

# Impact Of Feedstock Biodiesel Development On Society Around PTPN I Company

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## Abstract

This study examines the impact of biodiesel development on the community around the company. This research was conducted at the National Plantation Limited Company I (PTPN I) Palm Oil Mills (POM) Tanjung Seumantoh, Karang Baru District, Aceh Tamiang Regency, Indonesia. This study uses a qualitative method with descriptive analysis. Data collection procedures were carried out through observation, interviews, Focus Group Discussion, and documentation. The sampling technique was conducted by purposive sampling. Mukim (village leader) of Karang Baru District, village heads in three villages within Tanjung Semantoh POM, namely Gampong Tanjung Seumantoh Gampong, Simpang Empat, and Paya Awe villages, as well as with the community in the three towns served as respondents. Data analysis was carried out through three stages: data reduction, data presentation, and conclusion drawing. The results of the study concluded that the development of Biodiesel had an impact on air quality. Polluted air containing fine sand/kettle ash caused by palm oil production causes congestion, interferes with vision, damages roofs, contaminates clotheslines and water reservoirs, and damages car bodies. In addition, the workforce absorbed in the palm oil mills had a minor impact on reducing unemployment. This can trigger a conflict between the community and the palm oil mills. The social responsibility programs of the palm oil mills to the surrounding community have not been maximized. Monoculture culture will lead to reduced crop diversification which increases commodity prices. The company also holds long-term Cultivation Rights and is extendable, resulting in lessening land owned by the community.

**Keywords:** Feedstock Biodiesel, Development, Pollution, Economy and Community Welfare

## Introduction

Dependence on energy sourced from fossil fuels, especially petroleum, is getting higher and inspired by Brazil's success in developing bioethanol, encouraging many countries, including Indonesia, to establish biofuels (Joni; 2011). Biodiesel is a biofuel derived from vegetable oil or animal fat through an esterification or transesterification process. Biodiesel is a strategic plan in using renewable energy in various parts of the world, including Indonesia.

The largest source of biodiesel feedstock in Indonesia comes from palm oil. Palm oil is one

of the renewable energy sources, which is a long-term plan for the Indonesian government (Denny, 2011). The development of Biodiesel is believed to be able to generate benefits for the community and the region, such as the creation of local jobs, infrastructure development, revenue generation for local governments, and a more negligible national dependence on fossil fuels and energy imports, as well as minimizing the negative impact of fossil fuels on the environment (Nuva et al., 2019).

Oil palm plantations produce more oil per unit than other alternative crops such as soybean, sunflower, canola (Purba, 2018). The

development of Biodiesel from the palm oil industry positively affects the CPO-based sector but harms the domestic cooking oil industry. This affects people's purchasing power which can increase the poverty rate of society (Wayan & Munadi, 2011).

Various kinds of literature show the positive and negative impacts of biofuel development for people in rural areas<sup>1</sup>, and the site has continued to increase in the last decade. Energy and regional development are interrelated aspects, where natural raw materials as alternative energy sources are often associated with the potential for selling between the economy and ecology (Nuva et al., 2019). Energy independence and environmental problems are the main issues in developing and using new and renewable energy. Therefore, creating new and renewable energy based on potential resources in the region will be more profitable for the community. Significantly it can also increase the capacity and livelihood of the neighborhood (Dharmawan et al., 2016).

Social issues that arise such as local community conflicts in the process of acquiring oil palm land. Land clearing for oil palm affects social relations and land ownership, and marginalized communities are often disadvantaged by large companies (Hidayah, 2016). In addition, in the distribution of benefits between oil palm farmers and oil palm plantations, independent smallholders tend to be parties who do not receive proper benefits (Alin, 2020), including the issue of waste disposal that impacts the environment of the surrounding area.

Aceh Tamiang Regency is one of the centers of oil palm plantations in Aceh Province. The area of plantation planting in Aceh Tamiang and the types of plants can be seen in the following table:

**Table 1: Area of Plantation Planted by District and Plant Type (ha)**

No	Districts	Palm oil		Coconut	
		2018	2019	2018	2019
1	Tamiang	4584	4593	7	8

<sup>1</sup>Villages in Aceh are known as Gampong. Especially in Aceh Tamiang, the village head is known as Datuk.

	Hulu				
2	Bandar Pusaka	2016	2256	24	24
3	Kejuruan Muda	866	866	13	14
4	Tenggulan	4068	3928	23	23
5	Rantau	608	608	26	26
6	Kota Kuala Simpang	10	10	1	1
7	Seruway	3400	3418	99	99
8	Bendahara	979	1475	92	92.5
9	Banda Mulia	299	299	128	128
10	Karang Baru	1220	1310	32	32
11	Sekerak	467	467	28	28
12	Manyak Payed	1185	1199	79	78.5
Amount		19.702	20,420	552	554

Source: Processed from Aceh Tamiang in Figures, 2020

From the data above, it can be explained that the total planted area of oil palm plantations in 2018 was 19,702 Ha, then in 2019, it increased to 20,420 Ha spread over 32 villages. Therefore, this research is essential and exciting to see sociologically, legally, and economically the impact of biodiesel development on the surrounding community. National Plantation Limited Company (PTPN) I Tanjong Seumantoh, located in the Karang Baru District.

### Literature Review

Biodiesel is considered a potential substitute for petroleum-based diesel fuel (IM Rizwanul Fattah et al., 2020). Biodiesel is generally produced from renewable sources such as agricultural products and microalgae in suitable and environmentally friendly catalysts (Ong, HC, Tiong, et al., 2020). The environmental advantage is the best benefit of Biodiesel compared to gasoline and diesel. Less pollution is associated with fewer costs for environmental protection, which translates into better opportunities to achieve economic growth. Policy recommendations should focus on promoting the consumption of biofuels by

reducing their prices (Mihaela Simionescu et al., 2019).

The development of Biodiesel also cannot be separated from the role of Biodiesel as a solution to overcome energy security problems, Biodiesel as a solution to reduce import pressures and overcome energy security threats. Palm oil's increasingly important position in the world biodiesel trade. The increase in demand for palm oil in the world market is due to the rise in world biodiesel production, which uses palm oil as a raw material. World biodiesel production increases every year in line with the mandatory biodiesel policy carried out by all exporting and importing countries of the world vegetable oil (Sulaiman Khan et al.; 2017)

In Indonesia, the primary source of Biodiesel raw material is palm oil, which reaches 90 percent. This is because palm oil-based biodiesel is considered more competitive and efficient for commercial-scale than other sources, and the supply of raw materials in Indonesia is quite large (Agency for the Assessment and Development of Trade Policy 2013)

The sustainability of palm oil-based biodiesel will be successful if appropriate, coherent, and robust policy directions. The policy of developing the biodiesel industry from palm oil can positively impact the increase in the price of palm cooking oil due to the increase in the price of palm oil as a raw material. The rise in the price of palm cooking oil is expected to cause a decrease in the demand for palm cooking oil and a reduction in the production of palm cooking oil. The increase in the price of palm oil and the production of palm oil has an impact on the rise in the price of fresh fruit bunches of palm oil. The increase in the price of oil palm fresh fruit bunches provides incentives for smallholders and large plantations to expand their oil palm plantation area. Expansion of oil palm plantation areas can increase the production of oil palm fresh fruit bunches. (Masjui Hj Hassan, et al.; 2013)

The development of the biodiesel industry from palm oil hurts the downstream palm oil industry, especially the palm cooking oil industry in Indonesia. This negative impact can be seen from

the increase in the price of palm cooking oil so that the demand for palm cooking oil and production of palm cooking oil has decreased. The development of the oil palm industry also causes forest degradation, which causes the depletion of water sources (Rafian Joni et al., 2010).

Palm oil-based biodiesel is developed in Indonesia and also in various other biofuel-producing countries. The issues raised in the development of biofuels cannot be separated from the biodiesel potential sell and reduce dependence on imported fossil fuels and stimulate economic growth through new job opportunities, increase household income, and has positive implications for regional development (Bambang Irwan et al.; 2021). Biodiesel production is also considered a threat to social justice and environmental sustainability, where oil palm plantations as the primary raw material for Biodiesel are deemed to have the potential to damage the ecology if not appropriately managed (T Yasinta et al.; 2021).

### **Methodology**

This study uses a qualitative method with descriptive analysis (Sugiono, 2013; 2019). This research was conducted in Aceh Tamiang District, Aceh Province, Indonesia. There are four types of data collection techniques used in this study: observation, interviews, Focus Group Discussion (FGD), and documentation (Nauman, 2007). The sampling technique is carried out by purposive sampling. Mukim (village leader) of Karang Baru District, village heads in three villages within PTPN I POM Tanjong Semantoh, namely Gampong Tanjong Seumantoh Gampong, Simpang Empat, and Paya Awe villages, as well as with the community in the three towns served as respondents.

The data from the research results were analyzed in three stages: data reduction, data presentation, and conclusion drawing (Moleong, 2002). Data reduction is selecting, determining focus, simplifying, summarizing, and changing data obtained from observations and interviews in Aceh Tamiang District. Presentation of data describes a set of structured information that

provides the possibility of concluding. Conclusions are drawn in stages, starting from temporary findings from the results of observations and interviews to the decision after the focus group discussion is carried out.

### **Results and Discussion**

The government has been working many ways to realize one of the MDG's (Millennium Development Goals) commitments and the national commitment to poverty reduction. Poverty alleviation is constantly pursued because of the complexity of the problems faced by the poor and limited resources to fulfill fundamental rights for their lives. Poverty reduction measures cannot be handled by one particular sector alone. Still, they must be multi-sectoral and cross-sectoral by involving relevant stakeholders to increase the effectiveness of the program's achievements.

As the world's largest producer of palm oil, Indonesia is developing Biodiesel from palm oil to reduce the negative impact of rising oil prices. Biodiesel from oil palm can affect palm plantations, palm oil, and downstream industries (Joni et al., 2012). Biodiesel is used in engine/motor applications. It is extracted from vegetable oil or animal fat through an esterification or transesterification process. The impacts arising from the development of Biodiesel are as follows:

#### **Sociological Impact**

Changes in agriculture from polyculture to monoculture have led to price instability in farm commodities. In addition, horizontal conflicts between companies and indigenous people are a severe impact that needs to be considered. Therefore, there is a need for government regulation and encouragement to minimize the adverse effects caused. In drafting regulations, it is also necessary to involve academics and various levels of society to obtain a win-win solution.

Such changes in agricultural culture did not approach or provide understanding to the people in Aceh Tamiang, which is an oil palm plantation area. This condition has had an impact that has

changed the people's behavior in Aceh Tamiang with the expansion of oil palm plantations.

The existence of the Tanjung Seumatoh POM company has a significant impact on the community, as indicated by the results of interviews with informants in Aceh Tamiang. From the observations of 3 (three) villages around Tanjung Seumatoh POM, it was found that the company created pollution to the quality of air (dirty air mixed with fine sand/kettle ash). Villages Gmpong Tanjung Sematoh Kampung, Paya Awee, and Simpang Empat can witness the impact using naked eyes in the afternoon. However, the consequences are not as severe as in 2015 (Observation, September 18, 2021).

The interview results with Datok Simpang Empat found that palm oil processing at the Tanjung Semantoh POM still encounters some problems. As stated by the following informant: Tanjung Semantoh POM is less concerned with the pollution caused during palm oil processing. The smoke that comes out causes shortness of breath for people. Boiler ash that comes out disturbs people's eyesight and damages roofs, clotheslines, water reservoirs, and parked cars without being covered. (Interview September 17, 2021)

The community once demonstrated against the boiler ash released by the Tanjung Semantoh POM, which was operating because the boiler was damaged. However, in the demonstration, some parties took advantage of the situation so that the community did not continue. The Tanjung Semantoh POM also did not compensate for the damage caused by boiler ash.

The same thing was also conveyed by Datok Tanjung Sementoh Zulkifli and Datok Paya Awe Zulfikar, that the development of Biodiesel, especially at the Tanjung Seumantoh POM, still causes several problems. For example, when the boiler is damaged, when palm oil is processed, it causes boiler ash that damages people's houses' roofs and hurts people's eyes. Gampong Paya Awe also suffered losses to community plants due to the waste from the Tanjung Seumantoh POM. Then, in terms of workforce, no human resources were accepted in the POM. (Interview September 18, 2021).

Then Mukim Medang Ara, Azruddin also said in line with the informant above that the development of Biodiesel is still impacting the community. The impact of the smoke and ash from the boiler disturbs the community, and there has been no compensation for the community (Interview September 19, 2021). Mukim Simpang Empat conveyed the same thing; Samsul said that the development of Biodiesel still impacts the community. (Interview September 19, 2021)

The Simpang Empat community believes that the Tanjung Semantoh POM does not always provide benefits to the community. Sometimes there is assistance for orphans and for people who are in trouble. However, the Tanjung Semantoh POM also has a detrimental impact on the community due to smoke and boiler ash, damaging the roofs of residents' houses, and interfering with vision. The same thing was conveyed by the people of Paya Awe and the people of Tanjung Semantoh Kampung. (Interview, September 18, 2021). Schematically the impact of biodiesel development sociologically can be explained as follows:

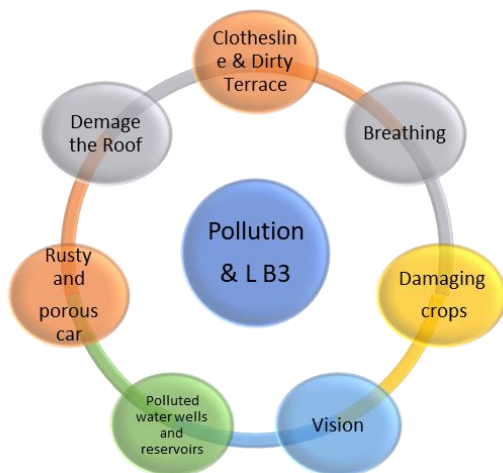


Figure 1: Sociological Impact

### Legal Impact

The increase in the area of oil palm plantations has a legal impact on the community. Farmers are only interested in growing oil palm because the demand is more significant than other crops. Monoculture culture will lead to reduced plant

diversification, resulting in an increase in the price of other commodities due to the scarcity of things other than oil palm. In addition to cultural shifts, horizontal conflicts are also an impact that can lead to horizontal conflicts caused by companies' conversion of forest functions without first consulting with indigenous tribes. Many of these events occur in Indonesia.

Aceh Tamiang Regency also experienced such a phenomenon. A large portion of land use and land rights have been altered. The presence of oil palm plantations in Aceh Tamiang caused many requests to be converted into Cultivation Rights. The holder of the Cultivation Right causes land tenure by the company in the long term and can be extended to reduce further the land owned by the community (Datok Paya Awe: Interview, September 19, 2021).

Then related to the labor problem in Aceh Tamiang, which palm oil mills absorb, it does not significantly reduce unemployment. This can also trigger conflicts between communities and palm oil mills because the workers are absorbed from outside the region and not openly. POM only accepts workers from Aceh Tamiang only as temporary contract workers and those who already have the expertise, such as dodos palm oil, truck drivers (Datok Tanjung Seumatoth: interview September 18, 2021). Employment relationships that are limited to casual contracts cannot be used as a guide for people's income in meeting the needs of their families because the work is only incidental so that they only get arbitrary wages.

In addition, workers who are accepted as contract workers must have the expertise of palm oil truck drivers. All communities do not possess this skill, so the people who apply as laborers do not meet the requirements set by the palm oil mills. Therefore, the community's rights as citizens around the company have not received attention from the company. Likewise, the Tanjung Seumatoth palm oil mills' social responsibility programs for the surrounding community do not yet exist (Datok Simpang Empat: Interview September 19, 2021).

The development of Biodiesel by palm oil mills is a central government policy that local

governments must follow. This policy supports the availability of non-oil and gas fuels in facing the shortage of oil and gas availability by choosing alternative fuels. Policies that strongly support the existence of oil palm companies must be the basis for strengthening the rights of the people in Aceh Tamiang. Schematically, the impact of biodiesel development from a legal aspect can be seen in the following graph:



Figure 2: Legal Impact

The impact of the law rolling on the Tanjung Seumatoh POM is an issue that encourages people to question the existence of CSR funds and job vacancies for the surrounding community. The case developed with the support of Non-Governmental Organizations. The community of Simpang Empat Village and NGOs also fought for the existence of the Cultivation Rights of POM land, which jutted into the community settlements and was separated from the main plantation to be converted for the benefit of the community.

**Economic impact**

The development of CPO-based Biodiesel can reduce poverty. Aceh Tamiang, as one of the districts with the largest plantation area in Aceh (20,420 Ha), has been able to reduce poverty in the area. In the last ten years, the poverty rate in Aceh Tamiang has continued to decline, and this can be seen in the following graph:

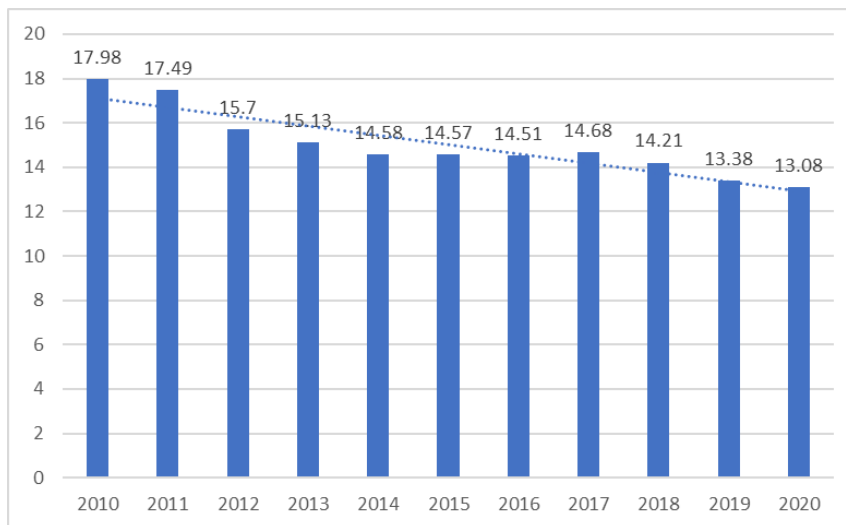


Figure 3: Poverty in Aceh Tamiang

Source: Processed from various sources

From the data above, it can be understood that the poverty rate in Aceh has continued to decline in the last ten years. In 2010 the poverty rate in Aceh Tamiang was at 17.98% and continued to reduce to 13.08% in 2020. This is hard work from all parties that should be appreciated. Increases in CPO prices and production can increase the income of oil palm farmers, which will reduce

poverty. However, the rise in CPO also causes a decrease in cooking oil production, impacting rising prices. Cooking oil is one of the staples of society. The slightest increase in the price of cooking oil will increase the level of poverty in a region.

Furthermore, Datok Simpang Empat explained that Tanjung Semantoh POM still impacts the

community positively and negatively. The positive result, although very little, is given in the form of compensation for orphans and people who experience calamities. Some workers are used in the POM but only as contract laborers for loading and unloading palm oil. The negative impact is the presence of smoke and boiler ash, which interferes with the breathing, vision, and roofs of the community's houses. Until now, there has been no compensation for the community (Interview September 20, 2021).

According to Datok Tanjung Semantok, Tanjung Semantok POM assisted orphans as much as Rp. 250.000- in a year. Then there is also assistance for big holidays, but it is very little and does not match the community's expectations because it is only given around Rp. 100,000 to Rp. 200,000,- only. Assistance for disasters is also provided every time there is a disaster, but it is only given to the community from delivering news of old disasters. Then there was also assistance to build badminton facilities, and there were provided iron poles for badminton courts. There is also assistance for borrowing heavy equipment such as tractors if the community needs it. For the workforce used by the people of Kampung Semantoh, only one as an employee, there has been no other for a long time. Schematically, the economic impact can be seen in the following scheme:



Figure 4: Economic Impact

## Discussion

Humans and the environment have a reciprocal relationship. Human activities affect the environment. Otherwise, humans are also influenced by the environment. This reciprocal

relationship exists between humans as individuals or groups of people and their natural habitat. The balance between the natural environment and the artificial environment is fundamentally disturbed. This is considered the beginning of the environmental crisis because humans are both perpetrators and victims. Sociologically the development of Biodiesel has resulted in a negative impact in the form of air pollution. This finding is in line with the results of a study (Wardana, 2004) which concluded that the industrial sector contributed 9.7% of air pollution, 63.8% of transportation, 7.8% of waste disposal, 1.9% of stationary combustion, and 16.9% of other pollution. Air.

Conceptually, pollution, according to experts, is the entry of living things, substances, energy, and materials into the environment, causing the background to be less or unable to function according to its designation. In total, pollution can be interpreted as unfavorable changes to the environment caused by the results of human activities in whole or in part, through direct or indirect effects, from changes in the physical-chemical composition, radiation levels, energy patterns, and waste of organisms.

This was conveyed by Surya Luthfi, S. S.TP as follows: Based on reports from Datuk in five villages, the Aceh Tamiang District Government has adopted a policy by writing a letter directly to Tanjung Semantoh POM and sending a copy to the Environment Agency. In the letter, the government asked the company to resolve the problems in the Tanjung Semantoh POM, especially those that directly impacted the community (Interview, October 19, 2021).

According to Corman (Mukono, 2008), air pollution is the presence of contaminants in the atmosphere due to human actions. This is to distinguish between natural air pollution and air pollution in the workplace. The air is contaminated with extraneous substances and is harmful to humans. In addition, such pollutants may also disrupt the dynamic balance of the atmosphere and negatively impact humans, animals, and vegetation.

Taking these conditions into account, the local government and oil palm companies must build synergy in providing benefits to the community for the existence of oil palm companies. Local governments should encourage palm oil mills to create programs for social responsibility to the surrounding community. Especially now that the government's policy strongly supports palm oil mills for biodiesel development, which causes the company's chances of profit to be higher. Social responsibility must be applied to the surrounding community with various programs, and this is the community's right around the oil palm company. Social responsibility programs such as community empowerment by providing training, scholarships for students around the company, assistance, and assistance for the poor, and various other activities, both regular and incidental.

The results of the FGD with the community of Simpang Empat Village, Tanjung Semantoh Village and Paya Awe Village, Karang Baru District, Aceh Tamiang Regency, it was found that:

The issue at Tanjung Semantoh POM is boiler ash and boiler ash; to this day, the problem of boiler ash has not been resolved. Companies must be responsible for social issues experienced by the community. The government must ensure that the cultivation rights land is dead. When the cultivation rights have expired, they will be transferred to a Green Open Space. Today, there are already cultivation rights released and then used to construct a mosque in the East area of Simpang Empat Village (Focus Group Discussion of Simpang Empat Village, November 5, 2021). The FGD found that: Companies and the government must disclose information to the public to have more confidence in the government and entrepreneurs. The government is more sensitive to the fate of the affected people. Attention and compensation is the right step to solve environmental impact problems that have occurred for years (Focus Group Discussion of Tanjung Semantoh Village and Paya Awe Village, 5-6 November 2021)

The issue has been followed up by the government as revealed by the informant Zulhadi, ST (Deputy Environmental Control of Tanjung Semantoh POM) that: Tanjung Semantoh POM has followed up on the monitoring and compliance report issued by the Aceh Tamiang Environmental Service. Regarding the boiler engine, which often has problems and emits boiler ash, the company has replaced it with a new machine and will be completed this week (Interview, October 21, 2021).

Palm oil mills must also continue to build partnerships with local communities. The company must also conduct socialization with the community to find out the constraints and comfort of the village community around the company. Thus, the relationship developed with the community can avoid conflicts and minimize the incidence of crime or demonstrations. We hope that in the future, the presence of the palm oil industry, especially the development of Biodiesel, can improve the economy of the community, especially the community around the company.

### **Conclusion**

From the discussion that has been presented above, it can be concluded that the development of Biodiesel has positive and negative impacts. Sociologically the product of Biodiesel affects air quality (pollution). Dirty blood mixed with fine sand/kettle ash resulting from Tanjung Semantoh's POM, palm oil production is still visible to the naked eye in the afternoon. The smoke that comes out causes congestion, interferes with vision, damages roofs, dirty clotheslines, dirty water reservoirs, and even damages the body of a parked car if it is not closed. Apart from that, the workforce absorbed by palm oil mills does not significantly reduce unemployment. One of the reasons why such a situation occurred was that the company recruited many of their workers from another region/ area and often done secretly. This can trigger conflict between the community and the palm oil mills.



Likewise, the Tanjung Seumantoh palm oil mills' social responsibility programs to the surrounding community have not been maximized.

The increase in the area of oil palm plantations also has a legal impact on the community. Farmers are only interested in growing palm because the demand is more significant than other crops. Monoculture culture has reduced crop diversification, increasing commodity prices due to the scarcity of things other than palm. The company also holds long-term Cultivation Rights and is extendable, resulting in lessening land owned by the community. On the other side, though only partially, POM comes with a positive side as it has contributed to an increase of welfare for the community around the company.

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