

# Co-Benefit Analysis from the Implementation of Climate Change Adaptation Program in West Kalimantan, Indonesia

Hangga Prihatmaja\*

## 1. Introduction

REDD+ is perceived as the prominent mechanism in decreasing atmospheric greenhouse gas emissions. Between 2013-2020, Government of Indonesia have had implemented the FORCLIME FC program that was using the mechanism of REDD+. The program was set up in Kapuas Hulu District, West Kalimantan Province and intended to reduce the greenhouse gasses (GHG) emission and increase the community's social welfare compared to the prior the program implementation. The REDD+ mechanism requiring the forest-based-activities to be limited up to the prohibition of activities in the forest areas to avoid further deforestation and forest degradation. Since REDD+ is understood as the aggregate of the initiatives and policies aiming to reduce emissions, therefore, there are other expected positive effects besides the intended target or benefits called with co-benefits. In REDD+ these may be social and environmental co-benefits, which result in better well-being outcomes. The main question is how villagers are finally supportive to the program in achieving the target emission reduction since the areas are consisted by indigenous communities that as known as forest-dependent-communities and practicing an intensive slash-and-burn activities for their livelihood. Meanwhile, this research is aiming to analyze the co-benefits obtained by the stakeholders that supports the achievement of the target of carbon emission reduction.

## 2. Methodology

This research was qualitative research with a case study strategy and written by using narrative systematic. The analysis framework was using the critical discourse analysis (CDA) to investigate the entanglement of micro (community) and macro (policy) aspects in social context of the implementation of the climate change adaptation program in these villages. The information of micro aspect gathered in 2018 during the focus group discussion (FGD) session at the level of Sub District of Batang Lupar attended by villagers from 8 villages, there are Mensiau, Labian Ira'ang, Sungai Ajung, Sungai Abau, Lanjak Deras, Sepandan, Labian, and Melemba. The information from the FGD then formulated and cross checked during the non-structural in-depth interview to the key informants targeted from 4 villages, there are Labian, Labian Ira'ang, Lanjak Deras, and Mensiau. Research continued in 2023 to the Labian and Mensiau to update the post-program situation. All research subjects were a part of the Kapuas Hulu District, West Kalimantan Province.

To the key informants from these villages, the in-depth interview was conducted to collect the targeted information, there are:

1. History of the program.
2. The governance of the program.
3. The strategy of carbon emission reduction by the program manager.
4. Economic benefit for the villagers by joining the program.
5. Consensual process between stakeholders.
6. Potential conflict between stakeholders

Meanwhile, the information of macro aspects was gathered from the analysis of the documents of the program implementation, and laws and regulations supporting the implementation of the climate change mitigation/adaptation program at the national and local level. Then the information from micro and macro aspects were analyzes, back-to-back.

## 3. Results

The FORCLIME FC Program has 2 Demonstration Areas (DA) for Kapuas Hulu District, there were DA#2 and DA#8. These DAs were known as villages intervened by the REDD+ mechanism. Research was conducted in the DA#2 by organizing the FGD and non-structural in-depth interview. DA#2 was taken as a sample area in which the villages situated in the upstream-hilly-areas, connected to the National Park of Betung Kerihun-Danau Sentarum, and consisted of Dayak Tribes communities from Iban and Embaloh Dayak Sub-Tribes. These communities were

\*Laboratory of Global Environmental Policy, Graduate School of Global Environmental Studies, Kyoto University, Yoshida-Honmachi, Sakyo-ku, Kyoto, 606-8501, JAPAN, [prihatmaja.hangga.87@st.kyoto-u.ac.jp](mailto:prihatmaja.hangga.87@st.kyoto-u.ac.jp)

known with their intensive shifting cultivation through the slash-and-burn activities as the source of the livelihood for generations. Through the areas that was being slashed-and-burned, they produced dry-land-paddy who doesn't need an intensive irrigation system due to the necessary irrigation were merely rely on the rainfall. Therefore, in order to maintain these practices, they were developing the agricultural calendar system to determine the respective timeline of slashing (June-August), burning (August-October), planting (October-December/January), and cultivating (January-February) the areas. Between March-June were known as resting time to held indigenous/cultural ceremony. The slash-and-burning activities had a great influence to their way of life that can be represented by rumah betang (wooden-indigenous-apartment). In Mensiau, the rumah betang consisted of 15 families. During the slash-and-burning season, all families will work together and the yields were distributed evenly among them. The yields could stand until the next season. Therefore, they maintenance this farming practice to endure their life along the generations. The tribal eldest said, "rice in the barns are remains, so as our life". Also, culturally it is ashamed to sell their rice to the market.



Fig 1. Rumah Betang of Mensiau Village

The slash-and-burn, nowadays, considered as unsustainable farming practices that may release carbon emission in major number. It is a potentiality to jeopardize the target of the Government of Indonesia (GOI) in the submitted Enhanced Indonesian Nationally Determined Contribution (E-INDC) to the UNFCCC. The GOI determined to attain the emission reduction target unconditionally of 31.89% and conditionally of 43.20% by 2030. Through the climate change mitigation/adaptation program, the GOI is intended to achieve these targets.

According to the FORCLIME FC, initially, during the program timeline there was an intention to achieved the mitigation target departed from the baseline per DA calculated between 1990-2012. Based on the REDD+ mechanism, the target can be achieved by eliminating any factors towards the deforestation and forest degradation, that was prohibiting any activities in the forest areas. This intention and prohibition action were hardly understood by the villagers due to the lack of knowledge and experience. However, through the program's local champion it is known that by improving the villagers their livelihood through the non-shifting cultivation activities, there is an indirect way to achieve the mitigation target. Therefore, the program set another target of socio-economic dimension so that the welfare level could be increased at least 80% compare to the prior of the program.

Generally, the program was inviting the villagers to submit their proposal assisted by their local champion. The proposal should be representing the alternatives livelihood with greater economic value than shifting cultivation but still in line with the indicators of REDD+ mechanism. There were agreed activities, such as: 1) Permanent agricultural plot; 2) Horticulture demonstration plot; 3) Plant Nursery; 4) Non-timber forest product: honey, rattan, bamboo, and natural dyes; 5) Silvofishery upon the Arowana's pond; and 6) Planting the medicinal plant of *Mitragyna speciosa*. Upon these activities, the villagers form a working group and the program put the investment to these villagers working group. The members of the group were teaching each other from their activities, including the commodities cultivation, market intelligence, and market negotiations. Besides, due to the limited capital by the program, so that the revolving fund is introduced to the villagers working group. Therefore, the revolving fund as a re-investment activity to the other similar or prospective working group. These activities have been done during the program timeline of 2013-2020. Meanwhile, according to the data during the research on 2018 it is shown that the emission of DA#2 in 2017 already reduced up to 13,730 tCO<sub>2</sub>e. Compared to the emission baseline of 1990-2012 using national emission factor that was 22,778 tCO<sub>2</sub>e, there was 60.28% of emission reduction.

#### 4. Conclusion

Nowadays most of villagers of the DA#2 were shifting their activities to the alternative's livelihood, especially horticulture commodities, conducted in the yards and/or non-productive lands surrounding the village areas. The livelihood alternatives created high economic value compared to the slash-and-burn practices in the forest, and that leads to the creation of better well-being outcomes. It is evidenced that the villagers have little interest to conduct any activities in the forest and leads to the decreased of deforestation and forest degradation levels. Forests are now intended merely for cultural or indigenous activities. By creating better well-being outcomes or the co-benefits, it has positive outcome to the achievement of carbon emission reduction target or mitigation target as a direct benefit of the climate change adaptation program.