

# Value Chain Map of Small Agricultural Product-Processing Enterprises in Bandung, Indonesia

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**Abstract**— Generally, informal small enterprises are still conventional in operating their business in view of some aspects, such as production and marketing, particularly from the side of value chain they create. This applies to small and micro processed food enterprises in Bandung Regency, of which more than 90 percent are informal enterprises with still low product values. Value chain analysis is an analysis of the activities that produce values, originating from both inside and outside the enterprises. The objective of this paper is to map the value chain of the entire activities undertaken by processed food enterprises. This value chain analysis approach is used to enhance the capacity of small enterprises by reviewing the whole value chain as a system. The value chain mapping provides clearness on which activities to enhance internally and externally in relation to other entities like suppliers, distributors, and consumers. The result of value chain map identified detail potential and barrier of SME Food Processing which be utilized as a solution for increased productivity, quality, and local value added as viewed from the entire activities.

**Keywords**— *small enterprises, food enterprises, value chain analysis, value chain map, productivity*

## 1. Introduction

Agriculture is the primary resource of the people of Bandung Regency, West Java Province, Indonesia. Bandung Regency is an area of around 176,239 km sq wide with a population of around 3,174,499 people. Its territory is mostly mountainous which is suitable for farming, and thus agriculture becomes a primary sector that drives people's economy in the area. Moreover, the mountainous condition of land makes agriculture one of the livelihoods of community, as indicated by the large number of vegetable and fruit farmers. The crops in forms of vegetables and fruits are mostly sold directly in form of agricultural commodity to traditional markets in Bandung Regency.

To maximize their income, people process the crops into processed foodstuffs, particularly when harvests are abundant and thus the prices of the agricultural commodity are being falling. This activity later becomes a prospective business area that offers some opportunities to local community as the enterprise of processing crops into processed food products. The small and micro-scale enterprises of processed foods are largely, i.e. approximately 90%, informal enterprises which desperately need some aid in form of guidance from different parties such as government, academics, financial institutions, and others in improving the capacity of their enterprises in production, marketing, and financial aspects.

The small and micro enterprises joint together in XYZ Association comprising nearly 400 enterprise members, both individuals and business entities. The types of processed foods that are produced include among others crispy chips of cassava, black sticky rice, eggplant sweets, carrot crispy chips, spiral potato, processed strawberry, processed mushroom, etc. It is hoped that through XYZ Association the guidance of small and micro enterprises of crop-based processed foods can be performed integrally and transparently so that all enterprises have equal chances of gaining aids in expanding their business.

From production aspect, it is shown that the production process performed is still very simple with relatively mediocre equipment and technology, non-standardized production quality, and inexistency of permit or registration from the government. Marketing is still carried out personally and there is no yet a marketing network that makes it possible to market crops in an extensive continuous way. Meanwhile, from capital aspect, there is no yet formal relationship with financiers such as bank, BPR, and other financing institutions.

The research would inquire the product value chain mapping of processed food enterprises for them to be capable of becoming professional enterprises and hence enhancing small and micro enterprises' living standard and welfare. Accordingly, the research objective is to conduct a mapping of processed food industry's agricultural produces value chain from upstream to downstream so as to find out any problems in each activity of the value chain.

## 2. Related Works

Value chain analysis is an analysis of those activities that produce value, derived from both inside and outside a company. Value chain concept renders a perspective of a company's position in an industry's value chain. A value chain analysis assists companies to understand the value chain that creates their product. Value starts from raw materials to the after-selling services. Companies should be able to recognize their own position in the value chain that creates their product or service. This is of importance in identifying opportunities of competition.

After having identified their own position, the companies would recognize those activities which create the value. The activities are then studied in order to identify whether they contribute some value to the product or not. If an activity contributes some value, it will remain to be held and improved for maximizing its value. Conversely, if it doesn't, it should be eliminated.

Value chain analysis can be carried out by dividing activities into ones outside company and ones inside company for creating value. Moreover, the activities carried out outside a company may be distinguished between ones originating from consumer linkages both in distribution and in after-selling service.

Value chain analysis has been applied to a study of camel milk in Northern Saudi Arabia with a conceptual model of camel milk value chain in producer, distributor, and consumer entities [1]. For small enterprises in agriculture sector, an approach applied to creating market shares is by using "value chain for development" [7]. The approach requires commitment and collaboration of diverse stakeholders, each having incentive, motivation, and responsibility [9].

Value chain approach is supported by a value chain analysis, elucidating the complex relationship between productive activities at company, state, and global levels; an interactional activities between producers, suppliers, and vendors [2], [5], [6], [10]. Complex systems need to (a) consider the whole system, from producers to consumers; (b)

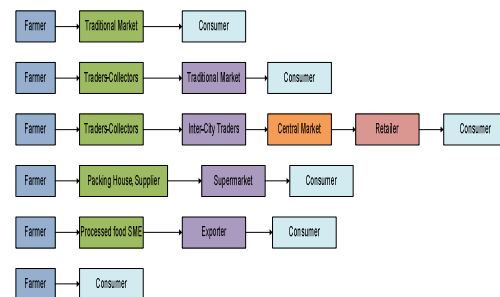
see agricultural value chain as a complex adaptive system with different interaction levels with inputs; (c) see value chain as the meta organization of some stakeholders which interact with one another, with markets, and with environments [8].

Value chain map in Indonesia Cocoa comprised of three level is manufacturing, processing, and trading/importing [3] to explore the constraint and barrier and systemic constraint identification [4].

## 3. Data Collection and Existing Models

The raw materials needed by small and micro processed food enterprises are obtained from those farmers who are residing in Bandung Regency. The farmers have been market-oriented, where the targeted markets of their agro products includes, among others, Bandung Regency, West Bandung Regency, Bandung city, outside city, and foreign (export) markets.

The marketing chains (rule of commerce) of agro products in Bandung Regency vary considerably, from very simple models to quite modern systems. In line with the developments in trade sector, supporting infrastructures, information and communication technology, and processing technology, the agro marketing system in Bandung Regency has also been developing toward a more advanced and efficient one.



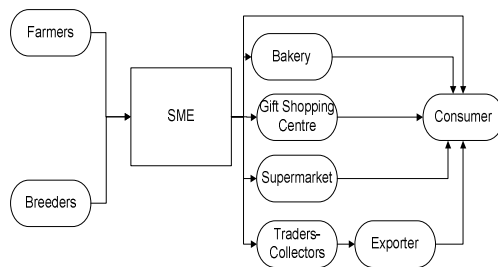
Figures 1. Existing Distribution Chain

The distribution of agricultural produces from farmers has been quite established and the farmers have been capable of exporting and supplying big food industries. The rest of the agricultural produces is then bought by small and micro enterprises as raw material for producing processed food products.

In principle, in one value chain there are two main flows. First is a flow of goods from suppliers to company, and then to customers. Inversely to the flow of good, there is a flow of information which

flows from customers to company, and then to suppliers. The flow of goods from suppliers to producer becomes an input for company, undertaken reactively and proactively, while the flow from producer to consumers is an output, undertaken reactively and proactively as well.

The key entities of a supplier chain are raw material suppliers, product processor (producers), distributors of produced products (retailers/distributors), and product end users (consumers). With the same entities, based on a field survey's result, a supplier chain scheme that exists for processed food enterprises in Bandung Regency is mapped as shown on Fig. 2.



**Figures 2.** Mapping Value Chain of Processed Food Products

The value chain scheme depicts the change in the value added of the product that agricultural processed food product enterprises produce. To the farthest left are the suppliers of raw materials, i.e., farmers or breeders. Those processed food enterprises which joint together in XYZ Association are ones which source their raw materials, including vegetables, fruits, and other agricultural commodities, from farmers. However, from the data of XYZ Association's membership available currently, there are some members that operate animal husbandry processed product enterprises. For these enterprises, the supply of raw materials is derived from breeders. To secure raw materials of high quality, it needs to select those farmers and breeders who offer good quality and prices affordable to small and micro enterprises. Moreover, to cut down expenditures, some members run a separate agricultural land as a source of production raw material.

Further entity is small and medium enterprises in their capacity as processed food-producing entity. With increasingly intense competition, enterprises should also generate their own competitive advantages according to their capacity and to the

quality of products they produce. When enterprises operate their business individually, they are frequently faced with any barrier in developing coordination and in marketing their own products. Therefore, the role and support of XYZ Association in facilitating its members are needed. This XYZ Association can expectantly support small and medium enterprises to be capable of holding a high bargaining power, facilitating cooperation and coordination with external parties. In addition, the Association may play a role as an access line of information with external parties pertaining to business and agricultural sector to be conveyed to small and medium enterprises.

The outcomes of small and micro processed food enterprises' production are then marketed by some ways to be finally delivered to the end users of the products. Based on the result of survey conducted to the sample of XYZ Association's members as small and micro enterprises, it is revealed that some ways undertaken to market their products are as follows:

- Bakeries;
- Gift shopping centre;
- Supermarkets or minimarkets;
- Traders-collectors

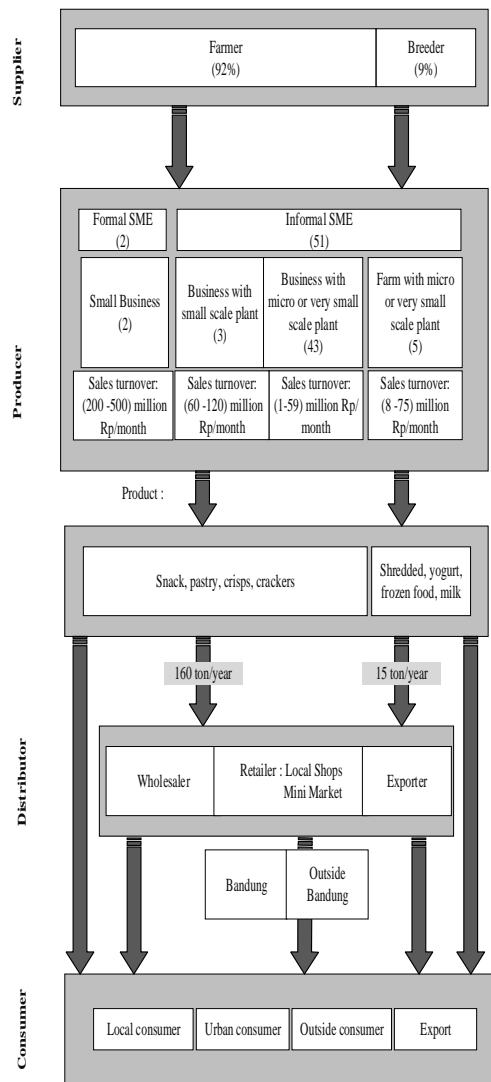
In addition to the ways, small and micro enterprises also market their products directly to those consumers who reside surrounding the location of production. This relates to the still traditional ways, namely thorough words of mouth, packaging, and exhibition (if organized by government or other institutions). The condition causes the product marketing is still limited in scope.

To ensure that the produced products successfully meet the product specification consumers want, an identification of needs and wants about products, including complaints on products, is needed. This process is valuable in developing further product innovation.

#### 4. Value Chain Mapping

A value chain starts from suppliers, producers, distributors, to consumers, as shown on Fig. 3. The activities of value chain represent the process of each activity that a value-generating product has to go through. In each activity there are always input and output representing the cost spent and the value of the product gained and thus the activity overall will create a value chain which is an accumulation

of the values gained from each activity the product passes through.



**Figures 3.** Small Enterprises' Value Chain of Agricultural Product Processing

**Supplier.** Supplier is the first entity in a value chain of agricultural product processing enterprise. The enterprises obtain their raw materials from farmers and breeders residing in Bandung Regency as the major supplier of agricultural processed products. The business sustainability relies on the continuous availability of the supply of raw materials. When the raw materials are unavailable, the enterprises cannot undertake their production. Both quality and price of raw materials that supplier sets affect strongly the quality and pricing of the processed products. Seen from the raw materials available, enterprises maybe categorized

into 2 (two) group agricultural product-processing enterprises and animal husbandry product-processing enterprises.

**Production.** Production activity is a processing from raw material into ready-to-market processed food products. Based on the raw materials used in a production process, there are 48 enterprises that process the raw materials of agricultural products and 5 enterprises that process the raw materials of animal husbandry products.

- i. The agricultural product processing enterprises with their products including potato crispy chips, mushroom, strawberry steak, condiment, jelly, dry cake, wet cake, etc. are the majority of XYZ Association.
- ii. Animal husbandry product processing enterprises with their products including yoghurt, frozen food, and milk, are a small part of the enterprises joining together in XYZ Association, that is, only 5 enterprises with a total turnover from Rp.8,000,000 to Rp.75,000,000 per month.

From the data obtained from a survey of 53 enterprises joining together in XYZ Association, they widely vary in business scale. Seen from their business legality, the enterprises may be grouped into formal enterprises and informal enterprises as described below:

- a) Formal enterprises are ones with an official business license. Included in this group are those enterprises with a quite large amount of turnover, and only 2 (two) of the 53 enterprises which achieved a monthly turnover of Rp.200,000,000 – Rp.500,000,000. This group of small formal enterprises has considerably developed and more established relative to other small enterprises.
- b) Informal enterprises are ones which lack of official business license from the government and are generally of small and micro scale. There are 51 enterprises with turnovers from Rp.1,000,000 to Rp.120,000,000 per month. These informal enterprises are classified based on their monthly turnover in conformity with Law No. 20 of 2008, that is:
  - i. Small enterprises with a monthly turnover varying from Rp.60,000,000 to Rp.120,000,000. There are 4 enterprises falling into this category, consisting of 3 agricultural product

- processing enterprises and 1 animal husbandry product processing enterprise.
- ii. Micro enterprises with a monthly turnover varying from Rp.1,000,000 to Rp.59,000,000. There are 47 enterprises falling into this category, consisting of 43 agricultural product processing enterprises and 4 animal husbandry product processing enterprises.

Total productions of agricultural and animal husbandry product-processing enterprises are 160 ton per year and 15 ton per year, respectively.

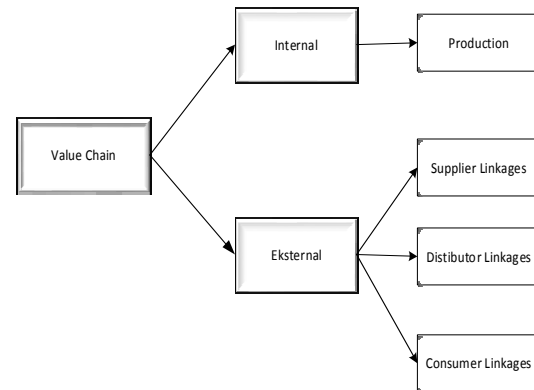
**Distributor.** The production results of the processed food enterprises are sold to consumers either directly or indirectly through distributors. The distribution of product is carried out in Bandung, outside Bandung, and for exports. The distribution should be made promptly because processed food products are of limited expiration time and thus they have to be delivered soon to consumers. Especially for informal micro enterprises, most of their products are sold directly to their consumers by traditional markets, exhibitions, and door-to-door. For those formal small enterprises whose business has been more established, sales are made through wholesalers, bakeries, minimarkets, and exporters. Meanwhile, for informal small enterprises, product distribution is performed through bakeries or directly to their consumers.

**Consumers.** Processed food product marketing to consumers is carried out by different ways. Marketing factor very often becomes a constraint for small enterprises in accessing their customers resulting from various barriers, e.g., they lack of marketing channel, of information on markets, and of capacity in distributing their products. Therefore, the consumers that processed food enterprises are capable of reaching are mostly in Bandung Regency and Bandung City. However, some enterprises, particularly large and established ones, have been capable of marketing their products to other cities and even have been exporting.

## 5. Result

Value chain is an activity brought about to gain some value added of the products produced from being raw materials to being delivered to

consumers. The value chains of agricultural and husbandry product processing can be classified into internal value chain and external value chain. An internal value chain is a production process to produce finished products of processed foods till they are ready to market. External value chain is in this case subdivided into three, namely (1) value chain of buying raw materials from suppliers, i.e., farmers or breeders residing in Bandung Regency; (2) value chain in relation to suppliers; and (3) value chain in relation to consumers.



**Figures 4.** Internal vs. External Value Chains

An external value chain starts from the processing of raw materials into finished products. The production processes practiced still commonly fall into a category of conventional by plain equipment. This applies to 51 informal micro enterprises, or 96% of all the enterprises. Enhancement of product quality should be carried out to meet the standard of consumption-worthy processed food products. Production processes should be enhanced as well by using those equipment which meet the standards of product processing. In addition, the competence of personnel in production processes has to be upgraded by holding trainings and their skills be improved by tutorials and advocacy for them to be capable of producing quality products.

The external value chain of raw material purchases indicates that during harvest seasons the prices of raw materials are cheap and thus the value added of processed products becomes high, while beyond harvest season, particularly when the raw materials are scarce, the prices of raw materials become more expensive, causing the product's value added lower and leading small and medium enterprises (SMEs), especially ones with small capital, to discontinue temporarily their production. Even some SMEs

don't produce their products continuously but rather they adjust to the supplies of raw materials in markets, i.e., when they are abundant (harvest).

A problem with the external value chain of buying raw materials from suppliers is in the availability of those raw materials which meet quality standard as well as the continuity and acceptability or distribution of the enterprises' products in the existing marketing distribution so that the products are delivered soon to consumers, given that some products are of limited expiration time, 1-3 days.

In general, the percentage of the basic prices of production varies from 50% to 80% of the selling prices of products. Thus, the gross profit margin is around 20% to 50%, excluding general administrative and marketing costs. It means that the value added of the product from the raw materials to ready-to-sell product is around 20% to 50%.

An external value chain from finished products to consumers' hand consists of several alternative distribution systems, namely:

- (1) Selling directly to consumers by door to door way, via partners, or by establishing an outlet. By this distribution way the selling prices that SMEs set are equal to ones burdened to consumers.
- (2) Selling through bakeries and gift shops. Marketing to big shops requires a continuity of production. Therefore, those SMEs which are capable of marketing here are ones with large volume business. The selling prices of shops to consumers are grossly 20% above ones imposed by enterprises.
- (3) Selling through supermarkets and minimarkets. The product distribution via supermarkets needs an effort of approaching the supermarkets by a consignment system.
- (4) Selling through the collectors/distributors of products to be exported. To be able to distribute products by this way some specified standards of quality and quantity should be met. Therefore, there are no SMEs in Bandung Regency capable of exporting their products.

## 6. Conclusion

A value chain map the existing activities in the processes that small processed food enterprises pass through in establishing a value chain of all the activities they perform from suppliers, production, distribution, and consumers. A value chain map is undertaken to spot the problems of each activity in producing a value so as to obtain the solutions to any problems in each activity to increased productivity and quality SME Food Processing in Region Bandung, Indonesia.

In the activity of supplier, the problems encountered are related to the continuity of raw material supply and the quality of raw materials. In the activity of production, there should be some improvement in production processes, be it in working method, personnel capacity, and equipment used in the production process. The local value added of products from being raw materials to being ready-to-sell products is from around 20% to 50% which can introduced into the market as local flavour.

In the activity of distribution, there should be capability to enter into any existing marketing distribution network in order for the produced products can be distributed to consumers widely and promptly. The responses of consumers are needed to know their needs and wants which the improvement of the quality of processed food products is based on.

Value chains are grouped into 2 categories: (1) internal value chain in form of production activity, and (2) external value chain, consisting of relationship with suppliers, distributors, and consumers.

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