The development of farmers cooperative in the potato agribusiness system in Batur Subdistrict, Banjarnegara

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Abstract. Farmers' corporations are a form of farmer economic empowerment that unites all farmer resources and manages them in an integrated management. Batur Subdistrict, is one of the potato-producing centers in Banjarnegara District. This paper aims to analyze the potential for developing farmer corporations in the potato agribusiness system in Batur Subdistrict, Banjarnegara. The Farmer Corporation Model developed refers to the Ministry of Agriculture No. 18 of 2018, which is in the form of cooperatives or other legal entities with the majority of capital ownership by farmers. The data comes from the results of the 2020 study. Respondents consist of potato farmers, administrators of the Dieng Farmers Union (SPD), owners of subsidized fertilizer shop, potato seed breeders, agricultural extension workers, potato marketing actors, and managers of Agribusiness Microfinance Institutions (LKMA). Data analysis was carried out qualitatively and quantitatively descriptively by taking into account technical, economic and management aspects. The results of the study indicate that the existing farmer institutions in Batur Subdistrict, both technically, economically, and management have the potential to develop farmer corporations. The corporate model formulated is the growth of primary and secondary cooperatives which include potato seed cooperatives, farming capital cooperatives, potato production facilities cooperatives, and potato marketing cooperatives. The amount of economic value that can be obtained by each potato farmer with the existence of a corporation ranges from Rp. 1.04 - 2.07 million per year. In order for a farmer corporation to run and provide benefits to farmers, support from the government is needed in the form of assistance, business training, and initial capital.

1. Introduction

Farmers' corporations are a form of farmer economic empowerment that unites all the resources owned by farmers and manages them in an integrated management. All added value of agricultural business from upstream to downstream will be collected to farmers. Through corporations, farmers are able to become the main actors in an agribusiness system.

The ideal farmer corporation is described with farmers who move in large numbers and are consolidated and manage farm businesses with professional and business-oriented management in the agribusiness corridor. Farmer groups (poktan), Farmer Group Associations (gapoktan) as an agribusiness actor are still weak in their bargaining position, because they are small in scale and are not legal entities so it is difficult to establish equal relations with other economic actors [1]. Existing farmer institutions are still focused on production and have not led to post-production activities [2]. Corporations for farmers can be done by increasing the scale of farming, competitiveness and industrialization upstream to downstream [3].
Banjarnegera District as one of the potato-producing centers in Indonesia is one of the locations for the development of the farmer’s corporate model. Potato production in Banjarnegera during 2019-2020 was 113,498.2 quintals and 126,092.5 quintals. Potato production in Banjarnegera is produced from 4 subdistricts, including Pejawaran, Batur, Wanayasa and Kalibening. Batur is the subdistrict with the highest potato production compared to the other 3 subdistricts. Potatoes provide significant economic benefits for farmers, mainly due to their high selling value and short growing season [4].

Batur Subdistrict is the center of potato production in Banjarnegera District. The development of planted area and potato production in Batur Subdistrict has decreased. The total area of raw potato planting area is 3,047 ha with an average of two to three plantings resulting in an average planting area of 4,234.83 ha during 2014 to 2019. The planted area for five years has decreased by almost 52 % from 2014 which was 5,316 Ha to 3,489 Ha in 2019. The potato production produced is not much different from the planted area which has decreased production by almost 52 % [5]. Even though it is still the main sector, threats occur gradually, for example environmental degradation caused by agricultural activities that prioritize high production due to excessive use of chemical substances [6].

The research [7] stated that potato farming in Banjarnegera was financially and economically profitable with a financial benefit of IDR4,784,027.71 and an economic benefit of IDR532,411.59. Potato farming in Banjarnegera District, Central Java has a competitive advantage both competitive advantage and comparative advantage because it is efficient in production with PCR and DRC values smaller than one, namely PCR of 0.852 and DRC of 0.981. Meanwhile, the result of research [8] stated that the largest income contribution of farmers came from potato farming income, which was 69.7% of farm household income and other sources of income in the form of farming seasonal crops other than potatoes such as carrots, cabbage, leeks, red beans, chili, tobacco, annual crops, and livestock which have a small contribution of less than 25% of the household income of farmers.

Seeing the potential for profitable potato farming, the existing agribusiness system needs to be developed. An institutional engineering effort is needed to increase the bargaining power of farmers. How is the form of farmer corporations that can be developed in Banjarnegera District in order to increase farmers' income. The purpose of this study is to provide an alternative form of farmer corporations to support the potato agribusiness system in Banjarnegera District.

2. Materials and methods

2.1. Materials
The data used in writing this paper is primary data from the 2020 research and is complemented by secondary data as support. Considering that this smallholder corporation is based on a region, the main primary data collected is about the potential of the region. Furthermore, data and information related to the main agricultural commodity trade system as a business base, as well as data and information related to existing organizations in the region. Secondary data is mainly used to complete information on regional potential.

2.2. Methods
The research uses qualitative methods. Data were collected through deep interviews with respondents related to the potato farming agribusiness system using a questionnaire guide. The scope of the area in this study is in one Subdistrict, namely Batur subdistrict, Banjarnegera District, Central Java, Indonesia. Respondents are actors in the potato commodity trade system both on the upstream side, cultivation, downstream, and supporting side. From each respondent, two individuals or organizations were selected purposively who were champions in the Batur subdistrict. Respondents consisted of potato seed breeders and owners of subsidized fertilizer kios (upstream side), potato farmers (cultivating side), potato commodity wholesalers (downstream side), as well as agricultural extension workers, administrators of the Dieng Farmers Union, and managers of Agribusiness Microfinance Institutions (supporting side). The data were analyzed quantitatively to determine the economic potential of the overall business
activity in the potato trading system. Qualitative analysis is used to formulate a strategy for forming a farmer corporation.

3. Results and discussion

Farmer corporations are defined as farmer economic institutions with legal entities in the form of cooperatives or other legal entities with most of the capital ownership owned by farmers [9]. Conceptually, the purpose of farmer corporations is to strengthen the position of farmers in facing business competition with other economic actors by relying on market mechanisms. Within the farmer’s corporation, the economic institutions of farmers in an area synergize with each other to be able to provide benefits for farmers. Based on the Regulation of the Minister of Agriculture of the Republic of Indonesia No.18/Permentan/RC.040/4/2018, it is known that farmer economic institutions are institutions that carry out farming activities formed by, from and for farmers with the aim of increasing productivity and efficiency of farming, both incorporated legal or not. A farmer group or a combination of farmer groups can become the embryo of a farmer’s economic institution.

3.1. Potential of potatoes in Batur Subdistrict

Banjarnegara District is one of the regencies in Central Java Province which has an area of 1,069.73 km². Administratively, Banjarnegara District consists of 20 subdistricts, 266 villages and 12 subdistricts. In 2019, the total population was 1,022,503 people with a composition of 521,256 male population and 501,247 female population, with an average population density of 853 people/km². In Banjarnegara District, potato commodities are cultivated by farmers who are in areas that have an altitude of more than 1,000 m above sea level. Potato commodity centers include Batur, Pajawaran, Wanayasa, and Kalibening Subdistricts.

Batur Subdistrict is the largest potato-producing area and is the only area in Banjarnegara District that has exported [10]. In Batur Subdistrict, there are 8 Combined Farmer Groups and 104 Farmer Groups, most of which are potato farming [11]. The area of potato plants in Batur Subdistrict in 2019 reached 3,394 ha. As a leading commodity, the development of potato commodities in Batur Subdistrict requires a synergy between agribusiness such as seed breeders, potato product processing and marketing industries, farming financing institutions, and the development of environmentally friendly potato agrotourism.

3.2. Farmer organizational capacity

Farmer’s corporations will be realized quickly if there are farmer organizations and farmer economic organizations in an area. Farmers’ organizations and economic organizations of potato farmers have been formed in Batur Subdistrict in the form of farmer groups and farmer groups combined. In a wider scope (one mainland Dieng), there is a farmer association that has a passion for developing potato agribusiness, namely the Dieng Farmers Union (SPD). The role of the Dieng Farmers Union in the potato agribusiness system is in the form of internal consolidation and farmer advocacy when facing a problem.

Organizations that are also needed in potato farming are farm financing organizations. In Batur Subdistrict, there is an Agribusiness Microfinance Institution whose role is to assist farmers in overcoming capital problems. The initial capital of this financial institution comes from the savings of children and parents who are active in non-formal educational institutions with savings of IDR 100,000 per month. The accumulated savings are used to provide loans to potato farming. The financial institution does not determine the interest on the loan and does not use a profit-sharing system, but borrowers are advised to provide additional voluntarily. To date, the total funds managed have reached IDR 1.5 billion.

The existence of farmer groups, farmer groups combined, Dieng Farmers Union, and Agribusiness Microfinance Institutions are still running independently without any synergy. This situation is a major problem in the development of potato agribusiness in Batur Subdistrict as the results of research [10]. Whereas the synergy between these organizations can be a key factor in increasing the competitiveness
of farmers as market players. The concept of potato agribusiness development in Batur Subdistrict must be implemented comprehensively by taking into account all aspects and segments of agribusiness from upstream to downstream along with its supporting devices.

The key factors that influence the development of potato agribusiness in Banjarnegara District are (1) government policies, (2) Farmers’ education and knowledge, (3) land potential, (4) training and counselling, (5) information on the latest R&D results, (6) planting and harvesting time, (7) agricultural production facilities, (8) Regulating the use of production facilities, (9) central and local government involvement, and (10) productivity [8]. The most influential factor in formulating a strategy for developing potato agribusiness in Batur Subdistrict is productivity, the most important actor is the government, and the alternative strategy that must be done is empowering farmers/farmer groups. Based on the results of in-depth interviews with each respondent, it is known that the respondents have a strong desire to establish a farmer corporation. They hope to provide additional income for each farmer.

From several farmer organizations and farmer economic organizations that have been described previously, the following table provides information on the results of the analysis of the distribution of potato agribusiness institutional capacity values in Batur Subdistrict in terms of technical, financial and management capacity values.

Table 1. Distribution of potato agribusiness institutional capacity values in Batur Subdistrict, 2020

| Agribusiness activities | Rated technical capacity | Value of financial capacity | Management capacity rating |
|-------------------------|--------------------------|-----------------------------|---------------------------|
|                         | M | RI | RK | M | RI | RK | M | RI | RK |
| 1. Seed preparation     | 3 | 5  | 3  | 2 | 4  | 3  | 3 | 5  | 3  |
| 2. Provision of fertilizers and medicines | 1 | 4  | 3  | 1 | 4  | 3  | 1 | 4  | 3  |
| 3. Capital preparation  | 1 | 4  | 2  | 1 | 4  | 2  | 1 | 4  | 2  |
| 4. Provision of alsintan | 1 | 3  | 1  | 1 | 3  | 1  | 1 | 3  | 1  |
| 5. Manpower preparation | 4 | 3  | 1  | 4 | 3  | 1  | 4 | 3  | 1  |
| 6. Harvest processing   | 1 | 1  | 3  | 1 | 1  | 4  | 1 | 1  | 4  |
| 7. Harvest marketing    | 1 | 4  | 2  | 1 | 4  | 1  | 1 | 4  | 1  |
| 8. Provision of market information | 3 | 3  | 2  | 3 | 3  | 2  | 3 | 3  | 2  |
| 9. Provision of technology information | 3 | 3  | 2  | 3 | 3  | 2  | 3 | 3  | 2  |

Note: 1=Unable or at a loss, 2=Somewhat capable or somewhat profitable, 3=Quite capable or quite profitable, 4=Able or profitable, 5=Very capable or very profitable

3.3. Farmer cooperative development strategy

The farmer's corporation to be formed and developed must cover all aspects and stages of business as well as agricultural business actors. However, the business units in the farmer corporations will be directed at upstream and downstream business activities, while the cultivation business will still be run by farmers in general and regulated by farmer groups. In practice, the business units within the farmers’ corporation will be run by primary cooperatives and secondary cooperatives.

The initial stage of developing farmer corporations that need to be built and developed is the formation of farmer economic institutions. This institution should be built by prominent farmers or local entrepreneurs engaged in agriculture to cooperate with surrounding farmers to build a corporation [12]. In Banjarnegeara, the Dieng Farmers’ Union as an organization that has played a successful role in advocating for the interests of farmers, can become a pioneer of farmer economic institutions in the context of leading farmers’ corporations.
In the context of horticultural commodity agribusiness, [13] develops farmers’ economic institutions into five, namely: production facilities institutions, production input distributors/distributors, farming/production institutions, postharvest institutions and product processing, and product marketing institutions.

The results of the identification of farmer economic organizations involved in the potato agribusiness system in Batur Subdistrict, there are several business unit opportunities that can be carried out by farmer corporations. Some of these business units include potato seed business, farm financing, subsidized fertilizer distribution business, and potato post-harvest processing business. Before carrying out these business opportunities, the main thing that must be done is to strengthen the existence of farmer organizations that will run their business legally, namely as legal entities, both as cooperatives and other legal entities.

The economic potential that can be obtained by potato farmers is calculated based on the level of profit per hectare of each business unit that will be run. The calculation of the scale of the farmer's corporate business unit is based on the potato harvested area in 2019, which is 3,394 hectares. Cumulatively, the economic potential of the smallholder corporation business unit can be seen from table 2 below:

**Table 2.** Economic potential that can be received by farmers from potato farmer corporation development in Batur Subdistrict, 2020

| No | Koperasi                                | Business potential (IDR million/year) |
|----|-----------------------------------------|---------------------------------------|
|    |                                         | Optimistic scenario | Pessimistic scenario |
| 1  | Potato germination                       | 13,870                  | 6,935                  |
| 2  | Potato farming financing                 | 1,700                   | 850                    |
| 3  | Subsidized fertilizer distributor        | 145                     | 126                    |
| 4  | Potato yield marketing                   | 29,698                  | 14,849                 |
|    | Total business value                     | 45,413                  | 22,760                 |
|    | Business value per farmer                | 2.07                    | 1.04                   |

The biggest business potential is the distributor of subsidized fertilizers, which is IDR145 million/year in the optimistic scenario and IDR126 Million on the pessimistic scenario. This was later caught by the Dieng Farmers Union to be the type of business they would do. In accordance with the business potential to be worked on, the farmer corporation that will be formed, there will be at least four cooperative units engaged in the seed business, sales of production facilities, capital and marketing businesses. The four primary cooperatives are under the auspices of 1 secondary cooperative unit or can also be in the form of a company. The growth of farmer cooperatives originating from existing farmer institutions is in line with the results [8] which states that an important alternative strategy to be carried out in the development of potato agribusiness in Banjarnegara is the empowerment of farmers/farmer groups. The design of a farmer corporation in Batur Subdistrict, Banjarnegara District is shown in Figure 1 below:

Based on the picture above, the formation of cooperatives can use existing farmer institutions. Farmer groups or gapoktan just form a cooperative so that it has a clear and legally strong legal entity. The Dieng Farmers’ Union which covers several subdistricts can be a means to consolidate the economic institutions of farmers in the Batur Subdistrict and its surroundings along the Dieng plateau.

In accordance with the business potential to be worked on, the planned farmer corporation model consists of four cooperative units engaged in the seed business, sales of production facilities, capital and marketing. Cooperatives are an appropriate form of farmer economic organization for now[14]. There are two main advantages for farmers if the corporation is in the form of a cooperative, firstly, the level of profit from each corporate business unit will return to the farmers through the remaining revenue
mechanism. Second, with the form of cooperatives, farmer corporations still have the opportunity to access assistance programs from the government, such as programs for providing agricultural tools and machinery.

![Diagram of actors and institutional structure of farmer corporations](image)

**Figure 1.** Design of actors and institutional structure of farmer corporations in Batur Subdistrict, 2020

After these cooperatives are formed and running, the role of the government becomes important as well. Apart from being a policy maker and provider of farming infrastructure, the government is encouraging farmers to actively participate in the cooperative. As in the research [15] which looking at the development of the potato agribusiness system in Bandung District, namely the role of the local government in this case Bandung District is to strengthen the bargaining position of farmers by motivating farmers not to make transactions individually but through cooperatives to cut supply chains.

4. Conclusions

Based on the mapping of potential organizations that accommodate potato farmers in Batur Subdistrict, Banjarneagara District, both technically, economically and management, the development of farmer corporations can be a strategy to improve the bargaining position of farmers in the existing potato agribusiness system, so that farmers’ welfare can increase. The farmer corporation model in the form of establishing primary and secondary cooperatives which includes potato seed cooperatives, capital cooperatives, potato production facilities cooperatives, and potato marketing cooperatives is an option that can be done by potato farmers in Batur Subdistrict, Banjarneagara. The economic value that can be obtained by each potato farmer with the existence of a corporation ranges from IDR 1.04 - 2.07 million per year.

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