

MARKET CONDUCT OF THE CORN SEED PRODUCERS: MULTINATIONALS VERSUS LOCAL COMPANIES

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ABSTRAK

Sekarang semakin banyak petani jagung yang menggunakan varietas yang produktivitasnya tinggi baik komposit maupun hibrida. Kecenderungan ini mendorong produsen benih untuk mengintensifkan bisnis mereka dengan berbagai strategi. Penelitian ini bertujuan untuk menganalisa strategi pasar yang dilakukan oleh produsen benih jagung di Jawa Timur. Dengan modal, teknologi dan sumberdaya manusia yang lebih baik, perusahaan multinasional cenderung oligopolistik dan mendominasi industri benih jagung. Perusahaan multinasional juga lebih banyak melakukan penjualan melalui pasar terbuka dan memiliki indeks integrasi lebih tinggi. Pemerintah harus melakukan pengawasan yang ketat dalam industri ini agar kepentingan petani tidak dikorbankan. Untuk bersaing dengan perusahaan multinasional, perusahaan lokal harus menerapkan strategi pasar yang lebih baik, misalnya meningkatkan kualitas benih dan mengurangi ketergantungan penjualan terhadap proyek pemerintah.

Kata kunci : *strategi pasar, benih jagung, produsen jagung*

ABSTRACT

Currently corn farmers tend to apply high yielding varieties of composite and hybrid types. This trend encourages the corn seed producers to intensify their business, but tight competition has forced them to set their own strategy in order to get market shares. This study aimed at analyzing market conduct carried out by the corn seed producers in East Java. Having stronger capital, technology, and human resources, the multinational producers tended to be oligopolistic and dominated the corn seed industry. The multinationals were better off in selling their products through open market and had higher integration indexes. The government has to strictly apply the existing policy related to this industry' conduct in order to protect farmers' interest that may be negated by the competing corn seed producers. To contest with the multinationals, the local producers have to apply better market conduct, for example improving corn seed products and lessening reliance on captive market.

Keywords : *market conduct, corn seed, corn producer*

INTRODUCTION

Background

Domestic corn production shows an increasing trend during the last several years. In 2000, national corn production was 9.4 million tons and it rose by 12 percent to 10.7 million tons in 2003. Furthermore, the corn production in 2004 expanded to 11.2 million tons and in 2005 it is predicted to be as many as 11.7 million tons (BPS, 2005). The national corn production increase reduced corn import from 1.5 million tons in 2003 to 0.17 million tons in 2004. Apart from an increase in harvested area during the last five years, yield improvement also contributed to national corn production enhancement (Swastika *et al.*, 2004).

One of the main factors affecting improved corn yield is high yielding varieties (HYV) applied by the farmers consisting of those composite and hybrid. Hybrid corn varieties' yields range between 7 to 8 tons per hectare. On the other hand, composite corn varieties' yields are only 3 to 5 tons per hectare (Nugraha and Subandi, 2002). Increased hybrid corn seed varieties application is due to rigorous promotion carried out by the corn seed producers. Tight competition among the corn seed producers encourages them to set their own strategy in implementing market conduct. Regardless of soaring corn seed price, each producer tries to improve or at least to maintain its market share through many marketing strategies.

Objectives

This study aims to assess market conduct of the corn seed industry carried out by the multinational versus local companies in East Java. Specifically, the study analyzes:

- (i) product flow, marketing agencies and services, seed growing contract, selling contract agreement, corn seed growing, seed processing, and firms integration
- (ii) pricing, payment, storage, transportation, packaging, advertisement, seed labeling and risks bearing

METHODOLOGY

Conceptual Framework

Market conduct refers to the ways in which firms as individuals and as a group act competitively to maximize joint returns of the industry. According to Bain (1968), market conduct refers to the patterns of behavior which firms follow in adopting or adjusting to the markets in which they sell or buy. Market conduct

reflects the behavior of sellers and buyers in the market including pricing policies and practices, product lines and advertising strategies, research and development, investment, and legal tactics (Scherer and Ross, 1990). Other forms of conduct include collusion with rivals and strategies against rivals, such as coordination and adaptation of price among competing firms, and predatory tactics (Sheperd, 1997; and Bain, 1968).

Bain (1968) also mentioned five aspects of market conduct, namely: (i) the method employed by the firm or group of firms in determining price and output; (ii) the product policy of the firm or group of firms; (iii) the sales promotion policy of the firm or group; and (iv) means of coordination and non-adaptation of price, product, and sales promotion policies of competing sellers.

Institutional and Functional Approaches

Institutional approach studies the various agencies and intermediaries which perform the marketing processes (Aragon, 1984). Marketing institutions are the wide variety of business organizations which have developed to actively participate in marketing of seeds. This approach considers the nature and character of various middlemen and related agencies and also the arrangement and organization of the marketing system. In this approach, human element receives primary attention of the researchers and it is essentially descriptive.

One method of classifying the activities that occur in the marketing processes is to break the processes down into functions. A marketing function may be defined as a major specialized activity performed in accomplishing the marketing process. The functional approach examines the important marketing functions of exchange (buying and selling), physical handling (storage, transportation and processing) and facilitation (standardization, financing, risk bearing, market intelligence).

Pricing Policies and Pricing Behavior

Three types of pricing behavior include the following: (1) one-price policy, (2) price discrimination, and (3) price differentiation (Bressler Jr. and King, 1970). The one price rate is the application of selling the same kind of product at the same time to several purchasers. On the other hand, price discrimination in the rate of technically similar goods at prices disproportional to their marginal cost, taking full account of manufacture/production, sale, delivery, and risks and uncertainty. In contrast, price differentiation need not be discriminatory. Price discrimination may occur in the absence of a price differential if two buyers of the same kind of product are charged identical price by a single seller, but the seller incurs different production, selling, or transportation costs in selling them (Suvanichwong, 1997).

An oligopoly market is characterized by few firms that exist in the industry, given the market demand size. If the products are homogeneous, it is called as pure oligopoly. It is a differentiated oligopoly if the products are relatively heterogeneous. Based on the market strategies, firms may collude or act independently. Collusion may be perfectly or imperfectly implemented among the firms in the industry. The types of market conduct engaged in the oligopolistic markets include: (a) unfair exclusionary, predatory, and coercive tactics; and (b) tacit or express price collusion, pricing to shield inefficient practice, pricing to induce uniform high growth and uniform seasonal output (Scherer and Ross, 1990).

There are two main types of perfect collusion in an oligopolistic market, namely centralized oligopoly and market-sharing oligopoly (Eckert and Leftwich, 1988). The purpose of centralized oligopoly is to maximize joint profits. Price and output decisions are submitted to the central association. It is assumed that the product is homogeneous. The association should determine total output at the lowest market cost and it is implemented through quota allocation among the members. Each individual firm should produce the quota at which its short-run marginal cost is equivalent to the market marginal revenue.

In the long run, there are two types of adjustments that could be implemented by oligopolistic firms, namely: size of plants and exit and entry of firms. Size of plants depends on the level of output of each firm. If perfect collusion exists, the level of output such as quotas, market shares, and output of individual firms could be predicted with some degree of accuracy. The size of the plant desired by each firm, however, may not reflect the most efficient size.

Firm Integration

There are three types of mergers or integration, namely: horizontal merger, vertical merger, and conglomerate merger. Horizontal integration is the merger or combination of two or more firms that are of the same state and the same productive process. On the other hand, vertical integration combines firms with different stages of production in a particular market. Vertical integration is also defined as the merger or combination of two or more firms of several separable stages of the same production process. Conglomerate merger unites firms that are neither rival, nor produce the same product line (Oster, 1994). It is possible that this integration involves firms producing the same products. This type of merger may lead to higher profitability if the combined firm has more market power. Higher profitability could be achieved by eliminating side-by-side competition between the two firms. The magnitude of the effects depends on both firms' shares and other market conditions (Sheperd, 1997).

There may be several reasons for vertical integration. One of the possible motives for vertical integration is reduction of uncertainty in the supply of inputs from the upstream firms and also information required by downstream

firms (Arrow, 1975). Other reasons for vertical integration are cost reduction or improving efficiency and avoiding cost associated with mere mechanism. Integration may also give producers enhanced control over their economic environment (Suvanichwong, 1997).

Data Collection

The main respondents of the study were the corn seed companies and their seed distributors. Data gathered from the seed companies included the following information: technology used in corn seed production, area planted to corn for seed production purposes, production practices, production costs, marketing practices, (e.g., seed quality maintenance, storage, mode of transport, type of packaging, mode of sales, mode of payment, labeling and branding, price setting, and other risk-bearing activities), marketing strategies including market promotion strategies, market outlets, sales revenue/income, practice of vertical or horizontal integration, contract growing scheme, brand names of seeds grown and sold, and production and marketing problems encountered in the corn seed business. On the other hand, data collected from the seed distributors were source of corn seeds, market outlets/distribution network, marketing practices, knowledge of market information, and brand names of seeds sold. Secondary data were mainly gathered from the Seed Control and Certification Services (SCCS) in the provincial and regency levels in the study area.

Study Area

East Java Province was purposively selected as the study area because it is a major corn-growing area in Indonesia and has the biggest number of seed growers/companies and the second biggest distributors in the country. Complete enumeration was employed in the survey of corn seed companies and distributors in the study site. The study was focused in the Regencies of Jombang, Kediri, and Nganjuk where sale and application of high-yielding corn seed varieties were the most intensive among the other regencies in the province. The study, lasting from May to June, 2002, covered 3 multinational seed companies, 4 local seed companies (i.e., 1 government-owned and 3 privates), and 107 seed distributors.

When the survey was conducted, there were only three multinational seed companies selling their corn seed products directly to the consumers in East Java. The other multinational companies, namely Syngenta Thailand and Asian Hybrid Seed Technologies Inc from the Philippines, sold their corn seed products through collaboration with PT Sang Hyang Seri. There were only four local companies producing corn seed, the others did not produce corn seed anymore but they still supplied rice seed. All of the corn distributors in Nganjuk, Jombang, and Kediri Regencies became the respondents subject to willingness

for interview. The seed distributors consisted of wholesaler-retailers and retailers. Respondents of wholesaler-retailers in the Regencies of Jombang, Kediri, and Nganjuk were 7, 14, and 11 persons, respectively. On the other hand, respondents of the retailers in the Regencies of Jombang, Kediri, and Nganjuk were 14, 33, and 28 persons, respectively.

The corn seed producers chosen as samples of the study were PT BS (MNC-1) and its marketing company PT TSP (based in Kediri and Sidoarjo regencies), PT DI (MNC-2 located in Surabaya municipality and Malang regency), PT SHS (Local-1 in Pasuruan and Malang regencies), UD KT (Local-2 in Kediri regency), CV TB (Local-3 in Malang regency), and ST (Local-4 in Jombang regency). On the other hand, all data related to PT MK (MNC-3) and its marketing company PT BRS were gathered through the corn seed distributors, the SCCS staff, and secondary information.

Data Analysis

Market conduct of the corn seed industry in three major corn-producing regencies in East Java was evaluated using institutional and functional approaches. The institutional approach consisted of product flow, the analysis of the marketing agencies, and the nature of firm integration. Meanwhile, the functional approach composed of the exchange functions (pricing and payment), physical functions (storage, transportation, packaging, and advertisement), and facilitating functions (seed labeling and risks bearing). The followings were the analyzed variables:

Product flow. Marketing channels were discussed by analyzing the flow of corn seeds from the seed producers/companies to the farmers/end-users with the aid of charts.

Marketing agencies and services. All agencies/marketing channels of corn seeds were identified. The types of services provided by each marketing agent were described including the SCCS.

Nature of integration of firms. The study assessed whether the corn seed companies practiced horizontal integration or vertical integration. Vertical integration means that the seed firms implemented selling contracts with the seed distributors through exclusive sales of certain brands of corn of seeds and with the seed growers. With regard to the vertical integration analysis, the ratio of value added to sales was used to determine the successive stages of the production operation of the corn seed industry. The average value added which is higher than 0.42 would indicate that the industry has a higher degree of integration (Scherer and Ross, 1990).

Integration index was computed using the following formula adopted from Suvanichwong (1997):

$$\text{Integration Index} = (\text{Value added})/(\text{Sales})$$

where:

$$\text{Value added} = \sum P_j Q_j - \sum w_k x_k$$

$\sum P_j Q_j$ = total sales

x_k = volume of k^{th} input purchased from other firms

w_k = price of k^{th} inputs purchased from other firms

Exchange function. Pricing policies/strategies of both multinationals and local companies were determined, whether it was a cost-plus or competitive pricing. The study determined whether both companies consistently set their pricing policies over time, such as cost plus profit or based on government controlled price. The modes of payment were also described.

Physical function. Seed treatment as well as packaging practices were described at the seed growers'/companies' level and/or seed distributors' level. In addition, seed storage and transportation practices were examined in this study. The study also determined whether the seed companies advertised their products through mass media, extension workers, or field experiments and whether they influenced the government officials in selling their products.

Facilitating function. Risk-bearing and seed labeling are the components of facilitating function. The seed companies dealt with risks from seed growing to seed distribution. The SCCS established some requirements for commercial corn seeds sold in the market. In each package of corn seeds, there must be a label containing information on variety, weight, moisture content, purity, vigor, and expiration date. The study determined whether the information written on the labels was correct and whether the seed firms withdrew their products if already expired.

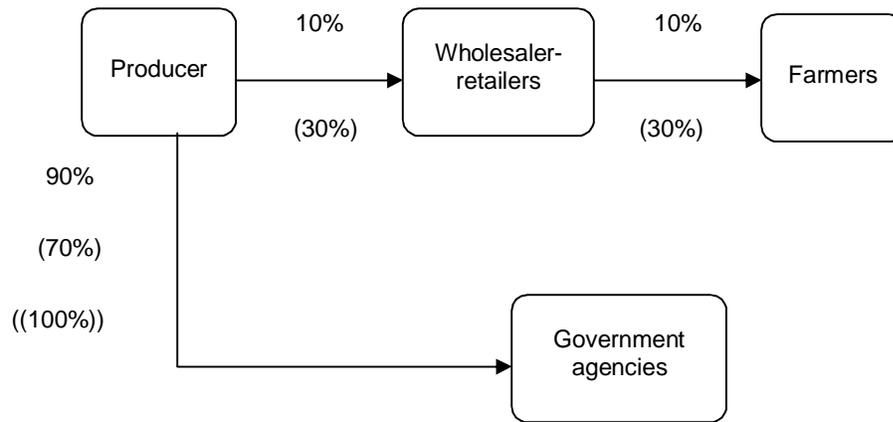
RESULTS AND DISCUSSION

Product Flow

The seed producers did not sell directly to the consumers or farmers, but coursed their sales through the projects of the government agencies. All of the big corn seed producers had authorized distributors to sell their products. The marketing channels of corn seed produced by multinational companies are presented in Figures 1 to 3, while those for the local producers are depicted in Figure 4.

The corn seed distribution of MNC-1 involved marketing agents, such as the marketing company, distributors, wholesalers-retailers and retailers of agricultural inputs. MNC-1 had its own marketing company, namely PT TSP. The corn seed company offered various incentives to its distributors in terms of price discounts and bonuses, seed delivery, credit sales, after-sales services,

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Notes: Figures in parentheses were those of Local-1.
 Figures outside parentheses were those of Local-2 and Local -3.
 Figure in the double parentheses ((100%)) was that of Local-4.

Figure 4. Marketing Channels of Corn Seed Products of Local-1, Local-2, Local-3, and Local-4 in East Java, 2002

and seed label extension. The marketing company would only sell to the traders, i.e. wholesalers and retailers, if they executed selling contract agreements with the company, with one condition that they sell at least 5 tons per season. The distributors also usually functioned as wholesalers and retailers, thus, both traders and farmers could directly buy corn seed from the distributors. The seed distributors' contracts were not exclusive because they could sell other seed corn brands.

The marketing channel of MNC-1 was the same as that of MNC-3. Through its marketing company, i.e. PT BRS, the firm sold its seed corn varieties, the C-5 and C-7, to distributors based on selling contracts. However, two of its products, the C-1 and C-3, were still produced and sold through Local-1. Buyers, i.e. corn seed traders, government agencies, or farmers, were allowed to buy directly from the company through a selling contract.

MNC-2 did not sell its products directly to the buyers but through its distributors since it was not allowed by law to sell directly to the consumers. The company usually had at least one distributor in each regency of corn growing centers in East Java. Selling contract agreements were signed between the producer and the distributors. From the distributors, the seed corn product flows along the same channels as those of MNC-1 and MNC-3. Total volumes of sales of corn seed of MNC-1, MNC-2, and MNC-3 in East Java were 600, 625, and 400 tons, respectively.

However, government institutions and other organizations such as non-government organizations could purchase seed corn directly from the producers, although government agencies could also purchase seed corn from the distributors. Usually, government agencies bought larger volume of seed corn directly from the producers to avail of bigger price discounts than those offered by the distributors.

Marketing agents of Local-1 were wholesalers and government agencies. The wholesalers distributed 30 percent of corn seed produced and marketed by Local-1, while the remaining 70 percent is sold to government agencies for the government projects' requirements. However, during the time of this study, no corn seed was produced by Local-1 although this was sold in the agricultural input stores. A hybrid seed corn variety, namely A-4, produced by PT AAM and marketed by Local-1, was sold by a wholesaler-retailer in Kediri regency since 2001. The A-4 corn, however, was withdrawn from the market in September 2002 due to its very low demand. Total corn seed production of Local-1, Local-2, Local-3, and Local-4 were 180, 40, 40, and 60 tons, respectively.

The local producers sold their seed corn products directly to wholesaler-retailers. Marketing companies were not necessary because of the relatively low volumes of sales compared to those of the multinational corporations and big companies. Consumers could buy directly from local producers but they could not avail of price discounts for low volume of purchases. The local producers did not have any selling contract with the wholesaler-retailers. However, the local producers usually had selling contract agreements with government agencies who buy seed corn directly from them. Items mentioned were volume of purchase, buying price, and schedule of delivery.

Marketing Services

All of the corn seed producers provided marketing services in order to satisfy their distributors, wholesaler-retailers, and consumers. The services come in the form of seed delivery, credit sales, bonus, and even delayed payments where corn seeds were already planted in the field by the farmers. After sales services for consumers, such as farm practice guidance on corn growing and seed replacement due to low field performance, were also available.

MNC-1 offered some services for its seed distributors. The seed distributors who either paid in cash or within 7 days would get price discounts of 5 percent. Payment could be made up to 21 days after seed delivery, but they were not entitled to price discounts. Payments made after more than 21 days would be charged monthly interest rates of 3 percent. In reality, however, the company never penalized distributors who paid more than 3 weeks after seed delivery, especially during the off seasons. The fines imposed by the company

would only serve to encourage the traders to shift to other seed producers. Traders who had not paid their credits would be allowed to buy seed only after they have settled their old accounts. Bonus of 5 percent would be offered to the contract traders who sold at least 50 tons of seeds in one year. In general, the contract traders would only get a bonus of 2 percent because their volumes of sales for MNC-1's products were less than 50 tons. MNC-2 also offered credit sales and price discounts to its distributors. Services offered to the consumers included technical assistance in corn growing practices that was given through training programs. The company was also willing to assist farmers sell their corn harvest to traders at prevailing market price. These services were offered to consumers who patronized the seed corn and chemical products of MNC-2.

On the other hand, services offered by the MNC-3 consisted of seed delivery to traders who purchased directly from the company, through its marketing arm, i.e., PT BRS. It meant that the traders had to sign selling contract agreements. Credit payments from the company to the distributors were also available. Other services to the traders included seed label extensions which will be carried out by the SCCS but at the expense of the producer. Replacement of seeds with lower germination rates was also provided by the company through the distributors.

Services offered by Local-1 included seed delivery to distributors and to the sites of the government project. The company also extended generous credit terms for their corn seed transactions. Unlike the multinational companies, Local-1 had no field supervisors who give extension services to farmers. Thus, Local-1 does not obtain feedbacks from the farmers regarding the quality of its product and consumers' preferences. As most of the Local-2 product sold to the government's projects, most of the marketing agents of Local-2 were officials of the Agricultural Services, where most of the product was sold. The rest was sold to wholesalers and retailers in neighboring regencies. Price discount could reach up to 50 percent of the prevailing market price especially when the distributor picked up the seed from company warehouses. On the other hand, the producer did not give any service to ordinary buyers whose purchase values were relatively low. As in the cases of Local-1 and Local-2, marketing agents of Local-3 were wholesalers and government officials and it did not provide specific services to the farmers who bought corn seed from its outlets.

Similar to the previous cases, Local-4 also did not have marketing agent as all of the corn seed was destined for government projects. The producer always tried to get touch with government officials at the Agricultural Service in order to sell his seed product. A price discount of Rp 500/kg was offered to consumers for purchases of at least 10 tons of corn seed. Buyers in Java Island had to pick up the seed from the firm's warehouse, although the producer would deliver the seed to the seaport in Surabaya or to any destination outside Java Island depending on the transportation costs. Seed deliveries outside of Java

would include an all risks insurance of Rp 750,000 (\$ US 84) which covered the risks worth up to Rp 100 million (US \$ 11,100).

Seed Growing Contract

Most seed growers did not have their own farm land for growing seed, thus they conducted seed growing contracts. Common requirements for farmers involved in seed growing contract were following practice guides of the seed producers, providing farm land free of charge, and selling all harvested corn to the seed producers subject to prior agreed price. The seed producers provided seed, fertilizers, and pesticides in credit term and transported the harvested corn to the processing plants or warehouses. The SCCS staff inspected the seed growing fields at least three times per season before harvest.

The average land area of the contract growers of MNC-1 was less than 0.25 hectares. On the average, around 13,500 farmers cooperated with the company per season. The farmers had to sell all harvested seed corn to the company at a guaranteed purchase price that was 160 percent higher than the prevailing market price. The composite corn seed plantations (i.e., Surya and Arjuna BISI varieties) were harvested in 110 DAP and the hybrid varieties (i.e., BISI-2 and BISI-5) were harvested in 100 DAP. Farmers carried out land preparation, planted the corn seed, and all subsequent farm operations until harvest. The inspection of the SCCS staff was no longer necessary since the company had acquired a certification awarded by the Agency for Quality System Certification of Food Crops and Horticulture Seeds. Once in a season, however, the SCCS staff conducts unannounced random inspections to check whether the company satisfied standard procedures. In general, the SCCS inspections were not really necessary since the company pressures the seed corn farmers to achieve the desired quality for its seeds.

According to the terms of the seed growing contract, the company provides parent materials to the contract growing farmers for free. The company compensated farmers for their labor to de-tassel and cut male corn plants. All of the corn harvested by the farmers was purchased by the company at 220 percent of prevailing market prices as stipulated in the contract agreement. Payments to the farmers are coursed through the bank and were to be made within 10 days after harvest.

In 2002, MNC-2 through its Malang-2 Processing Plant, had around 12,500 contract growers in the regencies of Malang, Blitar, Lumajang, and Jember, which covered 2,500 hectares of farmland areas. In 2001, its contract growers planted 1,600 hectares. In Kabanjahe, North Sumatera province, the area devoted to Pioneer corn seed growing was 500 ha although there were rumors that the Kabanjahe Processing Plant would soon be closed due its inefficient operations (Agro News, 2001).

The criteria used by MNC-2 in selecting farmers for corn seed growing, were (a) they should have their own farmland; (b) they were willing to follow the practices and rules promulgated by the company and; (c) the farmers' lands were located in contiguous areas. The farmers would be organized into groups and they would elect a leader for each group. A field supervisor, assigned by the company to assist the farmers, manages 40 hectares of corn seed farms.

To become contract growers, farmers should be a group with a total land area of at least 5 hectares on which to grow composite corn seed varieties. To grow hybrid corn seed, all farmers in a village had to be members of the contract seed growers' group. In 2001, the contract growers for the composite and hybrid varieties covered 20 hectares in Kulon Progo regency, Yogyakarta province, and 6 hectares in Pasuruan regency, East Java province. Up to June 2002, the company only produced sweet corn seeds in Pasuruan regency, East Java and 10 hectares of sweet corn seed of the SHS Selection variety in the Pujon sub-regency, East Java. The theft of corn stalks in the seed growing farms accounted for around 5 percent of its total corn seed production losses. The purchase price of the company was based on the prevailing market price of corn grain plus a 5 percent premium.

Four field inspections per growing season were conducted by SCCS for Bisma composite corn seed variety i.e. at 0, 30, 60-70, and 100 days after planting. Of these inspections, the third was conducted unannounced.

Contract of Local-2 growers consisted of 25 persons who had land areas ranging from 0.25 to 1.0 hectare per person for a total area of 9 hectares. The group leader represented the farmers in dealing with the producer in a contract arrangement and the contracts were not written officially. The producer provided for free 25 kilograms per hectare of parent stock material to the contract growing farmers. The corn seed harvested by the contract seed growers were bought by the producer at 5 percent higher than the prevailing market corn price.

There were 10 farmers cooperating with Local-3 to grow corn seed with a total land area of 7 hectares. This firm did give specific requirements for its contract farmers. The producer just makes sure that the farmers had fertile agricultural land and is experienced in corn growing. The farmers and the producer had to agree on price for the corn to be harvested by the farmers, which normally is 10 percent higher than the prevailing market price. The producer gives the stock seeds for free. Nearby corn plantation outside of the seed multiplication area which were planted at the same time should be at least 200 meters away to avoid contamination from other corn pollen.

Local-4 owns 20 hectares of land for seed production, thus, it did not enter into contracts with seed growing farmers. If the company could not meet market demand, it would buy the ready-to-sell corn seed from other local

producers. However they realized much lower profit than from its own production.

Selling Contract Agreements

Multinational companies established non exclusive selling contracts with wholesalers and distributors. Local companies did not have selling contracts with traders but they had selling contracts with the government agencies.

MNC-1 appoints an authorized distributor or dealer to sell its corn seed. These distributors usually carry other agricultural products being marketed by PT TSP. The company had selling contracts with all seed traders, whether they were wholesalers or retailers. The contract terms specified a quantity to be sold by a seed trader in one season. The company also offered credit facilities, price discounts, cash bonuses at the end of the season, and other services such as seed delivery, label extension, and seed replacements for seeds that did not meet the specifications on the seed label. A corn seed trader could engage in a selling contract agreement if he could dispose a minimum volume of 5 tons per year, which would also entitle the trader to a cash bonus. Contracts were evaluated annually by the company. Seed traders who did not satisfy the required volume of sales for two consecutive seasons could not renew their selling contracts with the company. Seed traders who achieved the minimum sales volume would be required to sell at least the same quantities for the next season, with higher bonuses for traders who surpassed the minimum target. However, many seed traders were not interested to enter into selling contracts with the company because they were not willing to be pressured to achieve the minimum quantity established by the company. Traders who did not have selling contracts with the company usually relied on selling other products, thus, turnover from seed selling was relatively low.

Selling contract of MNC-2 specified a minimum quantity to be sold every 6 months. If the seed traders achieved the required quantity, they would get bonuses at the end of the season. Seed delivery was subject to a credit limit and distributors were not allowed to sell outside East Java province (PT DI, 2002). The distributor, however, sold the corn seed to every buyer regardless of their origin that includes seed traders from Central Java even if they did not sell directly to the other provinces. The bonus received by the seed traders ranged from 2 to 5 percent of their total volumes of sales. The traders would receive bonus of 5 percent if they achieved a sales volume of 50 tons per season. Traders who did not meet the minimum sales volume for two consecutive seasons could not renew their contracts with MNC-2. Evaluation of MNC-2's distributors was done annually.

Local-1 sold corn seed to the government projects based on a contract agreement, but most of the seeds sold to the traders did not have selling contracts. A major item of the selling contract specified the quantity to be sold

for a given time period as determined by the producer and the government agencies. The company usually purchased corn seed from local producers if its production could not meet the demand. Similar to Local-1, selling contracts of Local-2 were engaged with government agencies and it did not involve marketing agents or brokers. Seed distributors who purchased directly from the company shouldered the transportation cost.

Such as the cases of Local-1 and Local-2, marketing agents or brokers were not required by Local-3. All buyers, usually government agencies, would contact them directly. The seed traders came to the company for purchase of seed and have to provide their own transport.

Before 2000, Local-4 entered into a contract with Local-1 to purchase and market its seed corn. Their contract had stipulations on the quantity, price and delivery of seeds that have to be complied with by the producer. However, at present the producer did not have a contract with Local-1 anymore due to lack of corn seed orders for government projects. Price discounts were given for a minimum quantity seed purchases. Contracts with the government agencies were prepared one season prior to the actual seed purchase.

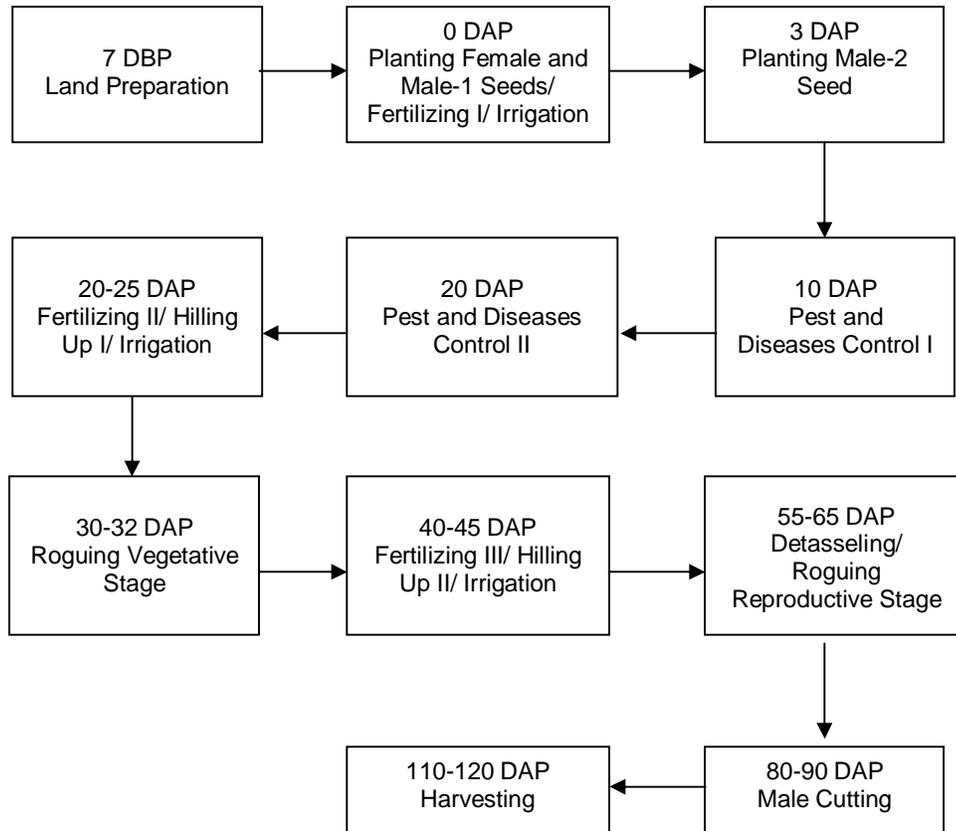
Corn Seed Growing

Each seed producer had their own seed growing which was quite similar with the others. The following is detailed practice example of hybrid corn seed growing carried out by MNC-2.

The corn seed growing was conducted in accordance with the steps specified in Figure 5. Land preparation was done 7 days before planting. There were two types of planting materials, namely, the male and female. The first male seed is planted on the first day and a second male seed is planted 3 days later. Stalks (female flowers) of the female plants got pollen from the tassels (male flowers) of the male plants. Thus, tassels of female plants had to be removed before the silking stage or until female plants' stalks blossomed in an activity called detasseling. The next step involves cutting the male plants to avoid their mixture with the corn stalks of female plants when they are harvested. The corn seed plantations should be isolated from other corn plantations at a distance of at least 200 meters. Otherwise, corn seed plots should be planted not less than 40 days before or after the neighboring corn plots. The procedure is called isolation. Roguing or the removal of off-types to maintain uniformity was also done to maintain the seed's purity.

The corn seed crops were harvested in 110 to 120 days after planting. All activities from planting, up to harvesting and the transporting of the corn to the nearest roads were carried out by the farmers. Field supervisors inspected the grower's seed farm for about 10 times in one season that commences from land preparation until harvest.

Officially the SCCS did not inspect corn seed farms managed by MNC-2 as the company was awarded a certificate by the Agency for Quality Certification System (LSSM) published by Directorate of Seed (2002). The certificate was renewable, valid for two years and it implied that the company was allowed to label its corn seed products. In addition, field inspections conducted by SCCS were no longer required. Nevertheless, the company was committed to maintain the quality of its products whether there were SCCS's field inspections or none at all.



Note: DBP (day before planting)
DAP (day after planting)

Figure 5. Steps of Corn Seed Crop Growing in MNC-2 (PT DI, 2001)

Seed Processing

In MNC-1, after harvest the moisture content of the corn stalks' had to be reduced from 28 percent to 10 percent through the driers. It normally takes from 2 to 3 weeks to dry the stalks before the corn kernels were peeled using peeling machines. Germination rate of the seed lot had to be examined next. Fungicides were used to treat the seeds prior to labeling and packing. For every 5,500 tons of corn seed produced every season, about 10 to 40 percent remain unsold and have to be disposed as feed grains. The company had its peak production of 1,000 to 2,000 tons during the months of June and July.

After the corn stalks were delivered to the processing plant of MNC-2 and were sorted, the stalks would then be dried using mechanical dryers. The dryers were using only 70 percent of their capacity, thus far. The dried corn stalks were then processed to remove the corn grains after which they were graded, treated with fungicides for bagging and storing (Figure 6).

Seed processing in Local-1 was as follows: upon arrival at the processing plant, the corn ears would be peeled and dried using mechanical dryers. Treatment with chemicals was done after the inspections of the SCCS staff. The corn seed was then packed into bags of 5 kilogram each. The seeds were stored in the storage house at a room temperature of 30 to 31°C and a humidity of 70 percent. It would be better if the room temperature in the warehouse was equal or less than 27°C. Storage of seed could last for 90 days before it was sold.

Local-2 transported the corn seed harvested to the storehouse and then dried it under the sun for 1 to 5 days depending on the length and intensity of solar heat. Mechanical peeling tools were used to remove the seed grain from its stalk. The seed grains were then re-dried under the sun. The SCCS staff would inspect the seed quality in terms of its moisture content, germination rate, cleanliness of seed, color of other seed variety, seed purity and the validity of the attached labels. Seed treatment, using the fungicide Ridomil, followed at a rate of 5 grams for every 10 kg of corn seed. The seeds were then placed in plastic packs before they were labeled. The purple-colored labels depicted the information on the SCCS's staff examination results.

Corn seed processing was done manually by Local-3. After the corn stalks were harvested, the producer dried them under the sun. The kernels are then peeled from the stalks for sorting. The SCCS staff would examine the seed samples at the laboratory and if the seed samples meet the SCCS requirements, the seed will be treated with chemicals. The seeds are then packed into plastic bags of 5 kilogram each and labeled. Even if the SCCS staff did not conduct inspections, the producer would strive to maintain the quality of their seeds.

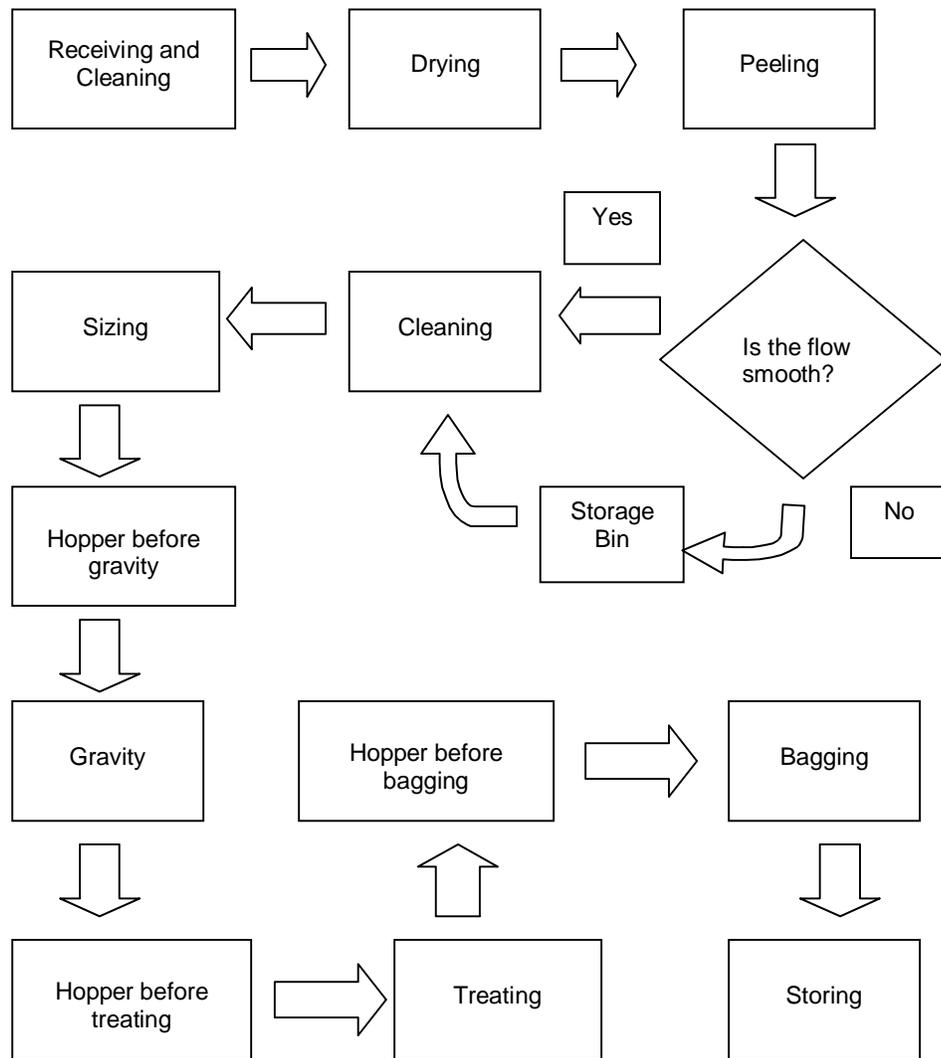


Figure 6. Corn Seed Processing in MNC-2 (PT DI, 2001)

The corn seed harvested by Local-4 would be transported to the storehouse and then peeled into kernels. Solar drying was used that could take up to three days. After being inspected by the SCCS staff, the corn seed would

be treated, packaged, labeled and stored. Corn seeds could be stored in the warehouse for up to six months, provided it was treated with pesticides.

Integration Index

MNC-1, MNC-2, and Local-1, who all produced hybrid corn seed, had higher integration index compared to local companies producing the composite varieties (Table 1). MNC-2 had an integration index of 83 percent, followed by MNC-1 and Local-1 with 81 and 74 percent, respectively. On the other hand, integration indexes of the local producers were relatively lower and ranged from 46 percent (Local-2) to 73 percent (Local-4).

The higher integration indices of the companies producing hybrid corn seed were mainly due to their higher average selling price, even if they incurred higher costs in purchasing physical inputs from other firms. Among the local corn seed producers, Local-4 had the highest integration index because the company grew the corn seed at its own farmland. Thus, the costs of purchasing physical inputs from other parties were lower.

Table 1. Integration Index of Corn Seed Producer in East Java, 2002

Corn Seed Producer	Corn Seed Variety	Value of Sales (Rp '000/ha)	Other Firm's Inputs (Rp '000/ha)	Value Added (Rp '000/ha)	Integration Index (%)
MNC-1	Bisi-2	61,200	11,405.05	49,794.95	81.36
MNC-2	P-11	50,000	8,424.38	41,575.63	83.15
Local-1	C-3	33,600	8,648.50	24,951.50	74.26
Local-2	Bisma	15,000	8,111.25	6,888.75	45.93
Local-3	Bisma	13,500	5,818.13	7,681.88	56.90
Local-4	Bisma	13,750	3,756.75	9,993.25	72.68
Local-1	Bisma	15,120	6,998.50	8,121.50	53.71

Note: the existing exchange rate was US \$ 1 to Rp 9,000

Pricing

Determination of corn seed price of MNC-1 was based on cost plus profit. The government did not intervene in price determination of corn seed. To some extent, however, the profit earned by the company was far above normal. The company was able to set high prices due to the high demand for hybrid corn seed which could be met by only three big hybrid corn producers. Average selling price set by MNC-1 was Rp 18,038 per kilogram.

MNC-2 determined price based on its cost plus profit method. It was determined from the international hybrid corn seed price of U.S. \$ 2 per kilogram. To some extent, their profit was as high as possible compared to

production cost. On the average, Pioneer seeds had the highest price among the hybrid varieties (Rp 20,000/kg).

There were two ways of determining corn seed price conducted by Local-2. First, the producer would set the price based on the cost of production plus profit. The other way of setting the price was based on the competitive market in which the producer was willing to lower price as long as it was still profitable when the market demand was low. Conversely, the producer would keep increasing price above normal profit when the market demand was relatively high. Average selling price of this company was Rp 3,000 per kilogram.

The price of seed set by Local-3 was based on the production cost plus profit. However, prevailing market price was usually adopted. Large volumes of purchase would get more discounts during the off seasons than peak seasons. The retail price of the corn seed was around Rp 6,000 per kilogram, but for government projects it would cost around Rp 3,000 per kilogram.

Local-4 formerly pegged its seed corn price between Rp 2,500 to Rp 2,750, but since 2002, the price increased to Rp 3,000 per kilogram when its broker asked for fee of Rp 500 per kilogram. Thus, the producer passed on the fee to the buyers.

Payments

Payments received by MNC-1 were either in cash, credit, or cash paid in advance. Cash payments included the payment received not more than seven days after seed delivery. Seed traders who paid in cash would get price discounts of 5 percent. Credit payment was allowed up to 21 days from seed delivery. Credit payment beyond three weeks after seed delivery was common during off-season or outside the peak months of April to June when market demand is relatively low. Advanced cash payments were made by seed traders during the peak season when market demand is relative high when most seed traders did not want to have shortage of seed stock because it meant loss of potential profits.

MNC-2 could receive payments in cash or cash in advance. During the peak season, 75 percent of the traders in East Java advanced cash to be assured of seed supply from the company. Around 5 percent of the traders paid cash and the rest by credit. The company could deliver its seeds to the traders or buyers, however, the buyers were also allowed to pick up the seed in the company's warehouse to get price discount equal to the transportation costs.

Local-1 receives cash payments for its government sales. However, the company accepted credit purchases from the seed traders. Price charged by the company was based on cost plus profit. Similarly, Local-2 asked for cash payments from the buyers whether they were farmers or seed traders. Payment from government agencies was preferred to be on cash basis as credit payment

would be quite risky for the producer. It was also true to Local-3 in which payment for seed purchase had to be made in advance or cash to lessen the risks of unpaid credit. However, it was difficult to get cash payment from the government agencies and usually only a portion of the seed's value would be paid in cash. Unlike the other local companies, Local-4 required 50 percent down payment for the corn seed and the remainder had to be paid upon delivery of the seeds. Should the buyers fail to pay the additional 50 percent, the producer would raise the price from Rp 3,000 to Rp 3,500/kg. The producer adopted a firm's gate price for its seeds. Payments received by the producer were either in cash or credit depending on the agreed terms and volume of seeds sold. Officially, the producer did not impose additional interest charges, but the seed price could be increased by more than 15 percent if payments are made in more than two installments. The price for distributors and traders was only one-half of the official price paid by the government agencies. This could indicate that some government officials involved in the seed purchase would illegally earn 50 percent of the total value of sales. In some instances, the producer had to pay a broker's fee of Rp 500 per kilogram of seed sold. Thus, the producer would receive only a net amount of Rp 2,500 per kilogram out of its official selling price of Rp 6,000 per kg if payments were made in cash.

Storage and Transportation

The marketing company of MNC-1, i.e. PT TSP, had warehouses located in its branch offices, namely: Kediri, with a capacity of more than 1,000 tons; Bandung, 600 tons; Semarang, 600 tons; Lampung, 1,000 tons; Medan, 1,000 tons; Makassar, 100 tons; Kalimantan, 25 tons; and Bali, 25 tons. The warehouses were not used mainly to store corn seed only, but were also utilized for other products sold by PT TSP. Seed delivery from the producer to the seed traders or consumers was common. All of the seed producer would deliver seeds provided the volume was beyond minimum quantity at no additional cost to the buyers. The traders who picked up corn seeds at the company's warehouse would get price discounts equal to transportation costs.

In terms of seed sales to the buyers, MNC-2 delivered the corn seed through the nearest sales offices. PT DI had some satellite warehouses located in the provinces of West Java, Central Java, and Lampung, and in Jember regency, East Java, each with a capacity of 200 tons, good for a supply to last for one month. The corn seed would be sent to the satellite warehouses from Malang or Kabanjahe processing plants.

Local-2 usually took less than 30 days for the seeds to be in storage before it was sold in the market. During the seed storage the producer maintained low humidity and good air circulation in the warehouses. One warehouse owned by the company in the Kediri regency had a capacity of 400 tons that also served to store rice seeds. There was no financial risk during seed

storage because the producer would sell the seeds as soon as possible in order not to keep the seed for a longer period in the warehouse. The producer is paid in cash at his warehouse and transportation costs including risks during transportation were at the expense of the buyers. On the other hand, the company delivered to the retailers or farmers who purchased corn seed and other agricultural inputs subject to minimum values of purchases.

One of the Local-3's warehouses in Malang regency had a capacity to store 50 tons of seed corn, which was also utilized to store rice that the company also produces. A 7-ton capacity truck was used to transport corn seeds to traders in the regencies around East Java. To some extent, the producer also delivered corn seeds to Central Java province using rented trucks. Due to high cost of seed transportation (Rp 200/kg) going to other provinces like Central Java, the producer did not give any price discounts. For nearer destinations within East Java, the producer could offer price discount of Rp 100 per kilogram. The price was determined by the producer based on the prevailing interest rates and feasible profit rates. The price to traders was between Rp 3,000 to 4,000 per kilogram depending on the method of payment and distance of delivery. The farmers, however, had to pay a higher price of Rp 5,000 per kilogram. This indicates that the farmers paid a higher price to the producer due to a relatively low volume of purchase.

One warehouse of Local-4 used either for corn seed or rice seed storage was located in Ngoro sub regency with an area of 500 m². The warehouse had a capacity of 850 tons for corn seeds or 200 tons for rice seeds. There were no physical and financial risks for storing corn seeds since these could be disposed in the market as grains. This practice was possible since the corn seeds were treated with chemicals only if there were confirmed purchases from buyers.

Packaging

Local-1 used plastic bags in packaging its corn seeds which could take an average of 90 days before it was sold. Seeds were stored in temperatures ranging from 30 to 31⁰C and a humidity of 70 percent. Ideally, the room temperature should not be more than 27⁰C. The 500-ton capacity warehouse is located in Pasuruan regency. The seeds were transported using rented trucks which cost of Rp 50 per kilogram for a distance of around 40 km. The company does seed deliveries up to Sumatera Island covering a distance of more than 1,000 kilometers.

All of corn seed produced by MNC-2 was sold in plastic bags of different packaging sizes of 1 kg, 5 kg, 4 k (4,000 kernels or 1 kilogram), 10 k (10,000 kernels or 2.5 kilograms), and 20 k (20,000 kernels or 5 kilograms). Introduction of corn seed packaging in number of kernels, i.e., 4 k, 10 k and 20 k, was intended to guide farmers more accurately in purchasing seed requirements. Each hectare of land usually needed 70,000 kernels of corn seed or around 17

kilograms. However, not all Pioneer corn varieties were packed in number of kernels because some farmers were already accustomed with bags measured in kilograms.

On the other hand, MNC-1 and MNC-2 corn seed varieties were packed in kilogram units. The corn seeds packed in number of kernels tended to be misleading to the farmers because the company does not differentiate between small and big kernel size. Packaging of 1 and 5 kilograms were more common than the other sizes. Local producers packed the seeds in 5 kg bags (Table 2).

Table 2. Size of Corn Seed Packaging by Variety, Sold in East Java, 2002

Producer	Variety	Size
MNC-1	BISI-2	1 kg, 5kg
	BISI-5	1 kg, 5 kg
	CPI-2	1 kg, 5 kg
	Surya	5 kg
	Arjuna BISI	5 kg
MNC-2	P-4	1 kg, 5 kg
	P-5	1 kg, 5 kg
	P-7	1 kg, 5 kg
	P-8	1 kg, 5 kg
	P-11	4K, 10 K, 20 K
	P-12	4K, 10 K, 20 K
	P-13	4K, 10 K, 20 K
MNC-3	C-5	5 kg
	C-7	5 kg
Local Producers	Bisma	5 kg

Note: 4 K (4000 kernels or around 1 kg), 10 K (10, 000 kernels), 20 K (20,000 kernels)
Local producers were Local-2, Local-3, and Local-4

Advertisement

Advertisement was one of the methods undertaken by MNC-1 through its marketing company, i.e. PT TSP, to promote its products through television, billboards, name plates, radio, stickers, and street banners. The company, through the seed traders, also had promotional giveaways like hats and t-shirts with company logo on them. This was available to consumers who purchase the required minimum amount. In 2001, PT TSP spent around Rp 1 billion or more than US \$ 100,000 for advertisements through the television stations. PT TSP's budget allocation for advertisement was around 10 percent of its production costs. In 2002, the company spent Rp 4 billions or more than US \$ 440,000 for sales promotion. Advertisement through television was among the most influential mode but was also the most expensive.

Another promotion method done by the company was farm demonstrations. The farm demonstrations were carried out by the company's employees on the farmers' land in cooperation with the SCCS or the Agricultural Service. The sites chosen for farm demonstration were located along the main roads or streets with billboards bearing the company brands of seeds. This enabled the passers-by to see the hybrid corn variety grown by farmers.

Officially, the company did not approach the Agricultural Service to sell its products. In business transactions, however, each party would initiate moves to conduct corn seed selling or purchase. Usually, the company was able to sell corn seed to the government projects at the national level which could account for up to 30 percent of its total sales volume. The company would give price discounts of 29 percent for government projects or higher compared to its sales to seed traders.

To introduce new varieties, the MNC-2 conducted field demonstration carried out by company employees. The company also teamed up the Agricultural Service staff in performing the field demonstrations. In April 2002, the company conducted demonstration plots to introduce a new corn seed variety, the P-12, in all sub regencies in Kediri regency, East Java province. The experiments were carried out on one hectare plots in each regency. The company offered for free 17 kilograms of P-12 corn seed per hectare. The farmers involved in the experiment also received free 300 kilograms of fertilizer from PT Petro Kimia Gresik. This experiment was accomplished in cooperation with the Agricultural Service in Kediri regency (Kompas, 2002). The producer also gave 25 tons of free samples of P-12 in packs of 0.5kilogram to the farmers through seed traders and farmers' groups.

Advertisement of the company's products was conducted nationwide. Media used for advertisement were television, billboards, street banners, name plates, and brochures. The company also advertised using t-shirts in coordination with the seed distributors, with the costs being shared equally between them. Most of the company's sales were done in the open market. However, to expand its market, the company cooperated with the NGOs and government agencies to facilitate its growth. The company gave more price discounts to these institutions. However, if the purchased volume was relatively low, the company offered price discount of 2 to 5 percent.

The promotion method of MNC-3 used of placards installed along the main streets or roads. On its initial year, many corn seed traders did not settle their credit even though the seeds were sold out. The marketing company kept on selling through its reliable traders. The company relies on the competitive quality of its products. Its corn variety, the C-7, could be harvested in 90 days which was 10 days earlier compared to the BISI-2 variety or almost two weeks earlier than P-8 variety. The sales volume for the C-5 and C-7 greatly increased from 200 tons in year 2001 to 400 tons as of June 2002. The company cooperated with any institution in order to sell its seed products. One such

private institution, the Merak Foundation in West Java, cooperated with the company and the local government of Sukabumi regency, West Java province in 2002 to plant corn on farmers' land (Suara Karya, 2002).

Local-1 advertised its product through some pamphlets. There was no advertisement in the mass media like newspapers, magazines, and television due to its limited budget, which is only 2 percent of its budget where the ideal level is at least 10 percent. The corn seeds produced by Local-1 such as the Bisma, Arjuna, Semar-2, and Semar-3, were also produced by other producers. Thus, if the company advertised them, it would also benefit other producers, although it might only an alibi of the company.

This company produced and sold unique seed products like the C-1 and C-3, but no sufficient promotion was done. For the S-2, S-3, and Bisma varieties, for example, the company could promote them by adding the name or logo of the company in each seed package. Most corn seed varieties sold by Local-1 had low productivity except for the C-1 and C-3 that were patented by Cargill. The C-5 and C-7 varieties, however, had higher yields and is marketed by another company, i.e., PT BRS. To some extent, especially for the new varieties, the company employees conducted farm demonstration for new varieties together with the staff of SCCS or staff of the Agricultural Service. In mid-2002, Local-1 cooperated with the SCCS in Jombang regency to conduct field trials of the SHS-1 and SHS-2 hybrid corn seed.

Due to limited budget for promotions, Local-3 did not advertise their products. Field demonstration was not done by the producer but it was common for the producer to approach government officials at the Agricultural Service to sell his product. Price discount offered could be as high as Rp 1,000 per kilogram or more than 25 percent while the price charged to government agencies was Rp 3,000 per kilogram or lower. The higher the quantity bought by the buyers, the greater was the price discount offered.

Farm demonstration plots were made by Local-4 in collaboration with the government agencies, especially the Agricultural Services. Costs of demonstration plots were shared between the producer and the government agencies. The producer offered 500 kilograms of corn seed for free. Other inputs, such as fertilizers, pesticide, and labor, were provided by the government agencies.

Risks Bearing

A big risk in corn seed production of MNC-1 was that not all of corn stalks harvested were submitted to the company. The farmers sold the unreported corn seeds to other seed traders secretly at a price of Rp 5,000 per kilogram or almost twice the price offered by the company. The company estimated that between 5 to 10 percents of corn seed production was sold in this manner. The farmers sold some of the corn seed harvested to other seed

traders due to the significant difference between the buying price of the company and traders. Several methods of cheating were done by the contract growers. Some contract growers cheated by reporting larger farm areas compared to the actual area so that they could get more parent seeds than what was required. The extra seeds were planted on other farms outside of the contracted areas. Sometimes, farmers harvested some of the corn stalks even before the official order to harvest them.

The company responded to consumers' complaints about their product. A common complaint was poor seed germination that was lower than that written on the seed label. The company would replace the corn seed bought by the farmers. Complaints could be addressed to the distributors, wholesalers or retailers and the company would compensate the farmers through these traders. In certain instances, one of MNC-1's distributors complained that the company would not replace the seed claimed by the buyers. Thus, the cost of the seed replacement was shouldered by the distributor.

MNC-2 was open to consumers' complaints. For instance, if the Pioneer seeds that they bought had low germination rate, the seed would be replaced by the company; however, the company would continue to investigate whether the low germination rate was attributable to poor seed performance or to the wrong practices of the farmers. The company would also trace the seed channel from production site, warehouse and distributors to find the cause of poor seed performance.

One of the most popular hybrid corn seed varieties of MNC-3 is the C-7. This variety was grown in the provinces of West Java, Central Java, East Java, Lampung, and South Sulawesi. Some Non Government Organizations claimed that the hybrid corn seed variety of C-7 was classified as a genetically modified organism (GMO). This product was believed to be a GMO in the sense that it was a biologically engineered product in which genes were inserted to protect the plant from pests or to resist a specific herbicide. However, PT BRS, the company distributing C-7 corn seed, claimed that all of their varieties were simply hybrids.

Some of risks faced by Local-1 in marketing seeds were deterioration of stocks, label expiration, and decreasing germination rate. Unsold seeds due to label expiration would be re-examined by the SCCS, but the costs of reexamination was borne by the distributors. The company adopted a policy that customer complaints due to dissatisfaction of service or inconsistent information on the seed labels should be done within one week after the seed was delivered. Most claims were usually related to low germination rates although these were not more than 2 percent of sales volume.

A common risk encountered by Local-2 was the expiration of seed labels that reached up to 10 percent of total production. If the producer's seed supply was less than the demand, he would purchase seed from other producers to meet the demand. If the label expired after more than 6 months,

the producer would ask the SCCS to reexamine the seed lot. If the seed still meet the SCCS standards, the seed label would be extended another 3 months, otherwise the seed had to be withdrawn from the market. Furthermore, if the customer complained before the expiry date on the seed label, e.g. the germination rate was lower than that depicted on the label; the producer would replace the defective seeds.

The main risk of Local-3 in corn seed marketing was label expiration. However, there were no physical and financial risks during seed transportation. The SCCS staff in Sidoarjo regency, East Java, reported on November 7, 2001 that 12.17 tons of Bisma corn seed and 10 tons of IR-64 rice seeds that were shipped by CV MJ and Local-3 to East Nusa Tenggara province were not labeled. The SCCS sent warning letters to both companies not to ship the unlabeled seed anymore. If both companies fail to comply with the directive, their Licenses of Seed Traders shall be suspended (SCCS, 2001c).

The label was valid for six months and it could be extended for another three months subject to re-examination of the SCCS. The seed should be disposed if the re-examination results showed that the corn seed did not satisfy the official standards anymore. After 3 months from the re-labeling and if the seed remains unsold, it had to be disposed. Based on a September 2001 report of the SCCS Malang, East Java, Local-3 produced 4.5 tons of Bisma corn seed variety. The seed label validity was good for six months from September 7, 2001 to March 3, 2002. However, based on a re-examination carried out by the SCCS Malang the germination rate dropped from 81.0 percent on September 7, 2001 to 67.8 percent on November 14, 2001 or four months before the date of expiration. This was lower than the 80 percent minimum germination rate for commercial composite corn seeds as established by the Directorate General for Food Crops. It meant that the company was no longer allowed to sell the mentioned volume of seed (SCCS, 2001a).

Local-4 had once received complaints from the buyers regarding low germination rate of only 60 percent. If the cause was due to low seed quality, the producer would replace it with new lots of seed. However, if low germination rate was attributable to farmers, the producer could reject requests replacement. A report from the SCCS East Java found out that on January 19, 2000, the company's Bisma corn seeds in East Nusa Tenggara province had lower quality than the official standard. The moisture content of the seed was higher than that established by the Directorate General for Food Crops. The producer got official warning letters from the SCCS East Java regarding the rule violation (SCCS, 2001b).

Seed Labeling

Information written on the label indicated the moisture content, seed purity, dirt content, seed of other colors, germination rate, and label validity.

During the survey, however, no seed produced by Local-1 was sold in the agricultural input stores. The only corn seed marketed by Local-1, partly through agricultural stores, was the A-4 hybrid corn seed produced by PT AAM. It showed that almost all of the corn seed produced and marketed by Local-1 was sold to government projects.

Compared with the standard seed label established by the Directorate General of Food Crops, not all data required were depicted on the label of commercial seed packaging. For example, the corn seed label of Surya variety produced by MNC-1 did not mention the seed content of other colors. The label on Bisma corn seed variety did not reveal the content of seed of other varieties. Nevertheless, the labels on both composite corn seed varieties contained the other required information (Table 3).

Table 3. Information Written on the Corn Seed Labels by Variety in East Java, 2002

Variety	Moisture Content (%)	Seed Purity (%)	Dirt Content (%)	Seed Of Other Varieties (%)	Seed Of Other Colors (%)	Germination Rate (%)	Label Validity (Months)
	Max.	Min.	Max.	Max.	Max.	Min.	Max.
Standard*)							
1. OPV	12.0	98.0	2.0	0.2	1.0	80.0	6
2. Hybrid	12.0	98.0	2.0	0.2	1.0	90.0	6
Commercial							
1. OPV							
Surya	11.4	99.9	0.1	0.0	ns	94.0	7
Bisma **)	11.0	99.9	0.1	Ns	0.0	98.0	6
2. Hybrid							
A-4	12.0	99.8	0.2	0.0	ns	87.0	6
BISI-2	11.1	99.9	0.1	Ns	ns	98.0	8
CPI-2	11.0	99.9	0.1	Ns	ns	90.0	8
C-7	Ns	99.9	0.1	Ns	ns	97.0	6
P-7***	12.0	98.0	2.0	Ns	1.0	90.0	3
P-8***	12.0	98.0	2.0	Ns	1.0	90.0	3
P-13	12.0	98.0	2.0	Ns	1.0	90.0	9

Note: *) Requirements based on the Dir. Gen. of Food Crops (1984)

) Produced by Local-3, *) Relabeling

ns: not specified on the seed label

Violations of the official requirements on the seed label were more frequently found on the packaging of hybrid corn seed varieties. The label on the C-7 corn seed variety produced by MNC-3 did not include the moisture content. There was no information on the content other seed varieties on the seed labels of the BISI-2, C-7, P-7, P-8, and P-13 corn varieties. Contents of seed of other colors were also not found on the labels of corn seed varieties on the labels of

A-4, BISI-2, CPI-2, and P-7. The labels of BISI-2 and CPI-2 were good for 8 months and surpassed maximum standard of 6 months. The same was found on the label of P-13 which had a label validity of 9 months. All germination rates of P-7, P-8, and P-13 satisfied the minimum requirement of 90 percent. MNC-2, the producer of the P-13 variety, guaranteed the label validity of 9 months. Unfortunately, no action was undertaken by the SCCS to resolve the issue.

CONCLUSIONS AND IMPLICATION

The multinational companies distributed corn seed through non-exclusive distributors, which also performed as wholesaler-retailers, who also sold to wholesaler-retailers, retailers, and finally to farmer-users. Except for a local producer who relied on government projects for his sales volume, other local producers sold only around 10 percent of their products in the open market. The market share of the multinationals from government projects ranged from 30 to 40 percent. Marketing services, such as seed delivery and seed replacement due to lower performance, were provided by all producers. Contracts with corn seed growers were carried out by most of the producers because they did not have sufficient farmland. Selling contract agreements were implemented between multinationals and distributors with bonus incentives subject to a minimum volume of sales. The big companies processed seeds using modern plants while local producers relied more on manual procedures. On average, the multinational companies had higher integration indexes than those of local producers.

The selling price of corn seed was set by the corn seed producers was based on cost plus profit, but the local companies to some extent also applied competitive price. Higher selling prices of the Multinational Companies revealed that they were able to control market and tended to be oligopolistic. Payments received by the producers were usually on cash basis, but some traders also paid in advance or in credit. Storage of corn seed was carried out in the warehouses where the conditions were sufficient to maintain corn seed quality before it was sold. All corn seeds sold in the market were well packed in plastic bags with brands and labels. Multinational producers always advertised their products through different mediums of communication. The local producers, however, rarely promoted their products and usually conducted farm demonstrations only. Unsold seed due to expired seed labels was the main risk faced by the producers. Except for producers who were awarded certificate of seed certification, the corn seed producers labeled their seed in accordance with the standards established by the Directorate General of Food Crops.

To protect the consumers' interest, role of the SCCS is still significant especially in controlling corn seed growing on farms and validity of seed label. On the other hand, the government has to strictly control distribution of illegal

seed to protect both producers and farmers' interest. Furthermore, it is possible that the government restricts maximum retail price of those hybrid varieties produced by the multinationals because it is deemed very expensive. The local companies need to increase efficiency and to get more aggressive in marketing to compete with the multinationals.

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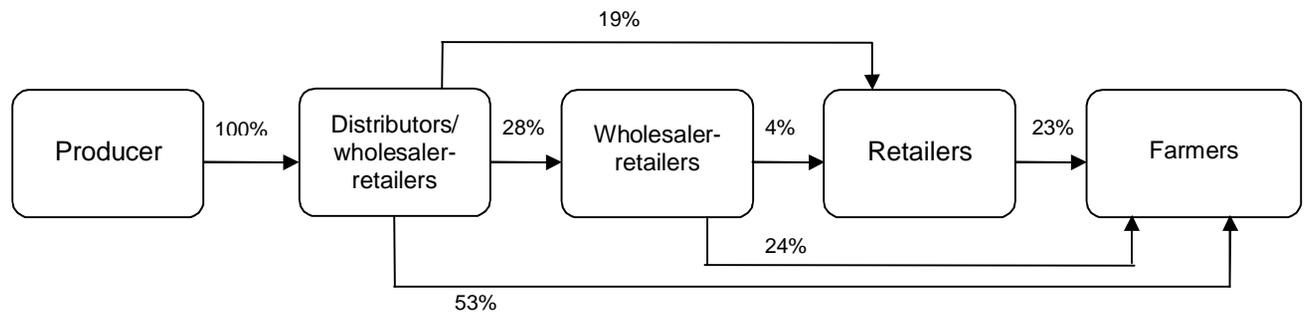


Figure 1. Marketing Channel of MNC-2's Corn Seed Products in East Java, 2002

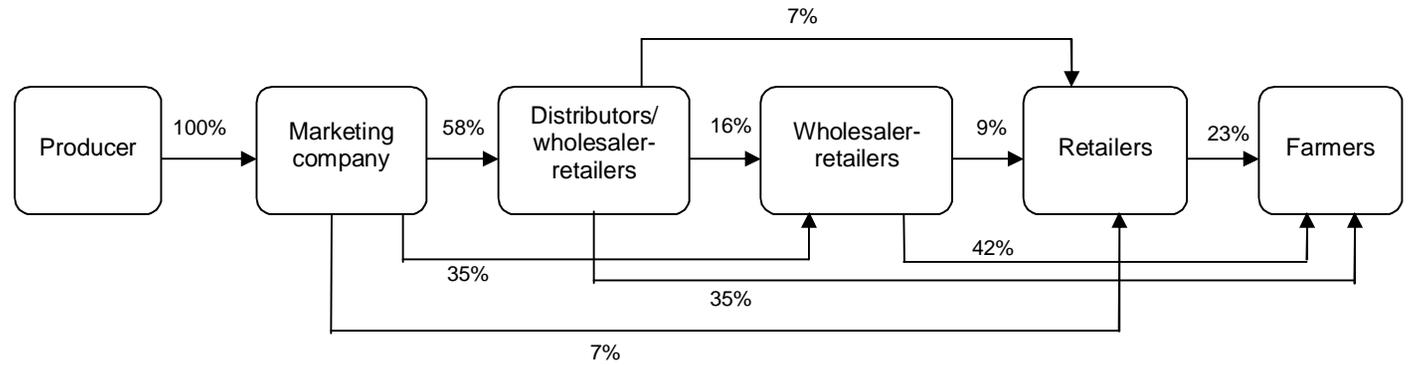


Figure 2. Marketing Channel of MNC-1's Corn Seed Products in East Java, 2002

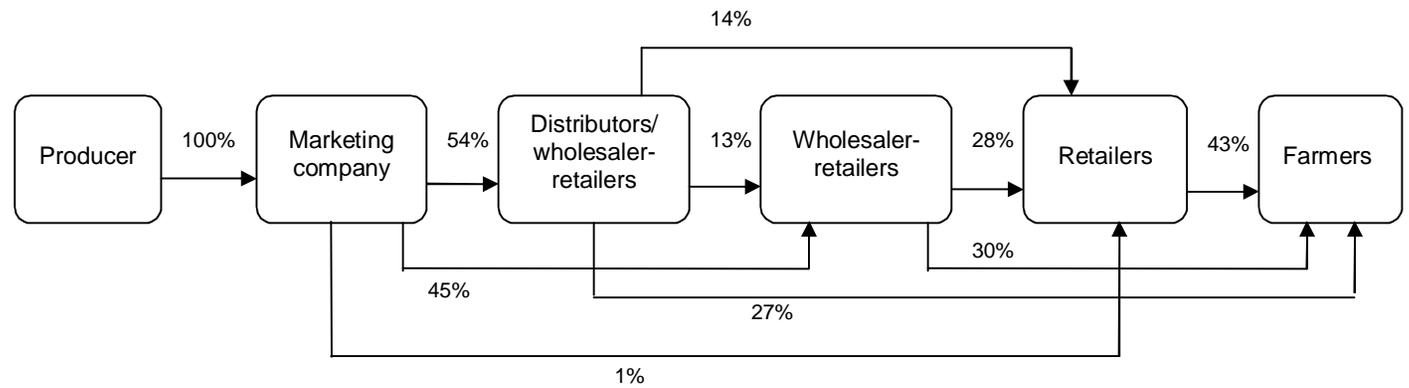


Figure 3. Marketing Channel of MNC-3's Corn Seed Products in East Java, 2002