The role of Garut Agricultural Science and Technology Park in Garut, sheep business supporting community economic development

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Abstract. The purpose of this study was to evaluate the role of the Garut Agricultural Science and Technology Park (TSTP) by running the Garut sheep business, to support the economic development of livestock farming communities. This research was conducted by purposive sampling and interviews and questionnaires on 3 nucleus farmers in TSTP Garut and 20 plasma farmers outside TSTP, in Garut Regency, West Java Province in 2018. Data were collected in the form of primary data obtained directly from farmers and secondary data from the local Office of Agriculture and Animal Husbandry and several other parties. Primary and secondary data were analyzed descriptively and qualitatively, calculated based on an analysis of the balance of R/C receipts. Indonesian Research Institute of Animal Production (IRIAP) has developed science and technology at TSTP Garut, which was distributed to plasma farmers at outside of TSTP Garut. Technology and innovation increased the productivity of Garut sheep efficiently and develop improvements in farmers' businesses and income. The results showed that the profit of nucleus farmers was IDR 3,308,334/year with an R/C value of 1.09. The benefit of plasma farmers was IDR 1,608,334/year with an R/C ratio of 1.01. Garut sheep business in nucleus and plasma farmers was economically feasible to be cultivated again.

1. Introduction
Dissemination of information on the existence of the Agricultural Science and Technology Park (TSTP) Garut can be conducted by proactively and promoting technological innovations in the management of sheep farming and animal feed, through the Agriculture Agency of Research and Development (AARD) who choosed the Indonesian Research Institute of Animal Production (IRIAP) as a companion in the implementation of activities with the main implementing actor is the Agricultural Institute of Technology Assessment (AITA) in the form of TSTP. IRIAP as a research institute and inventor of these technologies was more technical in its application. Furthermore, TSTP Garut as an implementing actor was ready to spread agricultural and livestock technological innovations to the community of farmers, especially sheep farmers [1]. The community or farmers who accepted and adopted these innovations with IRIAP assistance certainly increased their income and welfare. Thus, the TSTP development program for the application of appropriate technology that supported the utilization of local potential, was very good to be implemented by the Ministry of Agriculture, through AARD which in this activity was the role of IRIAP and BPTP. Of course, TTSP will greatly help farmers, extension workers, and local government agencies. Efforts to develop sheep
in the Garut TSTP area and outside Garut TSTP, will increase sheep population growth and income of sheep farmers.

Appropriate technological innovations are needed by every farmer, to increase the value of livestock products, in supporting the economic development of the society in the current condition and for the future [2,3]. TSTP acts as a provider of technology solutions from production to marketing, through the study of science and technology produced by academics and researchers and as an institutional engineering designer. TSTP has developed with the function as a place for developing and implementing agribusiness-oriented technological innovations as well as a place for training, business partnerships, technology dissemination centers and business advocacy. Since the formation of government agencies that handle the livestock sub-sector, there were many information and technologies that were recommended to be applied in farmers [4]. Technological developments and innovations can be influenced by world developments, therefore recommended technologies and innovations should be appropriate in accordance with the capabilities of the community or farmers and local feed supporting resources [5].

Farmers in rural areas mostly occupy low-income families, and a small proportion of middle and high income [6]. Various efforts of the government and/or non-governmental organizations to increase the income and welfare of farmers can be done, through various approaches and improvement of sheep farming. The dynamics of the development of the livestock industry, of course, followed by various modifications to the cultivation system itself, which dynamically continues to be developed by following developments nationally [7]. Based on the considerations to increase the productivity of the Garut sheep farmers' community and the competitiveness of sheep products in local and international markets, an agricultural and livestock commodity production center was developed.

The development and expansion of TSTP that include the participation of farmers' land in one area requires significant support from the Regional Government, especially in infrastructure development and program sustainability. Creativity of West Java AIAT and IRIAP as AARD Technical Implementation Unit (UPT), as well as all institutions under the Ministry of Agriculture are urgently needed. West Java AIAT and IRIAP work together in order to provide technological innovation to advance the role of TSTP Garut. Farmers in rural communities behave statically, so that if appropriate technology is offered that can increase knowledge, in the livestock business there needs to be an approach with farmers, so that the technology can be well received. Sheep farmer business group have been formed and their are continued [1]. Based on the problems mentioned above, it is necessary to explore the potential sources of economic growth for the community of farmers, through the business of Garut sheep farming and food crops. Various obstacles and problems that are often faced by farmers and should be the focus of attention of Garut TSTP, so that TSTP can play a significant role as a vehicle for the development of Garut sheep business. The purpose of this paper is to find out the role of Garut TSTP in Garut sheep businesses to support the sustainable improvement of the farmer's community economy.

2. Method
Determination of the location of the study and sample of farmers was elected purposively. The study was conducted in TSTP Garut and surrounding areas in the District of Cikajang, Garut Regency, West Java Province, in 2018. Selected research locations, previously had been reviewed in advance about the characteristics of the area that has the potential for developing Garut sheep business, based on agricultural land and supported by facilities and adequate infrastructure. Selected farmers were 3 farmers in TSTP Garut as nucleus farmers and 20 farmers outside TSTP Garut as plasma farmers, and the number of sheep raised by both nucleus and plasma farmers was well recorded. The study used a survey technique with interviews and questionnaires for selected nucleus and plasma farmers.

The results of the study of Supriyati and Suryani (2016) revealed that the profits obtained by farmers will be greater, if the workforce in the livestock business used an increase in family labor, because the business carried out was an independent family business [8]. Garut sheep business was carried out by nucleus farmers in Garut TSTP and plasma farmers outside Garut TSTP through the
rearing/fattening and breeding business segments. Analysis of each business segment will be a reference in determining business choices that will be run by each group of farmers. The financial economy was the main benchmark of a business analysis, especially cash flow that occurs during current business activities [9]. The amount of costs and profits obtained by each farmer will be seen based on the amount of real income. The gross profit value was reduced by the value of the production costs incurred during the business.

Garut sheep commodities cultivated by nucleus farmers in Garut TSTP and plasma farmers outside Garut TSTP have been given the introduction of knowledge in an effort to increase profits. The introduction included procedures for selecting breeding stock and feeder, rearing, fattening, as well as more efficient feeding and handling of health and institutional support. The accuracy in determining the parameters was very influential on sheep business performance and will determine the final results of a business feasibility study. Analysis of the balance of revenues and costs was calculated by analysis of the R/C ratio. The aimed was to find out how much revenue was obtained from each IDR spent on production costs [10]. The condition of nucleus farmers in TSTP and plasma farmers outside TSTP requires an economic approach, which in calculations was very different. Assumptions for the cost of purchasing breeding stock, feeder, feed, labor can be calculated based on the time of the business year.

3. Results and discussion

3.1. Regional support power

Cikajang Sub district at Garut Regency has a good geographical location, and is strategically in the main capital for developing various types of vegetables and sheep farming. The carrying capacity of most of the land in Cikajang was for agriculture, especially horticultural crops and vegetables, as the biggest livelihood for residents. The area of Cikajang was 2.144 ha, population in the end of 2016 was 83.078 people with the number of family was 23.824 households. Almost all of the farmers and others people called farmers have Garut sheep and they used agricultural waste as feed for sheep. Priorities developed at TSTP Garut Cikajang besides sheep were also horticultural crops which include potato, and arrowroot. The output target that has been achieved by TSTP Garut was export quality horticulture potato seed with a grade for making potato chips [11].

Garut sheep are divided into 2 types based on their uses, namely the Garut Sheep type of Pidangan (art/fight) and the type of meat for general consumption. The reason for farmers in running a livestock business was a hereditary business. The application of technology was strongly influenced by various factors which was priority to increase the ability of farmers to analyze their business. The business carried out has a positive impact on the welfare of their lives, so the technology offered will be immediately welcome by farmers.

3.2. The role of TSTP Garut

The role of IRIAP was the Technical Implementing Unit of the Agricultural Research and Development Agency in Ministry of Agriculture which was responsible for the progress of the TSTP. The effort made by the Ministry of Agriculture was to develop a leading prime commodity production center, which was integrated with the TSTP development model, including product marketing [12]. Garut TSTP is an investment of local government that needs to be considered for its existence, because TSTP can create economic value for the surrounding community, both participating in Garut TSTP and outside Garut TSTP.

The Competitiveness will increase if human resources have science and technology (IPTEK) that can be utilized and applied in farmers’ activities and production processes. The technology of the invention must be disseminated, adopted and applied by the production sector to produce products with higher economic value, especially for farming communities. Technology has been produced and developed by IRIAP and Universities. The success of a business using technology and cultivation of agriculture and animal husbandry can be judged by the profitability of its human resource capabilities.
3.3. Development of livestock technology innovation

Research and assessment activities in the dissemination and development of innovations in animal husbandry technology and introduction of superior livestock were carried out in stages in accordance with the readiness of the breeder groups. Various components of livestock business as well as several technological components have been introduced and practiced to cooperative farmers in the TSTP and surrounding areas. The institutional model developed at each TSTP developed well, because it received support from farmers and farmers' groups, as well as from Central/Regional Government Institutions and Universities. The support was to develop agricultural and livestock areas in an integrated and agribusiness oriented manner. The implementation of the strength evaluation and prospects for Garut TSTP business development in each business activity was very strong. Nucleus farmers in TSTP and plasma farmers in outside TSTP Garut, have the ability to have a good sheep business.

Obtaining facilities for the sheep business greatly supports the economic growth of the farming community. The results of the evaluation in each activity, TSTP Garut can be identified into two clusters. The first cluster was as an information center for agricultural and livestock knowledge and technology, to facilitate regional economic development, especially farmers. The second cluster is the center of acceleration in the dissemination of knowledge and technology in Garut sheep. The suitability of the agriculture - ecosystem in the Garut TSTP area is very supportive with the availability of new and superior knowledge and technology.

3.4. Sheep business management

Training activities of farmers groups in TSTP Garut in developing food crops and sheep businesses can be seen in table 1.

| Training activities                                      | Number of participants | In discipline                           |
|-----------------------------------------------------------|------------------------|-----------------------------------------|
| Training of potato cultivation practices                  | 40±0.28                | Cultivation                             |
| Training of milk processing                               | 40±0.28                | Pasteurization etc                       |
| Training on the cultivation of carrot plants              | 30±0.34                | Cultivation                             |
| Cultivation training for citrus plants                    | 22±0.12                | Cultivation                             |
| Training for cultivation of feed plants                   | 25±0.17                | Cultivation                             |
| Training of formulating, processing and feeding sheep feed| 50±0.67                | Sheep farming practice                   |
| Training on standardization of Garut sheep                | 50±0.67                | Sheep farming practice                   |
| IT-based agricultural training                            | 58±0.72                | Sheep farming practice                   |
| Training on mozzarella cheese processing                  | 42±0.33                | Mozzarella cheese                       |
| Training of breeding on crops and sheep practices         | 50±0.67                | Crops breeding and sheep breeding practices |
| Training of entrepreneurship on crops and sheep           | 22±0.12                | Crops and sheep farming practices        |
| Total number of participants                              | 429±3.55               |                                         |

Garut sheep raised by nucleus farmers in Garut TSTP and plasma farmers outside Garut TSTP which were almost all properly housed and apply a group marriage system. Some farmers have prepared livestock sometimes to mate separately and do not need the help of experienced farmers. Initially livestock were held individually, last observations were carried out by farmers and sheep
breeding was carried out with the help of other farmers. Sheep marriage in TSTP has been carried out by changing individual cages into group cages, where in one group consists of 5–6 female sheep with 1 male for 2 estrous cycles. While in farmers outside of TSTP there were still many who use the individual housing of 1 female and 1 male.

Efforts to optimize the performance of TSTP required support from mentoring and escort activities from various institutions including IRIAP. Where IRIAP played a role in escorting and assisting animal husbandry technology in accordance with its duties and functions. The application of animal husbandry technology innovation becomes the nucleus business in TSTP and farmers, prospective entrepreneurs, and other stakeholders [14]. The development of technological innovation can be done in and outside the TSTP area nucleus farmers and plasma farmers in sheep business, providing cut and carry forage feed from the field and waste from surrounding agricultural products in the TSTP area.

3.5. Characteristics of the nucleus farmers and plasma farmers at TSTP Garut

The population development of Garut sheep in the plasma farmer group is shown in table 2.

| No | Group name               | Number of farmers | Number of sheep Male | Female | Total number of sheep |
|----|--------------------------|-------------------|----------------------|--------|-----------------------|
| 1  | KDI                      | 6                 | 1                    | 22     | 23                    |
| 2  | Familty                  | 5                 | 4                    | 50     | 54                    |
| 3  | Putra harapan -1         | 3                 | 6                    | 36     | 42                    |
| 4  | Putra harapan -2         | 1                 | 65                   | 0      | 65                    |
|    | Sub - total number       | 15                | 76                   | 108    | 184                   |

Development in 2016

| No | Group name               | Number of farmers | Number of sheep Male | Female | Total number of sheep |
|----|--------------------------|-------------------|----------------------|--------|-----------------------|
| 1  | KDI                      | 5                 | 9                    | 21     | 30                    |
| 2  | Familty                  | 0                 | 1                    | -18    | -17                   |
| 3  | Putra Harapan -1         | 4                 | 7                    | 1      | 8                     |
| 4  | Hittda Mandiri           | 2                 | 6                    | 19     | 25                    |
| 5  | Bangkit                  | 1                 | 4                    | 3      | 7                     |
| 6  | Bukti Tani Jando         | 1                 | 2                    | 8      | 10                    |
| 7  | Hikmah Usaha Tani        | 1                 | 1                    | 3      | 4                     |
| 8  | Muncul Jaya              | 1                 | 0                    | 2      | 2                     |
|    | Sub - total number       | 15                | 30                   | 39     | 69                    |

Development in 2017

| No | Group name               | Number of farmers | Number of sheep Male | Female | Total number of sheep |
|----|--------------------------|-------------------|----------------------|--------|-----------------------|
| 1  | KDI                      | 5                 | 10                   | 43     | 53                    |
| 2  | Familty                  | 5                 | 5                    | 32     | 37                    |
| 3  | Putra Harapan -1         | 4                 | 13                   | 37     | 50                    |
| 4  | Hittda Mandiri           | 2                 | 6                    | 19     | 25                    |
| 5  | Bangkit                  | 1                 | 4                    | 3      | 7                     |
| 6  | Bukti Tani Jando         | 1                 | 2                    | 8      | 10                    |
| 7  | Hikmah Usaha Tani        | 1                 | 1                    | 3      | 4                     |
| 8  | Muncul Jaya              | 1                 | 0                    | 2      | 2                     |
|    | Sub - total number       | 20                | 41                   | 147    | 188                   |

The experience of farmers in the sheep business was between 10–22 years on average. The Garut sheep livestock that were managed were quite varied in age, the nucleus farmers at TSTP Garut Cikajang kept 119 heads consisting of 108 females and 11 males, while in the plasma farmers outside TSTP Garut Cikajang as many as 203 heads with 169 females and 34 males. The variety of yields...
obtained by both the nucleus farmers and plasma farmers was the result of livestock production and manure. The selection of technology components in TSTP Garut was in accordance with the needs of plasma breeder groups. The application of technology was carried out in mid-2015, so that the results of the study obtained from TSTP Garut in 2017. The assessment in dissemination and development of livestock innovation and superior livestock technology from IRIAP has been carried out in stages.

Technological innovation needed for Garut sheep livestock business, was very simple, and depended on the capital capacity of farmers [15]. Business priority for the people of Garut Regency apart from food crop business was sheep farming. Activities had been carried out by IRIAP and TSTP Garut in 2016–2017, through research and technology assistance in sheep farming and at the same time introducing for the development of sheep. Technology assistance through training in formulation, processing and feeding, good farming practices, cultivation of animal feed plants and sheep business.

Table 2 showed the development of the number of Garut sheep (head), which was disseminated in the plasma farmers group, was seen to be varied with varying ages in males and females and there was an increase of 4 head in 2 years.

At the beginning in 2015, the number of Garut sheep managed was 184 heads, in 2016, it decreased to 69 heads and in 2017 it increased again to 188 heads. However, the confidence of plasma farmers increased from 4 groups to 8 groups. The increase in the number of sheep did not show a significant increase, but it did not affect the maintenance of Garut sheep in other farms.

### 3.6. Dynamics and institutional support

The criteria for the financial feasibility aspect of the Garut sheep business at the nucleus farmers in the Garut TSTP and plasma farmers outside the Garut TSTP, were businesses that need support from government institutions and private sectors. Technically at TSTP Garut, sheep business has a strategic location, which was not far from the city and not affected by urban areas. The facilities and infrastructure were very supportive for the development of the Garut sheep business and facilitate business operations. Management aspects, the sheep business was feasible to run because the organizational structure of TSTP Garut was quite clear and job descriptions were carried out in accordance with their respective responsibilities. In the legal aspect, the livestock business at TSTP Garut and outside TSTP Garut already has a business permit from the surrounding community and from the Services Offices of Agriculture, Livestock and Fisheries in Garut Regency. The local government has provided guarantees for the smooth running of Garut sheep business activities.

In social and economic aspects, the sheep business was feasible to run. The business can absorb labor from the surrounding community thereby reducing unemployment and increasing farmers' income. In environmental aspects, sheep business was feasible to run because the waste generated in the form of livestock manure did not cause odor, every day the cage was always cleaned by the breeder. The manure was collected as manure and returned to the farm. Garut sheep are livestock that are easy to rear and also have the potential to be developed to increase the farmer's family income. In line with the national livestock development program to achieve food security from livestock based on local resources, the Government continues to strive consistently [16]. The output for the livestock sector was a certified Garut sheep breeding center. In line with the economic growth, efforts were continuously made for the economy to increase. Sheep and goat farming can be used as an alternative as a key of new economic growth for farmers [12].

### 3.7. Market opportunities of Garut sheep

Socially and economically in the Cikajang Subdistrict, Garut Regency, the dynamics of the community were almost 70% of the food crop business and Garut sheep. Current opportunities for the sheep market were quite supportive, if seen from a sufficiently increasing demand for meat. Sheep business was usually used as a short-term savings business for farmers. Periodically, sheep have a fairly high market demand, when it came to the Qurban or Eid Al-Adha during the Eid Hajj season and other days such as aqeqah. During the sacrificial season the price of sheep was quite high and the time was right for the farmers to sell their sheep.
The sheep market has a regular cycle, so that it was easily used as a consideration for local government policies to develop sheep livestock [17]. The livestock sector has a very strategic role, in an effort to make ends meet, absorb labor, increase the income of farmers [18]. Market opportunities and demand for sheep were quite large, customers usually come directly from Bandung, Jakarta, Bogor, Tangerang and Bekasi on a regular basis. Sheep and goats have a very promising global market segment in Asia, Africa and the Pacific [14]. The sheep market was still quite open to countries in Southeast Asia itself, such as Brunei Darussalam, Malaysia, and Singapore [19]. The characteristics of Garut sheep were in their fast growth, good body weight and posture, and their productivity was quite high (generally they gave birth to 2–3 kids in one pregnancy which three times per two years [20]. Garut sheep can be a top priority for development, because it was supported with the strong traffic of products and services between regions and countries in the era of globalization, TSTP Garut as an invention and can also encourage the birth of new products, which improved the quality of products that can be improved through international markets (exports).

3.8. Details of sheep business costs at nucleus and plasma farmers

The technical and economic aspects of the Garut sheep business can be calculated through the number of livestock kept and the number of livestock sold. The farmer profit was calculated based on the initial capital of the business, the number of livestock raised, the price and the number of livestock sold, based on a calculation for one year [10]. The calculation of the business of raising sheep for nucleus farmers in TSTP and plasma farmers in outside TSTP was based on the purchase value of sheep and other production costs as initial capital. Depreciation of pens and equipment sometimes be assumed to be part of the production costs of a sheep business. The cages that were made at the nucleus farmers in the Garut TSTP at the cost of the Government were the inventory for the Garut TSTP or the Garut Regency Government, while the cages made by plasma farmers were at the expense of the farmers themselves.

Based on the price of livestock per head, the total value of the livestock can be calculated as the initial capital of the business. The seed value of Garut sheep consisted of productive females in the form of heifers ready for pregnancy, breeding ewes who have given birth at list once, adult males who were not used as breeding rams kept for fattening and young males who were ready to be used as breeding rams. The cost of raising sheep was carried out by means of a continuous cage system, so that the farmers became business actors. The farmers work at any time to look for grass, clean stables and sell livestock at any time. The calculation can be converted into a year's fee. The value for production costs can be assumed and adjusted to the number of sheep raised by each farmer.

3.9. Business production costs of Garut sheep at the nucleus farmers

The assumed cost of making a cage for TSTP Garut nucleus farmers can be assessed as 1 unit of IDR 8,000,000/unit (±22 m²), as an investment for the following five years which depreciation cost for the cage was IDR 1,600,000/year. The cost of the cage equipment was IDR 500,000/package/year. Depreciation cost for cage equipment/year was IDR 41,666/year. Total depreciation expense of IDR 1,641,666/year. The cost of purchasing medicines was IDR 100,000,-/package/year.

Labor costs for nucleus farmers at TSTP Garut, as many as 2 people x IDR 15,000,-/day x year amounting to IDR 10,950,000,-/year. The cost of purchasing 4 breeding heifers that aged 8 months with an average price of IDR 800,000/ head of IDR 3,200,000. The cost of purchasing the breeding ewes Garut sheep with an average age of 2-3 years was 4 with an average price of IDR 1,200,000/head or IDR 4,800,000. The average age of young males aged 7.6–8.2 months was 5 heads with an average price of IDR 900,000/head or IDR 4,500,000. The cost of purchasing three breeding rams of Garut sheep aged 2.2 years which price of IDR 2,700,000/head or IDR 8,100,000. The total production cost was IDR 31,650,000/year. Total depreciation costs and production costs amounted to IDR 33,291,666.

3.10. Income

The proceeds from the sale of two breeding heifer aged 1.8 years with an average price of IDR
2,150,000/head or IDR 4,300,000. The results of sales three heads of Garut breeding ewes with an average age of 3.2 years which have price of IDR 2,150,000/head or IDR 6,450,000. The results of the sale of male and female kids with an average age of 5 to 7 months with an average price of IDR 820,000/head or IDR 4,100,000. The results of the sale of adult male Garut sheep were average age of 1.6 years was 3 head with an average price of IDR 3,750,000/head or IDR 8,400,000. The results of the sale of adult male and female Garut sheep as meat with an average age between 3–4 years with an average price of IDR 3,500,000/head or IDR 10,500,000. Total gross income of IDR 36,600,000. Total net income was IDR 3,308,334 with an R/C of 1.09.

3.11. Business production costs for the Garut sheep at plasma farmers.
The cost of making a cage for plasma farmers at outside the Garut TSTP was IDR 2,000,000/unit (±8 m²) and depreciation cost of the cage was IDR 400,000/year. The cost of cage equipment was IDR 130,000/year and equipment depreciation cost of IDR 10,833/year. The total depreciation expenses was IDR 410,833/year.

The cost of purchasing medicines was IDR 80,000/package/year. The cost of purchasing feed was assumed to be included in the farmer's workforce and was calculated based on 1 person x IDR 15,000/day x year of IDR 7,300,000/year. The cost for buying two head of breeding heifer Garut sheep with an average age of 7-8 months which was with an average price of IDR 800,000/head was IDR 1,600,000. So, the average age between 1.5–2.5 years was 2 heads with an average price of IDR 1,250,000/head or IDR 2,500,000. The cost of purchasing 2 young male Garut sheep with an average age between 7-8 months was 2 with an average price of IDR 1,100,000 or IDR 2,200,000. The cost of purchasing breeding ram of Garut sheep with average age between 2.5–3 years was 1 head at a price of IDR 2,750,000. The total production cost was IDR 9,860,000. Total depreciation costs and production costs were amounted to IDR 10,270,833.

3.12. Income
The proceeds from the sale of two breeding heifers with an average age of 1.2 years with an average price of IDR 2,150,000/head were IDR 4,300,000. The results of sales of one young male and one heifer with an average age of 3–5 months have an average price of IDR 700,000/head or IDR 1,400,000. The proceed from the sale of 1 head of female Garut sheep aged 2.5 years was at a price of IDR 2,100,000. The result of sale one productive male Garut sheep with an age of 1.8 years was IDR 3,500,000. The total gross income was IDR 11,300,000/year. Total net income was IDR 1,029,167 with an R/C of 1.01. The analysis of business income for Garut sheep in nucleus farmers and plasma farmers was shown in table 3.

| Description                          | Nucleus farmer (Amount/IDR) | Plasma farmer (Amount/IDR) |
|--------------------------------------|-----------------------------|----------------------------|
| Cost of depreciation and production/ year | 33,291,666                  | 10,270,833                 |
| Gross income/year                    | 36,600,000                  | 11,300,000                 |
| Net income/year                      | 3,308,334                   | 1,029,167                  |
| R/C                                  | 1.09                        | 1.01                       |

Data in table 3 showed that, based on the economic value of the Garut sheep business in Garut TSTP, nucleus farmers with raising >15 heads consisting of adult females and heifers and adult males and young males get a net profit of IDR 3,38,334/year with a value of R/C amounting to 1.09. Plasma farmers with maintaining >8 heads consisting of heifers, adult males and young males got a net profit of IDR 1,029,167/year with an R/C ratio of 1.01. The value of R/C in each business shows >1 means that the Garut sheep business can be continued. Nuclear farmers and plasma farmers that, feed was assumed to be in the workforce of farmers, so that the farmer's profit was obtained from the labor value calculated based on 1 year of business. The business of fattening male Garut sheep using a scale of 20 heads, farmers get a profit of IDR 4,150,560/ for a period of 4 months with an R/C ratio of 1.41.
The [22] stated that in the sheep business, farmers never calculated labor costs, because it was considered their own business. The assumption of the purchase value of livestock and the value of the sale of livestock can be balanced based on the amount of livestock production sold and the price of livestock. Livestock prices can be adjusted to the conditions of Garut sheep both at the core farmers at the Garut TSTP and in plasma farmers outside the Garut TSTP. The profits obtained by nucleus farmers and plasma farmers are not much different, as evidenced by several assumptions about the buying and selling value of sheep, which can be balanced with production costs.

4. Conclusion
The criteria for the financial feasibility aspect of the Garut sheep business at the nucleus farmers in the Garut TSTP and plasma farmers outside the Garut TSTP, were businesses that still need support from government institutions. The results of the feasibility analysis of Garut sheep business, nucleus farmers get a net profit of IDR 1,608,334/year with an R/C value of 1.09. Plasma farmers with maintenance >8 heads, young females and young males and adult males received a net profit of IDR 3,308,334/year with an R/C ratio of 1.01. The value of R/C in each business shows >1 means that the Garut sheep business can be continued.

It was evident from several assumptions that the buying and selling value of sheep were very balanced with the production costs. Nucleus farmers and plasma farmers production costs for feed were assumed to be in the workforce of farmers.

The farmer's profit can be obtained from the labor value, which was calculated on a one-year basis. TSTP Garut in terms of social and economic aspects, Garut sheep business both in the nucleus farmers and in plasma farmers were feasible to maintain their business.

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