

# The Economic Impact of CPO (Crude Palm Oil) Industry Development on the Lives of Fishermen Communities in Lubuk Gaung Village, Dumai City

## *Dampak Ekonomi Pembangunan Industri CPO (Crude Palm Oil) Bagi Kehidupan Masyarakat Nelayan di Kelurahan Lubuk Gaung Kota Dumai*

Mila Octavianti<sup>1</sup>, Trisla Warningsih<sup>1\*</sup>, Firman Nugroho<sup>1</sup>

<sup>1</sup>Department of Fisheries Socio-Economic, Faculty of Fisheries and Marine,  
Universitas Riau, Pekanbaru 28293 Indonesia

\*email: [trisla.t.warningsih@lecturer.unri.ac.id](mailto:trisla.t.warningsih@lecturer.unri.ac.id)

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### Abstract

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As much as 90% of the fisheries industry in Dumai City comes from capture fisheries. The capture fisheries industry is a crucial industry that requires more attention from the government because of its enormous potential. Every year, there is a decrease in the number of fishing households in Dumai City. The reason is the uncertainty of income received and the existence of other business sectors. Fishing communities depend on fisheries resources for their livelihoods. However, the fishing profession in Dumai City is susceptible to changes around it, including changes due to the development of the CPO industry. This study was conducted to analyze the economic impact of the CPO Industry's development on the Lubuk Gaung Village fishing community. This research uses a quantitative survey method, followed by quantitative descriptive data analysis and hypothesis testing with a paired sample t-test. The fishing community in Lubuk Gaung Village felt the economic impact of various indicators. Total household income experienced a significant increase of IDR 2,452,880. Total household expenditure also experienced a significant increase, amounting to IDR 1,185,800. Meanwhile, in terms of asset ownership, fishermen have experienced an increase in asset ownership to meet their daily needs since the existence of the CPO Industry.

**Keywords:** Economic Impact, Industry, Fishermen

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### Abstrak

Sebanyak 90% dari hasil industri perikanan di Kota Dumai berasal dari perikanan tangkap. Industri perikanan tangkap merupakan industri krusial yang membutuhkan perhatian lebih dari pemerintah karena potensinya yang sangat besar. Setiap tahun terjadi penurunan jumlah rumah tangga nelayan di Kota Dumai. Penyebabnya adalah ketidakpastian pendapatan yang diterima serta keberadaan sektor usaha lain. Masyarakat nelayan menggantungkan hidupnya pada sumber daya perikanan. Namun demikian, profesi nelayan di Kota Dumai sangat sensitif terhadap perubahan yang terjadi di sekitarnya, termasuk perubahan akibat perkembangan industri CPO. Penelitian ini dilakukan untuk menganalisis dampak ekonomi pada masyarakat nelayan Kelurahan Lubuk Gaung akibat pembangunan Industri CPO. Penelitian ini menggunakan metode survei dengan pendekatan kuantitatif, kemudian analisis data deskriptif kuantitatif dan uji hipotesis dengan *Paired Sample T-Test*. Dampak ekonomi dirasakan oleh masyarakat nelayan di Desa Lubuk Gaung dalam berbagai indikator. Pendapatan total rumah tangga mengalami peningkatan yang

signifikan yaitu sebesar Rp 2.452.880. Total pengeluaran rumah tangga juga mengalami peningkatan yang cukup signifikan, yaitu sebesar Rp 1.185.800. Sementara itu, dari sisi kepemilikan aset, nelayan mengalami peningkatan kepemilikan aset untuk memenuhi kebutuhan sehari-hari sejak adanya Industri CPO.

**Kata kunci:** Dampak Ekonomi, Industri, Nelayan

## 1. Introduction

One of the mainstays of Dumai City's economy is the fishing industry. As much as 90% of fisheries production in Dumai City comes from capture fisheries, namely 710 tons, and the remainder from fish cultivation and 289 tons. The Dumai City Fisheries and Maritime Service, the number of catches from fishing activities decreased from 930 tons in 2017 to 710 tons in 2021 (BPS, 2021). This concerns the existence of fish resources, environmental conditions, and the lives of community fishermen in Dumai City. The dependence of coastal communities on fish resources as a livelihood and commodity needs to be considered, with the tendency for fishing resulting in the decline of Dumai City waters. The cause is the income received and the existence of other business sectors.

According to Arief et al. (2019), small-scale capture fisheries still dominate the capture fisheries industry in Dumai City, which fishermen along the coast of the Malacca Strait carry out. Given the declining trend of capture fisheries yields in the waters around Dumai City, it is important to consider how much the coastal population depends on fish resources for livelihoods and food sources. Low catches and the high operational costs of fishing encourage some fishers to seek alternative employment. Every year, fewer and fewer households in Dumai City engage in fishing activities. According to BPS (2021) the number of fishing households in Dumai City is 353 households. This is likely due to the unpredictability of fishermen's income. This suggests that there are alternative business industries that are considered superior. As a result, many households have changed their livelihoods.

It is known that Dumai City has seven sub-districts. However, 353 fishing communities in Dumai City are recorded in the KUSUKA (Marine and Fisheries Business Actor Card) data spread across four sub-districts: Medang Kampai, Sungai Sembilan, Dumai Barat, and Dumai Timur. Compared to the other seven sub-districts, most fishing households are in Sungai Sembilan and Medang Kampai. Rahayuningsih (2018) indicates that a development process aims to create community welfare. The development process influences people's economic, social, cultural, and political aspects. One sector that contributes significantly to the development of a region is industry. In general, the existence of a sector can affect the growth of the surrounding environment positively and negatively. Tikson (2005) states that six factors indicate the success or failure of development, including economic structure, per capita income, urbanization, Quality of Life Index (QI), savings rate, and Human Development Index (HDI). Therefore, the development can be successful if development can change the community's economic structure, increase the savings rate, and increase per capita income in the neighbourhood.

The industrial sector in the coastal area of Dumai City is one of the most dominant sectors. Several industries help advance the Dumai City industry, including the CPO (Crude Palm Oil) processing industry. The CPO (Crude Palm Oil) industry is a processing industry that produces the primary raw material of palm fruit and products such as cooking oil, margarine, shortening, and vegetable ghee. According to Fatikawati & Muktikali (2015), industrial development has many other objectives besides creating jobs and reducing unemployment. One of these goals is to encourage economic growth. Fishing communities in Dumai City are negatively affected economically by the presence of several CPO industries that began in 2005. The year 2018 was a turning point for industrial development in Dumai City. According to Kemenperin (2022), the Dumai Industrial Estate (KID) has experienced rapid development in the last five years. It is currently the economic motor of both Dumai City and Riau Province.

Lubuk Gaung Village is one of the areas with the most potential for regional development and has the largest industry concentration. Lubuk Gaung Industrial Estate is part of the industrial estate intended for space utilization, according to Dumai City Regional Regulation Number 15 of 2019 concerning the Regional Spatial Plan (RTRW) of Dumai City. For Lubuk Gaung Village, the Industrial Estate designation covers an area of approximately 1,773 hectares, compared to the total area of the Village of 12,500 hectares. In addition, there is an industrial reserve area of 1,290 hectares (BPS, 2022).

The establishment of Lubuk Gaung Village as an industrial area certainly impacts the surrounding community and supporting factors for development. According to the Regulation of the Minister of Industry No. 35 of 2010 concerning Technical Guidelines for Industrial Estates, it is stated that there are several criteria in determining the location of Industrial Estates, including that the distance to settlements is at least 2 km, then land use, is non-agricultural land, non-settlement, and non-conservation. In reality, many industries in Lubuk

Gaung Village are very close to settlements (<2 km). Besides that, the industrial development is very close to the coastal area of Dumai City, so there is no doubt that this will affect the environment. Problems that arose after the development of the CPO Industry include shifting the fishing grounds of fishermen who previously fished around the Rupat Strait to outside the Rupat Strait, environmental pollution due to waste, and an impact on fishermen's livelihoods. In addition, three cases of CPO leakage occurred between 2014 and 2021 (Nufus, 2022). Incidents like this certainly impact the fishing community's livelihood, so the fishermen must inevitably find a new livelihood to continue meeting their daily needs.

The purpose of the study was to identify the characteristics of the Lubuk Gaung Village fishermen community, including age, education level, fishing experience, and the number of family dependents, and to analyze the economic impact, which includes household income, household expenditures, and asset ownership, due to the development of the CPO Industry.

## 2. Material and Method

### 2.1. Time and Place

This research was conducted in Lubuk Gaung Village, Sungai Sembilan Subdistrict, Dumai City, in May 2023.

### 2.2. Methods

The research location was chosen purposively based on specific objectives: the fishermen directly affected by the CPO Industry. In this research, the survey method is combined with a quantitative approach. A survey approach can collect data from a specific natural population (Sugiyono, 2018), but researchers do not apply treatment as in experiments. Instead, researchers distribute questionnaires to collect data. The technique for determining respondents in this study is to use the census method, which counts every member of the population as a respondent. As for the population in this study, namely, all people of Lubuk Gaung Village who work as fishermen, as many as 15 people and people whose primary profession is fishing with a side profession as an industrial laborer, as many as ten people, so 25 respondents can be determined in this study.

### 2.3. Data Analysis

The data analysis used in the research is to analyze the economic impact in the form of the effect on the amount of household income, the impact on household expenditure, and the impact on asset ownership of the fishing community of Lubuk Gaung Village due to the development of the CPO Industry, statistical analysis and hypothesis testing with the Paired Sample T-Test. According to Ghozali (2018), the Paired Sample T-Test is a test of the difference between two pre-post or before and after research samples, with the following formula:

$$t = \frac{d}{sd\sqrt{n}} \quad s = \frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n-1}$$

Description:

- $t$  = The t distribution value
- $\sum d$  = Mean difference between paired observations
- $sd$  = Standard deviation of the difference between paired observations
- $n$  = number of paired observations

Using the following criteria for decision-making: a) If the Sig. (2-tailed) <0.05, then there is a significant difference between the total income and expenditure of fishermen households in Lubuk Gaung Village before and after the construction of the CPO Industry. b) If the Sig. (2-tailed) >0.05, then there is no significant difference between the total income and expenditure of fishermen households in Lubuk Gaung Village before and after the construction of the CPO Industry.

## 3. Result and Discussion

### 3.1. Household Income

Indeed, the reason someone works is to earn money. After completing a job, whether a main job or a side job, income is the reward for the work done. This reward can take the form of a salary or wage. The working hours to complete a job impact how much income is generated (Darmawan, 2018). In addition, income also shows the socio-economic conditions of the community that affect household finances. Suparyanto (2021) defines a household as two or more people related by blood, marriage, or adoption who live together in one house. They play different roles and interact with each other to build and uphold a culture. Typically, a household consists of the head of the household and several other people. Family or household members are individuals who live in the same household as the head of the household and are his or her dependents. The head of the household is the person who bears most of the household responsibilities. Household income is compensation for labor, services, or other contributions to be paid after production activities (Siyapalan, 2020).

In this study, household income is from all household members working in the fisheries and non-fisheries sectors.

Based on interviews at the research location, many fishermen in Lubuk Gaung Village were truly poverty-stricken before the development of the CPO industry. This is because the catches they get differ from their needs, especially to pay for their children's education. Before the development of the industry in the area, fishermen in Lubuk Gaung Village only relied on income from fishing. They often used vacant land near their houses as agricultural land. Since the development of the CPO Industry in Lubuk Gaung Village, some chose to work in the industry even though they were only daily laborers. This has helped them to increase their income.

In the past, during the lean season, fishermen felt confused because their income from fishing was very little, but now that they have a side job, fishermen have no more difficulties during the lean season because they can still depend on their side income. In the interview with Mr. Burhan, he said that since working as an industrial laborer, helping to increase family income can meet daily needs, especially in children's education. The average income of fisher households in the fisheries sector before the development of the CPO Industry was IDR. 1,483,570, while after the development of the CPO Industry was IDR 2,087,450. The average income of fisher households in the fisheries sector has increased by IDR 603,880. This increase is caused by several factors, such as the more often fishermen go to sea, the more catches they get, and then fishermen also start looking for fish in the middle of the sea where there are still many fish that can be caught. In addition, with the development of the CPO Industry in Lubuk Gaung Village, more and more people live there, so the caught fish is also increasingly sold in the market.

Meanwhile, in the non-fisheries sector, the average income of fisher households before the development of the CPO Industry was IDR. 444,000, after the development of the CPO Industry, was IDR 2,302,000. The average income of fisher households in the non-fisheries sector has increased by IDR 1,858,000. This increase was caused by several factors, such as fishermen who worked on the side as industrial day laborers and their children who already had jobs, who also helped to earn a living. In addition, fishermen who work on the side as farmers or nibung artisans also experience an increase in income due to the community's increasing demand for their products. As for fishermen who work as traders of daily goods, they also experience an increase in income because more and more people live there, so basic needs also increase. In the past, during the lean season, fishermen felt confused because their income from fishing was very little, but now that they have side jobs, fishermen have no more difficulties during the lean season because they can still depend on their side income.

Table 1. Paired sample t-test results of the total income of fishermen households in Lubuk Gaung Village before and after the CPO industry

Tests	n	Descriptive Statistics		Paired T-Test		
		M	(Std. D)	t	df	Sig. (2-tailed)
Before the CPO Industry	25	1927570	(343237,48)	-16,448	24	0,000*
After CPO Industry	25	4380450	(757705,19)			

\* Sig. (2-tailed) < 0.05: significance value

Table 1 shows the results of the Paired Sample T-Test indicating a significant difference between the values before and after the CPO Industry, with a significance value (2-tailed) = 0.000 < 0.05 so that the research hypothesis H<sub>0</sub> is rejected and the hypothesis H<sub>1</sub> is accepted. This means there is a significant difference between the total income of fishermen households in Lubuk Gaung Village before and after the development of the CPO Industry.

### 3.2. Household Expenses

Expenditure is the total amount that households spend on various needs over a year. Examining income and expenditure is one benchmark that can be used to measure how a particular industry affects society. According to Suparmoko (2019), spending will inevitably follow when income increases because human needs increase over time. In addition, the cost of housing, recreation, transportation, and education are also necessary. Households will save some of their money in addition to spending it. There are three main types of expenditure for the community: food, non-food, and education expenditure. The results of interviews at the research location show that before the development of the CPO Industry, the fishermen's catches were mediocre and only met their daily needs. This often led them to choose to go into debt to stall to continue to meet their daily food needs. The debt will be paid later if the fishermen catch more than the previous catch. Fishermen's income has increased since the development of the CPO Industry in Lubuk Gaung Village. This is due to several factors, including some fishermen who also work as daily laborers in the industry, the increase in catches, and the increasing number of residents in the area so that their income can meet their daily needs.

Household expenditure will automatically increase directly proportional to their income. This is also the case with the expenditure of fishermen households in Lubuk Gaung Village. Since the increase in income earned, the monthly expenditure also automatically increases. In this study, household expenditure refers to the costs incurred to meet the needs of each family member, including costs for food, non-food, and education. Before the development of the CPO Industry, the average expenditure of fisher households in Lubuk Gaung Village was

IDR 1,708,800. In contrast, the average expenditure after the development of the CPO Industry was IDR 2,894,600. The average expenditure of fishermen households in Lubuk Gaung Village increased by IDR 1,185,800.

Table 2. Paired sample t-test results of total expenditures of fishermen households in Lubuk Gaung Village before and after the CPO industry

Tests	n	Descriptive Statistics		Paired T-Test	
		M (Std. D)	t	df	Sig. (2-tailed)
Before the CPO Industry	25	1708800 (313130,30)	-36,046	24	0,000*
After CPO Industry	25	2894600 (329083,07)			

\* Sig. (2-tailed) < 0.05: significance value

Table 2 shows the results of the Paired Sample T-Test indicating a significant difference between the values before and after the CPO Industry, with a significance value (2-tailed) = 0.000 < 0.05 so that the research hypothesis H<sub>0</sub> is rejected and the hypothesis H<sub>1</sub> is accepted. This means there is a significant difference between the total expenditure of fishermen households in Lubuk Gaung Village before and after the development of the CPO Industry.

### 3.3. Asset Ownership

According to [Siregar & Gustian \(2018\)](#), assets are goods (things) or everything (anything) that has economic value (economic value), commercial value (commercial value), and exchange value (exchange value) and is owned by a business entity, agency, or person/individual. This discussion covers immovable assets (such as land or buildings) and movable assets (tangible and intangible). Before the development of the CPO Industry, some fishermen did not have their own houses, but they still rented houses owned by others. This was due to uncertain income, which caused fishermen to focus only on their daily basic needs, and it was not easy to set aside money to build a house. After the development of the CPO Industry, along with the increasing income, the fishermen gradually bought several important items to support their daily activities, such as building houses, TVs, cellphones, refrigerators, washing machines, and motorbikes. Most fishermen's houses in Lubuk Gaung Village are semi-permanent, and some are still wooden. As for the ownership of fishing gear, the fishermen already have their fishing gear. Most fishermen own eight fishing gear units: gill nets, dredgers, and raw.

Before the development of the CPO Industry, it was recorded that overall, respondents had 112 units of fishing gear, 22 units of houses, four savings, 28 merchandise, 17 units of TV, 25 units of mobile phones, 18 units of refrigerators, 13 units of washing machines, and 25 units of motorbikes. Meanwhile, after the development of the CPO Industry, it was recorded that overall, respondents had 159 units of fishing gear, seven plots of land, 25 units of houses, 12 savings, 28 units of merchandise, 25 units of TV, 56 units of mobile phones, 25 units of refrigerators, 25 units of washing machines, and 35 units of motorbikes. Based on the analysis above, asset ownership also increases as the CPO Industry develops. This is, of course, balanced by the amount of income generated by respondents each month, where the more developed a household's welfare level, the more goods it needs to fulfill its daily needs.

## 4. Conclusions

The following conclusions were drawn based on the research results: the economic impact of the development of the CPO industry is felt by the fishing community of Lubuk Gaung Village in various indicators. Total household income experienced a significant increase in IDR 2,452,880. The amount of household expenditure also experienced a significant increase in IDR 1,185,800. Meanwhile, in terms of asset ownership, fishermen have experienced increased asset ownership to meet their daily needs since the development of the CPO industry.

## 5. Suggestion

Suggestions that can be given include the government paying more attention to fishermen because they are the primary source of fishery products in Dumai City. For fishermen, it is hoped that they can continue to improve the quality of the catch and be able to face the social and economic changes that are happening. In addition, further research is needed on different variables.

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