Agroecology-based Alipbata Program in Pantai Bahagia Village

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Abstract. The environmental damage that occurred in Pantai Bahagia Village, Muara Gembong Sub-district, impacted the lives of the local community. So that the damage does not continue to occur, there must be a change in the system through Agroecology. This study aims to analyze the process of the Alipbata program activities and analyze the economic, social, and ecological impacts of the Alipbata program for the community in Pantai Bahagia Village. The research method uses a qualitative case study type. Interviews, documentation, and participant observation are used as data collection instruments. Alipbata applies agroecology using social capital with a Collaborative Learning strategy with Group Awareness Tools. The tourism awareness group is in charge of promoting and running ecotourism, whereas the farmer group is in charge of producing mangrove seedlings to be planted and sold. The impact on the social aspect is the formation of tourism awareness groups and farmer groups who become actors and influencers for the local community. From the economic aspect, farmer groups earn income from mangrove ecosystem commodities (tree seeds and various types of fish), whereas from the ecological aspect, restoration has returned the mangrove ecosystem to its original condition.

1. Introduction

Agriculture is a sector that is very inherent in human life. The main problem of the current agricultural industry today is the era of the green revolution system that puts forward economic and social values by encouraging high production yields. This agricultural system has a bad impact on ecological conditions, resulting in a decrease in soil quality and agricultural productivity [1][2]. This raises questions about the sustainability of the agricultural industry in the future. The concept of agroecology is applied in order to realize a sustainable agricultural industry [3]. In its application, it has a good impact on the sustainability of agricultural production, ecology, farmer welfare, increasing accessibility, and agricultural innovation [4][5]. Natural resources and agricultural production are two things that are closely related, such as in mangroves. Mangroves can directly be a source of food because they can be processed into food or indirectly, where fish and shrimp nest [6]. Pantai Bahagia Village, Muara Gembong sub-district is one of the areas that depend on mangroves. When viewed from the mangrove forest area, it reaches 35% of the area of Pantai Bahagia Village [7]. According to the satellite image
analysis, the area of Pantai Bahagia village which was flooded by tidal flooding was 1045.81 ha or 35.46% of the total area. From this data, only less than 65% of the area can be utilized and includes main roads, settlements, mangrove forests, and public facilities [8]. According to Perhutani's initial data collection, the mangrove area in Muaragembong reached 10,480 ha and 95% was damaged [9]. The existence of mangrove forests in the area makes fish and shrimp resources abundant. Tiger prawns, pond fish and marine fish are the mainstay of the community to be used as a source of their income [10]. Communities also use mangrove forests as a place for agro-tourism to increase their income. These various potentials must be preserved and their functions are protected from human-caused damage [11].

Capture fisheries and ponds are the main sources of income for the community of Pantai Bahagia village and have made this village known as a producer of fish, and shrimp [12]. In accordance with the products produced, Pantai Bahagia village has a pond area of 2,723 ha [13]. Slowly, the abundance of fishery products began to decline due to sea abrasion which damaged the ponds so that they became unproductive. According to data from 1999 - 2014 sea abrasion in Pantai Bahagia village reached 1269.5, accounting for almost half of the pond area. This can happen due to many practices of land conversion from mangrove forests into fish ponds. Making the village area of Pantai Bahagia does not have a barrier of waves and salt water [14]. In addition, Muaragembong is inhabited by various types of fish, the most fish populations are from Sciaenidae, Leiognathidae, and Ariidae species reaching 35% of the life in the area around the mangroves.

The community of Pantai Bahagia have felt the ecological impact of the mangrove forests destruction namely sea abrasion which inundated the production area of ponds, settlements, and public facilities [15]. The community experienced a decrease in income and fish production by 10 - 13 kg per day. This has happened continuously since 2011. This product is very small because there is no natural recovery of fish resources and the environment is also damaged [15]. The decline in fishpond and marine yields causes social pressure as a result of reduced incomes in rural communities [16].

Currently, the community has felt the impact of environmental damage to the mangrove forest and has taken action to share responsibility together. The community also takes various ways to keep the ecosystem in the mangrove forest awake, one of which is reprimanding people who cut down or hunt animals [17]. Farmer groups and tourism awareness “Alipbata” are formed from people who have started to care about the environment. It was officially formed by the Bekasi district tourism office in 2016 [18]. This group started mangrove forest restoration activities with other conceptualized ideas. The Alibata group came up with the idea of a mangrove forest ecosystem area that also preserves and increases income for the community [18]. This can be studied further about the benefits of farmer groups and tourism awareness "Alipbata". The researcher uses the principles of agroecology, namely social, economic, and ecological to analyze [19]. This study aims to 1) analyze the methods and processes of the Alipbata program activities that have been carried out in Pantai Bahagia village and 2) analyze the economic, social, and ecological impacts of Alipbata activities in accordance with agroecological principles.

2. Method

This research took place during July 2021 in Muaragembong District, Bekasi Regency. Qualitative method was chosen to gain the necessary understanding of human experience from a naturalistic and interpretive perspective [20]. The process of collecting data in this study were interviews, participant observation, and documentation. Informants consist of; the village government (Pak Ahmad Qutuby), the village community (Pak Asep), and the "Alipbata" farmer group. The data that has been collected will be analyzed using the analysis technique of Miles & Huberman (1992) with the flow of ; data
reduction, presentation, and concluding the data [21]. Validation by triangulation through information from the literature, observations, and interviews.

3. Results and discussion

3.1. Alipbata Program: tourism awareness group and mangrove farmer group

A tourism awareness group and a mangrove farmer group were formed in 2014 and were nurtured from the start by environmentalist organizations from outside of Muara Gembong. Farmers and the Alipbata group consist of Pantai Bahagia Villagers from various professions ranging from farmers, aquaculture workers, teachers, fishermen, traders, and village government. This group is supported by the local community as one of the joint efforts to restore the mangrove ecosystem [17]. The main task of the Alipbata tourism awareness group is to promote and run ecotourism, while the farmer groups produce mangrove seedlings to be planted and sold. Together, the two of them educate the community to reforest mangrove forests and keep them from being destroyed again.

Alipbata in its activities prioritizes ecosystem improvement because from the beginning, since its formation, it has been aimed at restoring mangrove forests. In achieving this goal, Alipbata conducted a mangrove tree nursery with farmers and planted it with the community and visitors who came to Pantai Bahagia village. In addition, Alipbata empowers the community so that they can use mangroves to be processed into various products of sale value. This is done so that the community will no longer cut down mangrove trees in the future. According to Alipbata member Mr. Sugianto "We did various explanations about the benefits of mangroves as well as educating the community and most importantly providing examples and results so that community are motivated". This has produced good results where the community has new income, namely from mangroves processing. This system establishes sustainable agriculture without destroying the mangrove forest habitat. If look at the activities and core objectives of Alipbata, it can be compared with one of the three types of agroecological meanings, namely "movement" which aims to (i) rural development, (ii) environment and (iii) sustainable agriculture [22]. So that it can be interpreted that Alipbata indirectly uses "Agroecology social movement" in carrying out activities and determining its goals.

In the process of community activities, the explanations that have been obtained from Alipbata, they use "Collaborative Learning with Group Awareness Tools" as a strategy to invite the community. This concept was introduced by Lenka Schnaubert by combining the concepts of collaborative learning and Group Awareness [23]. This concept is in accordance with what Alipbata did in making people aware of the importance of reforesting mangroves. Alipbata raises awareness by one way of getting people to see the results by proving it first. It is as Mr. Sonhaji “if the community is willing to follow suit and realize that what they need can be fulfilled, then first must prove that mangroves are not harmful but profitable”. In the concept of Collaborative Learning with Group Awareness Tools, it is explained that if it is explained specifically and is related to the needs of the community so that they are willing to process information. In addition, if you look at the collaborative side, the community is also invited to participate in reforesting the mangrove forest by participating in planting and making seeds. This is also included in this concept, namely making the community as a stakeholder, not just a recipient of information [23]. Hearing from Mr. Asep said that "how people don't cut down trees anymore, they even remind each other, there are many community who process mangroves into products". Gives deeper confidence that Alibata has succeeded in using this collaborative learning with group awareness tools. Because in accordance with a thorough understanding of this concept, the community as the object of awareness can be aware naturally and be directed to a certain goal, namely reforesting Pantai Bahagia village, and this awareness occurs collectively [23].
3.2. Impact of Alipbata Program with agroecology principles

3.2.1 Social - Culture Aspect. The key to achieving food sovereignty by changing the industrial-based food system into agroecology is to create a social movement. This social movement focuses on activities that connect patterns of action to support and be friendly with nature. Farmer groups and tourism awareness groups consist of rural communities who start to care about nature. This group was the first to gain enlightenment about the importance of ecologically based food production. The group formed into Alipbata became a local organization that triggered social movements in the village to continue various community awareness efforts.

Alipbata is not readily accepted by other communities even though it consists of residents. Mr. Sonhaji, one of the members of Alipbata, said, "Not everyone wants to plant mangroves because most people still think that if the mangroves are planted mostly, the ponds will be closed." After providing education and socialization, which aims to provide information about the benefits and importance of planting mangroves and how to prevent ponds from becoming unproductive. This social acceptance process is not easy and takes a long time, so careful planning is needed. The process in the socio-cultural stage of the agroecological system refers to the giving and receiving of information. Changes in perception of the social structure will not occur if there are no actors who play a role in informing this. This actor plays a vital role as an agent of change that supports agriculture to produce food sustainably.

You do this by communicating clearly and slowly to the community, such as holding formal and informal community meetings with various light topics of conversation. Mr. Sugianto said, "The use of local languages that are easy to understand will facilitate the communication process." The use of regional languages is more effective in delivering messages directly to groups or individuals [24].

3.2.2 Economic Aspect. Community understanding of mangrove forests is an economic disturbance, and this can be seen from the people's intention to clear mangrove forests to open up economic opportunities. This economic understanding is in contrast to the agroecological system [3]. Therefore, the paradigm must first be changed into economic thinking with agroecological characteristics.

A tourism-aware group does this with a concept that they developed themselves to support the community's economy. All processes begin and end with environmental conservation, namely the restoration of mangrove forests. One of the processes in the economic aspect is that farmers and the community make mangrove seedlings, then it is planted in ponds so that if the tree is large, it can become a fish house, making it easier for community to get fish, then part of the profit from the fish sold is used for conservation.

In practice, products sell to visitors who come to Pantai Bahagia Village and leave the village through shops selling souvenirs and using online stores. That is to support the activities of the agroecological concept where the area must be able to develop in its way. Research results [25] also stated that creating a dual market according to how agroecology develops in the area can support developing agricultural systems. Mr. Sugianto also said that "the people who previously did not support, participate in the production and sale of products. That is because Pokdarwis Alipbata can create a market so that it is easier to sell, earn profits and become a promising opportunity for the surrounding community" [26].

To date, 176 community have contributed to this activity, which is a significant change from the initial five people. In terms of activity, community who do not have jobs because their ponds are not productive become active again. Economically, the community helps directly and indirectly. Community who mainly make a living as fishers become more energy efficient in looking for fish because they do not have to go far to the middle of the sea. Mothers who participate in processing mangroves into products help economically because these products sell. So, looking at the overall economic concept applied, now the community feels more economic benefits than ten years ago, which was the peak of damage to ponds
in Pantai Bahagia Village. Because Agroecology must be viewed holistically, not in terms of economy or production capacity alone, when this economic concept goes well, it will create a sustainable economy without running out of resources like before. It is essential because the occupied earth will not only be filled by one generation but also for the next.

3.2.3 Ecology. The approach taken by Alipbata is to tell the advantages and benefits first before saving the environment. It is further explained that social and economic approaches are essential for the community before protecting the environment [27]. Community's thinking that prioritizes social and economic interests without being accompanied by environmental and biological interests will cause environmental damage. As happened in Pantai Bahagia Village, they are more concerned with clearing land for economic and social strata than environmental sustainability to cut down mangrove forests.

Replanting mangrove forests is a form of restoration and maintenance of the area so that it is not drowned by seawater abrasion. This was done by various parties who care about the environment to help the community's economy of Pantai Bahagia Village. The improvement of the mangrove ecosystem impacts the function of fish, helping to fertilize mangroves to grow more clearly in the fish agroecosystems. Ecologically, mangrove forests provide a breeding ground for fish and shrimp [25]. In the future, everything will be as before; when the mangrove ecosystem has not been damaged, community can easily catch big fish and shrimp among the mangrove roots.

4. Conclusion

Alipbata applies agroecology using social capital with a Collaborative Learning strategy with Group Awareness Tools. A tourism awareness group in charge of promoting and running ecotourism, and a farmer group in charge of producing mangrove seedlings to be planted and sold. The impact on the social aspect is the formation of tourism awareness groups and farmer groups who become actors and influencers for the local community. From the economic aspect, farmer groups earn income from mangrove ecosystem commodities (tree seeds and various types of fish), and from the ecological aspect, restoration has returned the mangrove ecosystem to its original condition. This research only focuses on the Alipbata activities from social, economy and ecological aspect in general.

Acknowledgement

The success of this research conduct by financial support from the Ministry of Research and Technology/National Research and Innovation Agency for Fiscal Year 2020 with a Master thesis research scheme, Number: NKB-518/UN2.RST/HKP.05.00/2020.

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