

# Survival Strategy of the Fisherman Community Against Weather Changes in Tandurusa Village, Aertembaga District Bitung City

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**Abstract**— The aim of this research is to identify and examine the strategies of the fishing community in Tandurusa Village to survive in the face of weather changes. This research was conducted to obtain data that can be used as a reference in strategies and empowerment models to deal with weather changes which certainly greatly influence fishermen's catches which ultimately affects the household economy. This research was conducted in Tandurusa Village, Aertembaga District, Bitung City using a case study method. The population in this study were all fishermen in Tandurusa Village. The data collection technique was carried out using a sampling method, and the sample collection method used a purposive sampling method. The number of samples to be taken is 10% of the total population, namely 28 people. The data collected is in the form of primary data and secondary data. Primary data collection techniques using observation and interviews guided by questionnaires. The data obtained was analyzed using quantitative descriptive and qualitative descriptive analysis. Based on the results of the research carried out, the results obtained were that: Weather changes that occur every year can cause changes in the economy of fishermen's families. When the weather is friendly, it is often called harvest season because fishermen catch enough to fulfill all their household's living needs. On the other hand, when the weather changes, where strong winds and big waves, fishermen cannot go to sea to catch fish, so there is no income to support their living expenses. they. Situations like this make fishermen and their families look for ways or strategies to survive. There are 3 strategies used by fishermen in Tandurusa Village, Aertembaga District, Bitung City to survive. The three strategies are active strategy, passive strategy and network strategy, all three strategies are used and even combined according to the needs and situation and conditions of the fishing family faced at that time. The active strategy that fishing families use is to seek additional income outside of fishing at sea. Some fishing families are brave, trade, become motorbike taxi drivers, transport workers, construction workers and so on. The passive strategy used by fishing families is to save or reduce all living costs that can still be reduced as much as possible. Meanwhile, the last strategy used by fishing families to survive is the networking strategy, namely seeking loans from family, relatives, cooperatives, banks or others to maintain their family's lives.

**Keywords** – Strategy, Survival, Fisherman, Tandurusa.

## I. INTRODUCTION

Tandurusa Village is one of the coastal villages in the Aertembaga District, Bitung City. Many residents of

Tandurusa Village depend on the potential of the sea and coast for their livelihoods and work as fishermen and most of them are traditional fishermen.

Tandurusa Village, which is located in the Lembah Strait, although protected by Lembah Island, is by no means independent from weather changes. When strong winds and big storms hit the sea, fishermen from Tandurusa Village still cannot go to sea to catch fish. Not to mention when the moon is bright, the brightness of the moon can overpower the light of the lamp, causing the fish to not be able to gather in the light boat to be caught, which causes fishermen's catch to be very small or even empty.

The fishing community's efforts to respond to the problems that occur during the lean season in Tandurusa Village, which only have a little capital and basic fishing equipment and low human resource (HR) capacity, however, must still be sufficient for their family's living needs. Thus, action or survival strategies are needed as are done by other poor families.

The difficulty of fishermen in catching fish during unfriendly weather causes fishermen to have to look for solutions in various ways and strategies on how their families can survive in the face of unpredictable weather changes. Fishermen's difficulties in dealing with weather changes make fishermen more creative and innovative to look for other sources of income as alternative jobs so that their families can survive. These fishermen's strategies and ways to survive are what attracted researchers to conduct research in Tandurusa Village, Aertembaga District, Bitung City.

## II. RESEARCH METHODS

The research method used in this research is a case study method with the case unit being the survival strategy of fishing communities in facing weather changes in Tandurusa Village, Aertembaga District, Bitung City. The approach used in this case study is a qualitative and quantitative approach through primary and secondary data collection

The population in this research is the fishing community in Tandurusa Village. Data collection was carried out using a sampling method, namely taking a portion of the population to become respondents. The sampling method uses Accidental Sampling, that is, any fisherman the researcher meets when out in the field and is willing to be interviewed and used as a respondent as a data source will be used as a respondent. The number of samples taken

was 10% of the total population, namely 267 fishermen, so the samples taken were 27 fishermen. The sample collection method used purposive sampling, namely fishermen who happened to meet the researcher while out in the field and were willing to be interviewed.

The data collected is in the form of primary data and secondary data. The primary data collection technique used in this research is by conducting observations and interviews using a list of verbal questions to respondents so that they can provide accurate information about the object under study. Secondary data was obtained by quoting from existing data at the sub-district office or from previous research.

Primary data collection was carried out by observation, interviews guided by questionnaires and documentation. The data analysis used is quantitative descriptive analysis and qualitative descriptive analysis. Qualitative descriptive analysis is data processing carried out through logical considerations using the author's systematic language. The data that has been analyzed is then interpreted with logical considerations using the author's systematic language by referring to references related to research results, journals. Quantitative descriptive analysis is data analysis by providing a discussion or study of existing data using calculations.

## III. RESULTS AND DISCUSSION

### State of the research area

Tandurusa Village is one of the sub-districts in Aertembaga District, Bitung City. The distance between Tandurusa sub-district and the capital of Aertembaga District is 5 km and Bitung City is 8 km. Tandurusa subdistrict is divided into 5 wards or wards which are headed by ward heads, and each ward is supervised by the village head. The boundaries of Tandurusa Subdistrict are as follows: To the north it borders the Protected Forest; To the east it borders Makawidey Village; To the south it borders the Lembah Strait and to the west it borders Aertembaga Village.

### State of the Population

Based on data available at the Tandurusa Subdistrict office, the population of Tandurusa subdistrict is 3,864 people, consisting of 1,951 male residents or 50.49% and 1,913 female residents or 49.51%. Most of the population in Tandurusa sub-district is in the productive age group, namely 15-65 years, amounting to 71.3%, while the population in the unproductive age category <15 has 23.6%, and those in the elderly age group >65 have the smallest percentage, namely 5.1%. The majority of residents in Tandurusa Village make their living as fishermen, namely 267 people or 24.4%. The population who work as employees in companies or as honorary employees in government agencies is at the next level, namely 253 people or 23.1% and the least livelihood is as livestock breeders, which is only 2 people or 0.1%.

### Respondent Profile

The respondents in this research were 27 fishermen in Tandurusa Village. The respondent profile can be detailed as follows:

#### Respondents by gender and fishing gear

The respondents in this study were all fishermen, but of their gender, 8 people (30%) were female fishermen, the rest were male. All female fishermen are labor fishermen or work as workers to pull beach seines or better known in the regional language, namely Soma Dampar. The process of operating a Beach Seine or Soma Dampar requires quite a lot of labor, namely around 16 people to pull the net to the beach, especially if there are quite a lot of fish caught in the net so the net is heavy enough to be pulled to the beach. Apart from being fishing workers, there are fishermen who own Beach Trawlers or Soma Dampar and there are also light boat fishermen and fishing rod fishermen.

#### Respondents According to Age

According to Imelda in Tuankotta (2018), age is one of the factors that determines activities, perspective and also ways of thinking. Age of workers who are of productive age (15-65 years). Productive age has a positive relationship with labor productivity. This means that if the age of the workforce is in the productive category, their work productivity will increase. This is because at the productive age level the workforce has high creativity in their work

because it is supported by better knowledge and insight and has high responsibility for the tasks given.

Respondents in this study were aged between 18 and 66 years, so the majority of respondents were of productive age because there was only one person who was 66 years old, so 96% of respondents were of productive age, namely around 15 - 65 years, while 4% were of the same age. not productive. This indicates that they have high work productivity and creativity in pursuing their work as fishermen.

#### Respondents According to Education

Education is the main need today, with education a person can gain knowledge or skills that will be needed in the world of work. Of the 27 respondents, only 8 people or 30% of fishermen had elementary school education and the others had 10 people from junior high school or 37% and 9 people from high school or 33%.

#### Socio-Economic Conditions of the Fishing Community in Tandurusa Village

The fishing community of Tandurusa Village, even though their main job is fishermen, on average they have other jobs which are additional income and as a backup if their income as fishermen is insufficient or even non-existent because fishermen cannot go to sea due to weather changes. Income as a fisherman cannot be predicted, sometimes it is a lot but sometimes it is little or even none at all.

Several factors cause fishermen to not earn any income at all, one of which is weather changes or climate change. These weather changes have a big impact on the activities of fishermen and the economic needs of fishermen's families. The impact of these weather changes is felt by fishing families (women and men) in Tandurusa Village, including:

1. Changes in weather that are increasingly extreme, hot in a short time and suddenly raining, accompanied by storms which make it impossible for fishermen to work at sea and of course this affects the family economy.
2. Changes in seasons and rainfall mean that female fishermen are unable to carry out activities selling fish caught by fishermen at the market.
3. Meanwhile, changes in the weather mean that fishing families who live on the coast have to accept

gusts of wind and storms, even though Tandurusa Village is in the Lembah Strait, these weather changes have greatly affected the socio-economic life of the community, especially the fishing community.

4. The fishermen of Tandurusa Village are still technologically clueless so it is still difficult for them to read natural signs such as: wind, temperature, astronomy, biota or ocean currents on social media or the internet. Finally, fishermen find it difficult to predict when to go to sea and where potential catch areas are.

In general, changes in weather also influence changes in roles, functions and responsibilities in fishing families. Not only male fishermen work but also female fishermen play productive roles, roles involving work that produces goods and services, both for consumption and for trade. It is the family's economic limitations that require fishing families, both men and women, and even children, to work hard to face changes in the weather.

While facing climate change in coastal communities, fishing families, both women and men, try to survive with various tips and strategies. Strategy is a careful plan of activities to achieve specific goals. Strategy is an action used to overcome problems by determining choices from several available alternative actions. These weather changes encourage fishing families to work together to carry out various strategies to survive. This way of working together between men and women criticizes stereotypes in society that view the world of women's work as different from the world of men's work. However, due to economic needs, women dare to work in the male workforce. The proof is that 8 respondents in this study were women who always took part in pulling Soma Dampar nets to the beach.

### **Impact of Weather Changes**

These weather changes are not only limited to changes in the rainy-dry season, rising sea levels, but have an impact on various aspects of fishermen's lives: economic life, health, food security and others. These weather changes have a big impact, both directly and indirectly, on the lives of fishermen in Tandurusa Village, direct changes for example:

#### **1) Fishermen's Catch**

Fishermen in Tandurusa Village generally consider that changes in weather which cause them not to be

able to go to sea or only able to go to sea around the Lembah Strait which causes their catch to decrease drastically is a famine or difficult time. These weather changes make it increasingly difficult to get their catch or they can't even go to sea so they don't get any results at all, this causes fishermen's income to decrease or they don't get any income at all. Sometimes fishermen can get a lot of results, but the weather is often unpredictable at sea and this requires hard work because the fishing area becomes uncertain. Bad weather causes fish not to rise to the surface. This is an obstacle among traditional fishermen who still rely on local knowledge and experience alone in catching fish. When weather changes have a significant impact on the condition of marine ecosystems and make many differences compared to previous ocean conditions, fishermen's experience in catching fish no longer applies. It becomes difficult for fishermen to determine fishing areas.

#### **2) Reduced Income**

As a result, fishermen's catches decrease due to changes in weather, which in itself has an impact on fishermen's income, which also inevitably decreases. The reduction in fishermen's income makes fishermen and their families think about how to find other income to survive. In general, fishermen's education is low so finding alternative livelihoods is quite difficult except becoming a farmer or unskilled laborer which does not require a diploma. This is what fishermen in Tandurusa Village do when the weather makes it impossible to go out to sea to catch fish. However, there are no fewer fishermen who are looking for loans to cover their family's living needs, in the hope that when the weather changes to become friendlier, they will be able to fish again and their income will be able to pay off their debts. The lack of income earned by fishing families also greatly affects their family's diet. Families must be able to save money by reducing daily living costs so that debt does not pile up further.

#### **3) Economic Difficulties**

This kind of condition causes fishermen to often face economic difficulties, while their primary needs for life cannot be postponed. Fishermen doing side jobs when they are not fishing is an option and this must be done in order to overcome the family's economic



difficulties. The ability and willingness to do side work is really needed by fishermen to meet their daily living needs. The abilities or skills of fishermen are quite varied, there are fishermen who are used to doing side work when they are not at sea. However, quite a few fishermen admit that they have difficulty and are even reluctant to look for part-time work, because they feel they are not used to doing it and if there are difficulties in meeting their daily living needs, everything is handed over to their wives to find a way out.

### **Fisherman's Family Survival Strategy**

Economic problems involving meeting the needs of life require various survival strategies to overcome them. A survival strategy is a person's ability to apply a set of methods to overcome various problems that surround his or her life. The strategy for handling this problem is basically the ability of all family members to manage all the assets they own.

People have ways or efforts to survive when facing difficult times in their lives. One of the efforts made by the community can be to change their way of thinking, where they usually only rely on one job to meet their living needs, they can start trying other jobs that can improve their family's economy. Some survival strategies are trading, farming, gardening or working in companies in the area where they live.

The survival strategy of the fishing community in Tandurusa Village is the efforts made by fishermen and their family members to survive in the same or better conditions in living their lives. A survival strategy for them is basically a way to fulfill their living needs, even though their lives are in difficult and worrying conditions, but they can survive with various efforts or methods that can be done. Tandurusa Village fishermen carry out strategies to survive in 3 ways, namely active, passive and network strategies, even a combination of these three strategies. The strategy that fishermen from Tandurusa Village and their families use is:

#### **1. Active Strategy.**

Active strategies, namely strategies that optimize all family potential, for example by carrying out their own activities, extending working hours, utilizing wild sources or plants in the surrounding environment and so on. Based on the results of the research conducted, it is known that the active

strategy used by fishermen in Tandurusa Village and their families to survive is by optimizing all the family's potential in order to improve family welfare, including by doing other work such as:

##### a) Farming or Gardening

A total of 8 fishermen respondents or 30% have an active strategy to survive by farming or gardening. Tandurusa Village has hilly land topography, only a few are flat on the beach. The hilly land is mostly used for planting sweet potatoes, chilies, bananas, taro, nutmeg and coconut, the results of which are not much because the gardens owned by the fishermen are not large, in fact there are 3 fishermen who only borrow land from neighbors which is not used to plant bananas and sweet potatoes. Even though the results from gardening or farming are not much, they are very helpful for survival when there is no income from fishermen. The majority of fishermen in Tandurusa Village are from the Sangir Talaud tribe, so when they don't have money to buy rice they can replace their staple food with sweet potatoes or bananas. Other garden products are only sold or sold in Tandurusa Village or the neighboring village in Naimundung. Selling the garden products obtained can be used to buy other basic living necessities.

##### b) Labor

Tandurusa Village is 5 Km from the center of Aertembaga District and 8 Km from the center of Bitung City which is famous as an industrial city, especially fisheries and there are 6 ports, so a lot of workers are needed as laborers. That is why there are 10 fishermen or 37% of respondents who do not go to sea and work as laborers, either construction workers or transport workers at markets or ports. Working as a laborer who receives daily wages also really helps fishermen's families to survive when weather changes make it impossible for fishermen to catch fish at sea. Income as a laborer cannot be predicted every day because it depends on the number of customers who need his labor, however, it is very helpful to reduce the burden of life in difficult times.

##### c) Motorbike taxi driver

The mobility of Bitung city residents is very dense, so practical and fast transportation is needed. There are 6 fishermen respondents or 22% of respondents who own two-wheeled motorized vehicles to earn

additional income as motorbike taxi drivers. When seasonal changes make it impossible for fishermen to go to sea to catch fish, they seek other income by becoming motorbike taxi drivers. Becoming a motorbike taxi driver is only done in your spare time, to earn additional income so that fishing families can meet their daily living needs, this is one way for fishing families to survive.

#### d) Trade

One way to overcome life difficulties for fishing families is to trade, in this case by opening a stall for daily living necessities or basic necessities. There are as many as 4 fishermen or 15% of respondents who open a basic food stall at home, this is not only done by fishermen but also with their families, this stall is opened every day, so even though the fisherman is going to sea it doesn't mean the stall is closed but can be guarded or served by wife or other family. The income from this trade really helps fishermen's families so that when fishermen cannot go to sea to catch fish and do not earn income, the difficulty of meeting their living needs is not so pronounced because they still have other income from trading profits.

#### e) Spouse's income

The majority of fishermen's spouses, both wives and husbands, do not rely on income from fishing alone, but also look for other income to help the family economy. For example, there are 8 women fishermen or 28% who help their husbands by working to pull beach seine nets or Soma Dampar so they can get additional income to help their household economy. Apart from that, there are 7 wives who help earn additional income by making cakes or ready-made dishes which are then sold around the village. There are also 2 fishermen's wives who work as housemaids at the Bitung Polytechnic complex who earn income once a month, although it is not much, it is enough to help ease the family's economic burden. There are also 2 husbands of female fishermen whose main income is working at a ship docking company, and another husband of a female fisherman who works as a microbus driver.

## 2. Passive Strategy

Fisherman families in Tandurusa Village, apart from using various active strategies to survive in the face of weather changes, they also use passive

strategies to maintain their families' lives. The passive strategy used by fishing families is to reduce as far as possible the necessities of life which are not primary and which can still be reduced. Here, the difference between an active strategy and a passive strategy is that if you are active you are trying to find additional income in various ways, whereas if you are passive you only try to reduce the cost of living by reducing various living necessities that can still be reduced.

According to Gilarso in La Ode Sawaluddin et al, 2020 the necessities of life are a need that must or must be fulfilled as a means of living. The needs for life arise when impulses arise from within humans and as a fact that humans need something to survive (Mangkunegara in La Ode Sawaludin et al, 2020). In this case, the needs of family members are an issue that must be met and resolved. According to fishermen in Tandurusa Village, several variables for fulfilling family living needs that can and cannot be saved are as follows:

#### a) Food needs

Food needs are basic or basic needs that must be met. Lack of food needs can have negative consequences on the human body, according to Tejasari in Bakri, 2020, food needs must be met to survive because food is the vitality needed by the human body. There are 21 respondents or 78% of fishermen in Tandurusa Subdistrict who can no longer save on food needs because their families only eat what they have, only setting aside a small amount of the catch which is not economically important fish and which is not sold as a side dish for the family or with the vegetables they grow. just in their yard. However, some fishermen (6 people or 22%) stated that they could still save money by refraining from buying snacks if they didn't have money, because they were often tempted when there were people selling food around the village, even though they had to go into debt.

#### b) Clothing needs

The need for clothing is a need necessary to protect the body and provide comfort for the individual, as well as placing the individual in reality in normal social conditions. North Sulawesi is generally famous for its clothing and accessories with a motto that is often heard, namely "Let's lose on rice but don't lose on action" which, translated, means that even if you

don't eat, the important thing is that your appearance must follow the trend. This is a culture that is difficult to eradicate, so many fishing families are in debt just to keep up with the trends in their social life. There are 19 fishermen or 70% of fishermen who stated that they cannot save on clothes because they only buy new clothes at Christmas and birthdays every year. However, 8 fishermen or 30% of respondents stated that they could still save money by not buying clothes if they felt there were still clothes that were good enough to wear to church or worship.

#### c) Board requirements

The need for shelter is a need that must be met because humans need a place to shelter and shelter. Every family needs a house for its survival as a place for family activities to shape the happiness and welfare of humans, namely individuals, families and society. Of the fishermen respondents in Tandurusa Village, 59% or 16 fishermen already have their own house and 11 people or 41% still live at the house of their parents or in-laws because 2 of them are still single or unmarried. The need for houses for fishermen can be saved because according to them the important thing is that they can provide enough shelter, so spending on housing, the majority of fishermen state that they do not spend on houses every year except for electricity for lighting.

#### d) Educational needs

The need for education is a need that is useful for improving individual welfare. Education is a process of character formation and preparing oneself to be able to live in a complex society. Education is also a process of changing a person's behavior in an effort to improve the quality of human life through lessons and training. According to fisherman respondents in Tandurura Subdistrict, education is just a formality to obtain a diploma, and it is not required to become a fisherman. That is why fishermen do not place much importance on education. If they feel they cannot afford to pay for their children's schooling, to save on living costs, many fishermen's children drop out of school. The majority of respondent fishermen or 67% only have elementary and middle school education. Maybe this is one of the reasons for the circle of poverty in fishing communities who do not want to change their mindset, to save on living costs

fishermen actually stop their children's education. For them they say the important thing is that children already know how to read and write and count, because being a fisherman is not there are educational or diploma requirements.

#### e) Health needs

Health is an indispensable need because being healthy is a requirement for an individual to be productive. For fishermen, health is absolutely necessary because their work requires physical strength to work in the open air and on the high seas. However, none of the fishermen set aside money to look after their health, so there is no need to save money on fishermen's health because they only pay money if their family members are really sick and only need doctor's fees. If that happens and there is no money, they will suddenly look for a loan.

### 3. Network Strategy

Network Strategy is a survival strategy carried out by establishing relationships, both formal and informal, with the social environment and institutional environment. When respondents were asked whether they had debt, 100% of respondents answered yes. All of them (100%) have debts to relatives or family and 26% or 7 people have debts in cooperatives, but no one has debts in banks because they don't have collateral and the procedures are complicated. They go into debt to pay for the family's needs, because their income is not sufficient to cover the family's living expenses, especially when the weather changes when there is no income at all. Fisherman's families try to survive by going into debt, they hope that when the weather gets better and more conducive to going out to sea to fish, they can pay off their debts.

Based on the results of research conducted, regarding the gradual life strategies carried out by fishermen in Tandurusa Village, Aertembaga District, Bitung City in facing weather changes, it is known that there are 3 strategies for survival for fishing families in Tandurusa Village. The three strategies are active strategy, passive strategy and network strategy. These three strategies were all used and even combined according to the needs and situations and conditions of the fishing families faced at that time. The livelihood as fishermen is a seasonal livelihood where the income is uncertain, they will only survive

with the circumstances and what they have in order to continue to meet their needs, especially food.

#### IV. CONCLUSION

The Based on the results of the research conducted, regarding the gradual life strategies carried out by fishermen in Tandurusa Village, Aertembaga District, Bitung City in facing weather changes, it can be concluded that:

1. Weather changes that occur every year can cause changes in the economy of fishing families. When the weather is friendly, it is often called harvest season because fishermen catch enough to meet all their household needs. On the other hand, when the weather changes, where strong winds and big waves, fishermen cannot go to sea to catch fish, so there is no income to support their living. . Situations like this make fishermen and their families look for ways or strategies to survive

2. There are 3 strategies used by fishermen in Tandurusa Village, Aertembaga District, Bitung City to survive. The three strategies are active strategy, passive strategy and network strategy, all three strategies are used and even combined according to the needs and situation and conditions of the fishing family faced at that time. The active strategy that fishing families use is to seek additional income outside of fishing at sea. Some fishing families are brave, trade, become motorbike taxi drivers, transport workers, construction workers and so on. The passive strategy used by fishing families is to save or reduce all living costs that can still be reduced as much as possible. Meanwhile, the last strategy used by fishing families to survive is the networking strategy, namely seeking loans from family, relatives, cooperatives, banks or others to maintain their family's lives.

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