

Comparative Feasibility of Potato Farming By APKP Member and Non-Member Farmers in Purbalingga Regency

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Abstract. An association of potato farmers in Purbalingga Regency is known as APKP (Purbalingga Potato Farmers Association). APKP was founded in 2017 in Serang Village, Karangreja District, Purbalingga Regency, with a total of 30 potato farmers. With this study, we hope to find out how much money potato farmers in Serang Village, Karangreja District, and Purbalingga Regency make and whether it is even feasible. The study was carried out in the village of Serang in the Purbalingga Regency's Karangreja District. Because there is an APKP organization in the area that has been actively managing work programs, site selection is done on purpose. The study was carried out between December 2021 and January 2022. Because there are more farmers who are APKP members than respondents, a census is used to determine the respondents. According to the findings, farmers who are APKP members make more money than farmers who are not members. Farmers who are APKP members have a higher R-C ratio for their potato farming operation than farmers who are not APKP members.

1 Introduction

In the Karangreja District of Purbalingga Regency, Serang Village is a center for the cultivation of potatoes. In 2017, 30 local potato producers came together to join the Purbalingga Potato Producers Association (APKP). The tasks performed by APKP include collaborative land processing, joint extension, and joint operations for timing the planting of potatoes. Additionally, APKP organizes social gatherings and discussion sessions once a month to improve links among potato growers in the Serang Village region. Farmers' problems are technical problems of cultivation and capital. The rotting of seedlings, wilting of leaves, and moldy roots are among the agricultural issues farmers deal with. Even though growing potatoes requires substantial funds to be set aside for the acquisition of superior seeds and other means of production, farmers face the problem of limited access to capital. In potato farming, seeds are the primary means of production. The potato varieties grown are Atlantic and Granola. Farmers buy seeds of potatoes of the Granola variety in the local market, while for the Atlantic variety is obtained by farmers who partner with the companies

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Wings and Indofood. The partnership with both companies is done through APKP. Because partners would buy the entire crop of potatoes grown by partners, farmers will receive marketing guarantees as a result of their partnership. Farmers will also profit from consistent prices. Since prices for potatoes of the Granola variety grown by non-partner potato producers APKP vary widely, farmers might make significant profits when prices rise but also suffer losses when prices decline. This circumstance undoubtedly has a significant impact on whether farmers' businesses are viable. If the revenue generated by the firm exceeds the costs to be incurred, the business is considered to be practicable. The results of [1] show that the R/C ratio of potatoes grown in Sembungan Village, Kejajar District, Wonosobo Regency, is 1.5. This suggests that developing the farm makes sense. As indicated by the R/C Ratio value of 2.33 or more than 1, the land is viable for the development of potato cultivation, according to research on potatoes conducted in Kutabawa Village by [2]. According to the findings, potato farmers made an average of IDR 50,633,333 with a total expense of IDR 21,744,673. Research conducted by [3] in the West Midnapur district showed that the R-C value of potatoes was 1.81 lower than the R-C ratio of potato farming in Purbalingga. [4] conducted research on the feasibility of a sweet potato business in Gadingsari Sanden village, Bantul. The Socio-economic Research Viability of Growing Potatoes in Andhra Pradesh, India [5].

Generally, farmers who run potato farms rarely calculate the costs incurred in detail. Farmers also rarely record the revenue obtained, and the amount of costs incurred. This information will greatly help farmers find out the feasibility of their business so that farmers can evaluate the business they have done for years and plan their business development.

This study intends to ascertain the amount of potato farming income of APKP members and non-APKP members in Serang Village, Karangreja District, Banyumas Regency, as well as the viability of potato farming APKP members and non-APKP members in Serang Village, Karangreja District, Purbalingga Regency, based on the background and issues that have been brought up.

2 Method

Serang Village, Karangreja District, Purbalingga Regency was the site of the research. Site selection is done intentionally (purposive) because in that location there is an APKP organization that has been actively running various work programs. The study was carried out between December 2021 and January 2022. The research method used is a survey. Respondents were determined using 2 methods, namely the census for APKP member respondents and the simple random sampling method. There were sixty respondents in all, thirty of whom were potato growers who were members of the APKP and thirty of whom were not.

Both primary and secondary data sources provided the information used in this investigation. Primary data on potato growers who are APKP members and non-members were gathered through direct interviews and observations utilizing a set of questions (Questionare). Secondary data for this study were gathered from a number of government agencies, together with information from other literary works, to aid in the development of the research findings. This study employed the following analytical techniques:

2.1 Descriptive Analysis

According to [6], descriptive analysis is an analysis that uses data from variables obtained from the subject group studied and facts that occur in the field to accurately and methodically describe the facts and characteristics of the population/activities carried out in a particular field.

2.2 Revenue Analysis

$$TC = FC + VC \quad (1)$$

$$TR = Y \cdot P_y \quad (2)$$

$$Pd = TR - TC \quad (3)$$

Source: [7]

Information:

TC	:	<i>Total Cost (IDR)</i>
FC	:	<i>Fixed Cost (IDR)</i>
VC	:	<i>Variable Cost (IDR)</i>
TR	:	<i>Total Revenue (IDR)</i>
Y	:	<i>Production (kg)</i>
P _y	:	<i>Price of production (IDR)</i>
P _d	:	<i>Farm Income (IDR)</i>

2.3 Feasibility Analysis

The feasibility analysis used in this study used the R-C ratio.

$$a = \frac{R}{C} \quad (4)$$

Source: [7]

Information:

a	=	R-C ratio
R	=	<i>Revenue (IDR)</i>
C	=	<i>Cost (IDR)</i>

Decision criteria:

R/C > 1	feasible
R/C = 0	impasse
R/C < 0	Not worth it

3 Result and discussion

3.1 Characteristics of farmers

One of the things that influences a farmer's capacity to do their duties is their age. A person's age may tell you a lot about their productivity at work. Age groups are separated into three groups, according to BPS [8]: unproductive age (0–14 years), productive age (15–64 years), and unproductive age (>65 years). Potato farmers in Serang Village who are members of APKP range in age from 21 years to 60 years. The majority of farmers (40%) are between the ages of 21 and 30. This indicates that most farmers are young farmers. All potato farmers who are members of APKP belong to the group of productive age. The majority of non-APKP potato growers are between the ages of 41 and 50 (46.67%). [9], states that the age of the human is economically separated into 3 groups, namely the age range 0 to 14 years is referred to as the unproductive age, the most productive age range is from 15 to 64 years old, the unproductive age group is those beyond 65. The productive age is the best time to work and has a strong desire to learn about new agricultural technologies and knowledge. Table 1.

shows the age distribution of APKP member and non-APKP member farmers in the study area.

Table 1. Age distribution of APKP and non-APKP member farmers

Age Group	APKP member (person)	Percentage (%)	Non APKP (person)	Percentage (%)
21-30	12	40	1	3,33
31-40	9	30	7	23,33
41-50	5	16,67	14	46,67
51-60	4	13,33	8	26,67
Sum	30	100	30	100

Formal education can be used as a benchmark for the quality of human resources. The capacity of farmers to manage their fields will depend on their educational background. Farmers who pursue higher education tend to look more broadly and quickly when embracing innovations that might boost their company's production [10]. Table 2 shows the distribution of education for APKP members and non-APKP members. The most formal education of APKP members is elementary school (73%), junior high school (10%), and not graduated from elementary school (17%). Non-APKP potato farmers have the most formal education, namely elementary school (87%) and do not finish elementary education (13%). This condition shows that the education of APKP member farmers is better than that of non-member farmers because the highest education of APKP farmers is junior high school while the highest education of non-APKP farmers is elementary school.

Table 2. Education distribution of APKP and non-APKP member farmers

Education Level	APKP member (person)	Percentage (%)	Non APKP (person)	Percentage (%)
Did not finish elementary school	5	17	4	13
SD	22	73	26	87
SMP	3	10	0	0
SMA	0	0	0	0
Total	30	100	30	100

The phrase "number of family dependents" describes all of the family members—siblings and non-siblings who do not work—who remain living at home and are dependent on their parents. Family dependents are those who live together in a single home as a peasant family, including the head of the family and other family members who continue to be the head of the family's dependents. Siblings, parents who live in the same home as the head of the family and get assistance, and unmarried individuals are the main reasons why family members are still covered by the head of the family. In the family, family members help the head of the household with farming by working as laborers. Farmers' production and consumption habits will be impacted by the number of family dependents, which will lead to variations in the income that farmer families get [11]. The distribution of the number of family members of potato farmers can be seen in Table 3. The number of dependents of APKP potato farmer families in Serang Village shows that most of them have family dependents of 3 to 4 people, which is 56.57%, while non-APKP potato farmers who have 3-4 family dependents are 73.33%.

Table 3. Distribution of dependents of potato farming of APKP and non-APKP members

Number of family dependents	Member APKP (person)	Percentage (%)	Non-APKP (person)	Percentage (%)
0-2	4	13,33%	1	3,33
3-4	17	56,67%	22	73,33
≥5	9	30,00%	7	23,33
Total	30	100,00%	30	100,00

One of the key elements promoting farming's success is farm experience. [12] stated that the longer the time farmers spend in farming, the better it is expected that farmers can manage their farming to increase the farmer's income. The experience of farming is a learning process that can facilitate the adoption and application of dynamically developed technology [11]. However, long farming experience does not always reflect that farmers apply recommended technology. Farmers rely more on experience gained from generation to generation. This is shown by cultivation techniques and the use of low inputs of production facilities [11]. The experience of potato farmers of APKP members ranges from 1 – 40 years with the highest percentage of 21 – 30 years as much as 37%, 11 – 20 years as much as 27%, 0 – 10 years as much as 20%, and 31 – 40 years as much as 17%. The experience of non-APKP potato farmers with the highest percentage of 0-10 years as much as 43%, 11-20 years as much as 30%, 21-30 years as much as 23%, and 31-40 years as much as 3%.

Table 4. Distribution of farming experience of potato farmers of APKP members and non-APKP members in Serang Village, Karangreja District, Purbalingga Regency

Farm Experience (years)	APKP member (person)	Percentage (%)	Non-APKP (person)	Percentage (%)
0 - 10	6	20	13	43%
11 - 20	8	27	9	30%
21 - 30	11	37	7	23%
31 - 40	5	17	1	3%
Total	30	100	30	97%

3.2 Potato farm revenue

The quantity of potatoes produced, and the selling price farmers receive have an impact on how much money they make. Farmers will make more money as long as there is a greater output and a higher selling price. In Serang Village, Karangreja District, Purbalingga Regency, APKP members grow 26,067 kg of potatoes on average, whereas non-APKP members grow 27,516.67 kg. Table 5 provides comprehensive information on potato growers' earnings, production expenses, and business viability in Serang Village, Karangreja District, Purbalingga Regency.

3.3 Production cost

Potato cultivation involves both fixed and variable expenses in its production costs. Fixed costs are costs that are not affected by changes in production volumes. Fixed costs of potato farming include land tax costs and equipment depreciation costs. The average total fixed costs incurred by APKP member farmers amounted to IDR 3,982,996, while non-APKP member farmers incurred total fixed costs of IDR 4,332,125. Variable costs are costing whose size is greatly influenced by the volume of production produced. Variable costs in potato

farming include the cost of purchasing seeds, fertilizers, pesticides, fungicides, insecticides, and labor. Variable costs incurred by potato farmers APKP members amounted to IDR 53,549,067, while variable costs incurred by non-APKP member farmers amounted to IDR 62,765,777. The total of fixed and variable expenses in potato farming results in the average production costs that potato farmers experience, which are IDR 57,532,063 for APKP members and IDR 67,097,902 for non-members.

For seeds, APKP member farmers use Granola and Atlantic varieties, while non-APKP member farmers use Granola variety seeds. There are two types of Granola seeds used by farmers, both APKP and non-APKP members, namely G0 and G3. G0 seeds are granola seeds purchased by farmers, while G3 are granola seeds produced from previous plantings using G0 seeds.

Table 5. Production, revenue, total cost, income, and R/C ratio of potato farming of APKP members and non-APKP members in Serang Village, Karangreja District, Purbalingga Regency

ITEM	APKP Member	Non-APKP
Production (Kg)	26,067	27,516.67
Price (IDR)	6,000	5,582
Revenue (IDR)	156,400,000	153,602,619
Fixed Cost (IDR)	3,982,996	4,332,125
Variable Cost (IDR)	53,549,067	62,765,777
Total Cost (IDR)	57,532,063	67,097,902
Income (IDR)	98,867,937	86,504,717
R-C Ratio	2.69	2.22

The fertilizers used by potato farmers, both APKP and non-APKP members, are manure, and phonska. Manure is the basic fertilizer used by farmers before planting, while phonska fertilizer is given by farmers in the process of maintaining potato plants. Farmers also use pesticides, fungicides, and insecticides for crop protection from pests and plant diseases. Another means of production used by farmers in potato farming is labor. Labor is needed from tillage, planting, maintenance (weeding, fertilizing, controlling pests and plant diseases), and harvesting.

3.4 Feasibility study

Farm feasibility study looks at certain factors or eligibility requirements in an attempt to assess how feasible a particular business idea is. [13] If a business can turn a profit after all expenses, including direct and indirect expenditures, are paid, then it is considered practical. Measurement of the feasibility of potato farming is carried out by calculating the value of the R-C ratio. According to the findings of the feasibility study, APKP members' potato farmers had an R-C ratio of 2.69, but non-APKP members' potato farmers had a ratio of 2.22. The results of the analysis show that potato farming carried out by APKP member farmers and non-APKP members is feasible to be developed because it produces an R-C ratio value of > 1. The analysis's findings are consistent with the findings of studies on potato cultivation done by [2]; [3], which produced an R-C ratio of 2.33. The findings of this investigation had a lower R-C ratio than those of research by [14]. Ex vitro and non-ex vitro potato farming seeds were used in research [14]. Production will double as a result of using high-quality seeds and effective management [15]. The R-C ratio of potato farming of APKP member farmers is greater than that of non-APKP potato farmers. This shows that there is a difference in prices received by APKP members and non-member farmers. The price difference occurs because the prices obtained by APKP member farmers are more stable and products are

always sold completely without any unsold products. A stable price guarantee is obtained by APKP member farmers because they partner with 2 large companies, namely PT. Wings and Indofood. Meanwhile, non-APKP member farmers sell their products individually to local middlemen or to the main market in the Purbalingga Regency area. The price received by non-APKP member farmers follows the prevailing market price, besides that there is a risk that the product will not be sold all due to the implementation of grading. For potatoes that belong to grade A will have a high price, but for potatoes that do not pass the sort, they are not absorbed by the market. The results also show that APKP provides quite a lot of benefits for its members, including price and market guarantees, assistance in cultivation activities so that they can carry out potato cultivation activities properly and organized cultivation processes because planning has been done from the beginning together. Cultivation activities for non-APKP farmers are carried out individually so that there is no coordination between farmers with each other. This is very influential on the cultivation process, especially for IPM (pest and plant disease control) activities. Marketing activities are also carried out individually so that farmers do not have a strong bargaining position.

4 Conclusion

1. The income of potato farmers in Serang Village, Karangreja District, Purbalingga Regency of APKP members is IDR98,867,937, while the income of non-APKP potato farmers is IDR86,504,717
2. The R-C ratio of APKP member potato farmers is 2.69 and the R/C ratio of APKP non-member potato farmers is 2.22.

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