A Solution to The Dynamics of Aquaculture in Suku Akit in Riau Archipelago Province, Indonesia

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Abstract. This paper aims to describe solutions for the dynamics of aquaculture in the Akit community in Riau Islands Province, Indonesia. Akit is one of the remote indigenous communities (KAT) in Indonesia. After failing to cultivate mangrove crabs and snails by themselves, the Akit community evaluated. Several solutions were found by experts to help the Akit community to cultivate. This research uses a qualitative method with a descriptive type. The research was conducted in 2020-2021 and data processing was carried out in 2022. Researchers found several solutions carried out by Suku Akit for the successful cultivation of mangrove crabs and mangrove snails, namely repairing ponds and crab ponds, checking water quality, selecting seeds and stocking seeds, installing shelters and feeding. We recommend that the government pay more attention to Suku Akit, especially the aquaculture carried out and provide guidance by experts.

1 Introduction

Suku Akit is one of the indigenous entities in the Riau Islands. Like the Duano Tribe, Suku Akit is one part of the Sea Tribe people group (National Development Planning Agency in [1]. Based on historical records, in the 1970s, the Sea Tribe was known as an alienated tribe. It changed to alienated community (1987) and changed again to remote indigenous community (KAT) in 1999. The activities of non-governmental organizations usually use the term indigenous peoples or indigenous communities. [2]

The Sea Tribe people live nomadic lives on boats (called kajang). The interior of the Malay Peninsula and Sumatra is their home. In the past, they were named after their place of
residence or area of operation. In the 20th century they began to be referred to as Orang Asli (in Malaysia) and Terasing (in Indonesia). These terms were used solely to make administrative life easier. While these terms clearly imply marginalization, they do not mean that the Orang Asli/Terasing Tribe is necessarily marginalized. [3].

Sea tribes are part of Indonesian society who have rights in development. Equitable development can be seen from the utilization of resource results that can be enjoyed by every social element.[4]. Sea tribes are part of Indonesian society who have rights in development. Equitable development can be seen from the utilization of resource results that can be enjoyed by every social element. [4]

Provide a decent livelihood to society (without exception Sea Tribe), can reducing damage to natural resources, especially peatlands and watersheds, Creating economic growth in accordance with sustainable development, Utilizing natural resources by considering environmental sustainability and sustainability, Creating policies that integrate conservation and economic growth activities, Overcoming poverty.[5]

From the 1980s to 2015, the people of Suku Laut have been gradually laid off with Ministry of Social Affairs program mandated in the Presidential Decree of the Republic of Indonesia Number 111 of 1999 concerning Social Welfare Development of Remote Indigenous Communities), which had implications for subsequent regulations, namely Presidential Regulation Number 186 of 2014 which then regulated its implementation with Minister of Social Affairs Regulation Number 12 of 2015 concerning Social Empowerment of Remote Indigenous Communities which then explained that the social welfare development of remote indigenous communities was carried out as follows: a. identification and mapping of remote indigenous communities; b. preparation and determination of plans and programs for the implementation of fostering the social welfare of remote indigenous communities, the implementation of which is carried out by taking into account the advice and consideration of local governments and related agencies.

Previous research has been conducted there are some local wisdoms in the treatment of sea tribes that are still being carried out, namely by means of spells or incantations and charms as well as natural ingredients. [6]. Indigenous knowledge of the Sea Tribe that is synonymous with bekajang has begun to change because they live on land.[7–9]. Research of Sea Tribe has been conducted by [10]. Orang Laut and Palembang have a relationship in 17-18 centuries. The researchers use an anthropological approach. They found that relationship between Orang Laut and Palembang began to strain due to Orang laut was labelled as pirates by the Dutch. In Lingga District, Orang Laut live in Kajang which is maritime cultural heritage in east coast of Sumatera [11]. Benjamin and Chou found that the sea people have adapted their way of life to a new environment consisting of the sea, swamps, mangroves and coastal areas. they have natural knowledge of tides, rivers, winds and fishing grounds[12]

Research on Sea Tribe that has been conducted by previous researchers is mostly located in Lingga Regency. it is very rare to find research on sea tribes in Tanjungbalai Karimun Regency. The Sea Tribe in Tanjungbalai Karimun Regency is known by several names such as Duano, Suku Asli and Suku Akit. The interesting things to research, it can be seen from
the findings of previous studies [13] has mentioned that there is a desire for the Akit community to carry out aquaculture. Unfortunately, the research did not focus on the aquaculture practiced by the Akit people but discusses the existence of Suku Akit community. Those who used to only go to sea to meet their food needs have started working in charcoal kitchens, farming, collecting wood and becoming wage laborers. Changes are not only experienced in economic terms, but also in the meaning of education, economy, religious practices and the economy.

The things that distinguish this article from previously published articles are; first, this research takes place in Bangsal Ujung Hamlet, Belat District, Tanjungbalai Karimun Regency, very rarely used as a research location. Second, there is an Akit community that conducts aquaculture, there has never been a sea tribe community that does so. third, this study aims to describe the potential and development of the Akit community which is identical to the characteristics of remote and closed (As one of the remote indigenous communities in Indonesia). Based on the state of the art above, it is important to publish the research results on the solution of the dinamycs of aquaculture in Suku Akit in Riau Archipelago Province.

2 Methodology

The method used in this research is a qualitative method where what is studied is a description of human life and actions in social interactions. According to Bogdan and Taylor, qualitative methods are defined as research procedures that produce descriptive data in the form of written or spoken words from people and behaviors that can be observed [14]. Like social research in general, the data presented in this research report includes primary data and secondary data. Data collection was carried out in stages from 2020-2022 in Suku Akit settlement, Bangsal Ujung, Belat District, Tanjungbalai Karimun Regency.

In collecting data, researchers used observation, and interviews. Observations were conducted to obtain an overview of the life of Suku Akit in Bangsal Ujung, Riau Archipelago Province. Meanwhile, interviews were conducted with several informants using in-depth interviews to explore information on the dynamics of cultivation and the solutions that informants created to solve their problems. Some of the informants interviewed were Jaharep, Safar and Mardi as Akit people involved in the cultivation of mackerel and mangrove snails and Juriah as an elderly woman of the Sea Tribe who had experienced living nomadically in Kajang when she was young.
3 Result And Discussion

3.1 Current situation of Akit Tribe

Suku Akit is experiencing social change. They lived in kajang, now they have settled down. There are still some families in some locations who do not have a house. This is because they are newly married couples building a new family. At the time of the housing assistance program, they were still unmarried and living with their parents. Usually, the number of family members in an average house is around 2-4 people of the total population of Suku Akit community 35 Family heads. In general, the Sea Tribe community provides simple land ownership boundaries, one of which is with natural markers such as trees. However, some of the community's land ownership already has building rights certificates. The community has occupied 1 hectare of land and has made it permanent. Below is one of the portraits of Suku Akit house:

![Figure 1 Portraits of Suku Akit House](image)

Akit tribe were originally very closed, now they are open to renewal. Suku Akit began to emerge. They have embraced religion, started to switch from traditional fishing gear to cultivation which makes Suku Akit prepared as an Agro-tourism Village, and many have sent their children and grandchildren to school like the Malay people who inhabit Sungai Asam Village.

Akit tribe women's involvement in productive activities can be further enhanced if the cultivation of oysters, seafood and clams can run well. can be further enhanced if the cultivation of oysters, seafood and clams can run well. When the men go to the sea to fish, women can help maintain the seafood, crab and mussel ponds that have been made. Spreading seeds, feeding and observing their development. The enthusiasm of the Akit people, both men and women, is very great for cultivation. They have independently dug several holes manually and stocked small seafood, clams and mackerel from the sea. Unfortunately, due to limited knowledge and lack of mentoring from experts, they often fail in the cultivation process.
3.2 Solution to the dynamics of aquaculture in Suku Akit

Related to the problems experienced by Suku Akit Community in the cultivation of ketam (mangrove crabs/Scylla) or crabs, it is necessary to make various improvements, including.

a. Seedling Selection and Stocking

In fact, in the first attempt at aquaculture, Suku Akit only used seeds obtained from fishing, so, they did not consider the size, type and color. This is known from Mardi’s confession. When stocking the seeds, they were also not sorted according to size, so they preyed on each other.

Crab seedlings obtained from natural catches are sorted by size. This is done to reduce predation among seedlings to be cultivated. Choose the ideal size of mangrove crab seedlings with a size of 100-150 grams or 10-12 cm. this size is the ideal size in crab cultivation. The number of crab seedlings stocked in the culture pond also needs to be considered regarding the density of seedlings in the culture pond. According to Koniyo (2020), a factor that supports the success of crab cultivation is the selection and management of correct and appropriate seedlings. The selected seedlings must also be healthy with complete limb characteristics, have a bright brownish green color and be active.

b. Improvement of ponds or crab ponds

Due to the failure of the previous mangrove crab farming, Informant Mardi then evaluated and found that he did not separate the crabs cultivated based on their size, so that the large crabs cultivated did not separately eat the smaller crabs. A new problem arose, the big catfish climbed out of the ponds. Another problem was when the tide in their settlement was higher than the surface of the pond. This caused almost all of the oysters and seafood to be washed away by the tide. They also failed to cultivate. This is in accordance with Mardi’s confession:

"Another problem is that there is no security in the pond so that the oysters can climb out of the pond. Therefore, Informants repaired the ponds."

Improvements to the ponds were made because the aquaculture ponds were not optimal for crab culture. Crab ponds need to be deepened so that the pond substrate becomes muddy. Crab farming ponds need to be designed in such a way because crabs have a habit of soaking in mud and making holes in the pond. In addition, it is also necessary to add bunds and fences to crab aquaculture ponds, so that crabs are not washed away or run away when the tide is high. In addition, the improvement of crab farming ponds also needs to pay attention to physical, chemical and biological parameters.

c. Improvement of snail (Telescopium) ponds
The cultivation of mangrove snails (Telescopium sp) by the Akit community did not experience significant obstacles, unlike the cultivation of snails. After being cultivated for 3 months, mangrove snails began to develop even though they had never been harvested. The informant's cultivation on mangrove forest land will experience ups and downs, during the day the water will recede but at night it will rise.

Gaining knowledge by themselves makes the Akit people face difficulties. The solutions they get are generally also self-taught with round-the-clock observation of the ponds they make. The informants then discovered that it is important to maintain high temperature changes in the snail ponds. As Telescopium is sensitive to high temperatures and dry conditions, it is necessary to ensure that snails can take refuge from drought and hide in the mud or under mangrove roots. Snails have a more active behavior during spring tide compared to neap tide. This behavior is one of the adaptation patterns of gastropods to temperature changes (high temperature) and dry conditions.

d. Water Quality Check

Water quality checks need to be conducted on the culture ponds and the water entering the culture ponds. This inspection needs to be done regularly. This is because mangrove crabs (Scylla) are very sensitive to pollutants. Water quality is one of the determinants of the survival of mangrove crabs (Scylla).

e. Shelter Installation

Shelter installation needs to be done by tribal communities to reduce cannibalization between crab species (mangrove crabs/Scylla). Shelters can also be used to protect mangrove crabs (Scylla) that are in the process of molting.

f. Feeding

Feeding is very important in the process of mangrove crab (Scylla) cultivation. Feed that can be given can be in the form of small fish that are cut into pieces first. This feeding can be done twice a day, in the morning and evening until the cultivated mangrove crabs (Scylla) reach harvest size. Koniyo (2020) revealed several important aspects in crab rearing, namely preventing cannibalism, providing protection, choosing appropriate and sufficient feed and proper maintenance methods.

3.3 Social Capital as a Solution to Aquaculture Dynamics

Social capital relates to norms, trust and social networks that can facilitate collective action. In the Akit community, social capital functions and runs because of common interests to improve the quality of life, change, and adaptation. According to Burt in Hauberer, social capital is the ability of a society to relate to each other and is a very important force, not only in economic aspects, but also in every other aspect of social existence.
The development of livelihoods from only fishing to aquaculture carried out by some Akit people is evidence of the running of social capital there. This is because bound social capital tends to be exclusive. The most obvious basic characteristics of this typology of society, (in terms of ideas, relationships and concerns) are more inward looking than outward looking. Societies in this typology tend to be homogeneous. Aquaculture efforts carried out by the Akit community can be developed better because they have high social capital. It only requires guidance from experts and government attention.

4 Conclusion

The problem of aquaculture by the Akit people is not over yet. Their self-taught knowledge has not been able to make aquaculture efforts successful. Some of the things that the Akit people do in finding solutions to this aquaculture problem are repairing crab ponds and farms, checking water quality, selecting fry and stocking fry, installing shelters and feeding. Based on the research results above, it can be concluded that People of Suku Akit needs guidance from experts and attention from the government. Based on the dynamics of cultivation that occur in the tribal community, it is necessary for social capital to work well. The problem of cultivation in Suku Akit is not only a matter of science, but also a matter of social capital that is not working. Important elements of social capital are trust and social networks. The Akit community has not yet gained networks and trust from the external environment, so they only do what they can.

References

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