Social System and Impact of Modernization of Fishing Technology among Bugis Fishermen in Kemujan Village, Karimunjawa District, Jepara Regency 1979-2001

Febrian Aditya Nugraha, Mahendra Pudji Utama
Department of History, Faculty of Humanities, Universitas Diponegoro
Jl. dr. Antonius Suroyo, Semarang, Jawa Tengah–Indonesia

DOI: 10.14710/jmsni.v7i2.25682

Abstract

Bugis fishermen as residents of Kemujan Village came through migration. They have traditional knowledge in the fishing system by utilizing simple equipment. Before 1960, they still caught fish using sailboats. Using historical methods, this study analyzes changes in the modern equipment system after the modernization of fishing gear and changes in fishing orientation leading to large-scale fishing. This study also aims to describe the impact of changes in orientation and modernization of fishing gear for Bugis fishermen in Kemujan. The changes were based on the revolutionary policies of the New Order Government. Fishermen gradually used boats with outboard engines. Then, the existence of Global Positioning System (GPS) technology and fish finders influenced the ease of fishermen to catch fish at sea. However, in practice there is a gap in the fishing community because not all fishermen can access these new economic sources. The results of the study show that there is a reduction in income because government assistance often does not reach ordinary fishermen but can only be accessed by the *juragan*.

Received:
January 9, 2025

Revised:
January 14, 2025

Accepted:
February 7, 2025

Corresponding author:
adityan103@students.undip.ac.id

Keywords: Social System; Fisherman; Fishing Technology; Bugis; Kemujan.

Introduction

Karimunjawa sub-district has an area of 107,225 ha, consisting of 100,105 ha of ocean and 7,120 ha of land spread over 27 islands. Of the 27 islands, 5 are inhabited, namely Karimunjawa Island, Kemujan Island, Parang Island, Mosquito Island, and Genting Island. The ethnic distribution in Kemujan Village consists of various ethnic groups. The tribes that inhabit Kemujan Village include Javanese, Bugis, Mandarese, and Madurese. Of these ethnic groups, one of the most common ethnic groups in Kemujan Village is the Bugis ethnic group (Afifah et. al. 2018, 218-219).

The Bugis tribe comes from the Deutro Malay race that entered the archipelago around 500 BC. As a maritime nation, they certainly have social interaction relationships with various ethnic groups that inhabit the region. The existence of these interactions allows for trade relations between ethnic groups. Trading activities between ethnic groups require the ability to sail, the skills to build ships or boats, and knowledge of sea navigation (Saputra and Bakri 2020, 120). At first, the Bugis tribe only settled in the land of Bugis, Sulawesi (Ida 2004, 136). In its development, some Bugis people left their hometowns and decided to migrate to various regions. One of the interesting areas that became a destination for the Bugis was Kemujan village in Karimunjawa sub-district. In the 1930s, it is known that a man named Lato' Janggo (Ali Caco') decided to move from Masalembu to Kemujan village. They sailed to Kemujan village using a *lete'* boat. After arriving in Kemujan Village, most of them chose to live in Batulawang Hamlet. In the 1950s, there were new Bugis settlements in Kemujan village. They came from various regions such as Bone, Wajo, Makassar, Pinrang, Sidenreng, and Rappang.

Before the 1960s, fishermen in Indonesia still used traditional fishing equipment. At that time, they still used a type of sailboat that only relied on the wind to move the boat. After the 1960s, there was a change in the mechanism of the boats used by fishermen from only sailboats to motorboats (Masyhuri 1996, 66). The government supported the change in fishing gear by issuing a modernization policy on the development of coastal communities based on the Repelita I policy from April 1, 1969 to March 31, 1974. The policy was expected to encourage increased productivity of fisheries at sea (Ricklefs 2005, 582). In 1986, the Karimunjawa Islands and surrounding marine waters covering an area of ± 111,625 hectares were designated as a Marine Nature Reserve. In 1999, the status of the Karimunjawa Nature Reserve area and surrounding marine waters changed to a National Park under the name Karimunjawa National Park. Two years later, an area of 110,117.30 hectares of Karimunjawa National Park was officially designated as an Aquatic Nature Conservation Area.

Fishermen around Kemujan have also modified fishing gear to adapt to government policies, and changes in fishing areas. Research conducted by Dhanang Respati Puguh, Rabith Jihan Amaruli, Mahendra P. Utama revealed the fishing activities of Bugis fishermen in Batulawang (one of the villages in Kemujan) by modifying fishing gear. The modification is a form of adaptation of Bugis fishermen caused by changes in fishing ground. Zone restrictions have narrowed the space for fishermen to move. Fishermen are not allowed to enter certain water areas. As a result, fishermen's access is very limited and they are forced to look for fish outside Karimunjawa waters. This condition has led to different forms of adaptation. For example, fishermen using small boats only fish around Karimunjawa waters. Fishermen with medium boats conduct fishing activities outside Karimunjawa waters around 100 to 200 nautical miles such as in Jepara. For fishermen who have enough capital to access large vessels with multiple engine capacity, they can conduct fishing activities outside Karimunjawa, such as to Kalimantan and Belitung. The fishing season for the fishing community in Kemujan Village is divided into two periods, the first is the lean season (March-August) and the second is the cool season (September-February).

Bugis fishermen are residents of Kemujan Village, Karimunjawa Sub-district who came through migration (Kesuma and Ida 2004). As one of the maritime ethnic groups, Bugis fishermen have traditional knowledge in fishing systems by utilizing simple equipment. However, the introduction of modern equipment systems through modernization of fishing gear and changes in fishing orientation that lead to large-scale fishing force them to adapt to existing conditions and fishing technology. This is despite the government's ban on overfishing with the use of semi-trawl technology. In addition, the status of the Karimunjawa Islands as the Karimunjawa National Park has narrowed the fishing grounds for Bugis fishermen in Kemujan. This paper discusses Bugis fishermen in Kemujan Village who are trying to adapt to changes in fishing areas and modernization of fishing gear. Based on the description above, the researcher will also discuss fishing technology and social relations among Bugis fishermen in Kemujan Village. To further refine the discussion of Bugis fishermen in Kemujan Village, this paper will focus on the types of boats and fishing gear used, the social system of the community, and government policies that affected Bugis fishermen in Kemujan Village in 1979-2001.

Method

This research is qualitative research and uses historical methods supported by the collection of oral sources or interviews. The author conducts heuristics or primary source collection, namely official government documents such as archives in the Jepara Regency Archives and Library Office. Secondary sources are traced from books, articles in scientific journals, and other data that are still relevant to this research. The research was also supported by oral sources obtained from interviews with residents around Kemujan Village, Karimunjawa Islands. During the interview, there was one informant who could only speak Bugis. Therefore, a researcher friend named Dian Nurdiansyah helped in translating during the interview with the informant. Source criticism is done by comparing written and oral sources that have been obtained to check the authenticity and credibility of the sources. Interpretation

is done by assembling facts found through primary and secondary sources. The final stage in the historical method is historiography or writing about fishing gear, social systems, and government policies that affect Bugis fishermen in Kemujan Village, Karimunjawa Islands.

Fishing Equipment of Bugis Fishermen in Kemujan Village

Technology is a set of means to provide goods needed for human survival. According to Jacques Ellul, technology can also be defined as a set of rational methods that are directed and characterized by utilizing every human activity. According to Gary J. Anglin, technology is the ability to systematically apply practical, natural and other sciences to solve problems. Finally, according to Vaza, technology is a process carried out in an effort to realize rationally because it can be applied to anything such as products, services, processes, and organizational structures. Broadly speaking, technology is a means or tool to convey messages and solve problems through knowledge to produce certain disciplines (Suryadi 2020, 7). The intended discipline is fisheries technology, namely for catching fish carried out by Bugis fishermen in Kemujan Village. The fishing technology carried out by fishermen consists of three parts, namely season, sea navigation, and fishing equipment (boats and fishing gear).

Types of Ships

In catching fish at sea, boats are the most important thing for Bugis fishermen in Kemujan Village. The types of boats used by Bugis fishermen in Kemujan Village also vary. Each type of boat has its own advantages and disadvantages. In the 1980s, they initially relied solely on the wind to power their boats. Therefore, in those years, the boats used by Bugis fishermen in Kemujan Village almost all used sailing boats. They used sailing boats with a range of areas to Jepara and Masakambing. At that time, there was a sailboat manufacturing factory in Batulawang Hamlet, so Bugis fishermen in Kemujan Village did not need to buy boats in other areas. One of the shipbuilding factories was owned by Mr. Husen, a resident of Kemujan Hamlet.

In 1985 in Karimunjawa Sub-district, many fishermen still used sailboats to catch fish. The use of sailboats by fishermen in Kemujan Village in 1985 reached 91 units. This was more than the number of sailboats used by fishermen on Parang Island in the same year (Figure 1). The use of sailing boats declined further in 1995, with only 25 units of sailing boats used by fishermen in Kemujan Village. Meanwhile, in 2000 in Kemujan Village, sailing boats used by fishermen decreased even further and became the least compared to previous years, with 21 units (Karimunjawa Dalam Angka Tahun 1985-2000).

The blue revolution policy implemented by the government made most fishermen switch from sailing boats to engine boats. In 1990, this program was only known by fishermen in Kemujan Village. The blue revolution policy was implemented by providing business credit assistance in the form of engine boats and fishing equipment. Not all fishermen received this assistance because only a few people could get it. The fishermen who received this assistance were fishermen who still used sailing boats, including *punggawa sedang* fishermen who had more than 3 crew members. The existence of engine technology for ships, some fishermen then choose to use outboard engines. In contrast to sailing boats, which are increasingly being used less and less, outboard boats are increasingly being used by fishermen.

In 1985, there were only 16 units of outboard boats in Kemujan Village. Then, in 2000, the ownership of outboard boats by fishermen increased rapidly, reaching 55 units. Until the 2000s, fishermen in Batulawang Hamlet (one of the hamlets in Kemujan Village) were still found using sailboats without outboard engines to fish. Some fishermen continued to use sailboats because they did not have enough capital to access outboard boats (Karimunjawa in Figures 1985-2000).

According to Bugis fishermen in Kemujan Village, there are four types of boats: *lepa-lepa* (sampan), *kapalla' kecu* ' (small boat), *kapalla' lopo* (medium boat), and *lopi walopo* (large boat). Sampan, or *lepa-lepa* in Bugis, is the smallest type of sampan. *Lepa-lepa* is used simply to fish in shallow waters to fulfill daily food needs. Fish that are usually obtained by fishing using *lepa-lepa* are mackerel and stingrays. Lepa-lepa is also used by family members of fishermen for fishing, and is only

used from morning to evening. Lepa-lepa can be produced independently at a relatively low cost, because the raw materials are easily available, which is small, using types of *ngasingan*, *satemok*, and *lamoting* wood taken directly from the Karimunjawa forest. (Boy Anggara 2022).

Kapalla' kecu ' is the name for a small boat in the Bugis language. Kapalla' kecu' is a type of boat that has a larger size than the *lepa-lepa*. *Kapalla' kecu* ' is also usually used by fishermen who have a fishing range only around Karimunjawa waters. The maximum distance that can be traversed with a small boat is 65,000 meters. This boat is equipped with an outboard engine to support speed and fishing range. These small boats are often used by fishermen to catch fish that can have a selling value and are easy to obtain, namely squid and tuna (Abdullah 2019).

Figure 1: The shape of the sailing ship in Kemujan Village
(Source: Archives of the Archives and Library Office of Jepara Regency, No Year and No Archive Number).

Kapalla' lopo is a type of ship that has a larger size than *kapalla' kecu'*, but smaller than *lopi walopo*. It must be produced by a shipbuilding factory located in Batulawang Hamlet, owned by Mr. Husen. The shipbuilding process can take up to 1-3 months (90 days). *Kapalla' lopo* can carry as many as 3 to 9 crew members and can carry 5 to 7 tons of goods. *Kapalla' lopo* usually fishes out of Karimunjawa waters, between 150,000 meters - 300,000 meters offshore. Fishermen can already apply some modern navigation tools such as GPS and Fish Finder on *Kapalla' lopo*.

Types of Traps and Nets

Bugis fishermen in Kemujan Village use environmentally friendly types of fishing gear. This is supported by the socialization of environmentally friendly fishing gear carried out in an integrated manner by the village government to urge the community to preserve coral reef resources and fish resources. Skills in managing fisheries resources and the environment will be useful for fishing communities to improve business quality and minimize utilization that is less concerned with environmental sustainability. Before the socialization, Bugis fishermen in Kemujan Village had consciously used traditional fishing gear. The socialization of environmentally friendly fishing gear is expected to maintain the use of environmentally friendly fishing gear and increase public awareness not to use tools that endanger biota and ecosystems in zoning areas.

The types of fishing gear used by fishermen are usually nets and traps. Types of net fishing gear include gill nets, lift nets, *seser*, and *jala*. Meanwhile, the type of trap gear is *bubu/sicir*. Not only that, there are other fishing tools used by fishermen, such as spears and fishing rods (Weri and Sucahyo 2017, 36). To find out the types of fishing gear used by Kemujan Village fishermen, it can be seen in Table 1 below. It shows that fishing rods are the most widely used fishing gear by fishermen in

Karimunjawa, precisely in the year 2000 with 553 units. This is inversely proportional to bag net fishing gear, which is rarely used by fishermen in Karimunjawa. In fact, from 1995 to 2000, no fishermen used the gear. This is due to the basic principle of the Bugis fishermen in Kemujan Village who hold firmly to protect the sea. As stated by Mr. Ahmad Fajar regarding this principle. Meanwhile, other fishing gears (*bagan* and *bubu*) had the most rapid increase in 2000, totaling 1,004 units.

Table 1. Number of fishing gears in Karimunjawa sub-district 1985-2000.

No.	Fishing Gear	Year (unit)			
		1985	1990	1995	2000
1.	Gill Net	58	24	26	171
2.	Bag Net	7	1	-	-
3.	Fishing rod	450	510	500	553
4.	Other (Bagan, *Bubu)*	89	61	309	1.004
	Total	**604**	**596**	**835**	**1.728**

Source: *Jepara Regency in Figures 1985-2000.*

Social System of Bugis Fishermen in Kemujan Village

The social stratification of the Bugis fishing community in Kemujan Village is very diverse. There are two social layers that distinguish this group, namely *punggawa* and *sawi*. In this case, the *punggawa* can also be interpreted as the owner of capital in a fishing group in the Bugis tribe. Meanwhile, *sawi* are fishermen who only use their energy and assist *punggawa* in the fishing business at sea (Hasriyanti and Syarif 2021, 172). According to the Bugis people in Kemujan Village, the *punggawa* is a leader who is responsible for the fishing business and the *sawi* is a crew member who is required to work for a *punggawa*. *Punggawa* can be divided into three: small *punggawa*, medium *punggawa*, and large *punggawa.* The division of *punggawa* is differentiated based on the type of vessel, fishing gear, and the number of crew members. Small *punggawa* is a type of *punggawa* fisherman who uses a 3 to 4 board boat (small boat), with fishing gear and generally only has 1 to 2 crew members. Meduim *punggawa* is a type of *punggawa* fisherman who uses a 6 to 10 board boat (medium boat) with fishing gear or *bubu* and generally has a crew of 3 to 5 people. Large *punggawa* is a type of *punggawa* fisherman who uses boats measuring more than 10 boards (large boats) with fishing gear either fishing rods, *bubu*, or nets and generally has a crew of more than 5 people. *Punggawa* occupies a higher social layer compared to *sawi*. This can be based on various things such as capital ownership, experience, expertise, and hereditary inheritance. Of these indicators, some are dynamic except for hereditary inheritance because it is natural. In the recruitment of *sawi*, they usually do so based on kinship or the closest neighbor of the *punggawa* himself. The *sawi* recruitment process is entirely in the hands of the *punggawa* and influences the loosening of ties within the Bugis fishing community. In fact, not only Bugis people can become *sawi* from the *punggawa*.

There are two kinds of *punggawa* in the Bugis fishermen work organization system, namely land *punggawa* and sea *punggawa*. Land *punggawa darat*, who are the owners and managers of fisheries capital, have various important roles. Meanwhile, sea *punggawa* are fishermen who are in charge of leading during sea voyages and are responsible if something happens while at sea. Meanwhile, the work organization structure is divided into three, namely small *punggawa*, medium *punggawa*, and large *punggawa*. In the small *punggawa* work organization structure, they only have 1-2 *sawi*. The number of fishermen in the small *punggawa* work organization structure consists of 3 people, including land *punggawa*, sea *punggawa*, and *sawi pancing*. If there are only two fishermen, the land *punggawa* doubles as the sea *punggawa* and the rest are the *sawi pancing*. The sea *punggawa* is not only required to run the boat, but also to participate in fishing to get more fish. So, the division of the results of the small *punggawa* work organization system is that the land *punggawa* gets a share of 1/2

of the total income and the sea *punggawa* and *sawi pancing* get a share of 1/2 of the income after deducting the share of the land *punggawa*.

Then for the *punggawa sedang* work organization structure, they generally have 3 to 5 *sawi*. The number of fishermen in the medium *punggawa* work organization structure consists of 6 people, including land *punggawa*, sea *punggawa*, net *pa'je* (3 people), and *pakolo*. Unlike the small *punggawa*, in the medium *punggawa* work organization structure, the land *punggawa* usually does not double as the sea *punggawa*. In addition, there is one *sawi*, namely *pakolo*, who is tasked with cooking fish from the catch that will not be sold to be cooked and served to the entire crew. In addition, *pa'je* nets (*sawi* nets) have the largest number compared to other *sawi*. So, the distribution of the results of the medium *punggawa* work organization system is that the land *punggawa* gets 1/2 of the total income, the sea *punggawa* gets 1/2 of the income after deducting the share of the land *punggawa*, and the *sawi* each get 1/4 of the income after deducting the share of the land *punggawa* and sea *punggawa*. The third is the large *punggawa* work organization structure, where they generally have more than 5 *sawi*. The number of fishermen in the large *punggawa* work organization structure consists of 8 people, including land *punggawa*, sea *punggawa*, net *punggawa* (2 people), fishing pole *punggawa* (2 people), engine *punggawa ,* and cooking *punggawa*. In the work organization structure of large *punggawa*, land *punggawa* usually do not double as sea *punggawa*. To increase fishing yields, they usually have more fishers and netsmen than others. In addition, there is an engine *sawi* who is in charge of turning on, turning off, and repairing the engines used on the ship. So, the distribution of the results of the large *punggawa* work organization system is that the land *punggawa* gets 1/2 of the total income, the sea *punggawa* gets 1/2 of the income after deducting the share of the land *punggawa*, and the *sawi* each get 1/6 of the income after deducting the share of the land *punggawa* and sea *punggawa*.

When viewed, the relationship between *punggawa* and *sawi* can contain elements of both patron-client and exploitation. In the beginning, the relationship was merely patron-client with the aim of mutual benefit (Scott 1972, 92). The *sawi* basically had no control over their production activities as they worked under the control and command of the *punggawa*. However, the *sawi* are still dependent on their employers, the bargaining position of the *sawi* towards the *punggawa* fishermen is weaker, as they are more in need of work. The *sawi*, who generally have limitations in various ways, namely education, skills, experience and job opportunities outside fisheries, become *sawi* is a realistic life choice that they take. This relationship explains that there is a reciprocal relationship between individuals in a social interaction. This relationship is carried out vertically (one individual has a higher position than another) or horizontally (each individual has the same position). Even so, in essence the two individuals need each other because the patron cannot work if there is no client and vice versa (Usman 2004, 132).

Government Policy towards Bugis Fishermen in Kemujan Village

Prior to the 1960s, the marine sector was one of the most neglected sectors in Indonesia. The reason was the tendency for development to be more land-oriented compared to the sea. As a maritime country, it is necessary to orient the development from a land orientation to a marine orientation. In the 1960s, precisely during the Guided Democracy, efforts were made to modernize the boat mechanism and fishing gear used to catch fish. During the New Order period, the government also modernized and sought to develop coastal communities in accordance with the Repelita created by President Soeharto in 1969. The Repelita policy was initially set by the government between April 1, 1969 and March 31, 1974 (Ricklefs 2005, 582). During the 1970s, the government developed various things related to the fisheries sector in a short period of time. The government provided billions of rupiah in credit assistance to small-scale fishermen from sailboats to engine boats. This policy is expected to develop development, especially in the fisheries sector, which is useful for the welfare of fishermen. This is evidenced by the birth of policies regarding boat motorization and modernization of fishing gear, namely the Blue Revolution. Modernization of fishing gear is a substitution step for traditional fishing gear that was previously used by fishermen (Susilo 2010, 6).

In the 1980s, problems of coastal and marine environmental degradation with far-reaching implications began to be felt, especially in fishing communities. As a reaction and criticism from various parties to the operation of trawling gear carried out by fishermen outside Karimunjawa, it was considered to damage the environment and cause poverty of fishermen. Then on July 1, 1980, the government issued Presidential Decree No.39 of 1980 which banned the operation of the gear in Western Indonesia. The Presidential Decree was followed by the Decree of the Minister of Agriculture No. 503/Kpts/Um/7/1980 on July 10, 1980 on Steps to Implement the First Phase of Trawl Net Removal. For the Province of Central Java, this provision was clarified by the Decree of the Governor of Central Java No. 523.4/200/1980. Since then, trawl fishing gear has become one of the fishing gears that are prohibited from use in the fisheries management area of the Republic of Indonesia. This is because the gear can cause damage to fish resources and the aquatic environment. Thus, the sea fishing business entered a new stage, which prioritized the protection of community fisheries (Widodo 2005, 68).

However, the policy of motorization and modernization of fishing gear has created inequality because not all fishers get their rights. Easy access to available economic resources can only be achieved by a small number of fishermen, especially *juragan* (*punggawa*). As is the case with Bugis fishermen in Kemujan Village, they are largely excluded from any assistance from the government. Initially, they worked to catch fish with sailing boats so that the fishing range was only in Karimunjawa waters and took a long time. According to Mr. Thamrin, he bought all of his fishing equipment from his boat and fishing gear independently. He did not receive any assistance from the government. However, a different thing was felt by Mr. Ukase, namely there was socialization from the fisheries, net assistance for fishermen who could not afford it. Thus, it can be stated that some Bugis fishermen in Kemujan Village receive assistance provided by the government. However, government credit assistance to the Bugis fishing community in Kemujan Village is still uneven because only a few people get it.

In addition, in the late 1990s and early 2000s, the designation of Kemujan Village as a National Park area was a contributing factor to the decline in income for Bugis fishermen in Kemujan Village. The zoning by the National Park made the fishermen fish carefully. If not, they will be subject to fines or penalties which will certainly be burdensome. In addition, the proliferation of salt ponds in Kemujan Village has damaged the coral reefs and the fish ecosystem. During the 2000s, fishing by Bugis fishermen in Kemujan Village decreased drastically due to these factors.

Conclusion

Bugis fishermen in Kemujan Village only used sailing boats with a relatively limited range at the time of their arrival. After 1990, fishermen in Kemujan Village switched to using boats with outboard engines. According to the Bugis fishermen in Kemujan Village, the types of vessels consist of four vessels, including *lepa-lepa* (canoe), *kapalla' kecu* ' (small boat), *kapalla' lopo* (medium boat), and *lopi walopo* (large boat). The social system of the Bugis fishing community in Kemujan Village occurs because of the relationship between the *punggawa* and *sawi*. The *punggawa* is someone who owns capital in a fishing group in the Bugis tribe. Meanwhile, *sawi* are fishermen who only use their energy in the fishing business at sea. *Punggawa* can be further divided into three types, namely small *punggawa*, medium *punggawa* and large *punggawa*. The division of *punggawa* is differentiated based on the type of vessel, fishing gear, and the number of crew members. Government policies have influenced the fishing practices of Bugis fishermen in Kemujan Village. In the 1980s, problems with the coastal and marine environment began to affect the Bugis fishing community in Kemujan Village. On July 1, 1980, the government officially issued Presidential Decree No.39 of 1980, which prohibited the operation of fishing gear in Western Indonesia. The Presidential Decree was followed by the Minister of Agriculture Decree No. 503/Kpts/Um/7/1980 on July 10, 1980 on the Implementation Steps of the First Phase of Trawl Net Removal. For the Province of Central Java, this provision was clarified by the Decree of the Governor of Central Java No. 523.4/200/1980. In addition, in the late 1990s until 2001, the designation of Kemujan Village as a National Park area

was a contributing factor to the decline in the income of Bugis fishermen in Kemujan Village, as the zoning by the National Park Office limited their fishing.

References

Afifah, Nailul I. et. al. 2018. *Interaksi Lima Budaya Suku Bugis, Bajau, Madura, Mandar, dan Jawa di Pulau Karimunjawa Menggunakan Analisis Geografi Sosial Budaya*. Semarang: Research Report of Geography Department, Universitas Negeri Semarang.

Hasriyanti and Erman Syarif. 2021. "Strategi Pemberdayaan Sumber Daya Laut Melalui Kearifan Lokal Sistem Punggawa-Sawi di Desa Palalakkang Kecamatan Galesong Kabupaten Takalar." *Jurnal Environmental Sciene* 3 (2).

Kesuma and Andi Ida. 2004. *Migrasi dan Orang Bugis*. Yogyakarta: Ombak.

Masyhuri. 1996. *Menyisir Pantai Utara: Usaha Perekonomian Nelayan di Jawa dan Madura 1850-1940*. Yogyakarta: Yayasan Pustaka Nusatama.

Ricklefs, M. C. 2005. *Sejarah Indonesia Modern 1200-2004*. Jakarta: PT Serambi Ilmu Semesta.

Saputra and Muammar Bakri. 2020. "Implementasi Rasi Bintang Navigasi Bugis Perspektif Ilmu Falak." *Jurnal Hisabuna* 1 (1).

Scott, James C. 1972. "Patron-Clients Politics and Political Change in Southeast Asia." *The American Political Science Review* 66 (1).

Suryadi, Ahmad. 2020. *Teknologi dan Media Pembelajaran Jilid I*. Sukabumi: CV Jejak.

Susilo, Edi. 2010. *Dinamika Struktur Sosial dalam Ekosistem Pesisir*. Malang: Universitas Brawijaya.

Usman, Sunyoto. 2004. *Di Antara Harapan dan Kenyataan: Esai-Esai Perubahan Sosial*. Yogyakarta: Center for Indonesian Research and Development.

Weri, Michael Natanael and Sucahyo. 2017. "Keterkaitan Alat Tangkap Ikan dengan Jenis Ikan yang Didapatkan di Rawa Pening." *Jurnal Bioedukasi* 2 (2).

Widodo, Sutejo K. 2005. *Ikan Layang Terbang Menjulang*. Semarang: Undip Press