the same volume of vegetables from outside of Kuningan, such as Cirebon, Central Java and East Java because of the larger demand. In Mekarmukti, the vegetable production in dry season is very limited. They grow chili and peanut but not red onion and welsh onion mainly due to lack of irrigation water. Farmers in Mekarmukti are required to transport vegetables by themselves for selling to a local market in the vicinity for selling.

The payment is made almost always in cash and carry or one-day credit that means traders will pay farmers next day after they carried and sold commodity at the market. One-week credit is applied only in Cisantana among the Study area.

Neither farmers' group nor KUD handles vegetable marketing in the Study area. Traders manage all marketing function in the village at present.

2.2. Prices and Marketing Volume

2.2.1 Production Quantity of Vegetables

West Java Province occupies the largest production share of vegetables in Indonesia as shown below.

Production of Vegetables in Indonesia

Unit: Tons

	Cabbage	Potato	Red onion	Chinese cabbage	Welsh onion	Carrot
West Java	344,916	241,877	83,908	149,570	140,724	88,814
North Sumatra	219,314	207,657	144,554	64,496	15,423	38,856
Central Java	313,916	205,172	30,376	53,147	30,866	29,547
Total	1,350,101	848,102	602,998	454,112	272,004	230,013

Source: Statistik Indonesia, 1997

Total vegetable production in West Java Province amounted to 1.27 million tons in 1997 and this quantity increased to 1.56 million tons in 1998 as shown in Table VI-1. The comparison of the Districts related to the villages in the Study area is summarized in the same table. Among the concerned districts, the vegetable production is the biggest in Bandung district where Langensari, Tugumukti and Mekarjaya villages are located, followed by Garut district where Cisurupan and Tanjungkarya villages are located. The production quantity in Sumedang and

Kuningan districts is not so significant at present.

The production fluctuates by year and by commodity. The productions of potato increased drastically from 1997 to 1998, and welsh onion, cabbage, Chinese cabbage increased also to some extent while the production of chili and carrot in 1998 decreased from those in 1997.

Potato, cabbage, cucumber, Chinese cabbage, chili and tomato are dominant in West Java Province, which is exactly similar to the production pattern in Bandung district. Cianjur is dominant in the production of welsh onion and Garut district is dominant in the production of chili. Bandung and Garut districts occupy 93% share of potato production in West Java Province. They also occupy 82% share for cabbage and 61% of tomato. The ratio of occupancy rate of chili decreased from 59% in 1997 to 29% in 1998.

There is some deviation of vegetable production in the sub-districts as shown in Table VI-2. In Lembang sub-district of Bandung district, the production of cabbage, tomato and Chinese cabbage is dominant than other sub-district. The production in Arjasari sub-district where Mekarjaya located is still low in vegetable. The major production in this sub-district is cassava and corn. While vegetable production in two sub-districts in Garut district, where Cisurupan and Tanjungkarya are located, is almost similar in the volume. Potato, cabbage, tomato and chili are dominant in both areas.

2.2.2 Marketing Volumes

The incoming volume of vegetables to urban market will represent the demand of vegetables to be purchased by consumers. Since a large amount of vegetables move to Jakarta from West Java Province, the incoming volume at Kramat Jati market in Jakarta was examined. The volume incoming to Caringin market in Bandung, and a typical local market, Pasar Baru in Kuningan was also surveyed. The result is summarized below.

Incoming Volume to Major Markets

	Kramat Jati market, Jakarta	Caringin & Gede Bage markets, Bandung	Pasar Baru, Kuningan
Incoming volume Ton/day	1,090	112 (97 + 15)	23
Ton/year	393,600	40,900	8,200
Loss at the market, 10%	39,400	4,100	800
Estimated Consumption	354,200	36,800	7,400

Source: JICA Study Team, October 1999

Monthly incoming vegetable volume to Kramat Jati market in 1999 is shown in

Table VI-3. The incoming volume is less in January and February. Then the volume is increasing towards April. Once it decreases in May and June, but again increases towards December. The origin of vegetables coming to Kramat Jati market is summarized below. This survey was carried out from 8:00 pm on 24 October, 1999 until 8.00 am on 25 October 1999 by counting incoming trucks to the market.

Origin of Incoming Vegetables to Kramat Jati

Unit: Tons

	Cabbage	Chili	Red onion	Potato	Chinese cabbage	Total
West Java	55	30.5	2	43	35	165.5(43.7%)
Cent. Java	30	15	10	-	-	55(14.5%)
East Java	12	61	60	-	-	133(35.1%)
Sumatra	-	5	6	7	-	18(4.8%)
Bali	-	7	-	-	-	7(1.9%)
Total	97	118.5	78	50	35	378.5(100%)

Source: Commercial & Development Sec., Kramat Jati Market, Jakarta

As far as the incoming volume of vegetables to Jakarta market in October 1999 is concerned, cabbage, potato and Chinese cabbage from West Java Province are dominant, and the major origin of chili and red onion is East Java Province. In spite of long distance to Jakarta, some vegetables come from Sumatra and Bali. There is a competition of vegetables at the urban market among the production at each province.

2.2.3 Prices

(1) Market Prices

Market Information System (MIS) has been established in the Ministry of Agriculture in Indonesia since 1979. It collects prices from Monday to Friday in nineteen production areas and at twenty wholesale markets in 26 provinces in Indonesia. Usually prices in production areas are collected in the morning, while prices in wholesale markets are recorded in the afternoon when suppliers from the collection areas have arrived. Average prices are then sent to provincial Agriculture Service Offices in every province. It is sent to Jakarta Headquarter and disseminated by local radio. In West Java, Radio Bandung and RRI (National Radio) are used.

In West Java Province, 9 offices are operating at the following locations as shown in the next table.

The prices of vegetables in three wholesale markets, i.e., Caringin

(Bandung), Cibitung (Bekasi) and Kramat Jati (Jakarta) and six production centers for past three years are shown in Table VI-4 and Figure VI-3.

Market Information System Offices in West Java Province

	District/Municipality	Sub-district	Location
1.	Bandung	Pangalengan	Pangalengan
2.	Bandung	Ciwidey	Ciwidey
3.	Bandung	Lembang	Lembang
4.	Cianjur	Cipanas	Cipanas
5.	Garut	Garut	Cikajang
6.	Majalenka	Majalenka	Majalenka
7.	Bukasi	Bekasi	Pasar Cibitung
8.	Bandung City	-	Pasar Gedebage
9.	Bandung City	-	Pasar Caringin

Source: BINUS, Dinas Pertanian Jawa Barat

Wholesale market prices in Kramat Jati are always higher than those of in Bekasi and Bandung because of its larger demand than the others. The highest and lowest prices occur in the different months for different kinds of vegetables and the fluctuation ratios differ for the kinds of vegetables. The price fluctuation in Kramat Jati market for three years is summarized in Table VI-5. In 1999, the price of chili fluctuates largely almost 10 times, followed by red onion of approximately 8 times. While French bean, potato and carrot show very stable price. In 1998, the price fluctuation of chili, cabbage and French bean ranges between almost 5 to 6 times, while carrot, welsh onion and potato show rather stable price. In 1997, the prices of vegetables are generally stable, showing less than 3 times except cabbage.

Based on the above-mentioned tables VI-3 and VI-4, relationship between monthly average prices of major vegetables and their incoming volumes to Kramat Jati, Jakarta in the period of January and September 1999 is analyzed, as shown in Figure VI-1. The figures show that potato prices are changed linearly with incoming volumes, while chili prices are largely affected with incoming volumes, showing a tendency of large price down toward the increase of incoming volume. The price elasticity to the incoming volume is analyzed by means of the total market values (price x incoming volumes) and incoming volume, as shown in Figure VI-2.

From the result of analysis the vegetables are categorized into the following groups with respect to the price elasticity:

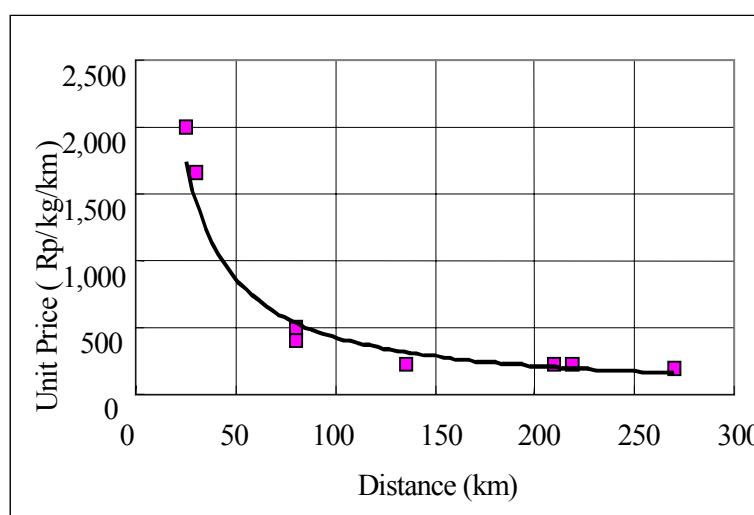
Categorization of the Vegetables

No.	Price characteristics	Vegetables
1	Stable prices for increase of income volume	Potatoes, Carrot, French beans
2	Price fall after certain incoming volume	Tomatoes
3	Large price fall after certain incoming volume	Chili,

The large price fluctuation of vegetables can be attributed to unstable incoming volume to the market. This large seasonal fluctuation of vegetable prices makes it difficult supplying vegetables to consumers constantly and reduces consumers' motivation for consumption of vegetable. To avoid price fluctuation of vegetable, the supply consistency should be ensured by market-oriented cropping system.

(2) Transportation Cost

Transportation cost is another important factor influential to market price of vegetables. Transportation and shipping in the Study area is usually carried out by 5 ton-truck from production areas to urban markets. Some time pick-up trucks of 1.5 ton are used in villages that have narrow and insufficient access road. The cost of transportation by distance is shown below.



The unit cost (Rp/kg/km) rapidly decreases with transportation distance to 150 km, and then it goes down gradually beyond 200-km distance. This is one of the reasons why vegetables produced in Bandung and Garut are transported to Jakarta.

Additional cost required for loading and unloading Rp.1,000 is necessary for

loading of 45 kg tomato box. Producers who sell tomatoes to traders pay this cost. Labor wage is necessary to transport products from field to collection point. It varies dependent upon distance, but it takes Rp.40 to 100/kg. Producers also pay this.

2.3 Marketing and Post-harvest Facilities

2.3.1 Marketing and Post-harvest Facilities in the Study Area

Among the survey area, six villages already have collection centers of vegetable in the village that were constructed by traders. The most simple collection center is provided only with the floor paved by concrete without roof. This floor is also used for washing and cleaning of carrot in Cisantana.

In Tugumukti, a farmer built a collection center by his own fund. The center is made of wood and bamboo having roof with tiles, but without electricity. The size of the center is 6m x 4m, and costed about Rp.5 million to construct.

In Langensari, a trader built his own collection center made of concrete structure. Sorting, grading and weighing is made inside for vegetables to be transported to West Kalimantan. He often sends tomato and cabbage to Kalimantan. When the volume in Langensari is short, he collects from Garut and Caringin market. He also exports ginger to Singapore. He has a network of clients in and out of the country.

There is no collection center in Cisurupan and Mekarmukti at present because of narrow road in the village and small production of vegetable. Evens there are collection centers in the village, grading and packaging are frequently carried out in the field without any sunshade. This comes from lack of knowledge for post-harvest handling technology for farmers. The first step of better post-harvest handling procedure is required to avoid damages from the heat after harvest particularly for perishable vegetables. There is no facility for storage of vegetables in any village. High roof cottage without wall is the typical storage of simple structure utilizing natural ventilation in high land area.

2.3.2 Market Capacities of Urban Markets

As mentioned in the previous section, there are three major urban markets in West Java Province to which the major production from the Study area is shipped, i.e., Caringin market in Bandung, Kramat Jati market in Jakarta, and Cibitung market in Bekasi. Their capacities are shown below.

Capacity of the Major Markets

	Caringin market, Bandung	Kramat Jati market, Jakarta
Organizing body	Market Cooperative	Municipal Government
Space	12 ha	15 ha
Shop number	1,200	3,600
Trader number	719	2,000
Trade volume of vegetable	87 - 140 ton/day = 36,000 ton/year	770 - 1,260 ton/day = 393,000 ton/year
Additional market	Gede Bage :5,400 ton/year	Fruits: 250,000 ton/year

Source: JICA Survey Team, October 1999

Kramat Jati market handles vegetable and fruits, but Caringin market handles meat, fish, egg beside vegetables/fruite and processed foods in general. As seen from the table, the market volume of Jakarta is 10 times larger than that of in Bandung. It is the reason why most traders in production areas prefer to transport vegetables to Jakarta, besides the higher prices than other markets.

The trading system adopted in those markets is a traditional way operating under the principle of common trust. These include:

- The "Consignment system" where the commodities are sent to trader at the market by producer or supplier for subsequent sale. After the products are sold, the proceeds are then paid to the owner.
- The "Commission system" where the trader deducts a certain commission from the product sold.
- The "Stall tenancy system" where product owner rents a stall from a trader at the market, either on daily or monthly term.

There is no auction system adopted at the market in Indonesia.

2.4 Agro-processing Activities around the Study Area

The Project purpose is to increase the production of vegetables mainly for the consumers in the public markets. In future, the farmer cooperatives to be formed in the villages might have a choice to produce materials for agro-processing or to commence the agro-processing. To grasp the present conditions of agro-processing industry around the Study area, the reconnaissance survey was made to Tafu manufacturing factory.

There are many Tafu manufacturers in Sumedang because the production of soybean was dominant at this area in the past. Tafu manufacturer forms COPTT (Cooperative Tafu Tempe Producers) for joint purchasing of soybean that is provided through BULOG at Rp.1,800/kg. Since domestic production of

soybean is now short for Tafu and Tempe manufacturing, imported soybean being used for processing.

The capacity of Tafu manufacturer in Sumedang is usually 1,000 kg/day soybean treatment. Due to economic crisis, it becomes 500 kg/day treatment because of weak consumers' purchasing activity. For processing, no chemicals are used for preservative purpose. Accordingly, daily production is limited only for one day's sold out quantity. For sales to Jakarta, they have a branch in Bogor.

A typical manufacturer has 75 workers for two shift working system. There are about 150 members of COPTT in Sumedang. The number of total workers amounts to 11,250. This is a big job opportunity in the region. There is about 10 process for Tafu manufacturing. The wage is Rp.1,800/process. It is paid depending worker's ability.

Each factory has own quality standard and they have specialists for quality control. The factory receives sanitary inspection by officers from Health Section of the municipality. Every processor now worries about contaminant chemicals from imported soybean. They are eagerly expecting to use domestically produced soybean.

Similarly to soybean, there might be lots of opportunity for agro-processing in West Java Province to utilize cabbage, chili, Chinese cabbage and potatoes. However, it is noted that surplus product is not sufficient for materials of agro-processing business. Raw materials for agro-processing are required to be homogeneous in quality, steady supply in volume and steady prices. The contract farming system with manufacturers is one of the choices to ensure the stable farm income, as well as to contribute to the development of agro-industry.

CHAPTER 3 GENERAL IMPROVEMENT PLAN OF MARKETING ACTIVITIES

3.1 Framework of Improvement Plan

3.1.1 Needs of Training for Farmers

(1) Shipping with standard quality

Most farmers in production area are sorting and grading vegetables before delivery. But traders in urban markets have to conduct re-grading of product after arrival from production areas. This means sorting and grading done by producer farmers do not reflect market or consumer requirements. In Kramat Jati market, potatoes from Garut were sold at Rp.3,500/kg, Rp.3,200/kg and Rp.3,000/kg for class A, B and C, respectively on October 25, 1999. A shop owner in the market has done this grading. Vegetable shipping is required on the basis of the information of what consumers want or need for quality.

(2) Careful handling during post harvest treatment

The present post-harvest handling procedure deteriorates the quality of vegetables. In most cases, the sorting, grading and packaging are carried out in the field without any sunshade, and the packaged product before delivery remains on roadside without sunshade. Direct sun or heat exposure affects taste and shelf life of product because vegetables are perishable commodities. It is firstly required to avoid damages from heat for better post-harvest handling. Transportation of vegetables to urban markets is also required at cool time in a day, namely evening or early morning.

(3) Planning of cropping pattern

With implementation of the Project, the cropping season will be adjusted with irrigation water supply so as to ensure the strategic production in the areas, since the price fluctuation of vegetables comes from unstable supply to the market. Farmers should be aware of the past tendency of vegetable prices in the urban markets and the market demands, and then they have to decide crop varieties and most preferable planting time. For adopting appropriate cropping, a favorable agro-ecosystem in the area can be fully utilized.

Implementing all the above mentioned training scheme should be done in collaboration with PPL and PIP in the district. Upgrading the capability of PPL is essential prior to the implementation of farmers' training.

3.1.2 Needs of Collection and Distribution Center in the Village

As mentioned in the previous section, six villages have already collection and distribution centers of vegetables, although they are of preliminary type of construction. Two villages have no collection centers as yet due to small production or narrow road in the villages. Even in the villages that have already installed collection center, sorting and grading are carried out in the field or roadside without any sunshade and on bare ground. One of the reasons of this phenomenon is that the number of collection center is not enough. Sub-centers of simple structure but with roof in every small area in the village are required. The use of the collection center will help farmers obtain the knowledge of joint work for sorting, grading and joint delivery of their product. The bargaining power of the farmers can also be made available by the joint work. This provides a good opportunity for farmers forming farmers' cooperative in the village.

In Cisantana, washing and cleaning of carrot are carried out on the floor of collection center by farm laborers. In Langensari, wooden crate boxes for tomatoes packaging are manufactured in the vicinity of a collection center. To emerge such works in and around village, the collection center provides good opportunity to create and develop rural employment.

3.2 Organization of Marketing Cooperatives

Existing organizations in villages of the Study area are KUD and farmers' group. Not all villages have KUD, since this has been established on the basis of sub-district. Although there is a branch of KUD in the village, it functions as KUT distribution channel and dairy business such as milk collection and compound feed distribution. It is not involved in vegetable business such as seed, fertilizer and pesticide distribution, and marketing of product.

Besides KUD and its branch, there exist several farmers' groups in villages. The groups were established recently to borrow KUT credit through KUD channel. Farmers have to submit a proposal to KUD of their own farming plan with expected financial statement by group for credit application. Usually KUT will be distributed to farmers around May to June. The estimation of fund required for vegetable cropping is as follows:

Required Fund for Vegetable Cropping

Commodity	Fund for 1 ha. Planting	Village
Tomato	Rp.25 million	Tugumukti
Chili	Rp.30 million	Mekarjaya
Red onion	Rp.41 million	Mekarjaya

Source: JICA Study Team, October 1999

KUT is allowed to use for corn, potato, chili and red onion planting recently. The rate of interest is 10.5% per year that is cheaper than commercial bank. Not all farmers can borrow KUT, and some village receives it only 20% of applicants. KUD is responsible to check farmers' field for farming implementation along with the submitted plan. In some villages, KUT is provided through NGO channel.

At present, the activities of farmers' groups are only limited to joint planning. It is said that some groups do joint planting and joint harvesting, but the activity is still weak. In Cisantana, farmers' cooperative is almost bankruptcy due to their large debt amount. This loss comes from unexpected price fluctuation of vegetables.

It is proposed to strengthen the function of farmers' group and to organize the farmers' cooperative not only for farming plan but also for marketing of product. To pursue the objective, the collaboration with and involvement of vegetable traders is inevitable. Some of them already assist farmers by building facility for vegetable collection in the village. In some village, a village chief is a trader. Traders know well what consumers or urban markets require on vegetables for its quality and quantity as well as information on new product of consumers' preference.

(**Note:** KUT application for vegetable planting was suspended as of October, 1999.)

3.3 General Plan of Shipping and Packing Facility

In order to attain the quality improvement of vegetables after harvest, the existing collection and distribution centers are required to be improved and additional centers will be provided.

Simple structure is desirable but concrete floor and roof are the minimum requirement. When farmers utilize the standard grading table and consequently the size of grading can be uniformed. Where there is a land space available in the village, it is also recommended to have a simple storage of high roof structure with shelf and without wall. This type of storage can be applied for short time storage of product before delivery such as for tomato, red onion, carrot and potato but not for leafy vegetables. Welsh onion has only two days shelf life after

arrival to the market.

Taking into account the limited land, limited market road condition in the Study area, and O&M and management method of the centers, the following general plan is proposed:

- (1) O&M body : Farmers' group (Kelompok Tani) consisting of about 25 farmers having fields of approximately 10 ha
- (2) Location : Beside rural market road or other available land
- (3) Handling capacity : Equivalence to production volume of one farmers' group approximately of 5-10 tons

The definite locations and designs of the collection centers will be determined for the selected priority model areas and detailed site inspection through the farmers participation.

3.4 Operation and Maintenance Plan

Farmers' cooperatives will be organized in every village. It will be responsible for O&M of the center and manage the administration of collecting, shipping and accounting matters of vegetable marketing. The village farmers' cooperative will be established before commencement of the improvement/construction works or at least before the completion of village collection and distribution center.

The expenses for operation and maintenance of the collection center in village have to be borne by beneficiaries. To sustain the O&M of the center, the fund deposit system is conceived.

At every shipment, a certain percentage of a sale amount will be deposited. Although it depends on the market prices of vegetables, 1% of total value for 5-ton shipment of vegetables is estimated to be Rp.152,000 to Rp.60,000 on the basis of the 1999 prices. On assumption of 60 days of shipping a year, the annual deposit will amount to Rp.9 to 3.6 million. It is understandable that in Tugumukti a farmer-cum-trader who goes to Kramt Jati market twice a week for vegetable sales has built a collection center with his own fund of Rp.4 to 5 million.

The O&M method to be applied is the sole matter of the farmers, but before commencement of the Project, the O&M method has to be confirmed, not only for the beneficiary responsibility of O&M of facilities but also for the sound operation and management.

CHAPTER 4 IMPROVEMENT PLAN OF MARKETING SYSTEM IN PRIORITY MODEL AREAS

4.1 Improvement of Post-harvest Processing Technology

4.1.1 Existing Situation of Post-harvest Handling and Marketing

Existing situation of post-harvest handling and marketing in the selected villages are shown in the next table.

Existing Situation of Post Harvest Handling and Marketing System

	Mekarjaya	Tanjungkarya	Gekbrong	Langensari
General harvesting	Irrigation water limited that makes difficult to grow vegetable in dry season	Many varieties of vegetable grown that make small quantity production	Irrigation water limited that makes difficult to grow vegetables in dry season	Arable farm land limited that needs purchasing from outside for shipping
Paddy growing	Only for self-sufficiency	On-time water management required for paddy	Paddy grower is only 10%. Farmer has option for growing paddy or vegetable.	No paddy growing farmers.
To whom farmer sell vegetable?	Not so many traders in the village.	75% to local traders, 25% sell by themselves.	So many traders competition in the village. Farmers have an option to select traders.	95% to local traders.
Infra-structure	Access road is very narrow and bad condition.	Access road is bad condition. No option to select traders.		Farm road is good condition that enables fewer wages for transporters.
Grading & sorting	Done by farmers.	Done by farmers.	Done by farmers.	No grading done.
KUD	Yes.	No.	No.	Yes.
Farmers group cooperative	Yes. (12)	Yes. (15)	Yes. (11)	Yes. (20)
Product volume of shipping	5 tons cabbage /day	10 trucks/day = 50 tons	4 trucks/day = 20 tons	10 trucks/day = 50 tons
Existing collection center	4	3	1	None
Destination of vegetable	Bandung	Bandung	Jakarta. Farmers market oriented.	Jakarta. Exporting good quality.

As shown in the table, each village has already equipped with collection center built by traders. The agricultural production will be expected to increase with

the implementation of the project. Accordingly, extra collection center will be needed in the model area in each village.

4.1.2 Planning of Collection Center

The numbers of collection center needed in each model area has been decided based on the area to be implemented the project, present skill of farming and also considering with request from farmers. The plan is summarized in the next table.

General Plan of Collection Center

	Mekarjaya	Tanjungkarya	Gekbrong	Langensari
Cultivated area (ha)	210	330	185	350
Model area (ha)	83	77	50	58
Major vegetables	Tomato, Chili, Cabbage, Beans, Red onion	Tomato, Chili, Mustard green, Cabbage, Beans	Tomato, Chili, Chinese cabbage, Cabbage, Beans	Tomato, Chili, Lettuce, Potato, Cauliflower
Yearly production (tons)	1,038	1,917	1,165	2,939
Farming skills	Low	Low - Medium	Medium	High
Cropping intensity Present	180%	220%	185%	230%
Proposed	255%	265%	270%	285%
Number of collection center	2	5	3	2 - 3
Daily quantity to be handled (tons)	$4.9/2 = 2.5$	$7.7/5 = 2$	$5.7/3 = 2$	$12.2/3 = 4$

4.1.3 Design of Collection Center

(1) Requirements of the location of collection center

- To have access road to market and from farm.
- To be flat land with enough space for incoming truck.
- To be free from strong wind and dust.
- To have the service of electricity, city water and telephone.

(2) Necessary facilities for a collection center

- Platform, enough space for unloading/loading, grading/sorting, temporary storage and packaging.
- Ceiling of platform for protection of sunshine and rain.
- Administration room. (With telephone and facsimile.)

- Storage room with lock.
- Washing basin
- Toilet
- Garbage collection
- Electricity wiring, water provision, penetration pond
- Fence and gate, if necessary

(3) Necessary space of platform

The space of platform is estimated with 50% excess of the daily quantity at peak harvesting time. It has enough space for unloading/loading, sorting/grading, packaging and temporary storage. The breakdown of each space required is summarized in the next table.

Required Space of Platform

	Major vegetable	Peak (ton/day)	X 1.5 (ton/day)	Grading (m ²)	Unload (m ²)	Storage (m ²)	Packing (m ²)	Total area (m ²)
Mukarjaya	Cabbage, Tomato	3	4.5	7	4	11	3	25
Tanjungkarya	Potato, Chili	2	3	5	3	8	3	19
Gekuburong	Chili, Beans	2	3	5	3	8	3	19
Langensari	Tomato, Lettuce	5	7.5	12	6	18	5	41

4.2 Post Harvest-handling Technology

It should be noted that the quality of product cannot be improved by post-harvest handling, but it is necessary to extend shelf life of product as long as possible in terms of appearance, size, shape and taste. The technology of post-harvest handling covers from the time when product harvested at the field until it reaches to urban consumers through market.

(1) Harvesting

- Selection of most suitable time of maturing for harvesting.
- Selection of the best time when harvesting.

(2) Transport to Collection Center

- To avoid from direct sunshine and heat.
- To protect from rain.

(3) Arrival to Collection Center

- Identify the name of producer.
- Measure the weight of product.
- Receive delivery sheet from the administration.

(4) Preliminary Sorting

- Exclude premature, overmatured and rotten product.
- Exclude plant debris, mud and stones.

(5) Washing and Cleaning

Some root crops need washing prior to delivery.

- Wash root crops free from mud.
- Washing should be made with flowing stream not by stored reservoir.
- Use hyperchloride if necessary for disinfection purpose.

(6) Grading for Quality and Size, Shape

- Grading of product is necessary when different price adapted by quality.
- Use visual inspection and manual handling.
- Use simple tools for grading for convenience.

(7) Packaging

- Handle carefully by manual.
- Use designated package.
- Use buffer material when multi layer packaging.
- Measure and record the weight of each packaging.

(8) Temporary Storage before Delivery

- Handle carefully to avoid the damage of content.
- To protect from direct sunshine and rain.

(9) Transportation

- Careful handling when loading.
- Use pallet for truck cargo.
- Enough ventilation necessary for cargo to avoid deterioration due to heat.
- Transport when temperature is cool.
- No worker loaded on the cargo.
- To avoid vibration of cargo by running bad road.

4.3 Training on the Improvement of Post-harvest handling technology

This is classified as two parts, namely the training necessary for the management of collection centers and training necessary for workers of collection center.

4.3.1 Training of the Management of Collection Center

The manager of newly installed collection center should be selected among the members of farmers groups in the model area. Since the manager is responsible to the weight check of farmers' product and the collection of fee for center from users, the reliable person should be elected. The training necessary to him/her is as follows:

- Collect information from urban and local market nearby.
- Disseminate information, particularly on quality to producer farmers.
- Estimate shipping quantity in advance and secure necessary labors.
- Purchasing of packaging material in advance.
- Training/education for labors working in collection center.
- Training for accounting of procurement and sales.
- Training for preparation and issue of delivery document.
- Training for preparation and issue of document on utilization fee.
- Training for collection of utilization fee among members.

4.3.2 Training Necessary for Workers in Collection Center

PPL, NGO and the management of center with the guidance of task team in the Sub-regional Agricultural Office shall carry out the training necessary in collection centers. Items required to training for improvement of post-harvest handling system are described in the previous section, 4.2.

The training by visit to a collection center owned by agribusiness organization that delivers high quality product to super markets shall be planned as one example of intensive collection center.

Tables

Table VI-1 Vegetable Production in West Java Province (1998 & 1997)

Unit: Tons

	Red onion	Welsh onion	Potato	Cabbage	Chinese cabbage	Carrot	Chili	Tomato	French bean	Cucumber	Total
1998											
Cianjur	437	61,883	2,019	13,691	39,432	20,991	14,332	22,824	29,672	17,859	283,843
Bandung	26,277	22,309	282,177	204,988	59,078	4,049	16,944	59,580	31,395	13,411	786,579
Sumedang	669	3,874	2,148	5,644	3,095	94	3,751	5,176	1,220	8,417	44,396
Garut	9,884	25,823	77,744	75,626	20,950	9,764	26,754	41,245	24,620	12,071	408,842
Kuningan	5,585	19,467	1,861	1,096	3,408	352	2,446	719	1,889	644	39,473
Total	42,852	133,356	365,949	301,045	125,963	35,250	64,227	129,544	88,796	52,402	1,563,133
1997											
Cianjur	304	63,390	2,486	41,707	49,356	65,243	34,678	19,690	27,923	20,166	324,943
Bandung	11,387	18,964	104,332	114,409	34,773	14,738	16,192	60,717	19,790	17,787	413,089
Sumedang	514	3,485	1,716	2,581	1,811	80	3,595	5,192	534	8,760	28,268
Garut	10,884	23,511	80,572	117,161	16,598	7,137	127,317	40,584	21,822	22,371	467,957
Kuningan	8,311	10,983	2,537	1,289	3,031	427	1,999	706	1,024	595	30,902
Total	31,400	120,333	191,643	277,147	105,569	87,625	183,781	126,889	71,093	69,679	1,265,159

Source: 1998: Laporan Tahunan 1998, DINAS PERTANIAN TANAMAN PANGAN,
1997: Jawa Barat Dalam Angka 1997

Table VI-2 Vegetable Production in Related Sub-districts

(1) 3 Related Sub-districts of District Bandung 1997

Unit: ton

	Sub-district Arjasari (Mekarjaya)	Sub-district Lembang (Langensari)	Sub-district Cisarua (Tugumukti)	District Bandung Total
Welsh onion	259	1,735	1,260	18,964
Red onion	806	-	-	11,387
Garlic	-	-	-	1,717
Cabbage	-	29,476	-	115,784
Tomato	160	6,690	1,940	43,653
Chili	129	2,973	430	11,008
Potato	-	8,485	950	104,740
Chinese cabbage	-	5,922	1,770	35,437
Sweet potato	290	215	75	3,933
Cassava	3,237	1,108	572	12,319
Corn	5,242	2,061	2,780	62,100

Source: Kabupaten Bandung Dalam Angka 1997

(2) 2 Related Sub-districts of District Garut 199 Unit: ton

	Sub-district Cisrupan (Cisurupan)	Sub-district Samarang (Tanjunkarya)	District Garut Total
Red onion	103	1,057	10,708
Garlic	68	677	1,226
Welsc onion	3,109	596	24,920
Potato	15,149	30,523	102,583
Cabbage	20,458	21,931	124,183
Chinese cabbage	2,494	1,130	16,293
Carrot	-	755	7,021
Kidney beans	819	88	16,367
Chili	1,884	1,818	73,238
Tomato	3,634	2,111	29,097
French bean	3,565	-	11,259
Cucumber	-	-	14,567
Sweet potato	1,478	1,059	44,134
Corn	9,269	5,995	150,729
Cassava	7,136	7,166	420,080

Source: Kabupaten Garut Dalam Angka 1997

Table VI-3 Monthly Incoming Volume of Vegetable to Kramat Jati (1999)

Unit: Tons

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Total vol.	23,284	29,474	36,097	36,916	29,746	30,013	34,819	37,881	36,768	36,697	37,821	38,530
Potato	1,275	1,630	1,966	1,675	2,319	1,983	3,027	3,637	3,726	4,115	2,622	3,390
Cabbage	2,110	2,120	2,666	2,883	2,756	1,497	1,726	2,438	2,075	3,425	3,168	3,032
Tomato	807	1,474	1,396	1,061	1,545	1,209	1,853	2,489	2,145	2,609	2,514	2,365
Chili	1,977	2,731	2,568	3,028	3,533	2,622	4,371	6,233	6,161	6,496	6,464	6,617
Red onion	1,623	1,939	2,183	2,840	2,548	1,924	3,380	4,314	4,166	3,400	4,354	4,685

Source: Commercial & Development Sec., Kramat Jati Market, Jakarta

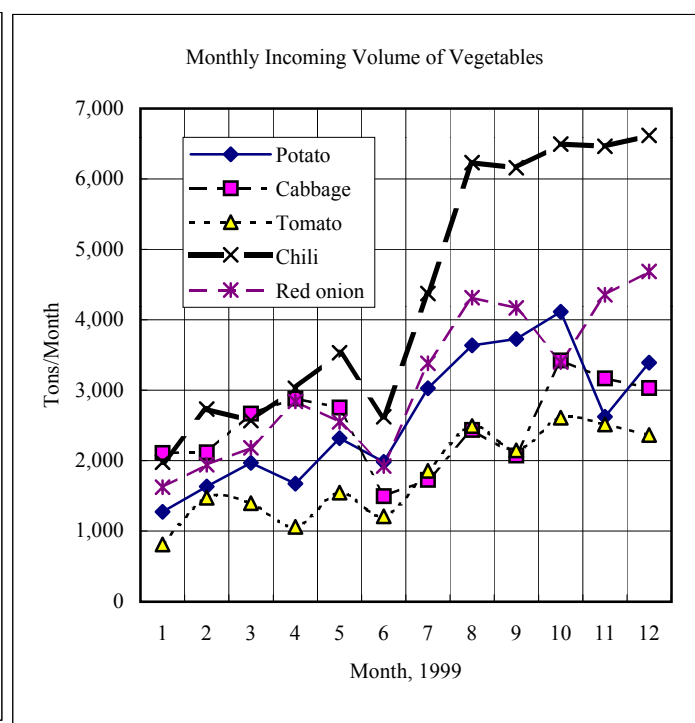
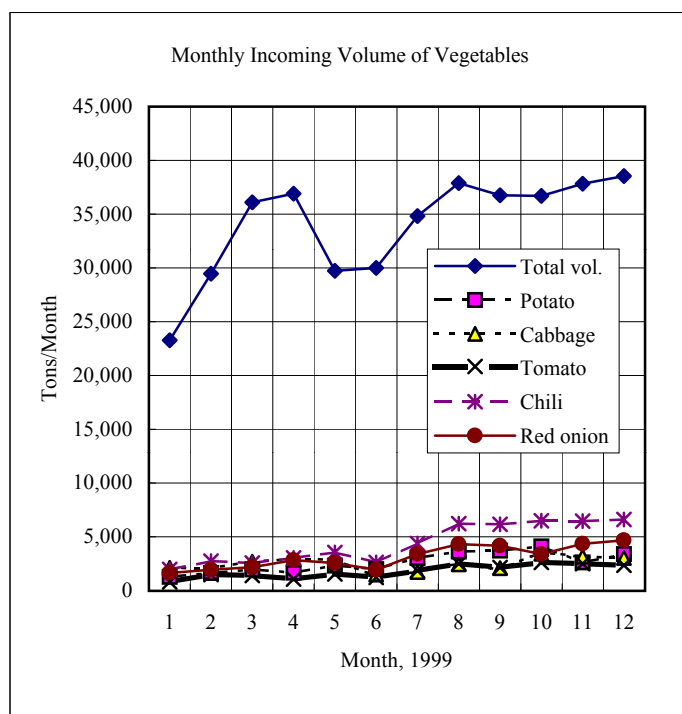


Table VI-4(1/6) Price Tendency of Vegetable in the Market of West Java Province (1997)

Market	Commodity	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Caringin (Bandung)	Cabbage	438	331	426	186	183	227	258	400	721	961	985	431
	Potato	790	798	831	970	999	1,118	1,192	1,186	1,000	1,006	1,356	1,582
	Welsh onion	571	470	558	462	532	660	973	1,121	1,111	1,296	1,574	1,734
	Red onion	965	1,196	1,357	1,146	1,042	1,120	1,567	1,131	890	920	1,310	1,995
	Chili	1,579	1,564	2,495	2,716	2,704	2,274	1,846	1,276	1,905	2,917	2,321	2,311
	Tomato	978	1,076	1,019	371	237	421	334	537	761	568	503	391
	Carrot	450	419	498	512	442	461	346	514	921	1,007	1,137	1,530
	Chili, small	2,120	2,136	3,676	3,442	3,375	2,836	2,250	2,283	2,970	4,310	3,947	5,425
Cibitung (Bekasi)	Cabbage	382	366	446	260	230	236	243	338	734	914	942	638
	Potato	827	859	837	950	1,067	1,055	1,353	1,260	1,105	1,111	1,267	1,706
	Tomato	986	1,102	976	312	410	528	403	553	762	728	655	502
	Welsh onion	648	609	698	624	733	806	1,049	1,197	1,235	2,108	1,919	2,040
	Carrot	665	620	612	616	625	542	576	704	942	1,206	1,269	1,818
	Red onion	940	1,205	1,250	1,228	1,174	1,284	1,572	1,252	905	1,064	1,315	2,358
	French bean	662	882	538	1,114	653	816	1,081	1,261	1,140	1,262	1,094	1,151
	Chili	1,619	2,136	3,010	2,716	3,063	2,488	2,245	1,815	2,248	2,310	2,045	2,528
Chili, small	2,427	2,580	3,944	3,553	3,684	3,730	2,965	2,876	3,890	4,736	4,258	4,713	
Kramat Jati (Jakarta)	Cabbage	433	371	400	358	349	300	276	324	620	983	1,146	707
	Potato	958	885	857	959	1,002	1,101	1,122	1,163	1,184	1,180	1,195	1,498
	Tomato	1,326	1,225	1,147	638	528	638	487	661	1,005	837	810	582
	Welsh onion	839	754	779	755	742	742	763	978	1,234	1,362	1,230	1,648
	Carrot	603	592	675	642	625	545	489	646	872	954	1,032	1,309
	French bean	736	856	1,016	755	821	709	857	1,126	1,395	1,259	1,284	1,039
	Red onion	1,221	1,354	1,421	1,403	1,416	1,481	1,555	1,516	1,020	1,115	1,306	2,219
	Chili	1,626	1,758	2,929	2,829	3,291	3,084	2,434	1,674	2,457	3,291	2,374	2,616
Chili, small	2,000	1,819	3,253	3,008	3,141	2,797	2,938	2,582	3,552	4,256	3,550	3,682	

Table VI-4(2/6) Price Tendency of Vegetable in the Market of West Java Province (1998)

Market	Commodity	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Caringin (Bandung)	Cabbage	390	293	1,188	1,695	2,745	1,199	548	456	416	330	1,181	1,490
	Potato	1,408	880	1,198	1,837	2,220	1,834	2,477	2,566	2,487	2,365	2,763	2,846
	Welsh onion	1,655	1,463	2,700	2,800	3,170	3,575	4,188	4,056	3,983	2,887	2,785	2,136
	Red onion	2,132	1,623	3,686	6,033	6,640	8,006	7,322	6,593	8,548	9,431	5,585	5,340
	Chili	1,542	1,395	4,180	2,235	3,715	6,756	7,543	5,772	3,073	3,648	7,713	6,084
	Tomato	369	1,193	1,734	3,023	2,265	1,155	588	782	1,002	1,030	1,883	2,401
	Carrot	1,321	555	496	523	819	1,128	1,039	819	795	621	613	735
	Chili, small	2,471	1,807	4,189	2,309	2,900	5,281	6,657	9,512	6,192	5,281	8,392	7,426
Cibitung (Bekasi)	Cabbage	468	230	896	1,725	1,842	1,222	872	630	619	967	1,307	
	Potato	1,258	1,100	1,143	1,892	2,328	2,418	2,551	2,750	2,792	3,024	3,250	
	Tomato	884	1,697	1,724	2,932	2,410	1,618	854	901	888	2,374	2,350	
	Welsh onion	1,438	1,331	3,390	3,601	3,682	4,145	4,431	4,713	5,239	4,962	3,200	
	Carrot	1,600	727	397	1,548	1,460	1,681	1,259	1,115	1,287	1,090	984	
	Red onion	2,335	1,887	3,631	4,946	6,204	8,413	6,158	6,985	9,690	8,174	4,525	
	French bean	443	1,212		1,423	1,127	1,329	1,272	1,407	1,285	1,624	1,908	
	Chili	1,224	1,550	3,510	3,211	4,668	7,429	8,188	6,363	3,357	7,232	9,850	
Chili, small	2,128	1,780	4,003	3,309	3,922	8,054	9,926	10,104	8,629	10,900	12,500		
Kramat Jati (Jakarta)	Cabbage	463	537	1,216	2,085	2,418	1,563	853	778	610	500	985	1,747
	Potato	1,583	1,376	911	1,859	2,318	2,354	2,645	2,955	2,789	2,598	2,763	3,025
	Tomato	867	1,946	2,387	4,195	2,793	1,579	928	978	1,111	1,366	2,613	2,875
	Welsh onion	1,882	1,830	2,818	3,440	3,931	3,952	4,138	4,005	3,195	3,109	3,597	3,231
	Carrot	1,747	1,198	866	1,144	1,478	1,429	1,619	1,505	1,409	1,057	1,116	1,127
	French bean	439	1,456	1,866	1,630	1,253	1,995	1,561	1,355	1,625	2,559	2,305	1,286
	Red onion	2,519	2,060	3,468	6,071	6,606	7,464	8,361	7,035	9,300	10,136	7,062	6,527
	Chili	1,874	1,960	3,455	2,519	3,038	7,269	9,480	7,860	4,509	4,561	9,921	8,113
Chili, small	2,416	2,280	3,776	2,234	3,062	6,139	10,095	9,575	6,977	5,809	10,574	9,965	

Source: Rekapitulasi Data Harga Sayuran, Palawija dan Buah-Buahan di Jawa Barat Tahun 1998

Table VI-4(3/6) Price Tendency of Vegetable in the Market of West Java Province (1999)

Market	Commodity	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Caringin (Bandung)	Cabbage	1,039	1,244	767	630	888	903	432	344	337	339	1139	1626
	Potato	2,929	2,742	2,896	2,979	2,364	2,313	2,477	2,092	2,006	2403	2930	2514
	Welsh onion	1,257	1,617	1,985	1,531	1,146	846	632	635	646	1036	1443	1533
	Red onion	6,889	8,496	7,238	4,562	4,344	3,985	3,035	1,988	1,304	1856	2049	1668
	Chili	7,265	16,292	11,904	8,217	6,940	4,025	2,656	1,932	1,313	1694	2393	2709
	Tomato	684	919	1,208	808	1,268	1,090	609	601	626	552	1299	2054
	Carrot	716	672	532	571	515	568	574	631	556	1031	2177	2422
	Chili, small	8,689	17,375	15,962	11,521	10,180	7,960	5,271	2,686	2,006	2058	2710	2794
Cibitung (Bekasi)	Cabbage	1,375	1,281	1,172	707	850	775	425	433	400	n.a.	1066	1560
	Potato	2,739	2,738	2,650	2,523	2,465	2,725	2,155	2,076	2,050	n.a.	2973	2775
	Tomato	2,086	1,357	1,425	1,063	1,706	1,342	775	786	740	n.a.	1341	2198
	Welsh onion	2,722	2,852	2,921	2,465	1,883	1,050	570	621	825	n.a.	2057	2047
	Carrot	1,072	1,025	988	906	918	1,075	700	686	600	n.a.	2039	3070
	Red onion	7,667	8,083	8,331	4,319	3,274	3,650	2,300	1,712	1,350	n.a.	2200	1740
	French bean	1,811	1,802	1,823	2,719	2,469	2,650	1,900	1,836	1,750	n.a.	1452	600
	Chili	14,260	15,529	14,635	8,502	8,318	3,000	2,400	1,968	1,100	n.a.	2940	2603
Chili, small	23,930	22,542	21,858	19,879	14,417	6,500	5,000	2,849	1,850	n.a.	3286	3605	
Kramat Jat (Jakarta)	Cabbage	1,532	1,260	1,041	918	955	854	819	569	479	548	956	1590
	Potato	3,550	3,110	3,100	3,062	2,889	2,550	2,427	2,098	1,928	2470	2400	3065
	Tomato	1,017	1,333	1,727	1,307	1,518	1,560	938	791	903	1117	2171	3005
	Welsh onion	2,357	1,853	2,191	1,912	1,782	1,523	1,481	1,348	1,170	1336	2198	2545
	Carrot	1,410	1,208	875	862	813	890	878	868	903	1177	2231	2938
	French bean	1,735	2,110	2,055	1,479	1,524	1,612	1,472	1,700	1,765	2156	2381	1823
	Red onion	7,667	9,270	8,164	5,876	5,366	4,400	3,694	2,465	1,735	1177	2130	3005
	Chili	10,428	16,775	12,341	8,952	8,238	5,821	3,131	1,938	1,620	2305	3046	3693
Chili, small	12,678	17,893	17,318	11,667	9,684	8,357	6,175	2,768	2,006	2356	2443	2310	

Source: Rekapitulasi Data Harga Sayuran, Palawija dan Buah-buahan dari Sentra Produksi dan Pasar Konsumsi Di Jawa Barat Tahun 1999

Table VI-4(4/6) Price Tendency of Vegetable at the Production Area in West Java Province (1997)

Area	Commodity	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec
Lembang (Bandung)	Cabbage	461	322	435	202	146	218	228	296	676	941	876	486
	French bean	431	419	578	781	673	410	707	774	742	879	910	781
	Chili, small	1,945	1,610	3,495	3,190	3,220	3,046	2,346	2,434	2,780	4,024	4,897	4,295
	Tomato	933	926	1,120	364	267	376	261	434	713	635	394	408
	Potato	765	787	751	859	1,028	1,072	1,151	1,083	982	995	1,285	1,467
Cipanas (Cianjur)	Welsh onion	462	448	529	449	437	607	907	993	1,085	1,329	1,471	1,589
	Carrot	339	332	357	326	223	244	265	323	661	1,016	949	1,267
	Cabbage	392	317	344	257	164	202	221	242	561	844	861	452
	Chili, small	1,984	1,757	3,876	3,454	3,355	2,964	2,905	2,829	3,311	4,401	4,311	4,214
	French bean	473	609	618	704	546	399	868	967	802	798	1,026	548
Ciwidey (Bandung)	Cabbage	374	276	323	195	115	199	228	258	480	818	944	680
	Potato	744	768	741	752	895	963	1,022	1,100	1,012	892	1,229	1,228
	French bean	362	487	471	639	625	422	715	780	716	688	885	688
	Welsh onion	397	330	388	377	403	510	691	830	892	1,180	1,566	1,372
	Chili, small	1,825	1,670	2,789	3,176	2,685	2,526	2,129	2,724	2,748	3,691	4,555	3,852
Cikajang (Garut)	Cabbage	357	224	313	132	166	175	173	246	513	700	855	439
	Potato	663	633	710	715	837	990	1,183	1,138	1,045	881	1,160	1,120
	Tomato	953	911	958	333	218	367	284	542	630	491	456	303
	French bean	371	287	590	577	359	376	494	609	926	948	951	808
	Chili, small	2,661	1,396	2,879	2,133	2,195	3,052	2,315	2,243	2,536	3,349	4,395	3,786
Majalanka (Majalanka)	Cabbage	330	297	408	200	160	158	196	276	625	844	821	482
	Carrot	475	389	346	704	395	390	336	405	738	968	1,062	1,486
	Red onion	979	1,204	1,275	1,136	1,163	1,251	1,692	1,111	714	884	1,207	2,250
	Welsh onion	428	554	532	380	609	736	969	1,002	960	1,188	1,301	1,531
	Potato	715	765	785	800	914	1,044	1,182	1,099	953	1,052	1,327	1,527

Source: Rekapitulasi Data Harga Sayuran, Palawija dan Buah-Buahan dari Sentra Produksi dan Pasar Konsumsi di Jawa Barat Tahun 1997

Table VI-4(5/6) Price Tendency of Vegetable at the Production Area in West Java Province (1998)

Area	Commodity	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Lembang (Bandung)	Cabbage	440	329	1,522	1,762	1,894	1,213	670	506	453	396	1,057	1,671
	French bean	306	726	1,345	791	565	819	1,103	903	915	1,515	2,112	680
	Chili, small	3,968	2,218	3,109	3,166	3,049	4,491	6,765	7,581	7,246	5,301	8,536	6,696
	Tomato	618	1,329	1,977	3,396	2,568	1,178	627	717	1,073	1,178	1,911	2,427
	Potato	1,277	1,025	1,201	1,600	1,993	1,842	2,295	2,588	2,416	2,345	2,474	2,853
Cipanus (Cianjur)	Welsh onion	2,289	1,590	2,880	2,925	3,393	3,987	4,050	4,295	3,650	2,791	2,419	1,875
	Carrot	913	250	297	465	935	813	823	679	558	420	472	508
	Cabbage	329	321	897	1,357	1,550	917	872	510	399	292	1,031	1,265
	Chili, small	2,476	2,073	3,045	1,935	2,648	5,042	7,231	8,827	6,688	4,765	8,333	6,525
	French bean	202	913	1,466	613	535	946	1,026	771	986	1,507	984	611
Ciwidey (Bandung)	Cabbage	292	243	942	1,552	1,763	1,275	601	449	505	337	894	1,385
	Potato	1,341	1,160	1,136	1,513	1,889	1,766	2,234	2,582	2,343	2,183	2,427	2,657
	French bean	246	645	917	1,470	518	875	1,117	984	956	1,178	1,600	794
	Welsh onion	1,453	1,187	2,618	2,468	2,475	3,429	4,015	3,805	4,155	2,702	2,898	2,296
	Chili, small	2,971	2,217	2,811	3,132	1,778	4,009	6,321	8,675	9,124	3,781	6,054	5,400
Cikajang (Garut)	Cabbage	249	204	772	1,403	1,603	1,023	430	281	287	210	871	1,142
	Potato	1,167	911	781	1,440	1,799	2,219	2,203	2,221	2,000	2,031	2,344	2,446
	Tomato	472	935	1,331	2,711	2,425	1,159	475	637	832	907	1,667	2,003
	French bean	316	177	733	892	762	662	787	635	756	1,194	1,025	543
	Chili, small	2,637	853	2,975	1,463	1,456	4,066	7,044	7,120	4,781	3,926	8,052	5,696
Majalanka (Majalanka)	Cabbage	401	330	1,106	1,730	1,785	1,058	503	436	437	331	1,076	1,534
	Carrot	1,337	827	476	698	1,225	1,392	1,022	1,000	793	637	725	873
	Red onion	2,118	2,067	3,684	5,397	5,252	5,019	8,115	7,383	8,917	10,174	5,998	6,008
	Welsh onion	1,142	1,550	2,709	3,133	3,392	3,700	3,846	4,072	3,581	2,545	2,471	1,963
	Potato	1,221	818	781	1,440	1,799	1,102	2,369	2,384	2,148	2,267	2,673	2,761

Source: Rekapitulasi Data Harga Sayuran, Palawija dan Buah-Buahan dari Sentra Produksi dan Pasar Konsumsi di Jawa Barat Tahun 1998

Table VI-4(6/6) Price Tendency of Vegetable at the Production Area in West Java Province (1999)

Area	Commodity	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Lembang	Cabbage	921	983	921	703	769	668	431	316	255	273	563	2140
(Bandung)	French bean	842	1,858	926	727	1,056	1,252	923	625	1,300	1185	1281	342
	Chili, small	9,076	17,552	15,038	10,192	7,180	6,638	3,909	2,200	1,150	1154	3256	1910
	Tomato	583	741	1,197	593	1,324	1,098	359	345	320	259	727	1874
	Potato	2,536	2,495	2,233	2,204	2,302	2,405	1,723	1,671	1,650	1863	2538	2090
Cipanas	Welsh onion	1,121	1,639	1,905	1,348	1,124	826	546	580	608	1226	1541	1200
(Cianjur)	Carrot	471	392	388	475	456	450	418	507	576	766	1686	2150
	Cabbage	934	1,108	910	667	828	791	496	414	375	370	689	1370
	Chili, small	8,605	15,900	16,980	9,325	9,380	8,454	4,498	2,599	1,530	2170	2757	1200
	French bean	1,134	1,712	1,365	894	1,105	1,269	1,182	857	1,208	1548	846	330
Ciwidey	Cabbage	1,160	1,110	806	611	900	793	457	345	290	311	688	1530
(Bandung)	Potato	2,781	3,015	2,706	3,035	2,406	2,294	2,020	2,118	2,048	2233	3017	1870
	French bean	863	1,791	1,450	763	1,049	1,210	1,011	738	1,200	1226	963	270
	Welsh onion	1,223	2,227	1,960	1,493	1,198	991	583	517	538	625	1173	1300
	Chili, small	7,757	15,612	16,635	11,944	9,426	8,260	5,740	2,048	1,684	1743	2411	1520
Cikajang	Cabbage	948	993	553	478	663	798	437	264	193	205	764	1415
(Garut)	Potato	2,800	2,738	2,651	2,708	2,098	2,110	2,024	1,817	1,804	2121	2553	2233
	Tomato	602	775	1,136	696	1,070	955	493	453	385	344	1064	1858
	French bean	915	1,329	1,083	699	931	1,093	796	694	935	988	1187	232
	Chili, small	6,757	14,771	14,036	8,781	7,422	7,298	5,236	1,732	1,154	1633	2012	1558
Majalanka	Cabbage	1,121	1,165	819	748	845	817	746	380	325	347	1079	1737
(Majalanka)	Carrot	971	806	695	765	699	688	705	620	648	881	1995	2015
	Red onion	7,700	9,438	7,838	6,319	5,104	4,033	2,952	1,816	1,269	1748	1543	1021
	Welsh onion	1,176	2,006	1,621	1,146	910	651	374	391	573	770	1932	1372
	Potato	2,880	2,723	2,908	2,840	2,310	2,241	2,124	2,154	2,111	1713	3070	2453

Source: Rekapitulasi Data Harga Sayuran, Palawija dan Buah-buahan dari Sentra Produksi dan Pasar Konsumsi Di Jawa Barat Tahun 1999

Table VI-5 Price Fluctuation of Vegetables in Kramat Jati Market

	1997			1998			1999		
	Highest price (Rp./kg)	Lowest price (Rp./kg)	H/L	Highest price (Rp./kg)	Lowest price (Rp./kg)	H/L	Highest price (Rp./kg)	Lowest price (Rp./kg)	H/L
Cabbage	1,146	276	4.15	2,418	463	5.22	1,590	479	3.32
Potato	1,498	857	1.75	3,025	911	3.32	3,550	1,928	1.84
Tomato	1,326	487	2.72	4,195	928	4.84	3,005	791	3.80
Welsh onion	1,648	742	2.22	4,138	1,830	2.26	2,545	1,170	2.18
Carrot	1,309	489	2.68	1,747	866	2.02	2,938	813	3.61
French bean	1,395	736	1.97	2,559	439	5.83	2,381	1,472	1.62
Red onion	2,219	1,020	2.17	10,136	2,060	4.92	9,270	1,177	7.88
Chili	3,291	1,626	2.02	9,921	1,874	5.29	16,775	1,620	10.35
Chili, small	4,256	1,819	2.34	10,574	2,234	4.73	17,893	1,790	10.00

Source: Rekapitulasi Data Harga Sayuran, Palawija dan Buah-Buahan dari Sentra Produksi dan Pasar Konsumsi di Jawa Barat Tahun 1999, 1998, 1997

Figures

Figure VI-1 Vegetable Prices and Market Volumes (1/2)

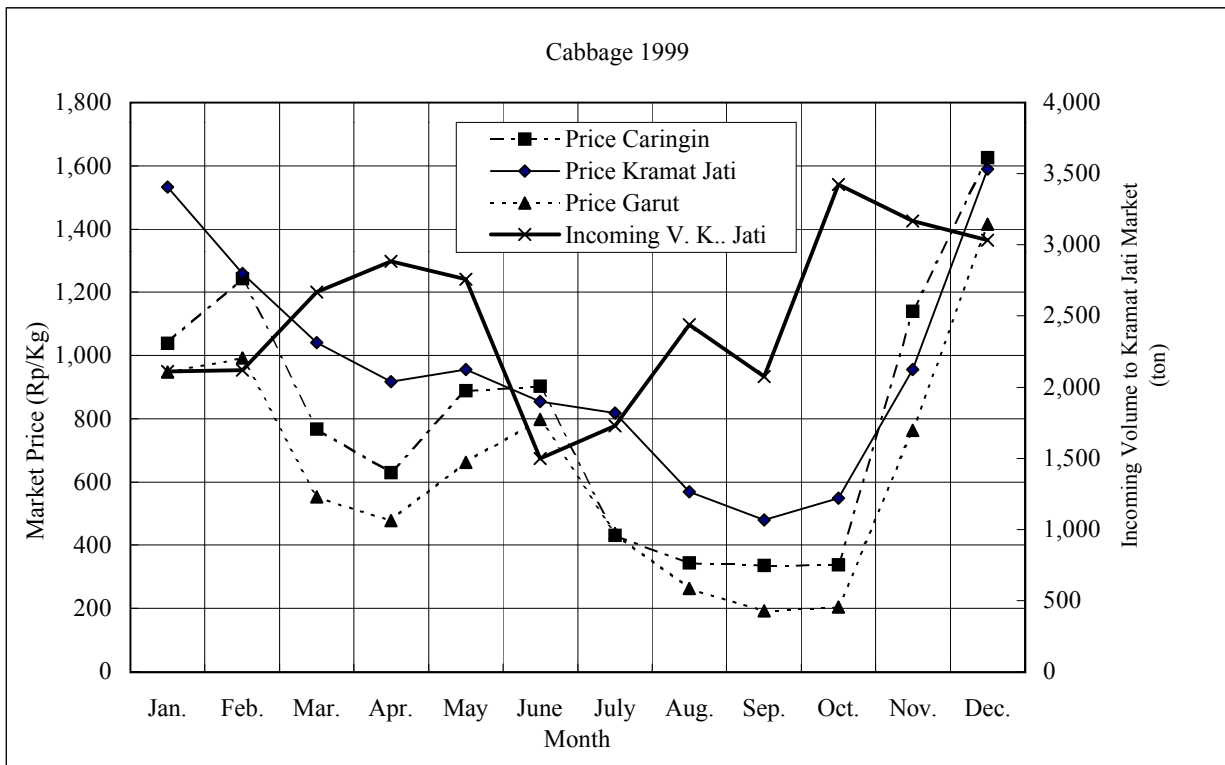
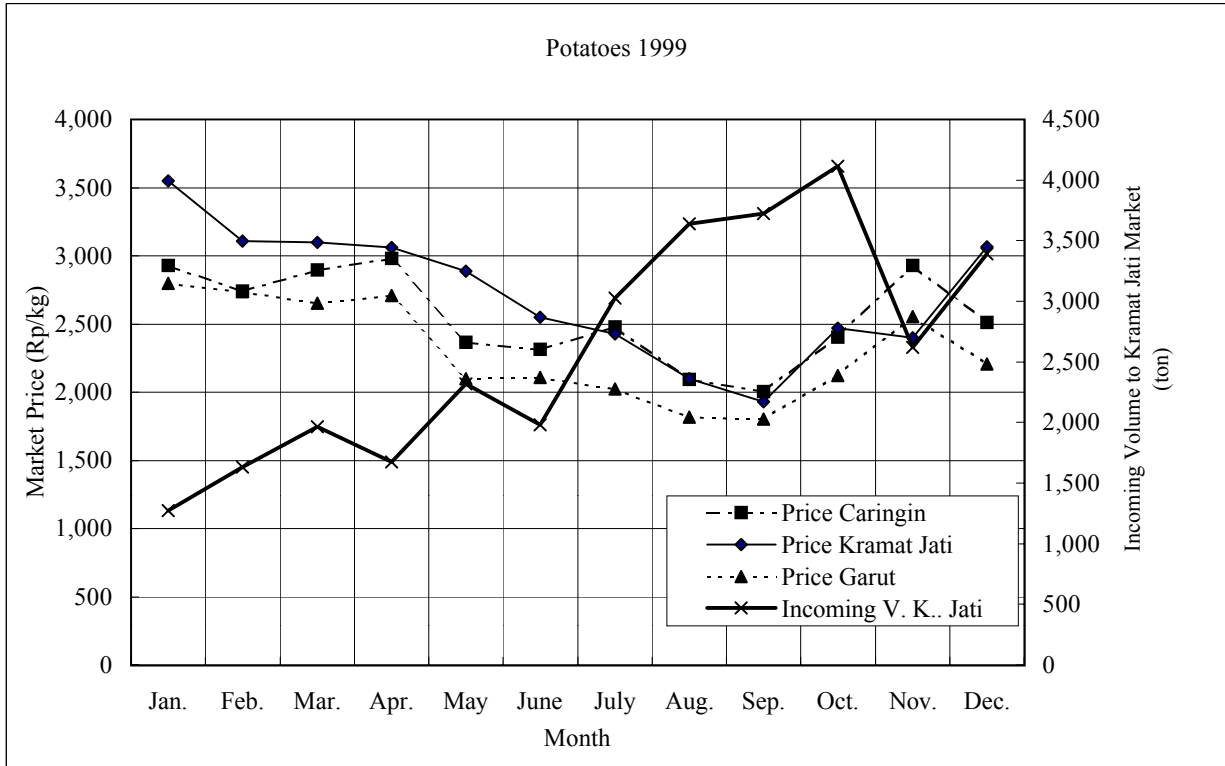


Figure VI-1 Vegetable Prices and Market Volumes (2/2)

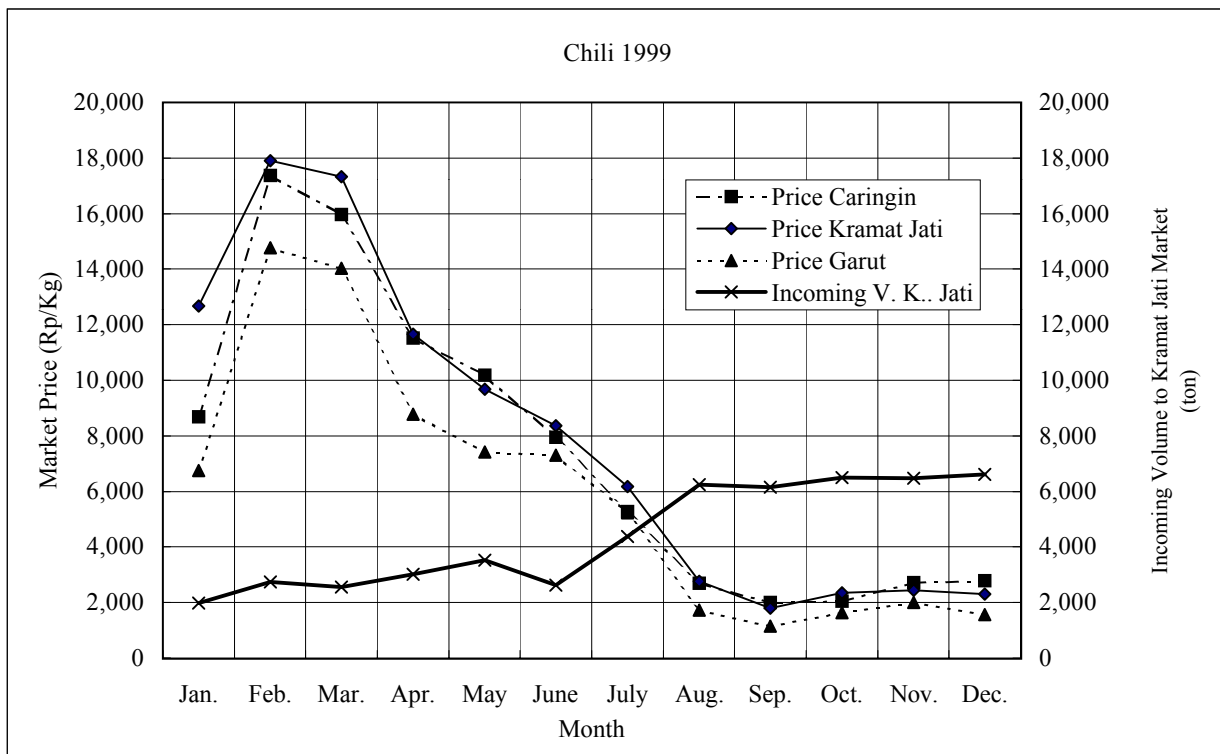
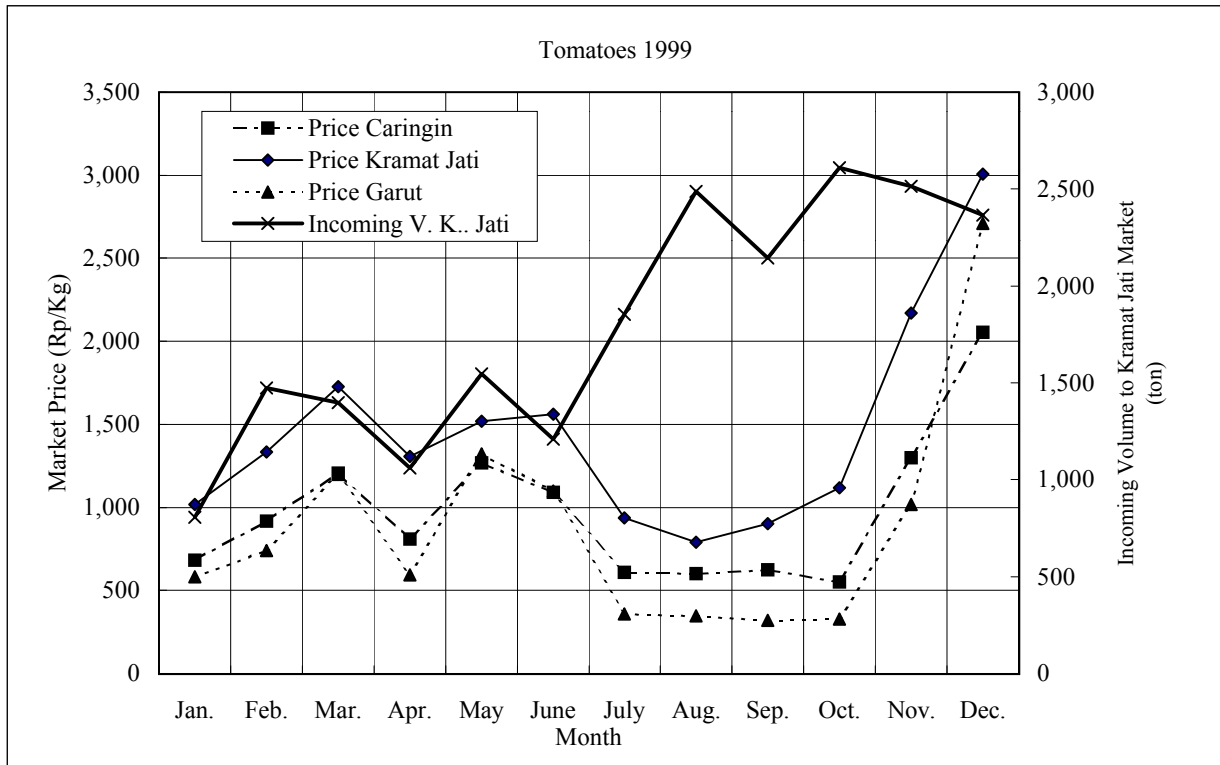


Figure VI-2 Vegetable Total Marketing Values and Monthly Incoming Volume of Kramat Jati

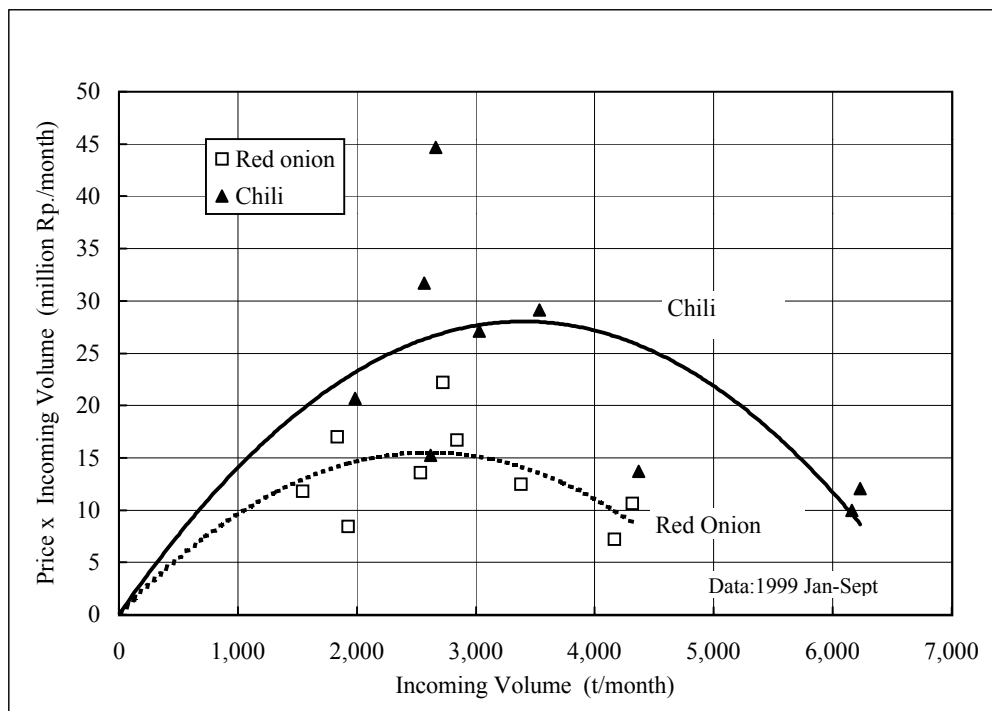
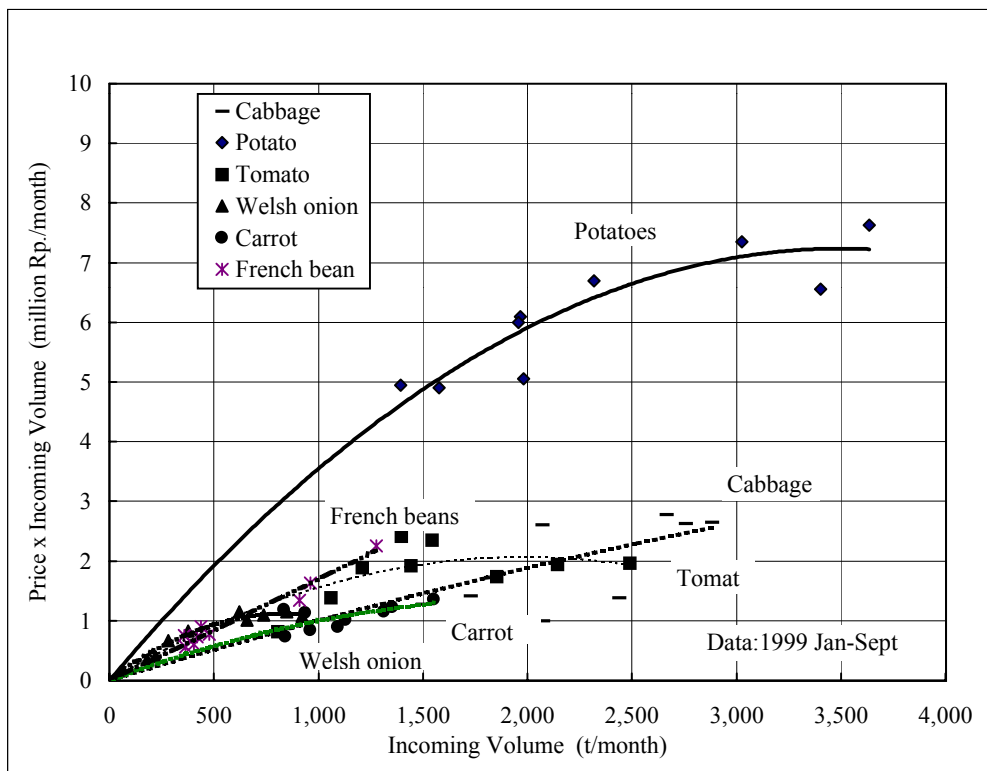


Figure VI-3 Price Tendency of Vegetables (1/3)

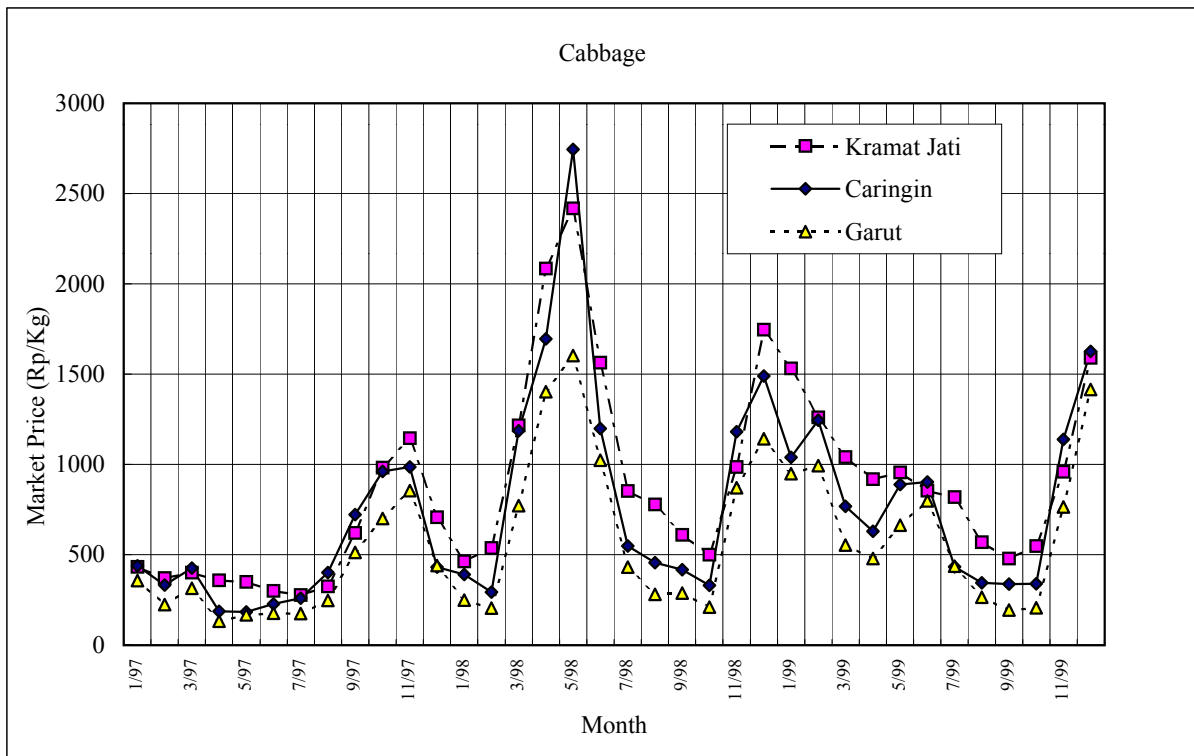
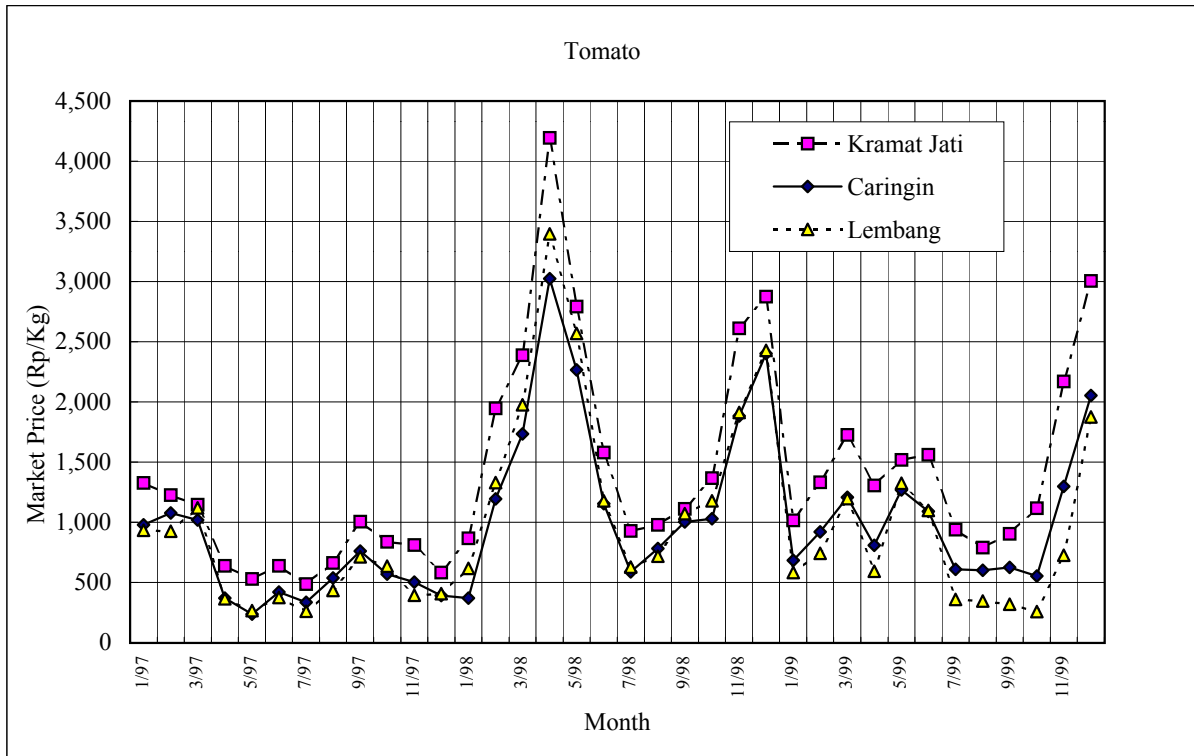


Figure VI-3 Price Tendency of Vegetables (2/3)

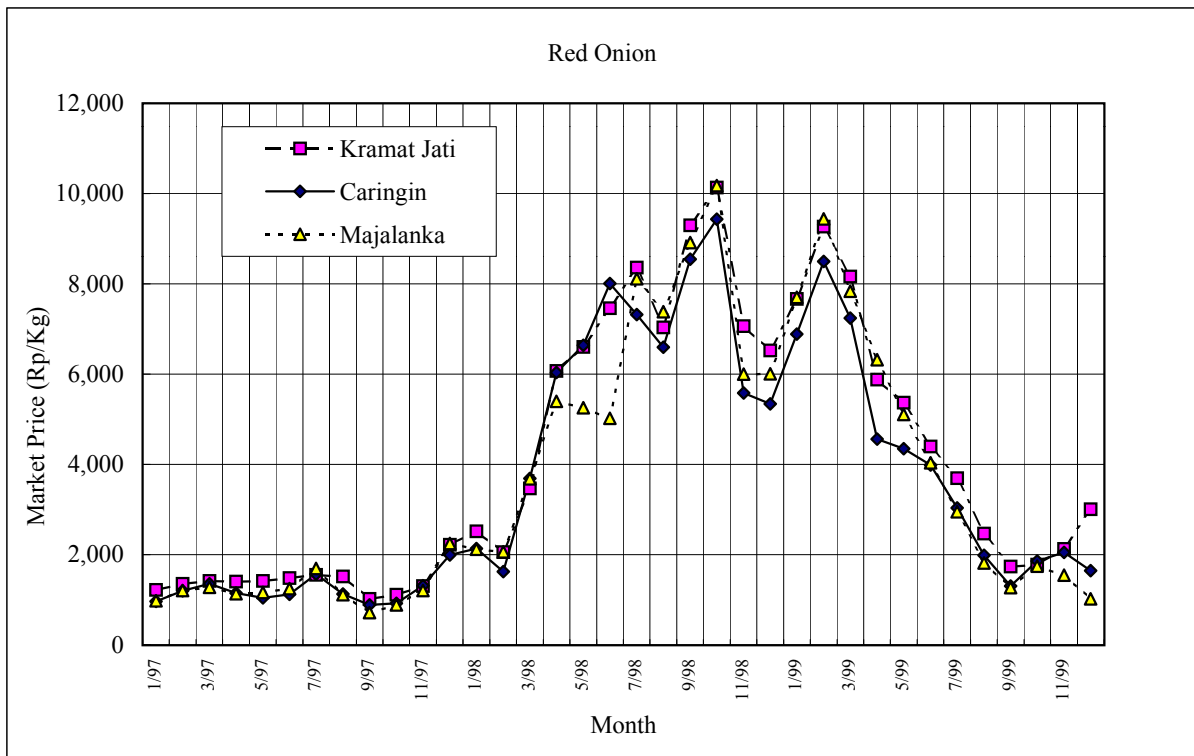
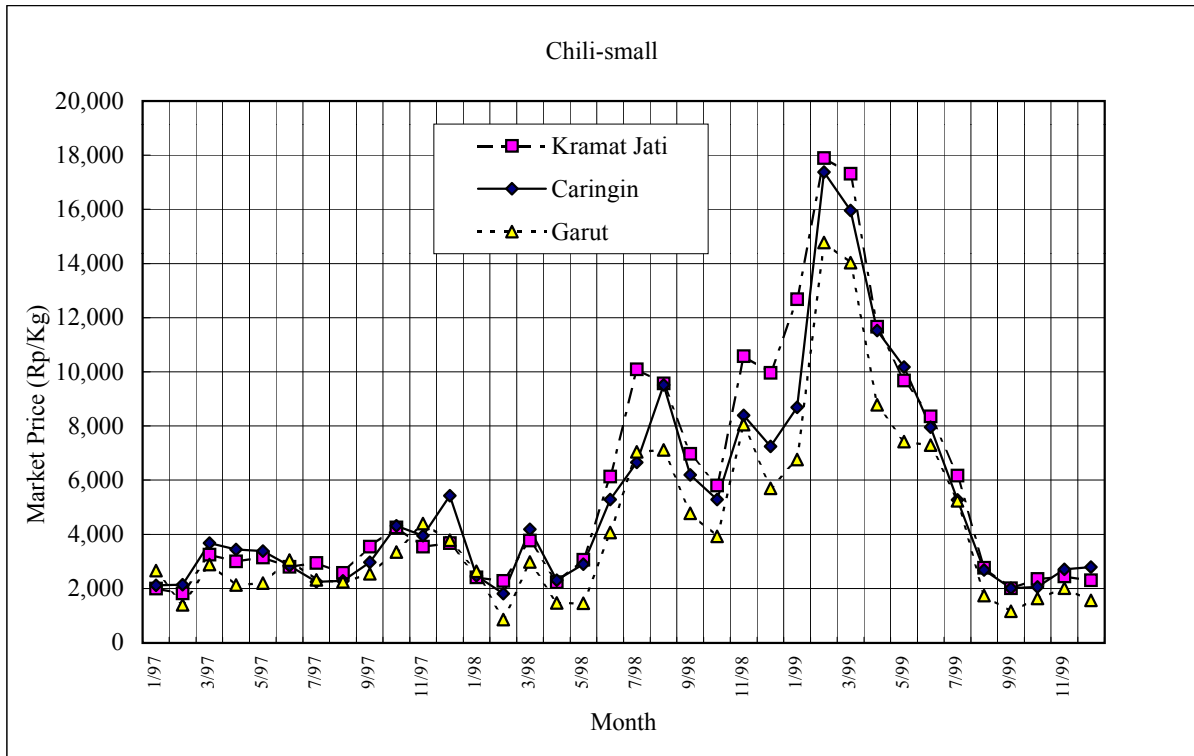


Figure VI-3 Price Tendency of Vegetables (3/3)

