



INCOME ANALYSIS OF SERICULTURE FARMERS (IMPORTED CHINESE SEEDS) IN PISING VILLAGE, DONRI-DONRI DISTRICT, SOPPENG REGENCY, INDONESIA

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Abstract

The research purpose was to analyze the income earned by sericulture farmers. This research was carried out in Pising Village, Donri-Donri District, Soppeng Regency with a purposive sampling method, as one of the locations of sericulture development in Soppeng Regency. Forty-nine respondents were interviewed. Descriptive analysis and income analysis were used to analyze the data. The results showed that the income of sericulture farmers in Pising Village, Donri-Donri District, Soppeng Regency was Rp602,831,897/year. Costs incurred were Rp 198,201,103/year with revenues of Rp. 801,033,000/year. The revenue was obtained from 1,286.2 kg/year raw silk produced by 49 farmers.

Keywords: income, sericulture, farmer, Soppeng

Introduction

Indonesia is a tropical forest country with great potential for sericulture agro-industrial development. The development of sericulture as one of the Non-Timber Forest Products is a social forestry activity aimed at improving the community's economy, expanding employment opportunities, empowering communities, and improving the welfare of the community through silkworm cultivation. Silkworm cultivation is closely related and inseparable from mulberry cultivation as silkworm feed. Aside from being a silkworm feed, mulberry plants also have functioned as soil protectors from erosion and land degradation (Sadapotto, 2010).

Silkworm cultivation has been known since the 1950s and still going until today. Alam (2014) stated that in there are several areas for silkworm cultivation in Indonesia including: West Java (Garut, Sukabumi, and Sumedang); Central Java (Temanggung); East Java (Pasuruan, Blitar, Kediri); Aceh; West Sumatra; Bengkulu; Lampung; South Kalimantan; Nusa Tenggara and South Sulawesi (Soppeng).

Based on this information, South Sulawesi is one of the producers of sericulture in Indonesia. Sericulture of South Sulawesi is a potential non-timber forestry resource and reliable regional commodity. Soppeng Regency is one of the locations of sericulture development in South Sulawesi with another potential in agriculture, mining, plantation, services, and tourism.

Besides being known as the City of Bats, Soppeng is also known as one of the centers of mulberry cultivation as a caterpillar feed (Dishut and ISPEI, 2011).

Sericulture in South Sulawesi, especially in Soppeng Regency, still has market opportunities and excellent prospects to develop. Due to the potential and assets of Soppeng, which can support the sericulture business. Some of these potentials include biophysical and agro-climate suitability, socio-cultural suitability and local customs, potential domestic and foreign marketing, possible development of silk technology development, and government support and commitment to continue developing sericulture. Sericulture farmers have varied ways of maintaining silkworms that affected by factors such as knowledge they have acquired for generations or based on

habitual factors. These matters can affect the costs and income that will be obtained by silk farmers (Kadir *et al.*, 2008).

Some communities in villages in the Donri-Donri district are still pursuing sericulture businesses, either as their main livelihoods or side-livelihoods. The development of sericulture in Soppeng is supported by several factors, including support from the government, agencies, community culture, parental heritage, and Perum Perhutani as a producer of commercial seeds, the availability of cocoon, and yarn markets (Nurhaedah and Hayati, 2015).

However, facts on the ground showed that silk yarn production has declined due to the low production of silkworm seedlings (the result of local seedlings and Japanese seedlings crossing) prepared by the government through the Perhutani public corporation. This condition results in a lack of people interested in preserving caterpillars and because of unclear income generated by silk farmers.

Some government efforts in increasing silk production and restoring the glory of Soppeng are bringing imported seeds from China, which have higher production. However, there has been no research specializing in sericulture farmers using imported seeds from China. For this reason, researchers are interested in conducting a research with the title "Income Analysis of Sericulture Farming (Imported Chinese Seeds) in Pising Village, Donri-Donri District, Soppeng Regency".

This research aims to determine the income earned by sericulture farmers in Pising Village, Donri-Donri District, Soppeng Regency. The purpose of this research is to provide useful information and input to assist the sericulture business and can be used as a reference for researchers in the field of sericulture.

Materials and Methods

Time and Place of Research

This research was conducted in October 2018. The research activity was carried out in Pising Village, Donri-Donri District, Soppeng Regency, South Sulawesi.

Research Tools and Materials

Tools and materials used in this research, namely:

- Interview guidelines used as a questionnaire in gathering

information from informants.

- Writing tools used to record data from interviews.
- A type recorder used to record conversations during interviews.
- The camera used to capture images during research.

Data Types and Sources

(i) Type of Data

The type of data used in this research is quantitative data in the form of numbers obtained from the field.

(ii) Source of Data

- Primary data is data obtained from field observations and direct interviews with silkworm farmers with a questionnaire.
- Secondary data is supporting data obtained from relevant agencies, the Central Statistics Bureau, Local Government, and others, which have been available, and related to this research.

Population and Sample

The population in this study were five farmer groups and 49 respondents as active silkworm farmers in Pising Village. Details are shown as below:

Table 1 : Number of farmer groups and the number of respondents

No	Name of Group	Number of Respondent
1	Anggalange	2
2	Tompo Jompi	7
3	Sabbeta	10
4	Mammesang Sabbeta	12
5	Mega Sutera	18
Total		49

Source: Primary data of Pising Village, 2018

Population and sample selection was done by census, which can be interpreted to collect data if all elements of the population are investigated one by one. The data obtained as a result of census management referred to as actual data (true value) or also called parameters (Supranto, 2008).

Research Implementation Methods

The method used in this study, namely:

(i) Observation

Observations in this research were to find out the name of the research location, geographical conditions, and climate of the research location, and silkworm farmers at the research location.

(ii) Interview

Interviews conducted in this research were to collect data by asking questions in the questionnaire directly to the respondent who conducts caterpillar business in the form of the identity and general information of respondents.

(iii) Documentation

Documentation in this research was collecting data and analyzing documents in images or electronics that related to the research, both profile of research location and socio-economic of the community.

Data Analysis

Data were analyzed quantitatively to calculate the income earned by silkworm farmers in Sering Village, Donri-Donri District, Soppeng Regency.

(i) Cost Analysis

$$TC = FC + VC$$

Note:

TC = Total Cost (Rp/Year)

FC= Fixed Cost (Rp/Year)

VC = Variable Cost (Rp/Year)

(ii) Revenue Analysis

$$TR = P \times Q$$

Note:

TR = Total Revenue (Rp/Year)

P = Price (Rp)

Q = Quantity (Rp/Year)

(iii) Income Analysis

$$I = TR - TC$$

Note:

I = Income (Rp/Year)

TR = Total Revenue (Rp/Year)

TC = Total Cost (Rp/Year)

Results and Discussion

Respondent Characteristics

(i) Number of Imported Chinese Sericulture Farmers

The number of imported Chinese sericulture farmers in Pising Village was 49 people divided into five farmer groups, namely Mammesang Sabbeta, Mega Sutera, Sabbeta, Tompo Jompi, and Anggalange. The number of active farmers in each group varied. Mega Silk was a farmer group that had the most active members; the number of members was 18 people or 37%. The Mammesang Sabbeta farmer group had 12 members (25%), the Sabbeta farmer group had ten members (20%), and the Tompo Jompi had seven members (14%). The farmer group with the least number of members was the Anggalange farmer group had two active farmers or 4%. These data are presented in Figure 1.

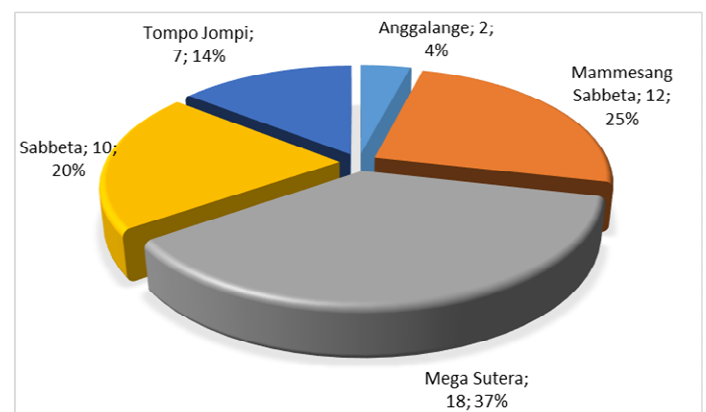


Fig 1 : Percentage of the number of silkworm farmers in Pising Village, Donri-Donri District, Soppeng Regency.

(ii) Sex

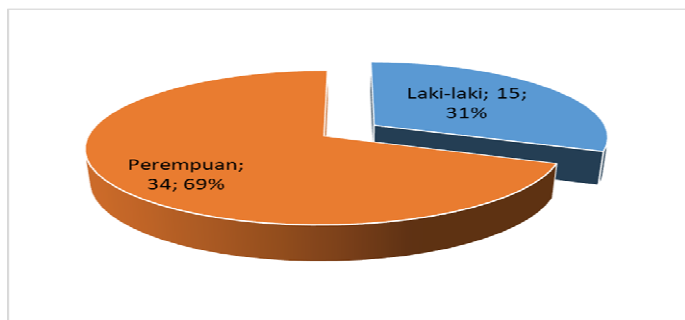


Fig. 2 : Percentage of the sex of silkworm farmers in Pising Village, Donri-Donri District, Soppeng Regency.

Figure 2 shows the characteristics of farmers based on sex. The most dominant farmers were female, with 34 respondents or 69%. Meanwhile, the number of male respondents was 15 people (31%). Most women in Pising Village are working as the farmer of imported Chinese silkworm seeds as their main livelihood in supporting the family economy.

(iii) Age

Figure 3 shows the characteristics of respondents based on their age. The highest age category of farmers in Pising Village was the 56 - 62 years old age category as much as 19 respondents (39%). This shows that silkworm farmers have started to enter the old age category and have experience in rearing silkworms. Then, the 49 - 55 years old age category consisted of 12 respondents (24%), the 42 - 48 years and the 63-69 years old age categories both had six respondents (12%), the 70 - 76 years old age category had three respondents (6%), the 28 - 34 years old age category with two respondents (4%) and the lowest was the 35 - 41 years old age category with one respondent (2%).

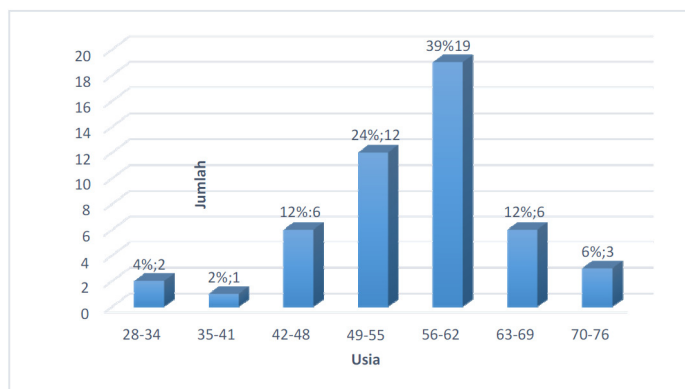


Fig. 3 : Percentage of the age of silkworm farmers in Pising Village, Donri-Donri District, Soppeng Regency.

(iv) Educational Background

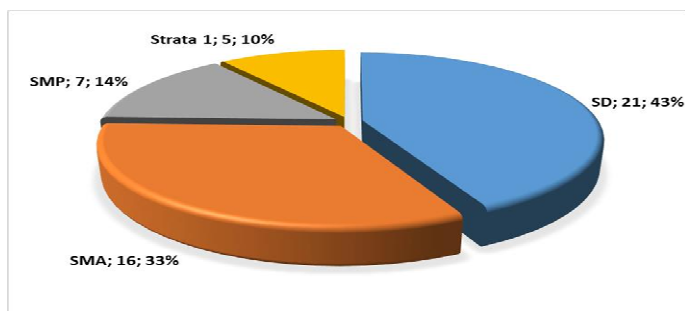


Fig. 4 : Percentage of the educational background of silkworm farmers in Pising Village, Donri-Donri District, Soppeng Regency.

Figure 4 shows the educational background of imported Chinese silkworm seeds farmers. Nearly half of the respondents or 21 respondents (43%) were elementary school graduates. Next, the high school graduates were 16 respondents or 33%, and then junior high school graduates were seven respondents or 14%. Only five respondents graduated from college, or 10% of all respondents in Pising Village, Donri-Donri District, Soppeng Regency.

(v) Number of Dependent

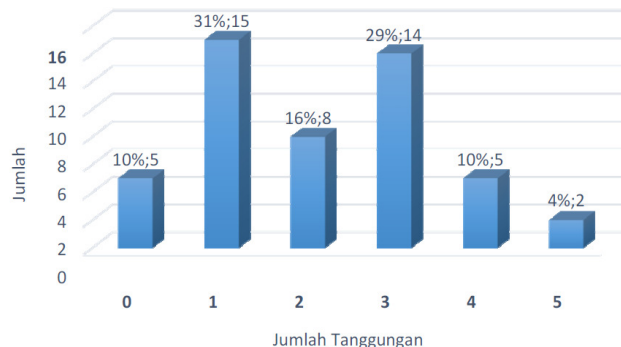


Fig. 5 : Percentage of silkworm farmers number of dependent in Pising Village, Donri-Donri District, Soppeng Regency.

Figure 5 shows the number of dependent on the respondent. Only five respondents (10%) did not have any dependent. Meanwhile, most respondents (90%) had dependents whose amounts vary from one to five number of dependents.

(vi) Length of Experience

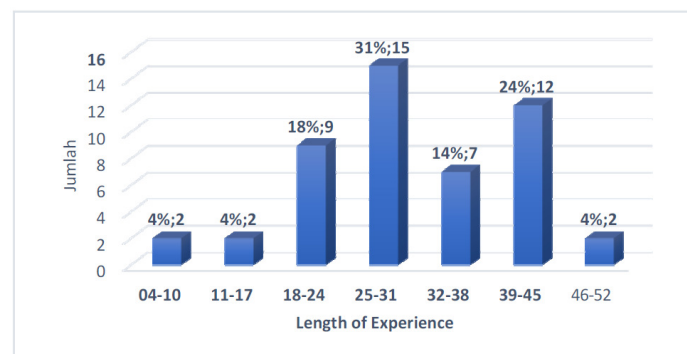


Fig. 6: Percentage of Length of Experience in Pising Village, Donri-Donri District, Soppeng Regency

Based on the field interview results, the shortest experience was four years, while the longest was 50 years. On average, the length of sericulture experience was 31 years. Figure 6 shows that the length of sericulture experience varies between 4 years to 52 years. However, the average range of sericulture experience was 25 to 31 years with the number of 15 respondents (31%) and three-time periods with the least amount were 4 to 10 years, 11 to 17 years, and 46 to 52 years, each had two respondents (4%).

Cost of Sericulture

(i) Fixed Cost

Fixed costs are costs that have a relatively fixed amount and continue to be incurred even if the product obtained is large or small. The amount of this fixed cost does not depend on the size of production. Fixed costs incurred in rearing silkworm consist of depreciation costs, property tax costs, and labor costs. The total costs can be seen in Table 7 and the details of the fixed costs for each farmer shown in Appendix 3.

Table 7 : Fixed Costs in Income Analysis of Sericulture Farming (Imported Chinese Seeds) in Pising Village, Donri-Donri District, Soppeng Regency.

Farmer Group	Depreciated Cost (Rp)	Property Tax (Rp)	Labor Cost (Rp)
Anggalange	602.667	90.000	
Mammesang Sabbeta	6.191.332	740.000	
Mega Sutera	7.186.000	1.610.000	19.840.000
Sabbeta	4.456.403	745.000	
Tompo Jompi	2.352.501	390.000	
Total	20.788.903	3.575.000	19.840.000

Depreciated Cost

The table above shows that the total depreciated cost in Pising Village was Rp. 20,788,903 / year. Depreciated costs consist of: (1) cost of preservation place in the form of semi-frame / bamboo, labor cost at bamboo cocoon racks, place of caterpillar preservation and

(2) cost of equipment and supplies such as boots, sandals, hoe, sprayer, thermometer, cuttings scissors, washbasin, bucket, knives, machete, trays, plates, plastic sieves, stick broom, fiber broom, trash shovel, and cultivators. Depreciated costs used in sericulture can be seen in Appendix 4.

Each depreciated cost varies depending on the number of farmers and stores bought the equipment. The government-subsidized sprayers, thermometers, cuttings, and cultivators for sericulture of cocooning rack; thus, farmers did not need to spend any money. However, there was some subsidized equipment that has been damaged; thus, the farmer bought it in another place. Tools such as bamboo cocooning racks, stick broom, palm-fiber broom, and trash shovel can be made by some farmers to reduce the costs. Some farmers using labor services in bamboo cocooning racks, thereby the costs incurred were increased.

For rearing location, most farmers place it under their house (47 people or 96%) and only two people (4%) in the rearing house. The number of racks used was 1-6 racks per farmer, with an average farmer using 2 racks with a size of 2x3, 2x4, 2x5, 2x6, 2x8, and 2x9.

Property Tax

Cost of property tax charged to farmers in the form of land and building taxes paid based on mulberry land and rearing houses. Details of the costs of property tax can be seen in Table 8.

Table 8 : Mulberry land and rearing houses in Income Analysis of Sericulture Farming (Imported Chinese Seeds) Per Year in Pising Village, Donri-Donri District, Soppeng Regency

Farmer Group	Mulberry Area (Ha)	Rearing house (m ²)
Anggalange	1	50
Mammesang Sabbeta	7,95	716
Mega Sutera	10,75	1.331
Sabbeta	6,75	651
Tompo Jompi	3,5	266
Total	29,95	3014

Total property tax costs of sericulture farmers in Pising Village vary according to the cage and mulberry land areas per farmer. The breakdown of property tax for the farmer as

follows: the Anggalange farmer groups paid property tax with the amount of IDR 90,000 / year for an area of 1 Ha of mulberry land and 50 m² of rearing house, the Mammesang Sabbeta farmer group paid property tax with the amount of IDR 740,000 / year for an area of 7.95 Ha of mulberry land and 716 m² of the rearing house. The Mega Sutera farmer group paid property tax with the amount of Rp. 1,610,000 / year for an area of 10.75 Ha of mulberry land and 1,331 m² of rearing house, then the Sabbeta farmer group paid property tax with the amount of Rp. 745,000 / year for an area of 6.75 Ha of mulberry land and 651 m² of rearing house, then Tompo Jompi paid property tax with the amount of Rp 390,000 / year for an area of 3.5 Ha of mulberry land and 266 m² of the rearing house. Therefore, the total property tax costs paid by Pising Village were Rp3,575,000 / year with a total area of mulberry land was 29.95 Ha, and a total area of the rearing house was 3,014m². The total cost of property tax for each farmer can be seen in Appendix 5.

Labor Cost

Labor cost is the cost incurred to pay workers in silkworm preservation. Labor costs consist of labor outside of the family and within the family. According to Sinaga *et al.* (2010), labor, according to its origin, is family labor. Workers who are family members such as father, mother, and child, their wages are not counted. While labor outside of family members receive wages depended on the income received by farmers. For example, one farmer from the Mega Sutera farmer group spent Rp19,840,000/year for labor cost.

(ii) Variable Cost**Table 9** : Variable Cost Per Year of Pising Village, Donri-Donri District, Soppeng Regency

Farmer Group	Variable Cost (Rp)
Anggalange	4.273.800
Mammesang Sabbeta	43.213.500
Mega Sutera	52.303.000
Sabbeta	35.022.300
Tompo Jompi	19.184.600
Total	153.997.200

Variable cost is the cost that influenced by the number of products produced. Variable costs consist of seed cost, silkworm feed, cocooning cost, electricity, sacks, chlorine, chalk, fuel, oil paper, Kaili paper, fertilizer, and grass poison. The total variable costs incurred by Pising Village was Rp. 153,997,200 / year. Details of variable costs can be seen in Appendix 6.

The silkworm seeds used by farmers in Pising Village were subsidized seeds from the Government of Soppeng, which imported from China. The subsidies have been going on from 2017 until now. With this subsidy, farmers did not spend any money on silkworm. Farmers also have their mulberry garden thus, they did not spend money on feeding. The types of mulberry in the farmer's garden are Alba, China, India, Katayana, Multicollis, and Rajawali.

In terms of mulberry gardens treatment, farmers were using fertilizers (urea and mpk), besides that farmers also using grass poison (nexone) so that the disturbing wild plants on the sidelines of mulberry plants disappeared and did not ruin plant productivity. As for the preservation of caterpillars, farmers use materials such as chlorine, lime, Kaili paper, and oil- paper, which can be adjusted with the number of seeds

that are kept. Farmers were using spinners to produce yarn. The price of spinning was Rp. 60,000 / kg for every yarn produced from spinning.

(iii) Total Cost

Total cost is the sum of fixed costs and variable costs. The total cost incurred by sericulture farmers in Pising Village is Rp 198,201,103 / year. Details of total costs can be seen in Appendix 7.

Table 10 : Total Cost of the Sericulture Farmers in Pising Village, Donri-Donri District, Soppeng Regency

Farmer Group	Fixed Cost (Rp)	Variable Cost (Rp)	Amount (Rp)
Anggalange	692.667	4.273.800	4.966.467
Mammesang Sabbeta	6.931.332	43.213.500	50.144.832
Mega Sutera	28.636.000	52.303.000	80.939.000
Sabbeta	5.201.403	35.022.300	40.223.703
Tompo Jompi	2.742.501	19.184.600	21.927.101
Total			198.201.103

Revenue

Revenue is the amount of selling raw silk produced by farmers. Sericulture farmers in Pising Village selling their products in the form of raw silk. There was a difference in the price of raw silk among farmer groups, for example, the Mammesang Sabbeta farmer group selling their raw silk to the industry with a price of Rp 630,000/Kg while other groups selling it to collectors for Rp 620,000/Kg.

Table 11 : Revenue of Farmer Group Per Year in Pising Village, Donri-Donri District, Soppeng Regency

Farmer Group	Yarn Weight (Kg)	Revenue (Rp)	Average Revenue (Rp)
Anggalange	27	16.740.000	8.370.000
Mammesang Sabbeta	358,9	226.107.000	18.842.250
Mega Sutera	502,5	311.550.000	17.308.333
Sabbeta	248,9	154.318.000	15.431.800
Tompo Jompi	148,9	92.318.000	13.188.286
Total	1286,2	801.033.000	73.140.669

Table 11 above shows the amount of revenue for each farmer group is different. The greater the amount of yarn produced, the greater the amount of revenue obtained by farmers. The farmer group that received the highest amount of revenue was the Mega Silk group, with a value of Rp311,550,000. However, by looking at the average income of farmers, the Mammesang Sabbeta farmer group was the farmer group with the highest average income with a value of Rp. 18,842,250 per year. This shows that the Mammesang Sabetta farmer group was a farmer group with the highest productivity among all farmer groups in Pising Village.

Income

Table 12 : The income of Farmer Group Per Year in Pising Village, Donri-Donri District, Soppeng Regency

Farmer Group	Cost (Rp)	Revenue (Rp)	Income (Rp)
Anggalange	4.966.467	16.740.000	11.773.533
Mammesang Sabbeta	50.144.832	226.107.000	175.962.168

Mega Sutera	80.939.000	311.550.000	230.611.000
Sabbeta	40.223.703	154.318.000	114.094.297
Tompo Jompi	21.927.101	92.318.000	70.390.899
Total	198.201.103	801.033.000	602.831.897

Income from silk farming obtained from a reduction between the income received and the costs incurred by the farmer. This is following the study by Rahim *et al.* (2012) that net income or profit is the difference between gross income and total expenditure. Technically, profits can be calculated by a reduction between total revenue and total cost.

Table 12 shows the income of the Pising Village was Rp. 602,831,897.00 / year. The total cost spent was Rp 98,201,103 / year with revenue of Rp 801,033,000 / year. The revenue was obtained from the production of 1286.2 kg silk yarns originating from 49 farmers. To get more information regarding the income of each farmer group, two additional information was collected, which are information related to productivity and information related to cost efficiency. This information is important because the size of the income depends on the amount of revenue obtained and the amount of costs incurred. The more productive the business or, the more efficient the costs incurred, the higher the income or profit earned. While the more unproductive the business or, the more inefficient in spending costs, the smaller the income or profit earned.

Productivity

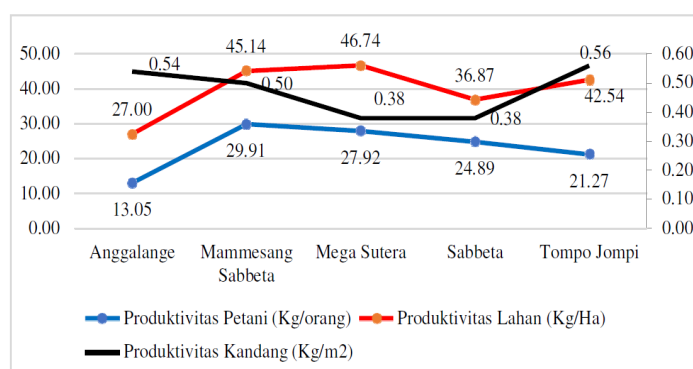


Fig. 7 : The productivity of Imported Chinese Seeds Farmers in Pising Village, Donri-Donri District, Soppeng Regency.

Figure 7 provides information regarding the productivity of farmers, cage, and land owned by each farmer group. In terms of farmer productivity, the Mammesang Sabetta farmer group was the most productive farmer group with a productivity value of 29.91 kg of yarn per farmer. Meanwhile, the Anggalange group was the most unproductive farmer group with a productivity value of 13.50 kg of raw silk per year per farmer.

Then, in terms of the cage productivity, the Tompo Jompi farmer group was the most productive with a productivity value of 0.56 kg of raw silk per m2, while the Mega Sutera farmer group was a farmer group with the smallest production which value was 0.38 kg/m2. In terms of land productivity, it can be seen that the Mega Sutera farmer group categorized as the most optimal or effective farmer group in managing land with a productivity value of 46.74 kg/ha. Meanwhile, the most unproductive farmer group was Anggalange, with a productivity value of 27 kg/ha.

Efficiency

Efficiency is a measure of success seen from the number of resources or costs used to achieve the results of activities that are carried out. According to SP Hasibuan (1984), efficiency is the best comparison between input (cost) and output (revenue). This shows that efficiency is related to cost and the results obtained from these costs. An effort can be stated to be more efficient if the ration value between costs and results is getting smaller.

Figure 8 presents the comparison between the costs and income or revenue of each farmer group. Figure 8 shows that the Mega Sutra farmer group had the highest revenue with a value of Rp. 311,550,000 million. However, the farmer group with the biggest profit margin was the Mammesang Sabetta farmer group with a value of 78% because this group being the most efficient farmer group with an efficiency value of 22%. This efficiency value indicates that the Mammesang Sabetta farmer group only needs a 22% fee to get 100% acceptance.

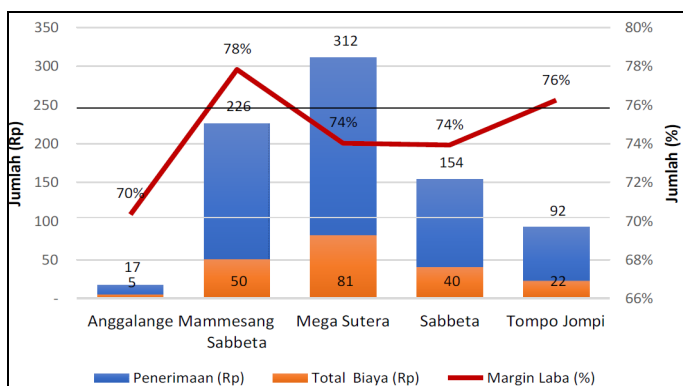


Fig. 8 : Revenue, Costs, and Profit Margin of Imported Chinese Seeds in Pising Village, Donri-Donri District, Soppeng Regency.

Figure 8 also shows that the Anggalange group was the farmer group with the smallest revenue and profit margin, which caused by two things. Firstly, the Anggalange farmer group acceptance was the smallest compared to other groups. The value was Rp. 16,740,000 million. Second, the Anggalange farmer group was the most inefficient farmer group in managing costs with an efficiency value of 30% means that the Anggalange farmer group spent 30% to get 100% income.

Conclusion

Based on the results, it can be concluded that the income of imported Chinese sericulture farmers in Pising Village, Donri-Donri District, Soppeng Regency was Rp 602,831,897 /year. The incurred expense was Rp. 198,201,103 / year with revenue of Rp. 801,033,000 / year. The revenue was obtained from the production of 1,286.2 kg/year raw silk that collected from 49 farmers.

Recommendation

The existence of the most productive and efficient farmer groups can be a reference for other farmer groups to be more productive in producing yarn and more efficient in managing preservation costs. In addition, farmers need to continue to get support from the Government of Soppeng, both during production and marketing. Thus silk farming as the primary source of livelihood for silk farmers in Pising Village, Donri-Donri District, Soppeng Regency can be relied on and be proud of it.

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