The Analysis of Poverty Trap on Smallholder Dairy Farms in Pangalengan Area

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Abstract. Dairy farming is dominated by smallholder producers in Pangalengan area. The characteristics of poverty trap are lack of capital, low productivity, low income, low savings and investment. Therefore, the purposes of this research were: 1) to find out the ability of smallholder farmers to increase the family income; 2) to analyze which factors influence on the existence of keeping dairy cows in small scale; and 3) to know the efforts of smallholder producers release from poverty trap. The research method used a survey method with quantitative and qualitative approaches. Number of respondents that chosen in study location were 100 respondents. The ordinary least square (OLS) is used to analyze the factors that affect the keeping dairy cows in small scale. The results showed that: 1) small scale dairy farms (one to three heads) have not been able to meet the needs of family life; 2) factors that influenced on the ownership of dairy cows in small scale those are cows asset, dairy farming income, cow productivity, and non-formal education; 3) the efforts of smallholder farmers to quit from poverty trap must increase number of cows, productivity, earnings, and improve non-formal education in the form of training and guidance.

1. Introduction
Dairy farmers are still exist due to the dairy business is to be a livelihood for most farmers. In general, farmers in Pangalengan area are members of cooperative Koperasi Peternak Sapi Bandung Selatan (KPBS). The cooperative has established five Milk Collection Point (MCP) program in five Cooperative Service Centers area, such as Los Cimaung, Cipanas, Warnasari, Citere and Mekarmulya. The MCP assists farmers to get the individual of price of fresh milk using KPBS standard where the justification of milk price was used to Cooperative Service Centre price. This price standard could decrease farmers income who has a good milk quality.

The phenomenon of emerging poor farmers is due to their inability to compete to increase production and compete with the outside world. In according to [1], various efforts have been made by small-scale dairy farmers, such as adding dairy cows, but due to limited land so that they still place them on a small scale of ownership, so that opportunities to increase income are still difficult to reach.

Poverty in small-scale dairy farmers is a social phenomenon that cannot be assessed as something that must be eradicated from the surface of the earth. They are trapped in a circle of poverty and difficult to escape from this condition. Trap poverty or known as the poverty trap is a mechanism that makes it very difficult to get out of poverty. The trap of poverty is created when the economic system requires a large amount of various forms of capital to generate enough money to get out of poverty. When individual farmers lack capital, they may also find it difficult to gain access to financial institutions to get loans.

This theory has actually been stated by Ragnar Nurkse in [2], which states that poor countries remain poor because of underdevelopment, market imperfections and lack of capital causes low productivity. Low productivity levels can cause low income. The derivative has an impact on low savings and investment. Low investment can have an impact on low employment and have implications for the emergence of unemployment and so on [3].

The problems expressed by Nurkse in [2] are closely related to what happens in the dairy cow
business. The dominance of small-scale livestock businesses raises more questions, what really happens with small-scale businesses. Do they themselves not want to leave the business community that only maintains 1-3 lactation cows? In addition, the low productivity of dairy cows further makes them in a vicious circle of poverty.

Some interesting things to be studied further in this study, namely:
1. Domination of small-scale animal husbandry businesses in the South Bandung Cattle Breeders Cooperative (KPBS).
2. Small businesses have supported farmer households
3. Low productivity of dairy cattle business has an impact on income
4. Ability to maintain small-scale dairy businesses
5. Are there households that can release from small-scale ownership circles

The above issues are the first step to detect the cycle of poverty that occurs in small-scale cattle farming. Poverty is not only assessed from an economic perspective but can also be assessed from a social perspective that leads to the limitations of individuals or groups in accessing networks and social structures that support opportunities to increase productivity. These inhibiting factors generally include internal factors, including individual farmers' characteristics such as age, formal education, experience, livestock ownership and cultural barriers. While external factors come from outside one's ability, such as bureaucracy or official regulations that prevent someone from getting resources. Therefore, to overcome this problem, a sharp analysis and comprehensive and sustainable handling by all parties is needed.

The objectives of this research are: 1) to find out the ability of smallholder farmers to increase the family income; 2) to analyze which factors influence on the existence of keeping dairy cows in small scale; and 3) to know the efforts of smallholder producers release from poverty trap.

2. Materials and methods
The location of the study was selected purposively at 5 MCPs, namely Los Cimaung, Cipanas, Warnasari, Citere and Mekarmulya from 23 group farmer in the KPBS Pangalengan area. Primary data was obtained based on the results of interviews with households of dairy farmers who have dairy cattle lactation of 1-3 heads. Interviews were also conducted to managers and cooperative leaders to obtain comprehensive data. For the purposes of calculation or analysis, secondary data support from various agencies is indispensable, such as from KPBS, the Bandung Regency Livestock and Fisheries Agency, the Bandung Regency Statistical Center (BPS), and other institutions related to this research. The research location was selected purposively at 5 Cooperative Service Centers namely: Los Cimaung, Cipanas, Warnasari, Citere and Mekarmulya from 23 Cooperative Service Centers in the KPBS Pangalengan area. Primary data were obtained based on the results of interviews with dairy farmer households that have 1-3 lactating dairy cows. Interviews were also conducted to managers and cooperative leaders to obtain comprehensive data. For the purposes of calculation or analysis, secondary data support from various agencies is indispensable, such as from KPBS, the Bandung Regency Livestock and Fisheries Agency, the Bandung Regency Statistical Center (BPS), and other institutions related to this research.

Respondent determination technique used in this research is Stratified Random Sampling, according to Paturochman random sampling stratification is a sampling technique that is carried out in layers with the characteristics of members who are heterogeneous or not uniform. Respondents taken from this study were members of breeders who kept dairy cows from five Cooperative Service Centers with total population of 506 members of the cooperative, taking samples of 100 people representing five Cooperative Service Centers.

Dairy business income is used to analyze the ability of small-scale business farmers to sustain their lives. The formula for finding income contribution from dairy cattle is as follows:

\[ \pi = \sum TR + \sum TC_i \]

\[ TR = \text{Total Revenue} \quad \Pi = \text{Revenue} \quad [4] \]

\[ TC = \text{Total Cost} \]
To find out the factors that influence small-scale dairy cattle business ownership, the Ordinary Least Square (OLS) method is used. The analytical method used in this study is quantitative approach, such as calculating the contribution of income, besides the frequency distribution is calculated. Qualitative approaches are used with in-depth interviews (independent interviews).

3. Results and discussion

The characteristics of respondents could be seen at Table 1, such as age, formal education, and livestock experiences. This is considered important because it is a factor that exists in farmers and is considered as the driver of its business. The first factor of age will influence the knowledge and mindset of respondents. The higher a person's age, the more knowledge or knowledge he has because the respondent's knowledge comes from his own experiences and experiences obtained from others. Younger age, farmers have a higher enthusiasm to know things they don't know yet.

| No | Description | Cipanas | Citere | Los | Mekar | Mulya | Warna Sari |
|----|-------------|---------|--------|-----|-------|-------|------------|
| 1  | Age (years) | < 50    | 18     | 11  | 16    | 6     | 16         |
|    |            | ≥ 50    | 11     | 6   | 2     | 6     | 8          |
| 2  | Formal Education | Elementary school | 16 | 12 | 8 | 10 | 18 |
|    |            | Junior high school | 11 | 4  | 8 | 2  | 2  |
|    |            | Senior high school | 2  | 1  | 1  | 0  | 4  |
| 3  | Experience (years) | < 10 | 4 | 5 | 5 | 1 | 5 |
|    |            | ≥ 10    | 25     | 12  | 13   | 11   | 19         |
| 4  | Length of membership (years) | < 10 | 9 | 5 | 6 | 1 | 10 |
|    |            | ≥ 10    | 20     | 12  | 12   | 11   | 14         |
| 5  | Ownership (heads) | 2,2 | 2,2 | 2,9 | 2,2 | 2,3 |
|    | Number of respondents | 29 | 17 | 18 | 12 | 24 |

3.1. Dairy farming is a livelihood for most farmers

Dairy cattle business is the main business for most farmers involved in dairy farming. At present, small-scale dairy farming business still dominates the milk business. Based on the survey results in five KPBS Pangalengan Cooperative Service Centers shows that the ability of small-scale farmers to support their households with dairy cattle business can be seen in Figure 1. This shows the income and costs of milk production from 100 farmers who were respondents. Based on the picture it is clear that if farmers rely solely on income from milk income, the dairy cattle business is not profitable because generally, milk income is not enough for production costs. This shows that the ability of dairy cattle businesses with only 1-3 heads cannot meet the livelihood needs of livestock families if they only rely on their dairy farming business. This is in accordance with the opinion of [3] which shows that the income of small-scale livestock households cannot meet the needs of a decent life.
Figure 1. Income of Milk and Production Costs of Small-Scale Dairy Cattle Businesses

Figure 1 shows that the combination of income with other income obtained by the families of small-scale farmers, such as the sale of calves, heifers, bulls, or rejected cattle. This means that there is another income from the dairy farming business that can sustain their lives. The results of the combination of revenue from dairy cattle business activities that generate income compared to the cost of dairy cattle production can be seen in Figure 2.

Furthermore, if the income from the dairy cattle business is compared with the poverty line in each respondent's family, see Figure 2. Determination of the poverty line refers to the poverty line of Bandung Regency in 2016, the poverty line is IDR 275,562 /capita/month or equivalent to IDR 3,306,744 /capita/year. The poverty line value is then calculated by the number of family members of each respondent, the results are seen in the Figure. In general, farmers who only rely on the sale of milk to the cooperative and there is no sale a calf, virgin, or male parent, will be below the poverty line. Therefore, poverty vulnerability occurs in these small-scale farmers if there is no income from other sources. Thus, one effort that needs to be attempted so that small-scale farmers are able to earn income other than dairy cattle businesses can help them get out of poverty through male calf sales.

Figure 2. Income of Dairy Farmers

Respondents would continue to do business if the income received from livestock products is better than other businesses. However, if the income from livestock is insufficient or classified as low income then it will seek additional jobs in other fields other than livestock breeding. In accordance with the opinion [5] which states that if a community's income or income obtained is relatively insufficient for the primary needs, the community will seek additional income. This is supported by the opinion [6] stating that income generated from livestock businesses, and outside the non-livestock sector, will play a key role in determining to keep raising or migrating to the non-livestock sector. The results [7] research also support that states that income results have a significant effect on regeneration. Based on the results of the above study it is known that the cognitive aspects possessed by respondents regarding the desire for regeneration of dairy cattle business are good enough because some respondents are quite understanding of the desire to regenerate dairy cattle business.
3.2. Networks and social structures that support productivity improvement

Social networks are relationships that are created between farmers in a group or between groups with other groups. The relationships that occur can be in the form of formal or informal forms. Social relations is a reflection of cooperation and coordination among citizens based on active and reciprocal social ties [1]. The cosmopolitan level is one indicator of social networks. Farmers' activities in dealing with other farmers or other parties. The level of cosmopolitan is also interpreted as an orientation outside the social system with broader interpersonal relationships. The cosmopolitan in this study was seen based on the activities of respondents out of the village, visiting and/or visited by other breeders in one month to get information. Farmers who like to join people outside the social system are generally more innovative.

Most respondents only do social networks with farmers in one group, close ones or communication occurs when depositing milk. Communication with farmers outside the group is only carried out at certain times such as meetings at KPBS. The Chairperson of the group has a wider social network than its members because the attachment of the chairman to the KPBS in the context of monthly meetings causes the chair to have a higher frequency for interpersonal and external communication. Farmers' social structure is partly formed because of the social networks that have been formed. The Social structure formed formally because as a group member. Position in groups also determines interpersonal and interpersonal communication networks.

3.3. The efforts of smallholder farmers out of poverty trap

The poverty trap is a circle that the family could not out of the trap if there is no effort to release from the cycle even that the situation will be transferred generation to generation. The vicious cycle of poverty can actually be solved through education or training or with other factors. The results of this study indicate that the cycle of poverty in small-scale dairy cattle business can be solved through 4 factors, namely:

1. Increased Dairy Cattle Assets
2. Increasing Farmer Income
3. Increasing Productivity of Dairy Cows
4. Improving Non-Formal Education

These results have shown that the cycle of the vicious cycle of poverty in dairy cattle businesses in the KPBS Pangalengan work area can be solved by increasing the number of dairy cows, especially the parent. Only this increase in dairy cattle must be accompanied by an increase in the area of the cage that must be provided by the breeder (see Figure 6). This is in accordance with the regression table above, even though land assets are not significant, but an increase in land area will increase the scale of the dairy cattle business.

Increasing cattle business income is an absolute thing to do so that the scale of dairy cattle business increases. Increased income can be done by increasing the price of milk at the farmer level, the ability to sell non-productive dairy cows, or generating other income from outside the dairy cattle business. This is in line with the research [3] which shows that the participation of the wife of a farmer can increase the income of a dairy cow family business in Bangladesh. The wife can break the circle by providing value-added income to the family of dairy farmers, for example working in the non-livestock sector or in line with the dairy cattle business that can generate additional income for the family. The productivity of dairy cows is another factor that can solve the vicious cycle of poverty. If livestock that is kept have high productivity, they just need to maintain a few livestock because by only raising livestock with high productivity, farmers can generate quite good income. Non-formal education will also increase the dairy business. If all farmers get training, they will be interested in maintaining large quantities. However, the survey results show that most farmers have not received direct training from instructors, either from cooperatives or from other extension officers. This is in line with what was suggested by the World Bank [8] that education can solve the cycle of poverty that occurs in rural communities.

4. Conclusion

Small-scale dairy cattle businesses are able to support farmers' households. Supporting networks and social structures to get opportunities to increase the productivity of small-scale dairy farmers in the work area of KPBS Pangalengan. Efforts of farmer households to get out of the small-scale business circle or poverty trap in the work area of KPBS Pangalengan can be done through an increase in livestock assets,
increase in dairy products, increase income, and improvement in non-formal education in the form of training and counselling.

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