Human Development Index (HDI) of the Fisherman Community in Ransang Island Indonesia

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Abstract. HDI of fisherman communities is an important indicator to measure the success of developing the quality of life of fisherman communities. HDI is used to see the development of fisherman communities in the long term. This research was conducted in May-August 2021 in Ransang Island, Meranti Islands Regency, Riau Province, Indonesia. This study used a survey method, the sampling method was carried out by multi-stage cluster sampling as many as 40 fisherman spread over several sub-districts. Data analysis for determining HDI is calculated based on the geometric mean of the health index, knowledge index and expenditure index which refers to the UNDP calculation model. The HDI value of the fisherman community of Ransang Island in 2020 was 57.83. The HDI value is composed of a Health Index of 75.08; Education Index of 62.57; and the Expenditure Index of 45.88. The value of the health index is influenced by child mortality. The low Education Index is caused by accessibility, facilities and infrastructure constraints and costs. The expenditure index value is influenced by low productivity, one of which is the impact of the Covid-19 pandemic. HDI of fisherman communities is an important indicator to measure the success of developing the quality of life of fisheries communities. HDI is used to see the development of fisheries communities in the long term.

1. Introduction

Ransang Island is one of district in Meranti Regency. This district is an archipelago in the east of Sumatra Island. As a part of Meranti Islands Regency that has a fairly high fishery potential and indicated by the large fishery production from both the capture fishery and aquaculture sectors, fisheries production is also basic economy in Ransang Island.

Fisherman community is belong to poor society [1], [2]. Low productivity, low income, limited education, skill and knowledge and also weak capital is a problem that causing fisherman poverty [3]. Lack of access and assets of fisherman cause their decreased welfare [2]. Fishing production hasn’t prospered fisherman yet. Internal limitation of fisherman and external factors like exploitative fish trade networks for fisherman as producers cause fisheries poverty [4]. That problem effect to fisherman productivity and also their income [5]. Welfare is development goals and created by increased income. Fishing household need to increase their welfare by increase their income in fisheries or non fisheries aspect. Welfare problem in fisherman community that caused by their limitations will create low standard of living for fisherman so that effect in Human Development Index (HDI). HDI is an important alternative to measured development. There was several research
about fisheries production and fisherman welfare. This research studied about how productivity in a region related to their HDI especially in fisherman community. Fisheries production is one of variabel that create fisherman income. And then, that income used to fullfill primary and secondary needs of fisherman household. By that income, human resources in fisherman household can keep their health and get education so can increase their welfare.

HDI of fisherman communities is an important indicator to measure the success of developing the quality of life of fisheries communities. HDI is used to see the development of fisheries communities in the long term. There was a relation between HDI and production (gross domestic product) that produced by economic actors [6].

2. Methods

2.1 Sources of Information

This research was conducted on Ransang Island, Meranti Islands Regency, Riau Province, Indonesia. The study locations are in 2 sub-districts in Ransang Islands, namely Ransang Pesisir District and Ransang Barat District. The location determination is based on the dominant fishing community population.

The research was conducted from May to August 2021. The data that used in this study were primary and secondary data. Primary data was obtained from the results of field surveys through 40 key informants, while secondary data was obtained from publications and literature of relevant scientific works. Key informants is fisherman that located in Ransang Islands and Fisheries and Marine Institution in Meranti Regency as stakeholder that expert in fisheries development in that region. Survey method is a data collection which information can get directly from the people that choosen as sample or respondent [7]. Survey method is one of methodology in fisheries socio economic study [8]. Primary data that collected is component of HDI index that consist of health aspect such as live expectancy and mortality number of fisherman, education aspect (length time in school and literacy rate) and economic aspect or living standar aspect (comparison between income and expenditure). Thus, primary data that collected is information about economic behaviour of fisherman (production and consumption activity).

2.2 Data Analysis

Data analysis for determining HDI is calculated based on the geometric mean of the health index, knowledge index and expenditure index which refers to the United Nations Development Program (UNDP) calculation model. This research have two analysis such as: identifying status of fisheries community development in Ransang Islands and HDI status' comparison of fisheries communities in Ransang Island, Meranti Regency, and Riau Province. The HDI is the geometric mean of the three dimensional indices [9]:

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\text{HDI} = (I_{\text{Health}} \cdot I_{\text{Education}} \cdot I_{\text{Income}})^{1/3}
\]

**Figure 1.** Calculating the human development indices graphical presentation [9]
3. Result and Discussion

The approach to formulating HDI in fisherman community is based on HDI formula by UNDP calculation model. The first step is calculating all the component that create each aspect. So, that formula gave result point of health index, education index and expenditure index. Health index describe about life expectancy that get by mortality index. Education index is summarize of length of school and literacy rate. Expenditure index get by compare fisheries income and expenditure. Point of HDI index will be categorized in very high, high, medium and low level. Very high category in more than 80, high category in 70-79%, medium category in 55-69% and low category in less than 55% [9].

Based on HDI formula, HDI of fisherman community was described in Table 1.

| Description                              | Score  |
|------------------------------------------|--------|
| Health Index / Life Expectancy           | 75.08  |
| Education Index                          | 62.57  |
| Income Index/Standard Living             | 45.88  |
| HDI of Fisheries Communities in Ransang Island | 57.83  |

Based on the result, HDI point of fisherman community in Ransang Island is 57.83 and categorized in medium category. According to BPS data in 2021, HDI Meranti Regency is the lowest in Riau Province. Fisherman as community with low welfare is a part of that lowest HDI. There was several causes of low point in HDI especially in fisherman community.

In health indicators, the life expectancy of fishing communities is categorized as high (above 65 years). Live expectancy is number of years which a person is expected to live. Its marked by mortality rate [10]. Life expectancy affected by low life standard, poor health facilities, governamental policies of health, high population, terrorism and low education [11]. The improvement in the level of public health, which is marked by a decrease in infant mortality and an increase in number of live births, determines the level of life expectancy. This is supported by improving the quality and quantity of health facilities and infrastructure. Low expectancy at birth describe that countries or region is low in health access [10].

In education indicator, the literacy rate of the fishing community in Ransang Islands is in the medium category. The score on the average length of schooling, shows that the average fishery community only received basic education because low income in their household limit their access to get higher education. Medium education is caused by poverty [12]. This is the concern of the local government to increase public awareness to continue education while facilitating educational facilities for the community, especially the fishing community. Based on [13], governement expenditure in education, have no effect in HDI. Education access is more important than education programm and facilities.

The income index is a forming indicator in HDI which is indicated by the people's purchasing power/purchasing power parity. This indicator shows the success of economic development, especially the fisheries sub-sector in improving the welfare of fishery households. People's purchasing power is influenced by per capita income and expenditure. The decent living index value of the fishing community is classified as low. The findings in calculating the decent living index of the fishing community show that the per capita expenditure of the fishing community is higher than the fishery income, so the Atkinson formula is used to determine purchasing power. Purchasing power parity (PPP) also affected by macroeconomic policies [14].
Second analysis is identifying HDI status comparison among Rangsang Island, Meranti Regency and Riau Province. The result showed that comparison of HDI status of fisherman communities in Ransang Island, Meranti Regency and Riau Province. The value of each HDI index of the fisheries community in the Ransang Islands is lower than the index value in Meranti Islands Regency and Riau Province. This is indicated that policies of the Provincial and Regency Governments in developing the HDI indicator has not been implemented optimally. Variabel that affecting HDI as positive and significantly such as economic growth and government expenditure in health [13].

4. Conclusion
Based on the research findings, the value of the health index is influenced by child mortality. The low education index is caused by accessibility, facilities and infrastructure constraints and costs. The expenditure index value is influenced by low productivity, one of which is the impact of the Covid-19 pandemic.

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