

Chapter 1

GENERAL CONSIDERATIONS

1. Introduction

Vegetables are important in Indonesia from the point of view of consumption, production and income (Ministry of Trade, Republic of Indonesia 1977). From the point of view of consumption, vegetables are a source of vitamins and minerals which are important human foods at all levels of development (Abbott 1970). Furthermore, from other points of view, vegetable production activities offer job opportunities, being more labour intensive than rice or secondary crops, and have a significant role in terms of gross domestic product (GDP) (Bogor Agricultural University 1984).

This chapter will firstly discuss the background of the study and the significance of the problem. Secondly, objectives and hypotheses of the research study will be detailed, and finally definitions of relevant concepts and the organisation of the study will be discussed.

1.2 Background to the Study

The cost of vegetable crops per hectare is three to four times the cost of rice or secondary crops (which include corn, cassava, soybeans and mungbeans) (Bogor Agricultural University 1984). Furthermore, vegetable products require special care because of the characteristics of the product, such as perishability: they cannot survive a long journey to the final consumer without suffering loss and deterioration in quality (Abbott 1966, p. 9).

The development of vegetable products in Indonesia is one of the main priorities in agricultural development and has at least three main objectives: increasing production; increasing the income of farmers; and increasing the status of nutrition of villagers (Government of Republic of Indonesia 1985). To achieve these objectives, several policies, which are outlined in five-year development plans, have been implemented. To increase production, a policy of promoting the use of high-yielding varieties, a credit policy and extension programs have all been implemented. To increase the income of farmers, the government has established some marketing facilities such as transportation systems, market buildings and market information facilities. Vegetable production has been increased every year since the early 1970s and, in 1983, it increased by 35.1 per cent over the 1982 level (Government of Republic of Indonesia 1985, p. 241). To increase the level of nutrition of villagers the government has implemented an integrated extension program which involves both the Department of Agriculture and the Department of Health.

Market information services, which have been implemented by the Government of Indonesia with assistance from the Federal Republic of Germany since 1979, are designed to provide information on the prices of vegetables for farmers and traders and also to improve the bargaining power of farmers (Subdirectorate of Marketing Information 1984). Farmers' opinion is that middle men (traders) sometimes do not inform them clearly of the prices in a city or other markets. The market information services provided by the government include the announcement of vegetable prices in various places, particularly in the farmer (in a village) and consumer (in a city) areas, through the government radio station (Radio Republik Indonesia). The prices are broadcast nationally every weekday at 8.05 p.m. (West-Indonesian Time) and are also listed on boards located in the various important markets and production areas.

Thus, farmers can now know the prices of vegetables in several places, especially in the important consumer markets, and they can choose to sell their produce where the price is the highest. Therefore, the capacity of middle men to exploit the farmers' lack of market information has been reduced, that is, if it ever existed.

1.3 Significance of the Problem

Vegetables have become a commercial crop which is still being developed, and aggregate production increases every year. However, it is not clear whether the prices farmers receive are at or near equilibrium prices. To establish the quality of information flows, one approach is to analyse to the extent that prices may be below equilibrium levels.

The government has implemented marketing programs to increase the income of farmers. One of the most important programs involves the improvement of market information services. This has been occurring since 1979. The role of market information, particularly market broadcasts, in marketing is to aid the free competitive marketing system to do its job better and at lower cost (McCallister 1950). In the ideal marketing system both producers and consumers receive optimal satisfaction. An effect of the broadcasting of prices should have been to reduce any price distortions among markets.

The research problem which is the focus of this study is to evaluate the extent to which farm level vegetable markets in West Java reflect relevant equilibrium prices.

West Java is one of the most important provinces of Indonesia in terms of agricultural production and is the biggest supplier of vegetables for the capital city of Indonesia, Jakarta. In 1982, vegetables in the economy of West Java ranked third (after rice and secondary crops) in their contribution to the food-crop subsector (Bogor Agricultural University 1984).

Vegetables consist of many kinds of crops. In West Java, the vegetables which have the main role in the economy are potatoes, cabbages, carrots, tomatoes, red peppers and onions (Regional Government of West Java 1984).

The broadcasting of the prices of vegetables, which occurs nationally every weekday, can be seen as a form of market arbitration from the point of view of farmers. In West Java, the important production areas for the vegetables mentioned above are the Regencies of Bandung, Garut, Majalengka, Bogor, Cianjur, Sukabumi and Cirebon. The important markets for the vegetables are Jakarta and the municipalities of Bandung, Bogor, Cirebon and Sukabumi. The distance of the important markets from the important production areas is between 10 kilometres (km) and 250 km. Since transportation facilities throughout the region are quite good, market information is very useful for the farmers who live in the contiguous areas (see Appendix 1 - Map of West Java).

Based on the discussion above, this study will focus only on how the market information systems provide information on prices for the farmers on the above vegetable crops for the three years from 1986 to 1988 inclusive.

No analysis of this type has been conducted previously with respect to the West Java vegetable market.

1.4 Objectives

Generally, the objective is to identify the price integration among markets for selected vegetables. More specifically, the objectives of the study are as follows:

1. to study the price integration of market places for major perishable vegetables over time;
2. to study the price integration of market places for relatively non-perishable vegetables over time; and
3. to draw policy implications from the foregoing analysis.

1.5 Hypotheses

From the general objective:

Hypothesis 1: The price integration among market places for selected vegetables is maximal.

From the specific objectives:

Hypothesis 2: The price integration among market places for non-perishable vegetables is identical to that for market places for perishable vegetables.

1.6 Definition of the Concept

Due to the possibility of different interpretations of certain terms relevant to the research, the following operative definitions are provided.

1.6.1 Producer market

Producer market in this study means a market which is located in a production area. The produce (commodities) of the production areas is mainly sent to other regions.

1.6.2 Consumer market

A consumer market is one which is located in the area which receives the commodities from the producer market mentioned in section

1.6.1.

1.6.3 Daily prices

Daily prices of the commodities are prices which are reported every weekday by an official of the Subdirectorate of Price Information, the Directorate of Supervisor of Farmers' Food-Crop Enterprises, Directorate General of Food Crop, Department of Agriculture (Subdirektorat Informasi Pasar, Direktorat Bina Usaha Petani Tanaman Pangan, Direktur Jendral Tanaman Pangan, Departemen Pertanian). The prices are in Rupiah (Indonesian currency) per kg which is abbreviated as Rp/kg.

1.6.4 Technique of reporting prices

Daily prices are reported from five wholesalers. From those prices, the maximum and minimum prices are excluded and the rest are used to calculate the average price. This price is a reported price.

1.6.5 The quality of commodities

The quality of commodities is based on the average quality of commodities which are traded. For example, the quality of potatoes reported is AB where AB is a mixture of A and B qualities and is standardised, based on ~~the~~ number of potatoes per kg. The number of A quality potatoes per kg is lower than that of B quality. The quality of cabbages, however, is based on the shape of the cabbages, which may be either round or elliptical. The cabbage quality which is reported is elliptical.

1.7 Organisation of the Study

This dissertation consists of six chapters. The theoretical background of the study is discussed in the second chapter. This includes the role of market information and the pricing system in commodity marketing, the concept of market integration and the characteristics of vegetable markets.

The third chapter incorporates a discussion on the production and distribution of potatoes and cabbages in West Java. Geographical area, agronomical aspects and marketing facilities are detailed.

Research and analytical methods are discussed in the fourth chapter. The model of market integration, the functional form of the model, data and data preparation, general problems in the model, and the testing of the model and hypotheses are all overviewed.

A discussion of research findings provides the focus for the fifth chapter. First, the appropriateness of the model and interpretation of the model output are discussed and then, secondly, the analysis of the whole study period and on a year by year basis market integration are detailed. Finally, the summary of the results are outlined.

Conclusions and recommendations of the study are provided in the last chapter together with a discussion of the study's limitations and suggestions for further research.

Chapter 2

MARKET INFORMATION AND INTEGRATION AND THE CHARACTERISTICS OF VEGETABLE MARKETS

2.1 Introduction

The theoretical background of the research is discussed in this chapter. Firstly, the role of market information and the pricing system in commodity marketing is overviewed. Secondly, the concept of market integration is discussed and finally the characteristics of vegetable markets are detailed.

2.2 The Role of Market Information

Irwin (1968) and Breimyer (1967) (in Rogers 1970) agree that commodity prices are of major importance in agricultural marketing. Price has a fundamental role in both long-run and short-run decision making at all levels in industry. For example, in the long run, prices should optimise resource allocation and consumer satisfaction, and, in the short run, they should facilitate trading and the orderly and timely movement of goods from producers to ultimate users (Rogers 1970).

Commercial farmers consider that prices provide signals for them to adjust their production activity. If the price of a commodity is sufficient to cover costs (both fixed and variable costs) and profit, the production of the commodity will be an activity included in their business. Obviously, prices on inputs as well as outputs are important. According to neoclassical economic theory, 'when finance is unlimited and uncertainty is absent, an input should be increased until

the return to the last unit per acre is just equal to the marginal cost of this unit when the objective is to maximize profit' (Anderson 1971, p. 5).

Clearly, the role of price in commercial agriculture is very important. The government of Indonesia has been implementing a market information service for selected vegetables since 1979. In 1981, the service also covered secondary crops.

In a pricing system, the process of price making is rarely passive but usually involves deliberate effort. Additionally, the general type of pricing system in operation, its individual characteristics, and the conduct of active participants in the system, all influence its performance (Rogers 1970).

Generally, the process of price formation of a commodity, or price 'discovery', is very difficult to investigate. This is especially in developing countries, where the infrastructure of marketing is inadequate and farmers are sometimes in a weak bargaining position. In this situation, buyers have the opportunity to gain a high profit.

There are several methods of price making in agriculture. Tomek and Robinson (1981) have classified the pricing arrangements for farm products in two ways. The first method is to base categories on what is commonly called 'market structure'. The term 'market structure' refers to 'the number and size distribution of buyers and sellers, the degree of product differentiation, and the ease of entry of new firms into an industry' (Tomek and Robinson 1981, p. 93). Market structure can also be viewed as a continuum from price competition to absolute monopoly. The market structure may be classified as competitive (many buyers and sellers), oligopolistic (few firms) or monopolistic (a single firm). Price behaviour varies with the type of market structure. It has been argued that the competitive market structure is the most efficient from the point of view of producers and consumers. The market structure for vegetables in West Java can be seen as a competitive market.

Another method is to categorise pricing arrangements by the

institutions or mechanics used to establish prices. In agriculture the categories which cover most of the pricing systems are as follows: informal negotiations between individual market participants; trading on organised exchanges or auctions, including both specific market places and electronic exchanges or auctions; pricing via formulae which are computed from an equation; bargaining conducted by producer associations or cooperatives by a negotiating team; and administrative decisions, both in the private and public sectors (Tomek and Robinson 1981, p. 214).

More than one mechanism may be used to determine the price of a particular commodity. Hayengga and Schrader (1980) found that some milk prices are negotiated, while others are fixed by formulae. Moreover, Tomek and Robinson (1981) conclude that no one system of pricing is inherently superior for all commodities or situations.

The pricing arrangements of vegetable marketing in West Java are similar to those categorised as informal negotiations between individuals or market participants. The category involves myriads of pricing decisions which are made on the basis of individual negotiations between buyers and farmers without benefit of a formal market (Tomek and Robinson 1981). Furthermore, if reasonably accurate economic information is readily available to both buyers and sellers, prices in the category will approximate the equilibrium prices implicit in a competitive market (Tomek and Robinson 1981). A range of prices rather than a single equilibrium is likely to prevail. This range may be reflected not only in differences among the lots of the product based on quality and location but also in imperfections in the pricing method, including the relative bargaining power and trading skills of the participants. In addition, the reporting of past prices, which provides a basis for current prices discovery and usually exhibits much variability, is time-consuming, expensive, and sometimes inaccurate.

Rogers (1970) states that the pricing arrangements commonly observed in fresh fruit and vegetable markets are consistent with those found in a free market. The basic price of the commodities in a free market is determined by auction, shipping point, and whether terminal

market sales are to receivers or retailers.

If the price of a commodity is arranged on the basis of a free market, it will be found that both consumers and producers receive optimal satisfaction. In other words, both consumers and producers in that market do their jobs better and at lower cost (McCallister 1950). Furthermore, a free market is one of the components of the perfect market concept (Bressler and King 1970). The perfect market concept refers to the market which is characterised throughout by the conditions of perfect competition. This concept is similar to the competitive market structure mentioned above.

Marketing information is defined as 'data and news relevant to marketing operations' (Hart and Stapleton 1981, p. 119). Based on this definition, marketing information can be seen as a source of information which is used by participant in a market. The government of Indonesia, as mentioned before, has implemented a market information service for selected vegetables and secondary crops. The service is designed to provide information on the prices of vegetables and secondary crops for farmers and buyers and thereby to improve the bargaining power of farmers. Farmers' opinion is that buyers or middle men sometimes do not inform them clearly of the prices in consumer markets. The service of the program for the farmers is the announcement of the prices, or the market news, through the government radio station (Radio Republik Indonesia). The prices are broadcast nationally every weekday at 8.05 p.m. (West-Indonesian Time) and also are listed on boards located at the various important consumer and producer markets.

The government has intervened in the vegetable marketing at times when the existing processes have not found an equilibrium price properly, or the fluctuations of prices from time to time have become quite high. A major contributor to these situations has been the lack of knowledge about the prices of the commodities in both producer and consumer markets by the farmers and buyers. Therefore, the supply of and demand for commodities have often been unbalanced over time. Based on these reasons, the objective of market information services has been to encourage farmers to produce commodities on the basis of underlying

supply and demand conditions. Therefore, ceteris paribus, the fluctuations of price can be reduced and, presumably, the bargaining power of the farmers can be increased.

Market news in vegetable marketing has been discussed since the 1930s, when Waugh (1936) stated that market news was one of the topics in most urgent need of research in the area of marketing fruit and vegetables. The role of market news in vegetable marketing was further discussed by McCallister (1950).

McCallister (1950) stated that a free competitive society (in which vegetables are often marketed) needs market news. There are several basic requirements to be met if the market news is to be conveyed most effectively: all buyers and sellers must be equally and adequately informed; there must be honesty in market dealings; and there must be prompt, intelligent responses to changing market conditions. These requirements are very important for achieving the objectives of the market information program. Kohls and Uhl (1985) add some further criteria for the effective transmission of market information: information must, for example, be complete and comprehensive, accurate, trustworthy, relevant and in useable form, timely (in the sense of being relevant to current decisions), and speedily transmitted to users.

In Indonesia, where vegetables are being improved not only for fulfilling domestic demand but also for export, the government should strive to meet those criteria listed above. Because vegetables are not a politically sensitive commodity like rice, the government is unlikely to be constrained in its attempts to achieve these market information requirements. One of the most important problems in agricultural marketing is the farmers' lack of knowledge of the local conditions and market potential (Subdirectorate of Marketing Information 1984).

One of the most important roles of market information is to improve decision making not only for consumer and producer markets, but also for government and other organisations which are involved in the marketing system (Kohls and Uhl 1985). For example, farmers use market information when selecting enterprises, changing production plans,

making long-term investments, and deciding the when, where, and how of their marketing strategies. Farm organisations, farm cooperatives, food marketing firms and legislators also depend upon market information for good decision making (Kohls and Uhl 1985, p. 320).

The role of market information in competitive market processes is also important for regulating prices in the food industry. Even though it is not widely recognised, market information also contributes to operational efficiency in the food industry. Without the widespread and timely availability of market information, both buyers and sellers would need to devote considerably more time and money to market research activity than they currently do (Kohls and Uhl 1985, p. 320).

2.3 Market Integration

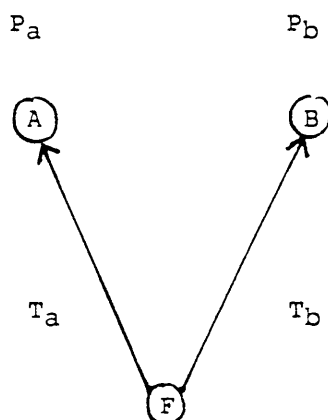
In West Java, potatoes and cabbages are mainly produced in the Regencies of Bandung and Garut. In 1986-1988, 45 per cent and 33 per cent of the total area of the potato crop were in the Regencies of Bandung and Garut, respectively. During the same period, 44 per cent and 27 per cent of the total area of cabbage crop were found in the Regencies of Bandung and Garut, respectively. The Regencies of Majalengka and Cianjur had the third and fourth largest production levels of potatoes and cabbages, respectively (Regional Government of West Java 1989). Each of these markets mentioned above, except for Majalengka, have market information services.

In an open market system, farmers from the producing regions can bring their commodities to the market where the price is 'suitable' or even the highest. In the present research, farmers from those regencies mentioned above can deliver their commodities to the market in their regencies, or to the consumer markets, Pasar Induk Kramat Jati (Pasar IKJ) in Jakarta and Pasar Ciroyom in Bandung municipality.

To deliver the commodity to a particular market, whether it is to the market in their regencies or to the consumer or producer markets,

the farmer will incur some transfer costs. Broadly speaking, transfer costs will include 'activities such as assembly or collection from small producing sites, loading and other terminal activities, the transportation to major market centres, and the distribution to wholesalers, retailers, and final consumers' (Bressler and King 1970, p. 108). For the small farmer, however, costs will generally be limited to those incurred up to the point of delivery to the market centre.

In a simple model of a market, let there be one farmer and two markets at which he can choose to sell. This is illustrated below.



The farmer can sell his commodity to either market A or market B. Assume that T_a is the transfer cost from the farmer to market A and T_b to market B, and P_a and P_b are the 'discovered' prices in markets A and B, respectively.

Based on the law of market areas¹, if $(P_a - T_a)$ is equal to $(P_b -$

¹ It is assumed that uncertainty is absent or identical in both markets and that the objective is to maximise profits.

T_b), or $(P_a - P_b)$ is equal to $(T_a - T_b)$, the choice between these two markets would be a matter of indifference to the farmer. However, if $(P_a - T_a)$ is greater than $(P_b - T_b)$, the farmer will sell his commodity to market A, and if the converse, to market B (Bressler and King 1970).

If it is assumed that the farmer knows the transfer cost to all producer and consumer markets and the transfer cost is usually constant, the farmer now only needs information of prices in those markets. It has already been explained that prices in both consumer and producer markets are broadcast every weekday. Therefore, the farmer can easily calculate where the 'net' price is the highest.

Lele (1969, p. 147) defines market integration as the 'interrelation between price movements in two markets'. Moreover, Monke and Petzel (1984, p. 482) define integrated markets as 'markets in which prices of differentiated products do not behave independently. Markets which are independent must be modeled in a disaggregate manner, while markets which are integrated may be amenable to aggregate analysis'. From the definition above, market integration can be seen as a system of one set of markets. Every market in the system has a close relationship with other markets within the system.

It has been argued that in an efficient marketing system, there will be positive correlation over time among prices at different market locations. Coefficients of correlation measure how closely prices of a commodity move together in various market places. However, the measurement may be misleading because the concept of marketing efficiency relates to the concept of competition. Harriss (1979, p. 202) makes the criticism that most studies of market integration fail to distinguish between the concepts of competition and market integration: 'we must note a common incidence of tautology in the definition of integrated markets as characterised by high [correlation] coefficients and the conclusion from their occurrence that markets are therefore integrated and competitive'. In addition to the high correlation coefficients, Heytens (1986, p. 26) states that 'high correlation coefficients, on the other hand, may result from price setting by public authority or private cartel; they nevertheless imply market integration,

at least in the sense that local markets are linked together, however inefficient this linkage may be'. Petzel and Monke (1980) state that integration is a spatial concept, and a spatially integrated market does not have to be competitive.

Although correlation and regression techniques cannot indicate the degree of competitiveness in trade, price analysis can still be a useful tool to investigate the degree of interconnectedness among prices in a market at any given time (Petzel and Monke, 1980). Ravallion (1986) states that the data of correlation coefficients, or the static bivariate method, can be readily extended into a dynamic model of spatial price differential. This can be done 'by permitting each local price series to have its own dynamic structure (and allowing for any correlated local seasonality or other characteristics) as well as an interlinkage with other local markets, the main inferential dangers of the simpler bivariate model can be avoided' (p. 102). Therefore, it was thought appropriate in this study to use price analysis to investigate the market integration of potatoes and cabbages.

Analyses of market integration have been undertaken for various commodities, such as rice, processed cassava, yam, cotton and wheat (see Blyn 1973; Monke and Petzel 1984; Petzel and Monke 1980; Ravallion 1986; and Heytens 1986). However, the investigation of market integration of vegetables has not previously been attempted. The following section details some of the distinguishing characteristics of vegetable markets.

2.4 The Characteristics of Vegetable Markets

Vegetables share the general characteristics of agricultural products: they are a raw material suffering the disadvantages of bulk and perishability, quality variation (Kohls and Uhl 1985) and uncertainly in yield and price (Abbott 1970).

The outputs of agricultural industries are mostly raw materials that will be processed further. Fresh vegetables can be processed to

become canned, dried, frozen, and so on. However, in developing countries, where processing is expensive (encountering capital and technological constraints) and consumer purchasing power is weak, most vegetables are consumed fresh.

Agricultural products are both bulkier and more perishable than most other products. Bulkiness affects the marketing functions concerned with physical handling, and automatically raises transportation and storage costs. Perishability, too, can be measured only in relation to other products. All vegetable products ultimately deteriorate. Fresh tomatoes and celery, for example, must move into consumption very quickly or they completely lose their value. Vegetable crops lose quality in many ways, such as: metabolic changes associated with respiration; moisture loss, with resultant wilting and shrivelling; bruising and mechanical injury; parasitic diseases; physiological disorder; freezing and chilling injury; flavour, composition and nutritional changes; and growth (sprouting, rooting) (Finney 1981).

The quality of agricultural products varies from season to season and from year to year. In addition, production often exhibits annual variability and much agricultural production is highly seasonal. As a consequence, it is very hard to apply uniform standards of quality from year to year. Moreover, because of the perishability and biological nature of vegetables, it is difficult to schedule the supply of these commodities to market demands. These difficulties, in combination, mean that there are generally higher risks and greater uncertainty associated with vegetables than other agricultural products. The consequent variability frequently results in extremely low prices (bearing no relation to production costs) which are accepted by producers because even a very low price is better than total loss (Abbott 1970).

Based on these characteristics, and as was indicated in section 1.2 above, vegetable marketing requires special care. Generally speaking, vegetable related activities can be categorised as high risk enterprises, not only from the point of view of the farmers who cultivate the commodities, but also from the point of view of the buyers who participate in the marketing system. To improve vegetable

marketing, measurement of market integration can be viewed as providing basic data for better understanding of how specific markets work (Ravallion 1986).

The discussion in this chapter will be considered when choosing an appropriate model for the study. The next chapter will discuss the geographical area of West Java, agronomical aspects, production, marketing and marketing facilities of potatoes and cabbages, which is also useful information for choosing the appropriate model for the study.

Chapter 3

AGRONOMICAL ASPECTS, PRODUCTION, MARKETING AND MARKETING FACILITIES OF POTATOES AND CABBAGES IN WEST JAVA

3.1 Introduction

The chapter will firstly discuss the geographical area of West Java. Secondly, agronomical aspects, production and marketing of potatoes and cabbages will be detailed, and, finally, marketing facilities of commodities such as market information, transportation and other facilities will be discussed.

3.2 Geographical Area

Indonesia is an archipelago with land coverage of 190 million hectares located between $94^{\circ}15'$ and $141^{\circ}05'$ East and between $6^{\circ}08'$ and $11^{\circ}15'$ South. The East-West distance is approximately 5110 km and North-South distance is approximately 1,888 km (see Appendix 2 - Map of Indonesia) (Prabowo and Anwar 1982).

The total population based on the 1980 Population Census is 147 million people. Based on a rate of population growth of approximately 2 per cent per annum, in 1989 the total population is estimated to be approximately 180 million people. Although Indonesia has 13 677 islands, about 60 per cent of the population occupy Java, which constitutes only 7 per cent of the land area. In 1983, 24 per cent of Indonesia's population lived in urban areas and 76 per cent in rural

areas. Moreover, 44.1 per cent of the population were in the 0-14 years age group; 51.4 per cent in the 15-64 years age group, and 3.5 per cent in the 65 years and over age group (Idrus 1986).

Java consists of five provinces, i.e., West Java, Central Java, East Java (including the island of Madura), Daerah Istimewa (the Special Region of Yogyakarta) and Daerah Khusus Ibukota (the Special Capital City of Jakarta). The last two are the smallest provinces in Java (based on area and population) (see Appendix 3 - Map of Java and Appendix 4 - The Area and Population of the Provinces in Java).

West Java Province (hereafter referred to as West Java) consists of 20 regencies and 4 municipalities. A municipality arises because of the development of a regency and is situated in the centre of a regency. The names of the municipalities, so far, are the same as the names of the regencies. The municipalities are Bandung, Cirebon, Bogor and Sukabumi. The major difference between a municipality and a regency is found in the respective economic structures; where cities are dominated by the service sector, the regencies are dominated by the agricultural sector (see Appendix 1 - Map of West Java).

3.3 Agronomical Aspects

Potatoes and cabbages are highland-vegetable crops which can only be planted in the highland areas. From Tables 3.1 and 3.2 it can be seen that potatoes were produced in 13 regencies and cabbages in 11 regencies.

As mentioned in section 2.3 above, approximately 70 per cent of all the commodities produced in West Java are produced in the Regencies of Bandung and Garut. It can be said that these regencies are the production centres of the commodities.

The commodities can be grown in sawah (wet-rice field) or in dryland. In sawah, the commodities are grown after padi (rice) in

Table 3.1

The Area of Potatoes Planted in West Java, 1986-1988

No.	Regency	1986	1987	1988	Average (86-88)	Percentage
		(ha)	(ha)	(ha)	(ha)	(%)
1.	Pandeglang	18	--	--	6.00	0.06
2.	Subang	48	43	34	41.67	0.38
3.	Bogor	267	304	110	227.00	2.09
4.	Cianjur	656	261	480	456.67	4.29
5.	Bandung	5 106	4 562	4 889	4 852.33	44.73
6.	Sumedang	87	83	97	89.00	0.82
7.	Garut	4 730	3 515	2 508	3 584.33	33.04
8.	Tasikmalaya	7	8	8	7.67	0.07
9.	Kuningan	183	50	106	113.00	1.04
10.	Majalengka	1 376	1 251	1 337	1 321.33	12.18
11.	Sukabumi	111	151	124	128.67	1.19
12.	Bekasi	--	---	---	---	----
13.	Ciamis	--	1	5	2.00	0.02
14.	Indramayu	--	---	---	---	----
15.	Lebak	--	---	---	---	----
16.	Serang	--	---	---	---	----
17.	Tangerang	--	---	---	---	----
18.	Purwakarta	4	11	14	9.67	0.09
19.	Karawang	--	---	---	---	----
20.	Cirebon	--	---	1	0.33	0.003
Total		12 593	10 240	9 713	10 848.67	100.00

Source: Regional Government of West Java (1989).

Table 3.2

The Area of Cabbages Planted in West Java, 1986-1988

No.	Regency	1986	1987	1988	Average (86-88)	Percentage
		(ha)	(ha)	(ha)	(ha)	(%)
1.	Pandeglang	55	--	--	18.33	0.01
2.	Subang	389	345	391	375.00	0.22
3.	Bogor	945	2 941	10 116	4 667.33	2.72
4.	Cianjur	8 282	3 884	7 799	6 641.67	3.88
5.	Bandung	79 709	67 807	83 183	76 889.67	44.87
6.	Sumedang	464	406	525	465.00	0.27
7.	Garut	72 454	55 237	57 486	61 725.67	36.02
8.	Tasikmalaya	22	34	26	27.33	0.02
9.	Kuningan	1 107	551	666	774.67	0.45
10.	Majalengka	17 199	17 521	18 461	17 727.00	10.35
11.	Sukabumi	2 259	2 282	1 722	2 088.67	1.22
12.	Bekasi	---	---	---	---	---
13.	Ciamis	---	2	8	3.33	0.002
14.	Indramayu	---	---	---	---	---
15.	Lebak	---	---	---	---	---
16.	Serang	---	---	---	---	---
17.	Tangerang	---	---	---	---	---
18.	Purwakarta	8	17	43	22.67	0.01
19.	Karawang	---	---	---	---	---
20.	Cirebon	---	---	2	0.67	0.0004
Total		182 893	150 990	180 248	171 377.00	100.00

Source: Regional Government of West Java (1989).

September-December and March-April (as the second and the third crops). In dryland, the commodities can also be grown twice per annum at the same time as in sawah. To increase the production of the commodities, farmers should use Sapta Usaha (Seven Efforts) (formerly, Panca Usaha or Five Efforts) in their production system. The Sapta Usaha is the use of good seeds, the use of fertilizers, plant protection with pesticides, better water management, improved cultural methods, better marketing and post-harvest handling (Tekon and Soewardi 1982).

Based on research by Bogor Agricultural University (1984), the commodities are planted by the farmer respondents as the main crops in their business. The respondents have already implemented the Sapta Usaha, and probably more; for example, the respondents apply leaf vitamins to increase the production of cabbages, although this is not mentioned in the Sapta Usaha. They are very responsive in implementing the new technologies.

In 1983, the average yield of commodities per hectare was 7.9 tons and 30.0 tons for potatoes and cabbages, respectively. From that yield, for potatoes, 88.5 per cent was sold, 10.6 per cent kept for seed and 0.9 per cent was consumed. For cabbages, 99.7 per cent was sold and 0.3 per cent was consumed (Bogor Agricultural University 1984).

In relation to the cost and revenue of commodities, this is an illustration of the farmer respondents in 1983. The ratio of revenue and total cost (cash and imputed costs) was 1.62 and 1.82, for potatoes and cabbages, respectively, and the ratio of revenue and cash cost was 1.69 and 2.68, respectively. From this, it can be seen that cabbages were more profitable than potatoes, because the higher the ratio the higher the profit. For example, if the farmers spend Rp 1.00 of cash cost, the revenue will be Rp 1.69 for potatoes, but if the cost is spent for cabbages, the revenue will be Rp 2.68. (Bogor Agricultural University 1984).

From the discussion in this section, it can be concluded that potatoes and cabbages are the main crops in the production system of the farmers who have implemented the Sapta Usaha, and these crops are highly

profitable. It can thus be said that the commodities are commercial crops.

3.4 Production

As mentioned in Section 1.2 above, the development of vegetable products is one of the main priorities in Indonesian agricultural development. Therefore, vegetables were included in the intensification program. The program is issued every year by the Ministry of Agriculture (MOA) which is called the MOA's Instruction. Based on the instruction, the governors of each province will issue an intensification program, called the Governor's Instruction for their provinces. Furthermore, based on the instruction, the regents of each regency will issue an intensification program, called Regent's Instruction for their regencies. The objective of these instructions (from the Ministry up to the Regent levels) is to maintain the agricultural development program and to achieve the maximum level of production. Based on the instructions above, the government will calculate how many factor inputs such as fertilizers, seeds, insecticides, and so forth, are required to implement the intensification program.

In West Java, the intensification program of vegetables on old and new land is to improve the productivity through individual and group farmers, or through cooperatives with enterprise supervision (as Bapak Angkat or foster father). The program can be implemented in monoculture, crop rotation and multiple cropping systems.

In West Java, the vegetables in the intensification program include potatoes, cabbages, onions, chillies, chinese cabbages, tomatoes and garlic. In the 1987 season, the program covered 8385 hectares and 7845 hectares, for potatoes and cabbages, respectively; and in 1987/1988, 9380 hectares and 9950 hectares, respectively (see Appendix 5 - Target of the Vegetable Intensification Program in West Java, 1987/1988).

The production of the commodities from 1986 to 1988 can be seen in Appendices 6 and 7 (Appendix 6 - Total Production of Potatoes in West Java, 1986-88 and Appendix 7 - Total Production of Cabbages in West Java, 1986-88). If these appendices are compared with Tables 3.1 and 3.2, the production per hectare or the productivity of the commodities can be calculated. These productivity estimates are provided in Table 3.3.

'From the table, it can be seen that the productivity of potatoes increased each year, with an average increase of 13.9 per cent.' The productivity of cabbages increased in 1987 (11.7 per cent), however it decreased in 1988 (23.6 per cent), with an average decrease of 1.0 per cent over the three year period.

The area and production of the commodities in each quarter (1986-1988) for the chosen subregencies in the study can be seen in Appendices 8 to 11.

3.5 Marketing

As mentioned in section 3.2, most of the commodities are sold (88.5 per cent for potatoes and 99.7 per cent for cabbages). Based on the research by Bogor Agricultural University (1984), the farmers sold their commodities to the village buyers (potatoes, 50 per cent and cabbages, 100 per cent). The rest of the potatoes were sold to the buyers in the subregency and the regency.

In Figure 3.1 the marketing channel for vegetables from the farmers to the ultimate consumers can be seen. The farmers sell cabbages only to the buyers in villages. This can be understood because the commodity is more voluminous and perishable than potatoes. However, for potatoes, the farmers sell to the buyers in the village, subregency, and regency.

In producer markets, the participants are the buyers from the

Table 3.3

The Production per Hectare of Potatoes and Cabbages
in West Java, 1986-88

Year	Potatoes		Cabbages	
	Production per ha	Changes over Previous Period	Production per ha	Changes over Previous Period
	(ton/ha)	(%)	(ton/ha)	(%)
1986	0.941	----	1.758	----
1987	1.136	20.75	1.963	11.66
1988	1.139	0.27	1.500	-23.59
Aver- age	1.072	13.92	1.740	-1.02

Source: Appendices 6 and 7.

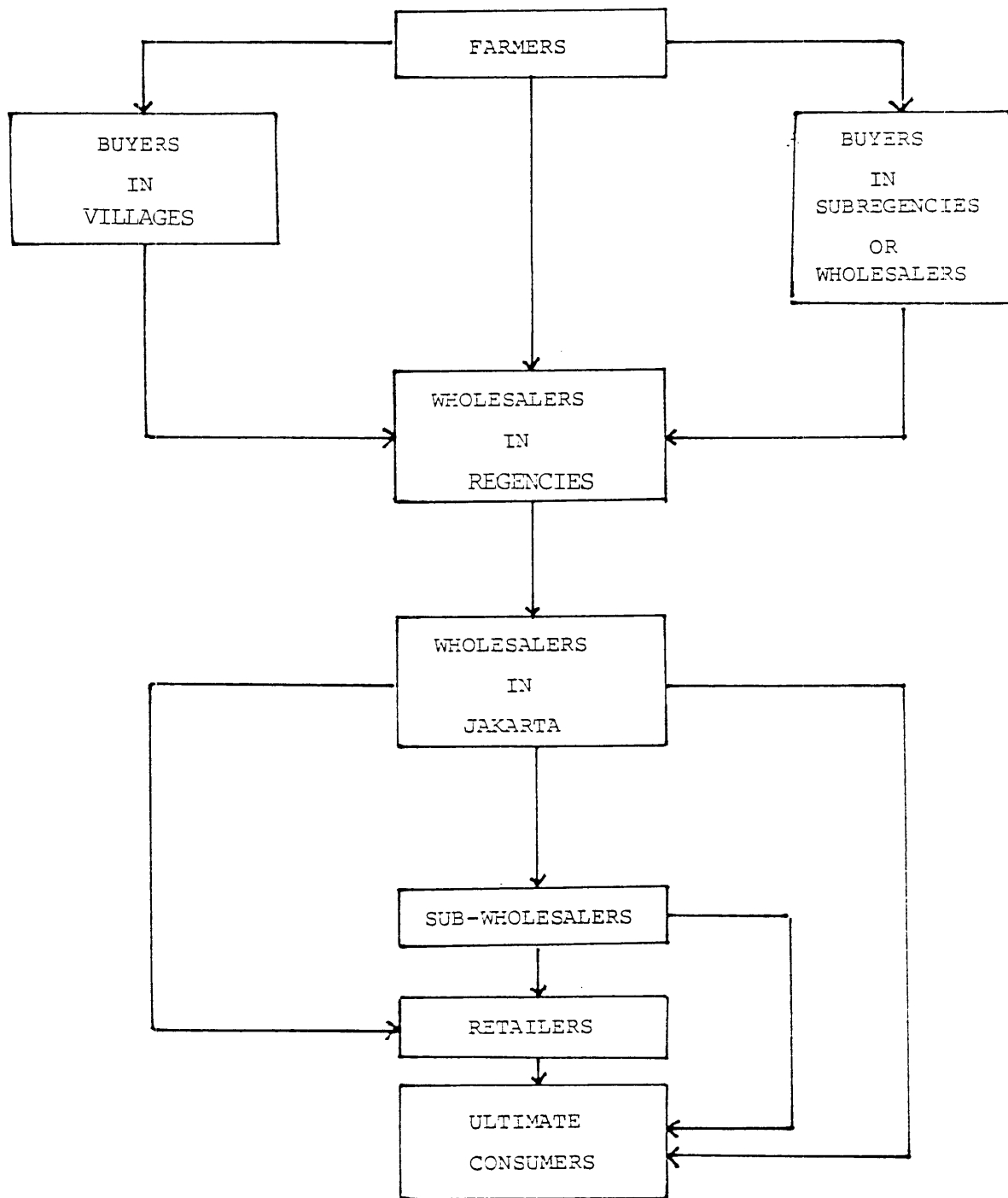


Figure 3.1 The Marketing Channel for Vegetables in West Java

Source: Bogor Agricultural University (1984).

villages, subregencies and regencies and the farmers. In consumer markets, the participants are the wholesalers from the producer and consumer markets, the big, medium and small retailers, and the ultimate consumers.

When the commodities are delivered from the farmers to the ultimate consumers, there are some activities such as sorting and grading which are undertaken by the marketing participants. These activities will reduce the weight of the commodity.

The commodities in the West Java consumer markets (Bandung municipality and Jakarta) were delivered mainly from the producer markets in West Java, as can be seen in Tables 3.4 and 3.5. From the tables, it can be seen that potatoes in Bandung municipality were mainly delivered from West Java (93.0 per cent) and the rest were delivered from Central Java (Dieng Regency). For Jakarta, potatoes were also mainly from West Java (73.0 per cent), and the rest was from Central Java (11.0 per cent), East Java (10.0 per cent) and North Sumatra (6.0 per cent). Delivery distance thus ranged from 250 kilometres (from West Java) to more than 2000 kilometres (from North Sumatra).

The situation for cabbages is quite different from that for potatoes. In Bandung municipality, 95.2 per cent of cabbages were delivered from West Java and the rest from Central Java. In Jakarta, only 0.8 per cent of cabbages were delivered from Central Java and 99.2 per cent from West Java. Delivery distance thus ranged from about 250 km (from West Java) to 500 km (from Central Java). In comparison with potatoes, cabbages were delivered shorter distances mainly because of the perishable nature of cabbages.

3.6 Marketing Facilities

Most of the marketing facilities which are provided by the government are for vegetables, that is, those vegetables listed in Appendix 5. This section will discuss the marketing facilities relevant

Table 3.4
The Source of Traded Potatoes in Bandung
Municipality and Jakarta, 1988

Producer (Supplier) Markets	Consumer Markets	
	Bandung Municipality	Jakarta
	(%)	(%)
<u>West Java</u>		
Bandung Regency:		
Pangalengan	34.61	26.85
Ciwidey	22.25	24.59
Garut Regency:		
Cikajang	36.12	21.43
<u>Central Java</u>		
Wonosobo Regency	----	1.45
Dieng Regency	7.02	9.28
<u>East Java</u>		
Malang Regency	----	10.07
<u>North Sumatra</u>		
Medan	----	6.33
Total	100.00	100.00

Source: Subdirectorate of Marketing Information (1989).

Table 3.5

The Source of Traded Cabbages in Bandung
Municipality and Jakarta, 1988

Producer (Supplier) Markets	Consumer Markets	
	Bandung Municipality	Jakarta
	(%)	(%)
<u>West Java</u>		
Bandung Regency:		
Pangalengan	46.92	30.56
Ciwidey	19.32	30.83
Lembang	----	37.82
Garut Regency:		
Cikajang	29.00	----
<u>Central Java</u>		
Wonosobo Regency	----	0.79
Dieng Regency	4.76	----
Total	100.00	100.00

Source: Subdirectorate of Marketing Information (1989)

to potatoes and cabbages, namely marketing information, transportation and other facilities.

3.6.1 Marketing information

Marketing is one of the constraints in Indonesian agricultural development (Subdirectorate of Marketing Information 1984). One of the important problems in agricultural marketing is the farmers' lack of knowledge of the local conditions and market potential. To eliminate this problem, marketing information services are provided to assist the farmers and buyers to understand the price movement and other marketing parameters. The services may be expected to provide the valuable information for good or rational decisions in production and marketing to be made (Subdirectorate of Marketing Information 1984).

The Improvement of marketing information services was initially a project in West Java which was assisted by the Government of the Republic of Germany in 1979. The project is called ATA 85/86, and focused on vegetables. In 1980, the project was expanded to cover East Java and North Sumatra. In 1981 the project was extended to include information related to secondary crops. The project became, in 1985, the responsibility solely of the Directorate General of Food Crops, Ministry of Agriculture (Subdirectorate of marketing Information, 1989).

The objectives of providing the marketing information services were:

1. to improve the marketing services, especially for the vegetable farmers;
2. to encourage the farmers and the buyers in agricultural production and marketing in order to achieve regional and seasonal balances of supply of and demand for commodities;
3. to reduce the price fluctuations and marketing risk through the

improvement of the farmers' bargaining power; and

4. to give a recommendation for policy makers and marketing institutions to improve the efficiency of agricultural marketing.

According to a survey by Zehrfeld (1981) the services appear to be very useful from the point of view of both farmers and buyers. For farmers, the services are useful in minimising cheating by the buyers (65-68 per cent of respondents), in improving their (the farmers') bargaining power (36-40 per cent of respondents) and providing a reference price in negotiations (23-26 per cent of respondents). From the point of view of the buyers, the services are useful in finding 'an appropriate' price for transactions (68 per cent of respondents), in providing a reference price for transactions with farmers (46 per cent of respondents) and in assisting the calculation of the profit which will be received (32 per cent of respondents).

3.6.2 Transportation

The transportation facilities to the consumer markets from the producer markets are quite good. This is evident from the fact that the government budget allocations for the facilities (roads and bridges) for maintenance, improvement, expansion and supporting infrastructure, increases every year. Appendix 12 shows the roads (in kilometres) and bridges (in metres) which were built by the government from 1979/1980 to 1984/85.

As mentioned in Tables 3.4 and 3.5, the commodities in consumer markets are mainly from West Java. The distance between consumer and producer markets and transportation costs can be seen in Table 3.6.

The transportation cost of most commodities is based on weight. There are three types of transportation from producer markets to the consumer market of Bandung municipality, i.e., small trucks (the capacity is between 0.50-1.00 tons), medium truck (2.00-3.00 tons) and

Table 3.6

The Distance between Producer and Consumer Markets and Associated
Transportation Costs (February, 1989)

Local Market/ Regency	Bandung Municipality			Jakarta		
	Dist.	Trans.Cost ¹	Trans.Cost ²	Dist.	Trans.Cost ³	Trans.Cost ³
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(km)	(Rp/kg)	(Rp/kg/km)	(km)	(Rp/kg)	(Rp/kg/km)
<u>Bandung Regency</u>						
Pangalengan	43	9 - 14	0.21 - 0.34	200	20	0.10
Ciwidey	45	7 - 10	0.16 - 0.22	190	20	0.11
Lembang	16	6	0.38	165	16	0.10
<u>Garut Regency</u>						
Cikajang	90	7 - 20	0.08 - 0.22	240	28	0.12
<u>Cianjur Regency</u>						
Cipanas	75	7 - 17	0.09 - 0.23	90	8	0.09

Source: Subdirectorate of Marketing Information (1989) (Adapted).

Notes:

1. Column (3) = Total Transportation Cost ÷ Quantity
2. Column (4) = Total Transportation Cost ÷ Distance [Column (2)] ÷ Quantity (kg)
3. The same explanation as for Columns (3) and (4).

big truck (≥ 5 tons). However, from producer markets to the consumer market in Jakarta only one type of transportation is used, i.e., big trucks.

The distance between producer markets and the Bandung municipality consumer market, ranges from 16 km to 90 km (the closest is Lembang and the furthest is Cikajang). In February 1989, the transportation cost per kilogram varied between Rp 6.00 and Rp 20.00. From the table, it can be seen that the lowest transportation cost per kg is Rp 6.00 (Lembang) and the highest is Rp 20.00 (Cikajang). However, based on the transportation cost per kilogram per kilometre, the figure is reversed.

The distance between producer markets and the Jakarta consumer market, ranges from 90 km (Cipanas) to 240 km (Cikajang). The transportation cost per kg varies between Rp 8.00 (Cipanas) and Rp 28.00 (Cikajang). However, based on the transportation cost per kilogram per kilometre the cost is quite similar (between Rp 0.09 and Rp 0.12).

3.6.3 Other facilities

So that farmers achieve maximal profit, the Regional Government of West Java has implemented several programs, such as (i) the broadcast of the reported prices through the regional radio station (after being broadcast by the National Broadcasting network) and, (ii) instructing the regents to investigate the marketing opportunities of the commodities.

In this chapter the geographical area of West Java and the production and marketing facilities for potatoes and cabbages were discussed. The following chapter provides a description of the research and analytical methods.