

# Everyday Flux of Smallholder Beef Farming: System Overview of the Beef Farming Situation Under a Government Grant

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**Abstract.** Smallholders dominate the beef farming in Indonesia. As a complex system, developing the smallholders need to be approached using a system thinking study. This study aimed to explore everyday activities of the smallholder beef farming which lead to an identification of any unfavorable conditions of the current situation. This is an initial step of a systems thinking approach. Descriptive study involving stakeholders of smallholder farmers group have been undertaken in Kabupaten Banyumas and Banjarnegara. Descriptive analysis was performed, and a qualitative model was developed to mimic the current beef farming in both locations. Result showed that there is a growing tendency of shifting from breeding to fattening, buying and selling conditions were disadvantageous for smallholders, and the availability of grant encourage side-tracking behavior which confirmed in the model.

**Key words:** smallholders, beef farming, side-tracking, qualitative model, systems thinking

**Abstrak.** Peternakan sapi di Indonesia didominasi oleh peternak kecil dalam sebuah sistem yang kompleks. Dibutuhkan pendekatan sistem untuk mempelajari sistem tersebut. Penelitian ini bertujuan mengkaji aktivitas sehari-hari yang terjadi dalam sebuah sistem usaha peternakan sapi potong skala kecil untuk mengidentifikasi aktivitas yang berpotensi menjadi sumber permasalahan. Identifikasi permasalahan merupakan awal penting dari sebuah analisis sistem. Studi ini menggunakan pendekatan deskriptif dengan melibatkan pemangku kepentingan yang terkait dengan sistem usaha peternakan sapi potong di Kabupaten Banyumas dan Banjarnegara. Data dianalisis menggunakan pendekatan deskriptif dan pemodelan kualitatif. Penelitian menunjukkan adanya kecenderungan peternak untuk bergeser dari pembibitan ke arah penggemukan, praktik jual beli yang tidak berpihak pada peternak, dan kecenderungan bertambahnya side-tracker dengan meningkatnya hibah.

**Kata kunci:** peternak kecil, peternakan sapi potong, side-tracking, pemodelan kualitatif, *systems thinking*

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## Introduction

Beef farming in Indonesia is dominated by smallholders, and involves more than four million households who raise almost 70% of the national beef herd (Boediyana, 2007). For this reason the improvement of smallholder beef farming remains the key to development of the Indonesian beef industry (Hadi et al., 2002).

One key characteristics of smallholder farming, is the interconnectedness among activities on the farm, in the household, and in the wider community or economy (MacLeod et al., 2011). External factors such as market prices, consumer preferences, and the political

situation can have a significant influence on smallholders (Pound, 2008). Thus smallholder farmers are involved with a wide variety of actors having a range of different interests and objectives (Hounkonnou et al., 2012). Acknowledging smallholder farming as a social system consisting of different stakeholders with a wide variety of interest makes an important contribution to the success of a development strategy (Binam et al., 2011, Kaufmann, 2007).

In terms of productivity, smallholder beef production tends to have poor performance (Hadi and Ilham, 2002, Patrick et al., 2010). However, from the point of view of the smallholder, beef farming is not merely an

economic activity, but also a “*culture*”, a “*way of life*” that for most farmers extends over generations. It therefore has a multifaceted role that includes income generation, provision of social status, and contributes to household security. For smallholder families, cattle frequently represent their only buffer or insurance (Huyen et al., 2010, Siegmund-Schultze et al., 2007, Stroebel et al., 2008, Dovie et al., 2006). Thus, studying smallholder beef farming requires a systems thinking approach (Setianto et al., 2014). It is only by acknowledging and accounting for the complexity arising from these characteristics of the smallholder farming that it will be possible to obtain the level of comprehensive understanding of the system necessary for the formulation and implementation of effective development interventions.

The first step to study a system is to explore the daily activities of the systems from which the problematic situations can be observed further (Checkland and Poulter, 2006). Understanding the existing current practice is a crucial step in structuring the problematic situation of the system which potentially contributed to problematic situations (Ackermann, 2012). This study aimed to describe the everyday flux of activities of the smallholder beef farming and identify its problematic situation. This step is essentially required as an entry point to develop further steps and analysis to generate strategy intervention.

## Materials and Methods

This research focused more on efforts to illuminate the behaviour of the beef farming system, rather than to make a generalization for a larger population of beef farmers. Therefore, non-probability sampling was preferred.

The study was undertaken involving five smallholders beef farmers groups in Kabupaten Banyumas and Banjarnegara which consisted of two active groups and three

disbanded groups. These groups were SMD program recipients. SMD is a special program launched by the government to boost cattle population. This program was mandated for each group to be supervised by a graduate.

The active group were the two main participants of this research. All of their members are involved in the interviews and workshops. In addition, three disbanded groups were also observed. However, due to the unwillingness of some members of disbanded groups, only their group leaders and the associated graduates were included in this study.

As the study aimed to describe the current farming situation, the initial steps of this study includes identifying the actors involved in the systems and the role of each actor. This was expressed without regard to their systemic linkages. The objective of this stage was to generate a rich picture of beef farming systems which visualized the current situation of smallholder beef farming in rural Java, their elements and the possible connections among them.

Operational steps to carry out this stage were as follows: 1) Conducted a meeting to gain mutual understanding among researcher and participants regarding the objectives and the approaches of the study. This aimed to improve their sense of being acknowledged, which was expected to promote future cooperation (Poppi et al., 2011). The meeting took place in the farmers' location so that they felt at ease and were familiar with the surrounding environment. 2) Undertook surveys using semi-structured interviews to obtain stakeholders' opinions and perspectives about the elements of the system and their roles. The survey involved all farmers in the two selected farmer groups. This was followed by in-depth interviews to obtain more information from four selected respondents (two farmers from each group). 3) A workshop was conducted to generate the rich picture of SSM, a situation

summary of the smallholder beef farming system, which described diagrammatically the main variables and issues involved in the system to capture: the main elements, structures, the existing process, and the currently recognized and potential issues (Maani and Cavana, 2007, Wilson, 2001). Workshop participants were beef farmers' representatives and their graduates, local extension agents, cattle traders, and the program coordinator.

Descriptive qualitative and qualitative modelling using the *Vensim* software developed by Ventana Systems was used to analyse the data and develop the model.

## Results and Discussions

### The Farming

At present, farmers prefer fattening over breeding. Discussion with inseminators and data from the local livestock service office indicated a similar trend. From the total target of 8,000 potential AI acceptors, the uptake was only 6,800 in 2011, 10% lower than the previous year. Several factors are presumed to contribute to this trend such as: the increasing importance of cattle to farming households; increases in farmer's knowledge and skills, particularly in relation to feed composition and preservation; but mostly because they believed that fattening was more profitable than breeding. This shift would bring some consequences.

From the farmer's point of view, the importance of cattle has gradually shifted from its social role as a saving and security instrument into a more economic role as an income generating activity. This was confirmed by 88% of the farmers. When cattle were regarded as a saving and security instrument farmers did not have any regular sales plan. They would sell their cattle whenever they could not afford to supply the feed or when they needed an immediate large amount of cash. Therefore, these farmers tended to be more insensitive to price changes.

Farmers who regard their cattle as an economic commodity, sell them regularly, usually 2 – 3 times a year. However, because as smallholder their capital strength was mostly limited, farmers were very sensitive to price changes. They were very vulnerable to price changes which unfortunately were outside of their control. When the price increased, farmers tended to buy cattle, assuming that price would keep rising and they would earn some profit. The reverse was also true, they tended to sell cattle when the price was falling, because they were afraid that the price would keep falling and they might suffer an even greater loss. This price sensitivity was a problematic issue among farmers because mostly they suffered losses.

### The Market

In relation to the market, farmers could buy or sell cattle from either local cattle traders, local markets or occasionally from neighboring farmers. However, due to issues of practicability and cost efficiency, farmers were most likely purchase or sell cattle through local traders who were always available when they were called. Selling to, or purchasing from, local traders mean that farmer did not need to bother with transportation. Commonly, there are four main vehicles used to transport cattle to and from livestock market ; (a) small pickup; (b) medium pickup; (c) light truck; and (d) truck with maximum load of 3, 4, 8 and 14 cattle respectively.

The cost for transportation depends on the vehicle capacity. For local transport from or to the local markets which are mostly located less than 30 km from farms, the cost started from Rp150 – 200,000 for the small pickup, Rp200 – 250,000 for the medium pickup, Rp300 – 400,000 for the light truck and Rp400 – 500,000 for the truck. By doing their transactions through local traders, farmers did not need to worry about the transportation cost.

However, this practicability came with consequences for the pricing. Cattle prices were rarely determined by body weight,

because neither farmer groups nor the traders had measurement scales. In most cases, price was based on the estimation and the appearance of the cattle both of which were mainly determined by the traders. Unlike farmers, traders had years of experience and were very skilful in accurately predicting body weight just by examining the cattle's body condition. Therefore, in many cases, farmers' cattle were undervalued by the traders.

Another issue was the farmer's tendency "to buy cattle which they like and sell when they need to". Interviews with farmers revealed that: farmers tend to choose cattle which they consider to be *handsome cattle* - the term refers to physically attractive cattle according to the farmers' criteria, such as color and body shape. It was purely an issue of cattle-likeability.

However, this would also influence the price. Handsome cattle were frequently valued higher than others having the same weight. This tendency often made farmers overvalued the cattle they purchased. Moreover, there was another unfortunate tendency; to make a sale at a time when farmers needed cash. This would lead to more unfavorable conditions for farmers. Traders would set a low price at the time when most farmers were selling their cattle because of a need of cash e.g. during the school entrance period, between June – August. Buying and selling conditions were disadvantageous for smallholders.

In the livestock market, cash transactions are more common than bank transfers. Although a mobile bank unit is available in the livestock market location, the transactions was mainly in cash. Even though the farmers realized the risk, they found that having cash-in-hand was easier. Additionally, traders argued that cash was often successful in persuading farmers to sell, rather than just numbers on a bank form, so that with this way traders could have a bargain price.

### The Chain

There are two supply chains of cattle: the beef chain refers to the supply chain of all cattle ready to be slaughtered (Figure 1); and the non-slaughter chain which include calves, feeders, heifers and productive cows. This second type refers to those not meant to be slaughtered (Figure 2).

The current marketing chain for beef cattle shown in Figure 1 revealed that farmers did not have any access to the local livestock market. They depended on local traders (the first middleman), mostly at village level, to sell their cattle. Although the local livestock market was available less than 10 km from the cattle housing, the limited number of animals sold at one time (two cattle per transaction, on average) made the transportation cost uneconomic. From the local traders, beef were then being sold to the butchers through one of eight different pathways (Figure 1).

Although there were 8 different pathways identified during survey of the beef marketing chain, farmers can only afford to play a role at the upstream end; from farmers to local traders.

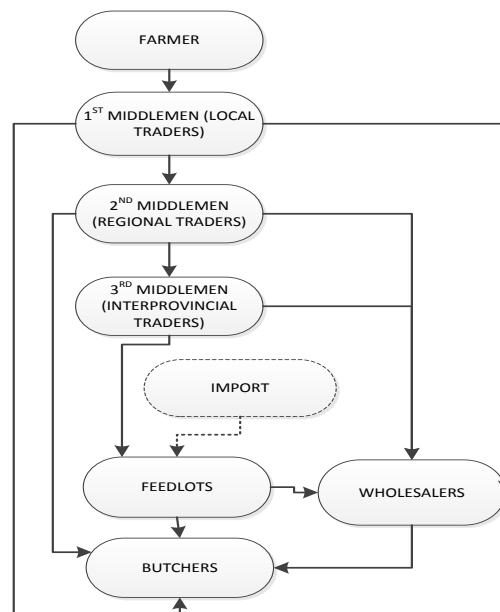


Figure 1. Beef supply chain from farmer to butcher

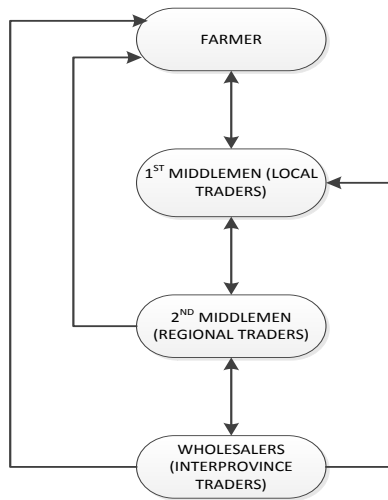


Figure 2. Calves and cows supply chain; from farmer to farmer

The second chain was the non-slaughter chain. Figure 2 described the marketing chain from farmers to farmers. There are eight different pathways. Farmers were mainly accessing the non-slaughter chain for cattle either weaned calves, feeders or heifers. Similar to the case of slaughter-ready cattle, in the calves and cows supply chain farmers also did not have access to a local market to sell their cattle. They preferred not to go to the market for the same reason; additional cost and less bargaining power against trader.

However, there were also two occasions when farmers could sell their cattle outside the regular pathways. During IdulFitri and IdulAdha, two major Islamic celebration days, farmers mostly sold their cattle directly to the consumers. IdulFitri is the day when Moslems end their one month fasting during Ramadhan, whereas IdulAdha, also known as the feast of the sacrifice, is the day when most Moslems slaughter sheep, goats or cattle and the meat is then distributed to the poor. These two major days are celebrated as a symbol of obedience to God.

As almost 90% of the 230 millions of Indonesian are Moslem(BPS, 2014), the demand for cattle during those two days is enormous. In KabupatenBanjarnegara for example, the average number of cattle slaughtered was 9,500

head per year, and 26.32% of them were slaughtered during IdulAdha Feast (Livestock Services Office Banjarnegara, 2012). This high demand results in an increased cattle price. Therefore, all farmers in both groups tried to sell their cattle on those two holy days. On these two feast days farmers could sell their cattle directly to the consumer without involving any other parties such as traders or butchers.

All interviewed farmers were reluctant to go to the butcher. This was driven by the fact that the butcher rarely set the price of a beast based on its live weight, but mostly by the weight of the carcass. Although the definition of carcass and slaughtering has been standardized, farmers needed to closely monitor their cattle at the slaughter house. They believed that many unfair practices occurred during the slaughtering. Meat stealing, and the slaughter point misplaced (decapitated lower than *os atlas* – thus some part of the neck above *os atlas* did not weighed as carcass) were two common examples. These practices were not monitored by the butchers, because they will only pay for the carcass weight. It was difficult for the farmers to do the monitoring because the carcasses were commonly cut into smaller pieces.

### The Government Program

Large government grant increases an expectation to gain more income. Discussion with the leaders of both groups revealed that soon after farmers knew that their group had been selected as a grant recipient, many members asked when they could get the cash for their household.

Farmers tend to secure their livelihood security needs first (Giller et al., 2009). Therefore, given the fact that the grant did not oblige farmers to repay, farmers admitted that at some level they were provoked to use some of the grant to satisfy their household needs. Unfortunately, meeting household needs is a never ending process because income has a

positive relation to expenditure (Sekhampu and Niyimbanira, 2013); as income increases, households will respond by trying to increase their want-satisfaction, in terms of quality and/or quantity (Nelson and Consoli, 2010) and diversity (Simon, 2011). Consequently, the response to receiving a grant is an increase in expectations of income to support them.

This expectation was exacerbated by the availability of cash from the government grant without any obligation to repay. Thus, they were provoked to use the grant for their household purposes. Experience from a poorly administered government agricultural credit program in Lombok, Indonesia (Sjah, 2005) also showed a similar situation. Farmers tended to seek to fulfil their immediate needs first, and thus were easily diverted from adopting certain practices the development program was designed to foster (Giller et al. 2009). As some of the grant which should be allocated for farming was used for non-farming purposes, the group assets could not increase as expected.

### The Shifting

There is a current tendency of “*shifting from government’s recommended breeding to farmers’ preferred fattening*”. SMD, like many development programs, has never been completely adopted. As reported elsewhere (Olivier de Sardan, 2005), selective adoption and side-tracking practices commonly occur. Selective adoption refers to the situation in which the target population will only adopt the certain part of the program which subjectively fits and works for them. Additionally, side-tracking emphasizes that the reasons for recipients to adopt the development program are usually different from those motivating program designer (Olivier de Sardan 2005).

In the case of SMD, the government designed this particular program to boost the national cattle population as well as to increase farmers’ welfare through strengthening the

breeding performance. The main goal of breeding is to produce calves, with most female calves retained for use as breeding stock, and increasing the number of breeding females, whereas males are sold to generate income. Thus the expectation of the program was that the farmers’ groups would be strengthened, having more cattle and capital, and thus, become less dependent on government grants in the future. However, farmers have their own objectives – to increase their income. Accordingly, farmers adopted certain parts of the program - those which were beneficial for accomplishing their goals. Farmers saw that the SMD, regardless of its intention, was their opportunity to increase their capital. Therefore, when farmers found that the breeding performance was low, they shifted into fattening, first by selling non-productive females, and then by buying young calves or steers and feeding to produce high quality meat.

### The Model

The causal linkages describing the government grant, breeding, fattening and the shifting from breeding to fattening is presented in Figure 3.

The CLD in Figure 3 describes the design of the government program to increase the cattle population and to generate cash for the farmers. Cash from the grant strengthened the *group capital* and enabled farmer to buy more cattle, thus increasing the *number of cattle purchased*. The purchased cattle should have been allocated mainly to increase the population of *cattle for breeding* to produce more *calves*. Selected female calves were to be retained for breeding, whereas males were for fattening purposes and could be sold, thus increasing the *number of cattle sold*, and generating *sales revenue*. Therefore, the government objective to increase cattle population and generate income for farmers could be achieved.

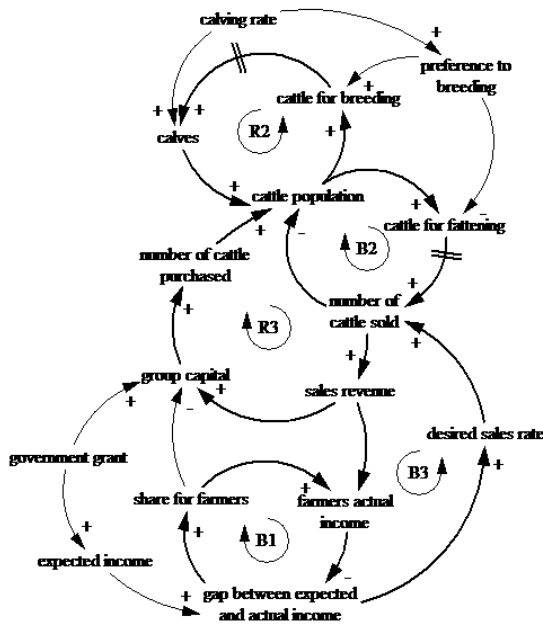


Figure 3. Breeding and fattening loops

The engine of growth of this loop diagram is *the breeding loop* (R2). R2 is a reinforcing loop showed that more cattle for breeding expectedly produces more calves which further increases the cattle population. The delay mark reflects the 9 months gestation and 4 – 5 months of weaning period. With the assumption of 50:50 chance of male: female calving ratio, half of the population goes to fattening and the other half is allocated as breeding cows. Therefore the *number of cattle for breeding* increases which further increases the number of newborn *calves*, and the cycle continues. The rate of R2 loop is positively affected by the *calving rate*. Unfortunately, the fact that the average rate of occurrence of second calving in all SMD recipient groups was very low (2.89%)(Yuwono and Sodik, 2010) significantly decreased the speed of the *breeding loop* (R2) to increase the population.

Additionally, there is another loop involved, *the fattening loop* (R3). R3 describes a reinforcing process whereby more sales will generate more cash which can be used to buy more fattening cattle as reflected by the following variables: *number of cattle sold – sales revenue – group capital – number of cattle purchased – cattle for fattening*. The fattening

loop rate is positively affected by the *desired sales rate*.

Figure 3 also highlighted that the *number of cattle sold* negatively affects the *cattle population*. This is described in a balancing loop, B2, which explain that an increase in the *number of cattle sold* decreases the *cattle population*. The rate of B2 is positively affected by the *desired sales rate* which has a goal to increase the *actual income* as an effort to close the *gap between expected and actual income* as shown by another balancing loop, B3.

The B3 loop describes an alternative pathway for farmers to increase their income apart from increasing the *share to farmers* from group income (as described by B1 loop). B3 shows that increasing *gap between the expected and the actual income* endorses the *desired sales rate* thus increases the *number of cattle sold*, generates more *sales revenue*, earns more profit and results in increasing *farmer actual income* and closes the *gap between expected and actual income*.

Further, farmers' argue that since they had received the grant, the reproductive performance of the cows seriously declined from 1 – 2 to more than four services per conception. Thus, farmers have to wait much longer to produce calves, but still have to provide adequate cut-and-carry feed every day to their unproductive cows. This incurred extra cost because of the cost of extra inseminations, with farmers need to pay Rp50.000 – 100.000 (AUD \$ 5 – 10) per insemination. In contrast, fattening has a shorter production cycle, and is much more attractive and lucrative. Generally, a fattening operation varies from 150 – 180 days from purchase to resale. However, almost 50% of these farmers prefer a shorter period, ranging between 100 – 150 days, so that they can perform three sales in a year, in order to increase their income as described in B3 loop. This imperative drove farmers to allocate more of their resources to increasing the number of cattle for fattening purposes.

The problem was aggravated by farmers' refusal to continue to receive the large-framed Brahman-cross cows imported from Australia for distribution through the program. These cows were pregnant when received, and were well regarded initially, but after calving their subsequent reproductive performance in Southern Central Java was very poor (Yuwono and Sodiq, 2010). Therefore farmers preferred to switch to conducting fattening rather than breeding operations.

Figure 3 also visualizes the situation where low *calving rate* reduces farmers' *preferences to breeding* to avoid losses, and shifts to fattening. As a result, the R3 and B2 loops are accelerated. Even when farmers have female calves, they would rather raise and sell the heifers than keep them as breeding cows. The cash will be used to buy a smaller steer as a replacement, to be fattened again, while the profit goes to the household. The implication is that the cattle population may not be increased, but as the number of sales increase, so does the income.

As more resources are allocated for fattening, availability of resources left for breeding will decrease because fattening and breeding compete for resources. As a result, *cattle for breeding* decrease and the R2 loop become a vicious cycle of declining breeding activities.

## Conclusions

Several unfavorable routine practices were able to be identified: 1) There is a growing tendency of shifting from breeding to fattening. 2) Buying and selling conditions were disadvantageous for smallholders. Farmers tend to buy overpriced good-looking cattle and sell the cattle under-priced as they need sudden cash. 3) Grant availability increases farmers' expectation for sudden additional income. This lead to the birth of side-trackers.

The model revealed that beef breeding is unattractive to smallholder farmers. There is a significant tendency of the farmers to prefer

fattening rather than breeding. Although the government program has specifically mandated farmers to maintain breeding, farmers chose to disregard it. This action indicates that farmers are very logical in seeking to maximise their own short term welfare. They decided to grasp the opportunity to obtain a grant, but then side tracked the intended program implementation. Thus, even though the model suggests that maintaining breeding is required to sustain beef farming, farmers cannot be forced to do breeding. Instead, ensuring the availability of quality cows for the program could be recommended, as the main reason for the shift from breeding to feeding-fattening was the poor reproductive performance of the cows. The calving rate is positively linked to preference to breeding (Figure 3). Thus, improving the calving rate should restore farmers' interest in breeding.

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