Mitigation Strategy for Fishermen's Households as a Result of Covid-19 Pandemic Social Engineering in Sungai Kayu Ara Village

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Abstract. Covid-19 had a major impact on people's lives, including the fishing community. Mitigation strategies are needed in order to reduce the impact of Covid-19. This research was conducted in March 2021 at Sungai Kayu Village. This village is one of the coastal villages located in Sungai Apit District, Siak Regency, Riau Province. The purpose of this study is to identify structural and non-structural mitigation and analyze the mitigation strategies carried out by fishing households in Sungai Kayu Ara Village. The method used in this study using the Survey Method. The population was fishing households totaling 48 households. The technique of determining the respondents is by census, which takes all the population as respondents. Data was collected by means of observation, in-depth interviews, documentation, literature studies, and online searching of data and information. The data that used: qualitative descriptive analysis and Analytical Hierarchy Process (AHP). Structural and non-structural Covid-19 mitigation in Sungai Kayu Ara Village, Sungai Apit District, Siak Regency is more focused on implementing government policies stipulated by the Regent's regulation on handling infectious diseases and the Regent's regulation on the application of administrative sanctions for the enforcement of health protocols in handling infectious diseases. Mitigation strategies for fishermen households in Sungai Kayu Ara Village, Sungai Apit District, Siak Regency due to the main social engineering of the covid-19 pandemic are: selling fish caught by fishermen online, receiving protection fund and empowering fishermen, owning a plantation business (alternative business), receiving social assistance and have saving and emergency fund.

1. Introduction
The Covid-19 pandemic has hit many countries in the world, including Indonesia [1]. The Covid-19 outbreak is not only a national problem in a country, but also a global problem. The spread of the Corona virus disease 2019 (Covid-19) in Indonesia is designated as a national disaster based on the Decree of the President of the Republic of Indonesia number 12 of 2020 [2]. This epidemic has an impact on people's life lines, both in urban and rural areas, including in coastal villages, especially coastal villages that close to the passenger port. Cities and villages adjacent to passenger ports are strongly suspected of being vulnerable to the spread of Covid-19, because they are places for people to flow in and out between cities, and even between neighboring countries.

The fishing community of Sungai Kayu Ara Village is strongly suspected of being vulnerable to the spread of the Covid-19 pandemic. This village is a coastal village adjacent to the Tanjung Buton
passenger port. This port is quite crowded, where from this port passenger ships lift away and return (in and out) people who come from the island of Sumatra, especially from big cities on the island of Sumatra to coastal cities, even from cities - The coastal city is the gateway to/from abroad. From the Port of Tanjung Buton, ships come and go from/to the cities: Dumai, Bengkalis, Selatpanjang, Tanjung Samak, Tanjung Balai Karimun, Batam, Tanjung Pinang. Bengkalis City, Tanjung Balai Karimun City, Batam City and Tanjung Pinang City are the entrances to/from Malaysia and Singapore. With such conditions, there is a high chance that the fishing community of Sungai Kayu Ara is vulnerable to the spread of Covid-19.

To anticipate the spread of Covid-19, various mitigation strategies are carried out, both nationally and locally. Mitigation is carried out in big cities to rural areas. National disaster management caused by the spread of *Corona virus disease* 2019 (Covid-19) is carried out by the Task Force for the Acceleration of Handling *Corona virus disease* 2019 (Covid-19) in accordance with Presidential Decree Number 7 of 2020, and then Presidential Decree Number 9 of 2020 which was implemented through synergies between ministries/agencies and local governments.

Anticipating the spread of Covid-19 with various mitigation strategies are also carried out to the countryside. This is a promotive and at the same time preventive effort for rural communities, especially people who are strongly suspected of having a high chance of spreading the Covid-19 virus. For this reason, it is urgent to know the mitigation strategy carried out by the fishing household of Sungai Kayu Ara Village as one of the villages that is vulnerable to the spread of Covid-19. For this reason, this study aims to identify structural and non-structural mitigation and analyze the mitigation strategies carried out by fishing households in Sungai Kayu Ara Village. The results of the study can be taken into consideration as input in policy making during the Covid-19 pandemic for fishing households.

### 2. Methods

This research was conducted in March 2021 at Sungai Kayu Village. This village is one of the coastal villages located in Sungai Apit District, Siak Regency, Riau Province (Figure 1).
the spread of the Covid-19 pandemic. The method used in this study using the Survey Method. The population in this study were fisherman households totaling 48 households. The technique of determining the respondents is by census, which takes all the population as respondents. Data collection is done by means of observation, in-depth interviews, documentation, literature studies, and searching for data and information online.

The data analysis used were: qualitative descriptive analysis and Analytical Hierarchy Process (AHP). Qualitative descriptive analysis was used to identify structural mitigation and non-structural mitigation carried out by fishing households. While the Analytical Hierarchy Process (AHP) is used to analyze the mitigation strategies of fishermen's households. AHP is a method for ranking decision alternatives and choosing the best one with several criteria [3]. The process of using the AHP method consists of 8 stages, namely: 1) compiling a hierarchy consisting of main criteria, sub-criteria and alternative strategies; 2) compiling the AHP questionnaire with paired comparative test; 3) filling in expert perceptions using a scale of 1 to 9, this is obtained from questionnaires filled out by experts who are considered to know the development of operational policies; 4) calculate the geometric mean of n respondents; 5) enter the geometric mean data in the pairwise comparison matrix; 6) test the consistency of respondents in each matrix and in the whole hierarchy; 7) calculate priority weights on criteria, sub-criteria and strategies; and 8) perform a sensitivity analysis.

3. Result and Discussion

3.1. Structural and Non-Structural Mitigation of Covid-19

Mitigation is a series of efforts to reduce disaster risk, both through physical development as well as awareness and capacity building to deal with disaster threats. Disaster mitigation consists of: structural mitigation and non-structural mitigation. Structural mitigation is an effort to reduce vulnerability to disasters by means of technical engineering, building various physical infrastructure and using technology. Meanwhile, non-structural mitigation is an effort to reduce the impact of disasters in the form of policy making, spatial planning, capacity building and so on. Mitigation are non-structural disaster risk reduction measures that are non-physical such as policy, community development, institutional strengthening, and caring [4].

The government must be alert in taking strategic policies, if the government is not alert it will have an impact on social disaster vulnerability, and it will be very easy for other unwanted conflicts to occur [5]. The government has implemented various policies related to Covid-19 mitigation. These policies are stipulated in the form of laws and regulations from the central level to the regional level. These laws and regulations include:

1. Siak Regency Regional Regulation Number 4 of 2020 concerning Handling of Infectious Diseases in Siak Regency.
2. Siak Regent Regulation Number 113 of 2020 concerning the Implementation of Administrative Sanctions for Enforcement of Health Protocols in Handling Infectious Diseases in Siak Regency.

The government has formed a Covid-19 task force (task) specifically assigned to deal with Covid-19 at the research location in an effort to implement the established policies [6]. The tasks of the Covid-19 task force are to provide socialization about emergency supplies to the public in case of emergency matters, to conduct rapid tests, especially for those experiencing Covid-19 symptoms. If there are fishermen who are reactive from the results of the rapid test, they will immediately report and coordinate with the puskesmas or local health office.

Structural and non-structural mitigation of Covid-19 carried out by fishing households in the research location is the 3M Health Protocol Policy, namely Wearing Masks, Keeping Distance & Avoiding Crowds, and washing hands with soap, among others, are [7] [8]:

a. Wearing a Mask
At the research location, it is mandatory for the community to wear masks every time they leave the house to prevent transmission of the virus between communities. Using masks effectively and keeping a distance that is implemented effectively can reduce the epidemic curve, which describes the frequency of cases based on when they started getting sick during the outbreak period [9]. The masks recommended by the Government are N95 masks, medical/surgical masks, and cloth masks.

b. Keeping Your Distance & Avoiding Crowds
Keeping Distance & Avoiding Crowds to the whole community by maintaining a safe distance of 2 meters from other people, not shaking hands, holding hands, hugging, avoiding being close to anyone and anywhere, and limiting gatherings with other people such as group activities to reduce risk transmission of the Covid-19 disease. By maintaining a safe distance of 2 meters, the community can reduce the risk of contracting and transmitting by up to 85% [10].

c. Washing hands with soap
The public is required to wash their hands before starting activities so that their hands are protected from viruses and germs that stick to their hands. Places for washing hands at the research site can be found in various places such as schools, health centers, banks, shops, village offices, and houses of worship. The mechanism of soap in killing germs and eliminating viruses is based on the mechanism of breaking the viral membrane, simple elution, and entrapment of the virus [11]. After washing your hands, dry your hands with a tissue, clean towel, or hand dryer as bacteria spread more easily on wet skin than on dry skin [12].

3.2. Mitigation strategies for fishermen's households
Mitigation strategies for fishermen's households are viewed from 4 aspects, namely: health aspects, economic aspects, social aspects and social policy aspects. Health aspects include: adherence to health protocols, healthy lifestyles and carrying out Covid-19 vaccinations. Economic aspects include: selling fish online, owning a plantation business, savings and emergency funds. Social aspects include: physical distance, avoiding going in and out of the village, avoiding activities that cause crowds. Meanwhile, social policy aspects include: complying with the PSBB policy, receiving social assistance and funds for the protection and empowerment of fishermen (Table 1).

Table 1. Indicators of Mitigation Strategies for Fishermen's Households as a Result of the Covid-19 Pandemic Social Engineering

| Health Aspect | Economic Aspect | Social Aspect | Social Policy Aspect |
|---------------|----------------|--------------|---------------------|
| Compliance with health protocols | Selling fish online | Physical Distancing | Comply with PSBB Policy |
| Healthy lifestyles | Own a plantation business | Avoid going in and out of the village | Auxiliary reception late social |
| Vaccination | Savings and emergency funds | Avoid activities that cause crowds | Receipt of community protection and empowerment funds |
| Covid-19 |                  |              |                     |

Based on the results of the multi-criteria analysis, priority aspects were obtained in the mitigation strategy of fishermen's households as a result of the social engineering of the Covid-19 pandemic at the research location. The economic aspect ranks first, with a value of 0.359. This shows the efforts of fishermen households to save their economic sustainability by involving family members to get money or alternative income. Efforts made by fishing households are: selling fish online, owning a plantation business, as well as savings and emergency funds. The second rank is: the health aspect with a value of 0.311. Efforts made by households are: complying with health protocols, healthy lifestyles, and carrying out Covid-19 vaccinations which are well campaigned by the Government. The third rank is the aspect of government policy with a value of 0.188. the efforts made by households are: complying
with the PSBB policy, receiving social assistance and protection funds and empowering fishermen. The government has launched various aid schemes to help the community during the Covid-19 pandemic. These various aids are expected to ease the burden on people whose economies have been affected by the pandemic. The last ranking is: social aspect with a value of 0.143. Efforts made by fishing households are: doing physical distancing, avoiding going in and out of the village, and avoiding crowd activities (Table 2).

Table 2. Priority Value of All Aspects

| No. | Pilihan                                      | Value | Consistency Ratio(CR) |
|-----|----------------------------------------------|-------|-----------------------|
| 1   | Health Aspect                                | 0,311 |                       |
| 2   | Economic Aspect                              | 0,359 |                       |
| 3   | Social Aspect                                | 0,143 |                       |
| 4   | Aspects of Government Policy                 | 0,188 |                       |

Determination of the Mitigation Strategy of fishermen's households as a result of social engineering of the Covid-19 pandemic in Sungai Kayu Ara Village, Sungai Apit District, Siak Regency to be carried out in the future is analyzed through AHP through a hierarchical arrangement (Figure 2).

Figure 2. Hierarchy chart of the Mitigation Strategy of the Fisherman Community as a Result of the Covid-19 Pandemic Social Engineering in Sungai Kayu Ara Village.

Based on Figure 2, the aspects formed from the Mitigation Strategy for Fishermen's Households as a Result of the Covid-19 Pandemic Social Engineering in the research locations, respectively, from the highest scores were: selling fish online (0.163), receiving social assistance (0.145), owning a plantation/alternative livelihoods (0.120), receiving funds for protection and empowerment of fishermen (0.107), compliance with health protocols (0.082), having savings and emergency funds (0.079), healthy lifestyles (0.078), carrying out Covid-19 vaccinations (0.064), comply with the PSBB policy (0.063), Physical Distancing (0.043), avoid crowd activities (0.034), adhere to not going in and out of the village (0.023) (Figure 3).

The results showed that 5 (five) fisherman household mitigation strategies that became a priority to anticipate the social engineering of the Covid-19 pandemic at the research location were: selling fish caught by fishermen online, receiving social assistance, owning a plantation business (alternative business), receipt of funds for protection and empowerment of fishermen, and compliance with health protocols.
Based on these findings, 3 (three) mitigation strategies that depend or are based on fishing households that must be fully supported by the government are: selling fish online, alternative businesses besides catching fish and having savings and emergency funds. While the other 2 mitigation strategies depend on or are based on the government, namely the receipt of protection funds and community empowerment and the receipt of social assistance.

The development of alternative livelihoods, managing household finances well and having savings as an emergency fund can be considered as a mitigation strategy from the social engineering of the Covid-19 pandemic. The trends of adaptation strategies carried out by fishing households that are successful in getting out of the poverty trap, respectively, from the largest are: good household financial management; anticipation savings, and business diversification or having alternative livelihoods other than fishing [13].

Fishermen households, have sufficient time to develop these alternative livelihoods, besides the time to go to sea not all year round, they can also use household labor, their wives and children. The average fishing effort carried out by fishermen is only about 8 months a year and about 20 days in a month. Households that are successful in getting out of the poverty trap are households that use their time not to fish to develop alternative livelihoods, both in the form of off fishing and non-fishing. The development of this alternative business can also involve wives and children who do not interfere with their domestic activities [14].

The development of alternative businesses for fishermen's households can be done in groups. A solid group, besides being able to assist in technical and management matters, can also add bargaining value to other parties related to upstream related to production facilities and downstream related to product marketing [15].

The local government is expected to fully support both in terms of selling fish online, as well as in the development of alternative businesses besides catching the fish. By cooperating with e-commerce through digital platforms to sell fish online / online. This is an effort to support the government's call for people to work at home and to meet the needs of the community while preventing the spread of the corona virus. For the development of alternative businesses for fishing households, the government must not only create a conducive atmosphere, but also provide venture capital assistance. In addition, the government needs to budget and allocate funds for protection and community empowerment as well as social assistance funds for fishermen's households.

![Figure 3. Mitigation Strategies for Fishermen's Households as a Result of the Covid-19 Pandemic Social Engineering in Sungai Kayu Ara Village](image)

4. Conclusion

The structural and non-structural Covid-19 mitigation in Sungai Kayu Ara Village, Sungai Apit District, Siak Regency is more focused on implementing government policies stipulated by the Regent's regulation on handling infectious diseases and the Regent's regulation on the application of administrative sanctions for enforcement of health protocols in handling infectious diseases. The
implementation of the Covid-19 structural and non-structural mitigation was carried out due to pressure from the Covid-19 task force formed by the government.

The mitigation strategies for fishermen households in Sungai Kayu Ara Village, Sungai Apit District, Siak Regency due to the main social engineering of the covid-19 pandemic are: Selling fish caught by fishermen online, receiving social assistance, owning a plantation business (alternative business), receiving protection funds and empowerment of fishermen, and compliance with health protocols.

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