

Constraints of Value Chain in Dairy Industry in Central Java

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ABSTRACT: Dairy value chain is a sequence of dairy production, processing and marketing activities: products pass through all activities of the chain in a certain order and, with each activity, the product gains value. The Objective of the study is to analyze the constraints of value chain in dairy industry in Central Java. The respondents were 90 dairy cattle farmers, and three heads of cooperative as informants. The data were analyzed using descriptive statistical analysis, and explanation. The results showed that formal education level, lack of credit/financial, low of skill, knowledge and quality, weakness in bargaining power, different access to extension service, farm size/number of animal owned, gender constraints risk and uncertainty, low level of technology, service and infrastructure, and market became the value chain constraints in dairy industry in Central Java. Even though livestock keeping among smallholders offers a promising opportunity to combat poverty specially as the demand for animal products such as milk continues to rise, most livestock policies and services tend to favour large-scale production. In order to take advantage of emerging market demands and reduce their poverty, small farmers need access to basic services and technologies as well as policies that take account of their needs and interests.

Keywords: value chain, dairy industry, dairy farmer

INTRODUCTION

Value chain approaches have been utilized by development practitioners and researchers alike to capture the interactions of increasingly dynamic (and complex) markets in developing countries and to examine the inter-relationships between diverse actors involved in all stages of the marketing channel (Bolwig *et al.*, 2010). They have alerted us to inequities in power relationships based on the governance of the supply chain and have highlighted potential points of entry (and exclusion) for smallholders (Dolan and Humphrey 2000; Hess, 2008). Value chain approaches play an important role in characterizing the complex networks, relationships and incentives that exist in livestock systems. They further provide a framework for mobilizing pro-poor development in the context of agri-food networks that feature livestock across a range of livelihood-improving roles for the rural poor (Richa *et al.*, 2010). These chains involve farmers, companies (processors), middlemen, big and small retailers, home-industries and consumers. The components of value chain in dairy cattle. In this value chain, milk from dairy smallholder farmers are brought by a collector who check the quality of the milk and then send it to the cooperative. Dairy cooperatives may also be established as an umbrella as a bridge between dairy farmers and milk processing plant. Cooperatives may help the farmer to ensure quality standard control and provide enhanced opportunities to gain market access. The objective of this study is to analyze the constraints of value chain in dairy industry.

METHODOLOGY

This study was conducted in Central Java, Indonesia, using survey methods. A number of 90 dairy famers was used as respondents. While the key informants were the head of cooperatives, i.e. KUD Cepogo, KUD Mojosongo and KUD Getasan, each cooperative was selected for 30 dairy farmers. Using semi-structure interview, the data were gathered such as reproduction data, production data, demographyc characteristic of the farmers, rate of adoption as well as the constraints overall of value chain in dairy industry. The data were analyzed using descriptive statistical analysis.

RESULTS AND DISCUSSION

There are many marketing channels in dairy products. The longer chain, the higher price margin is there typically between the farmer (primary production level) to the consumer. There may necessary for these farmers to change their mindset. More value added livestock products one of their chances to enhance their income for livestock production. The main objective of a value chain is to produce value products and services for market by transforming resources and by the use of infrastructures – within the opportunities and constrains of its institutional environment (Trienekens, 2011). Important issues in understanding the framework of value chain are value chain constraints, value chain governance, value added, chain/network structure and upgrading options.

Value Chain Constraints

Value chain constraints can be related to lack of ability and infrastructure (usually roads or transportation tools) to fulfill quality requirments. All barriers or constraints mean that a certain market exists, but that the smallholder farmer is constrained in some way to sell produce on that market. In Indonesia, especially Central Java there are typically many value chain constraints today. Some constraints cannot be change immediately such as the formal education of farmers and the low adaptation of technology It needs more training and highly awareness to adopt the new technologies. Other constraints can be solved by other partners chain such as lack of credit, low prices, access to extension service, farm size (number of animal owned), and dealing with risk and uncertainty. Table 1 shows the cattle status (productivity and reproductivity), adoption rate, and farmer's formal education.

Table 1 . Cattle Production and reproduction data and adoption rate of the farmer in Central Java Province

Parameter	Value
Milk production (liter)	8.1±4.5
Average of lactation period (day)	10.75±1.98
Calving interval (day)	16.0±6.40
Age of first partus (day)	27.88±4.73
Service per Conception (S/C)	2.0±1.3
Number of cattle owned	
Dairy cows (head)	2.74
Heifer	0.56
Calves	1.3

Adoption rate	0.24 ± 0.12
Formal education (%)	
No schooling	16.67
Elementary school	50.00
Junior high school	13.33
Senior high school	17.78
College/University	2.22

Production and reproduction. The production and productivity influent to the income of the farmers. Productivity such as milk production is still low (8.1±4.5 liters), while reproduction status such as calving interval and service per conception also still (Table 1).

Formal educational level. Low formal education is a major constraint in dairy production. Generally, the livestock farmer has only got elementary school level, primary school and an eventually high school (see Table 1). This major constraint influences the ability to adoption new technology opportunities. As example, Guntoro's study (2009) found that more than 60% of the cattle farmers in Central Java had just primary school level or below and among them about 14% were not graduated from an elementary school. The farmers with low education, tended to have lower rate of adoption. Majja and Bahdur (2008) found that education plays a prominent and differential role across low-return and high-return non farm activities. Higher educational levels of both males and females enable participation in the more remunerative non farm employment opportunities.

Credit/financial. Since the farmers who live in rural and remote area, and their animal ownership only for small size and not for single source of income, it makes their business financially do not get profit. The integration into the farming system was the main purpose for maintaining the animal. This condition become the challenge of farmers to get the financial support from the commercial institution, such as bank, investors, and other business oriented persons.

Skill, knowledge, and quality. Lack of business management skills (e.g. production planning and control) and, in particular, inadequate access to the knowledge and technologies needed to meet rising sanitary standards, making it extremely difficult for smallholders to gain certification of compliance with marketing requirements. Little understanding of processors' requirements, lack of laboratories and instruments for quality control as well as price and quality the veterinary services are important barriers.

Bargaining Power. Bargaining power is strongly related to access to information, to alternative options, to dependency relationships as well as to the perishable character of the product (Bijman *et al.*, 2007). The bargaining power of small farmers is especially low since they have poor access to market information and limited access to financial resources that prevent them from selling their (non-perishable) products at the most profitable time. It may cause the selling price the farmer's to be low. Their lack of bargaining power may lead them to under-value their production and obtain a smaller share of the added value created in the commodity chain. Smallholders have particularly low bargaining power when they operate in processed supply chains where the economies of scale in the product transformation stage lead to the creation of oligopsony (Bijman *et al.*, 2007). According to Thompson (2002), mostly the third world governments reduce incentives for farmers to produce and therefore reduce the availability of food from indigenous sources.

Different access to extension service. In agricultural office, the extension unit may cover several fields such as livestock, crop, forestry, etc. depending on the actual area. Unfortunately, often several area of expertises have to be handled by one extension worker. Therefore, it is no

surprise if an extension worker cannot cover all of the farmers' problems in various farm business activities. The needs of many farmers are ignored by the extension services due to those kind of expertise problems among extension workers.

Farm size/number of animal owned. The animals are integrated in multi-objective farming system, characterized as technological extensive but labor intensive, which partly explains the small size of animal number per farm unit. The result shows that the average of cows ownership was 2.74 heads (Table 1). While the previous studies in Yogyakarta, average number of ownership of dairy cattle is 3.64 AU (Guntoro and Sulastri, 2011). Therefore, it is difficult to obtain loans and credit from commercial bank institutions.

Gender constraints. In comparison to men, women face generally higher disadvantages. This is particular the case in terms of mobility, access to assets and to productive resources, and access to market information. The result is that they find it more difficult to access and maintain profitable market niches and capture a larger size of incomes from marketing activities.

Risk and uncertainty. Institutions that can mitigate risks (such as insurance companies) are missing or weakly developed. In the past, the government often reduced market risks by market interventions (e.g. through price stabilization), but these policies were often not very efficient. There are many different sources of risks in livestock farming, ranging from price and yield risks to the personal risks associated with injury or poor health, and moreover natural disasters such as flood, mount eruption and earthquake. According to Bijman *et al.* (2007) smallholders in developing countries, because of their low resource endowment, tend to be highly vulnerable to production risks due to natural conditions and climatic shocks, as well as to the market risks due to price fluctuation and opportunistic buying behaviour, etc

Level of technology. This constraint is the reality of many small farmer in Indonesia. Due to the small number of animals, adaptation of new technological is very costly (see Table 1). It is not surprised that adoption rate is not high. It supports other researchs that average of adoption rate in goat farmers was 64.5% (Guntoro *et al.*, 2009), and in cattle farmer was 33.5% (Guntoro, 2009).

Service and Infrastructure. Lack or inadequacy of roads, electricity, and processing facilities etc. may raise transaction costs, exacerbates information asymmetries between producers and traders and discourage investment in production and processing.

Market constraints. The dairy retail market is largely controlled by milk intermediaries who procure milk over large distances. The agents operate without oversight and therefore sometime adulterate milk by adding water to increase volumes. Other market constraints are lack of a ready market for fresh (full) milk and lack of modern technology for processing milk into milk products as well as information asymmetry between produces and marketers. This leads to overpriced inputs and under priced output, and also discourage increased production.

Chain/Network Structure. Small scale farmers have a low bargaining position. Middlemen, on the other hand, are often in a very strong the position to determine the local price because they have strong connecting position between the farmers and the market. Anyway the high risks associated with the products are still in the hands of farmers. The farmers do not care how much the price of the beef is in the traditional market or supermarket. The reason is that they do not account the difference in margin between the farm gate price and the price in the market/supermarket.

CONCLUSION

In this respect, the government should play a much stronger role in determining and regulating the market conditions. The price of animal products are determined by the interaction of many different stakeholder including feed plants, the feed industry, processing companies

and retailers and small holder farmers do not have any bargaining power to really influence this interactions. Government as the policy maker can make better make the regulations that ensure a fair and transparent competition among the stakeholders. The government could collaborate with research institutions, universities, and industries to support the development of appropriate farm technology and to enhance the quality of animals and their products, knowledge which should be disseminate and applied by local farmers. A better market guarantee for the small scale farmers may also be very important. Improved market guarantees are one way to enhance bargaining position of farmers.

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