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Abstract. An integrated farming system is an effort to utilize all potential energy so that it can be harvested in a balanced manner. The problems of partners in the field of livestock, fisheries and agriculture are that they have not utilized the yard and family labor and there is no touch of technology in improving animal feed, therefore the solution taken in partner villages is to utilize large yards by raising ducks, cultivating Azolla and breeding fish. PT Semen Bosowa in collaboration with Universitas Hasanuddin carried out community service activities in Baruga village in Bantimurung district, Maros regency, South Sulawesi province. The application of the animal husbandry sector in a sustainable agricultural system was the procurement of duck seeds, production of duck eggs and salted eggs. Integration of crops, livestock and fish using Azolla plants as an alternative feed for ducks, fish and fertilizer. The research concluded that the application of integrated farming systems between plants and livestock increased the income of farmers-breeders, reduced the risk of crop failure due to dependence on one commodity and can be in harmony with nature, easy to be implemented because it used local resources and most importantly was acceptable to the community.

1. Introduction

Integrated Farming System is a combined system of agricultural, livestock, fishery, forestry and other sciences related to agriculture in one land. In essence, integrated agriculture is an effort to utilize all the potential energy so that it can be harvested in a balanced manner. Sectors in integrated farming will make any area have a complete ecosystem and all components of its production will not produce waste, because it can be utilized by other components. Also, increased production yields and production cost savings can be achieved. Another advantage of the Integrated Agricultural System is that farmers can have multiple sources of income and are environmentally friendly. According to Kariyasa (2005), environmentally agriculture is an agricultural system that manages all resources wisely, based on technological innovation to achieve sustainable productivity increases [1]. Added by Soesanto (2003), that environmentally agriculture is an agricultural activity that is ecologically appropriate, economically profitable, socially acceptable and capable of preserving environmental natural resources [2].

Community service activities in the DIKTI Regional Partnership Program were carried out in Baruga village in Bantimurung district, Maros regency, South Sulawesi province, a village that had an impact on the Bosowa cement factory, therefore PT Semen Bosowa in collaboration with Universitas Hasanuddin paid special attention to improving community welfare in this village. To achieve this target,

an integrated farming system model is applied which can be developed for both limited agricultural land and large areas. On the limited or narrow land owned by breeders in Baruga village, this concept is very appropriate to be developed with a land intensification pattern between Azollah plants, laying ducks and fish farming. The final goal of this activity is to utilize an integrated farming system to improve land, human and environmental resources to increase the productivity of livestock, fisheries and community welfare.

In recent years, the need for animal protein from commodities of duck meat and eggs is on the rise and is in demand by the public. Not a few segments in duck farming can be used as a source of income, that is, cultivation of laying ducks for consumption eggs and hatching eggs, broiler ducks. Of the three types of business, the laying duck business is one of the most popular. There are many products that we can take from this business such as eggs, salted egg production, rejected duck meat, and manure. Breeding ducks can also be used as a means of community empowerment because they can be run with limited capital and relatively easy breeding techniques. The chances of success are also quite large because these animals are relatively resistant to various diseases which are often a problem for other poultry breeders.

Determining factors for the success of laying duck farming is the provision of quality feed. There are various types of ready-to-eat feed available which can be easily found in stores selling animal feed. This ready-to-consume feed has gone through precise calculations so that its nutritional value has been calculated properly according to livestock needs. Unfortunately, the price of laying duck feed sold in the market is quite expensive so it is not suitable for use by small scale breeders who are just starting their business. Therefore, it is necessary to find an alternative feed which can be made by themself so that the cost of feed can be reduced. Azolla plants are a priority for duck feed because of their high protein content and easy reproduction. The integrated system between Azolla, duck and fish is an integrated farming system that can provide great benefits, because of the use of Azolla as feed for ducks and fish, while for Azolla cultivation, livestock manure is needed so that Azolla can be developed.

The objective of this research was to know the impact of the integrated farming system of Azolla plants, duck and fish on the income of farmers groups, whether reducing the risk or not, in harmony with nature or not, whether using local resources or not and whether acceptable or not.

2. Research method

Community service activities carried out in Baruga village, Bantimurung district, Maros regency are activities that aim to help farmer-livestock group partners in overcoming the problems they face. Partner problems that are a source of priority problems to be addressed include agriculture, livestock and fisheries, all of which aim to improve the quality of life from pre-prosperous to prosperous. According to data from the Maros regency, Bantimurung district still has families that have not been able to meet minimum basic needs so that it is declared a district with a high poverty rate. The problems of partners in the field of animal husbandry, fisheries and agriculture are that they have not utilized the yard and family labor including the wife and children of the farming family and there is no touch of technology in improving animal feed, therefore the solution taken in partner villages is to utilize a large yardby raising ducks, cultivating Azolla and raising fish.

Livestock: the livestock sector in a sustainable agricultural system has three output targets, namely giving duck seeds, duck egg production and salted egg production. The method applied to achieve the output target of providing duck seed assistance is PRA/RRA, which is a way of learning with the community. Methods for realizing an independent society, placing the community as researchers, planners, implementers, as well as evaluators in development programs. The PRA/RRA is built on recognition and belief in the value and relevance of knowledge, experience, and people's ability to solve their problems [3] and [4].

The target output for the production of duck eggs and salted eggs used a group approach method with a participatory learning pattern, learning methods using learning by doing, presentations, discussions, demonstration plots, field schools (SL), models, markets, simulations. All were mixed into a multi-combination of effective methods and included counselling, exercises and visiting. Activities aimed to

increase motivation to excite breeders in implementing better farming activities, to increase productivity and income [5], field school education (SL), demonstration plots, mentoring and mentoring, learning by doing [6].

Plants: the agricultural sector in this integrated farming model was Azolla plant cultivation, which aimed to cultivate Azolla plants to feed ducks and fish. This program uses the PRA/RRA method [4] and [3].

Fish: the fishery sector in this program was fish and shrimp cultivation to utilize the farmers' yards in Baruga village, which was a pond area. The method applied was PRA /RRA [4], [3] and the learning method used learning by doing [6].

3. Results and discussion

The PKW-CSR program which was carried out in Baruga village, Bantimurung district, Maros regency, South Sulawesi province, was an activity designed to solve problems faced by livestock farmer groups. Most of the problems faced by group members were that they have not been able to meet the basic needs of their family, so they were categorized as underprivileged families. On the other hand, their yards have not been fully utilized, therefore the activities carried out were the concept of integrated farming. The integrated farming system was a combined system of agricultural, livestock and fishery activities in one land. In table 1, it can be seen the application of an integrated farming system in the fields of animal husbandry, fisheries and agriculture, the work methods used and the products produced in Baruga village, Bantimurung district, Maros regency.

The field of animal husbandry in a sustainable farming system was the assistance of duck seedlings, production of duck eggs and salted eggs. Duck seed assistance was given to the type of farmer group that has a cage and able to breed ducks properly. There were three benefits obtained by breeders from the assistance of seedlings, namely: 1) they were able to hatch the eggs they produced themselves, produce good eggs, in the form of DOD and then sold the DOD to other breeders, 2) the farmers were able to produce eggs for consumption. Besides producing eggs, they also get by-products in the form of rejected ducks which can be sold as broiler ducks, 3) farmers processed the eggs they get into salted eggs. The method applied in the field of laying duck farming was PRA /RRA. This method was used to create an independent society, placing the community as researchers, planners, implementers, as well as evaluators in development programs. Other benefits of raising ducks in the form of consumption of eggs and salted egg production were taught by providing training, counselling, making demonstration plots, and providing guidance and assistance in raising ducks.

The integration of plants, livestock and fish in a sustainable integrated farming system in the Bantimurung district used the Azolla plant as an alternative feed for ducks, fish and fertilizers. Azolla plants were easy to cultivate and did not require large areas, their growth was very fast in 3-4 days, which can be double the previous amount. In the community service program implemented in Baruga village, Azolla was used to meet the protein needs of ducks and fish. According to Djojosuwito (2000), Azolla was very rich in protein, essential amino acids, vitamins and minerals [9]. Based on dry weight, it contained 25-35% protein, 10-15% minerals and 7-10% amino acids, bioactive compounds and biopolymers. From the research results, it was found that the ducks that were given Azolla in their feed produced bigger eggs. The high protein content in the feed increased the protein in egg whites and yolks [10]. The use of Azolla as fish feed was also carried out in this CSR-regional partnership program, while the results obtained were that tilapia that consume Azolla grew faster than fish seeds that did not consume Azolla. This was because the Azolla plant contained complete essential amino acids so it was very good for fish growth.

Table 1. Application of integrated farming system in agriculture, livestock and fisheries in Baruga village, Bantimurung district, Maros regency, South Sulawesi.

Field	Method	The Resulting Products
Animal Husbandry	PRA /RRA [3, 4]	Production of duck seeds/ Day Old Duck (DOD)
Animal Husbandry	A group approach with a participatory learning pattern	Production of consumption duck eggs
Animal Husbandry	Field school education (SL) [7], demonstration plot [8], mentoring and mentoring, learning by doing [6]	Salted Egg Production
Animal Husbandry	The learning method used learning by doing [6]	high-quality cow feed from agricultural waste (rice straw) with the addition of a multi-nutrient lick
Fishery	PRA/RRA [3,6].	Tilapia fish production and Production tilapia fish seeds
Fishery	The learning method used learning by doing [6].	Vaname shrimp production
Agriculture	Field school (SL), model, market, simulation.	Cultivate Azolla plants for fish and duck feed
Agriculture	PRA /RRA [3,4].	Produces vegetable and medicinal plants
Education/ Improvement of Human Resources	Field school education (SL) [7], demonstration plot [8], mentoring and mentoring, learning by doing [6]	Cultivation of ducks, shrimp, Azolla and vegetable and medicinal plant nurseries
Education/ Improvement of Human Resources	The methods used were lectures, PRA/RRA, discussions, questions and answers, visits, courses, comparative studies, demonstration plots, mentoring and guidance as well as learning by doing	Demonstration plots for livestock, fisheries and agriculture
Economy	The methods used were lectures, PRA/RRA, discussions, questions and answers, visits and comparative studies. Next, hold a meeting to form UMKM cooperatives	Establishment of UMKM
Economy	The methods used were lectures, PPA/RRA, discussions, questions and answers, visits, pictures/examples, demonstration plots	Establishment of business centres to market community products

Duck farming activities produced waste that was not small in quantity, but it gave benefits to farmers because it was processed into organic fertilizer. Duck manure was also used as fertilizer which was added to the Azolla growing media pond. Through an integrated system, it was useful for efficient land use, optimization of production, utilization of waste, cross-subsidies for sustainable production. Cultivated Azolla plants were also used as compost because they had a C/N ratio of 12–18. So, composting can be completed fastly and can be directly fed to the planting medium as green fertilizer.

4. Conclusion

The integrated farming system program between plants and livestock in Baruga village was able to increase the income of farmers-breeders, reduced the risk of crop failure because of dependence on one commodity and integrated agriculture that was implemented can be in harmony with nature, easy to be implemented, and most importantly was acceptable to Bantimurung village, Maros regency, South Sulawesi province.

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