Land and forest fire disaster management through the arboretum gambut and community empowerment of masyarakat peduli api (mpa) csr program pt pertamina (persero) ru ii sungai pakning

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Abstract. This paper describes the efforts to resolve the smoke disaster caused by forest and peatland fires in Riau Province by PT Pertamina RU II Sungai Pakning CSR program. This paper is an empirical study carried out in Bukit Batu District, Bengkalis Regency, Riau Province, Indonesia during the period 2017-2019. The findings presented in this paper include the mitigation of smoke disasters carried out by various parties including private institutions, one of which is CSR of PT Pertamina (Persero) RU II Sungai Pakning which develops Forest and Land Fire Mitigation programs based on Community Empowerment of Masyarakat Peduli Api (MPA) and makes Arboretum Gambut as environmental education program for the community. The research method is qualitative research. The result is with the PT Pertamina RU II Sungai Pakning CSR program in Bukit Batu district area didn’t have a land and forest fire in that period.

1. Introduction
In recent years Indonesia has often been hit by land and forest fires, one of which is Riau Province. The fires of land and forests in Riau are caused by a number of things both intentional and unintentional. These forest and land fires cause material losses and fatalities. Fires also cause degradation of peatlands which creates a large amount of carbon emissions released in the air and also loss of biodiversity in that area [1]. According to the Indonesian Forum for the Environment or Walhi, forest and land fires in Riau are one of the annual disasters caused by human behaviour [2]. Field facts show that there is a deliberate factor in burning forests and land. The purpose of the burning is to carry out land clearing in preparation for plantation development [3].

Forest and land fires in Riau are not only the focus of the Riau Provincial Government, but have become a national concern. In addition to PT Pertamina RU II Sungai Pakning as one of the companies in the Riau Province contributes to efforts to resolve land and forest fires through Corporate Social Responsibility programs with Arboretum Gambut and Empowering Masyarakat Peduli Api (MPA), especially at the Ring 1 location of the company [4]. The location of the Land and Forest Fire Mitigation Program is in 4 villages and 1 urban village which are included in the Bukit Batu District, Bengkalis Regency. The four villages are Sejangat Village, Pakning Asal Village,
Sungai Selari Village, and Batang Duku Village, as well as one village namely Sungai Pakning Village. The main difficulty in efforts to mitigate smoke disasters from land and forest fires is the collision between the economic needs of the community and the conservation efforts implemented. Most MPAs are unemployed but on the other hand they volunteer to patrol and extinguish fires so often their focus is divided between earning a living by fire suppression. Based on these problems the CSR of PT Pertamina RU II Sungai Pakning seeks to solve these two problems through the Arboretum Gambut and Community Empowerment Masyarakat peduli Api (MPA) program.

2. Methods
This research was conducted using a qualitative method which is a research procedure to produce descriptive data from observed research objects. This method looks at the experience of individuals or organizations as a whole, so as not to limit the statements of individuals, organizations, or previous result into certain hypotheses [5]. While the approach taken is a case study by casually looking at the implementation of the Forest and Land Fire Mitigation Program in Riau Province by CSR PT Pertamina (Persero) Refinery Unit II Sungai Pakning during the period of 2018. Data collection was done through participant observation and focus Group discussion (FGD). The research informants were selected based on purposive sampling with the intention that the selected informants had known the problem in depth so that they could provide complete information. The research informants were the chairman and figures in the Bukit Batu Community Care Communication Forum (FORKOMPA) group and the Koperasi Tani Tunas Makmur in the Sungai Pakning region.

3. Results and Discussion
3.1 Peatland conservation efforts
Efforts to conserve peatland carried out by CSR of PT. Pertamina (persero) RU II Sungai Pakning aims to restore the natural function of peatlands so that people can reuse them for their various needs. This activity also involved local communities such as farmer groups and Masyarakat Peduli Api (MPA). Arboretum Gambut Making managed by Masyarakat Peduli Api (MPA) Sungai Pakning and Tunas Makmur Farmers Group are located on land saved from fire with a land area of approximately 1 ha. At the Arboretum gambut, the group together with PT Pertamina RU II Sungai Pakning identified typical peat plants that were saved from land and forest fires, and tried to cultivate typical peat plants so that they were not threatened with extinction. Some of the rare plants sought in this conservation activity are kantong semar (nepenthes spectabilis and nepenthes sumatrana and meranti trees, both of which fall into the vulnerable category and critical endangered in the IUCN red list [6].

Figure 1. Kantong Semar or Nepentes Sumatrana (left) and tourist on arboretum gambut (right).
Arboretum Gambut is also a learning tool for schools and universities around it as a field learning laboratory [7] (see Figure 1). So that learning in the arboretum will provide good knowledge of peat for students, and it is hoped that in the future these students will take care of the peat environment from land and forest fires. Economically, arboretum gambut also provides as basis sector which cerate multiplier effect via own income for the management group from the sale of tickets, food, as well as cultivated plants that visitors can take home [8]. Here are some photos of the Arboretum Gambut in Sungai Pakning: The planting of burnt land in Sungai Pakning was carried out with the Tunas Makmur Farmer Group and Masyarakat Peduli Api (MPA) in Sungai Pakning Village. Planting on burnt land is intended to turn vulnerable bushes into productive agricultural land and reduce the risk of land fires. At present, the burned-out land with this joint planting is 14.5 ha, consisting of pineapple and perennials such as durian, matoa, jengkol and soursop. The types of plants are chosen because in addition to economic value, it is also not necessary to do advanced land management such as burning peat land for planting (see Figure 2).

Figure 2. Pineapple plantation in peatland.

3.2 Empowering of Masyarakat Peduli Api
The Masyarakat Peduli Api (MPA) is a volunteer in every village around PT Pertamina RU II Sungai Pakning. The existence of MPA greatly helps the government in handling smoke disasters from land and forest fires. MPA conducts routine patrols and voluntary fire suppression. But on the other hand MPA also has personal needs that must also be met. For this reason, PT Pertamina RU II Sungai Pakning provides a CSR program for them to support land and forest fire mitigation efforts as a source of smoke disasters around the company [9]. Some MPA programs include 1) safetyman and fireman training and 2) M-Preneurship.

This CSR capacity building program is carried out every year for all MPAs. Aside from being a basic ability to carry out fire suppression, the certificate given after training can be used by MPA to carry out safety work both in the turnaround activity of PT Pertamina RU II Sungai Pakning refinery and in other companies, so that MPA has a job that is able to fulfill life needs day-to-day. Some MPAs who have worked using this training certificate are approximately 50% of the total MPA. With this permanent work, it is expected that MPA will be more focused in carrying out its duties as an MPA because their personal needs have been fulfilled [10]. Some examples of MPA images in carrying out training can be seen in Figure 3. Whereas, M-Preneurship is a CSR program of PT Pertamina RU II Sungai Pakning which is intended for MPAs who have not received other jobs. The participants of this program are all MPA members in five villages in the first ring of the company. The program consists of several types of entrepreneurial activities including honey bee cultivation, catfish cultivation, mushroom cultivation, and clothes screen printing. The program also aims to provide alternative
income for MPA so that they will get additional income from these activities and be able to meet their daily needs.

![Figure 3. Safetyman and Fireman Training](image)

### 4. Conclusion
By carrying out the Arboretum gambut program and Empowering Masyarakat Peduli Api (MPA), PT Pertamina RU II Sungai Pakning is trying to solve the social and environmental problems that exist in Sungai Pakning. The problem of unused land being burnt is transformed into pineapple farming, thereby reducing the risk of fire in the dry season. Then in the education sector Pertamina makes a Arboretum Gambut that is used as a peat laboratory for schools around it, so that it is expected that the younger generation will understand in maintaining the peat that is in the Sungai Pakning. In addition, the MPA unemployment problem which was an obstacle was overcome by the M-Preneurship program, so that MPA was able to focus on patrolling and suppressing fires because their needs were sufficient. So that with some of these programs in 2017 – 2019 there is no land and forest fire (zero fire) and the process of handling hotspots is able to be quickly.

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