Private forest as a model in critical land reconstruction in upstream area, Indonesia

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Abstract. The upstream Ciliwung river areas are now mostly occupied by critical lands due to deforestation and can also be the response to climate change. This condition leads to disasters at the downstream, including Jakarta. Lots of government programs have been conducted to control the critical land, but the results are not visible. The failure of rehabilitation programs are suspected to be caused by some factors, one of the most prominent is access to the area where the government does not wholly own the control of land rights. On the other hand, the function of protected areas should be maintained. A management model that has been successfully implemented is by "Hutan Organik or Organic Forest" in Megamendung. This model is community participation with private forestry, whereas the main purpose is to recover the function of the area. By using desk study, a survey of an existing condition and in-depth interview, this paper has a purpose of studying the private forestry policy model for critical land rehabilitation in the upstream of the Ciliwung river. Organic forestry program shows the success of community participation in land rehabilitation and can be developed as an alternative model in reconstructing critical land at upstream in Indonesia.

1. Introduction
The upper areas of Ciliwung river (Puncak and surrounding areas including Megamendung) recent are mostly occupied by critical lands1 due to deforestation and can also be the response to climate change. This is related to the possible increase of greenhouse gases such as carbon dioxide, one of which is caused by forest destruction as stated by Pittlock [1]. Forest destruction in the Ciliwung river basin area can be seen at least from data released by the Ministry of Environment (now Ministry of Forestry and Environment) in 2011 where there was a change in forest area from 4,716 hectares in 2000 to only 958 hectares in 2009 [2].

1 Critical lands according to Law Number 37 Year 2014 concerning Soil and Water Conservation is a land that functions poorly as a production medium to grow cultivated or non-cultivated plants.
The damage to the forest in the upper Ciliwung river area causes a lot of critical lands that can cause landslides and erosion, hence it affects to the river water (quality and quantity), as well as contributes floods at the downstream, including Jakarta. According to Lundqvist, Lohm and Falkenmark [3] land and water (river) have a dependency on one another. The correlation between land and water (river) can be seen from two things: land use that depends on the availability of water and the use of water that is disrupted due to land use. Meanwhile, according to van Dijk et al. [4] forests have a role in the hydrology where forests can affect the occurrence of flooding due to the reduced ability of the forest canopy in intercepting the outflow of rain so that it is directly infiltrated into the soil and increase the amount of runoff water.

To overcome the problem of critical land in the upper of the Ciliwung river including in the Puncak area, various efforts have been made by the Central and Regional Governments. The Bogor Regency Government, for example in 2015, has attempted to rehabilitate critical lands covering 634 hectares of the total critical land area of 9,660 hectares. However, the Government is still inadequate because the results are not visible. Moreover, the problem of flood and landslide are continuously occured.

Several factors are thought to be the cause of failure in critical land rehabilitation or reconstruction programs. The most prominent factor is the failure of the land rehabilitation program due to difficult access to the region. The access is difficult because ownership of land rights is not fully owned by the government but is owned by the private sector. There are also government-owned areas but are controlled by the community. Therefore, other efforts need to be done to overcome the problem of critical land, especially by promoting community participation because much of the critical land is land owned by the community.

Regarding community participation in efforts to rehabilitate critical land in the upper Ciliwung river area, especially in the Puncak area, it turns out that since August 2001 in the Megamendung area there was a community initiative in rehabilitating critical land and turning it into a forest area. This initiative was carried out by the family of Mr. Bambang Istiawan who initially used the name of the Megamendung Farmers Group (Kelompok Tani Megamendung) and currently uses the name of the Organic Forest Foundation (Yayasan Hutan Organik). The forest area of this initiative is now known as "Hutan Organik (Organic Forest)" which has a land area of approximately 27 hectares, of which 12 hectares are located in the Megamendung Village area, and 15 hectares are located in the Bojong Koneng Village area [5].

What is done by Mr. Istiawan and his family in developing "Hutan Organik (Organic Forest)" can be a learning and overview of best practices from the success of community participation for helping the rehabilitation of critical land and return it as a forest area. Its success is how to transform a critical land into a forest area with its ecosystem. Organic Forest developed by Mr. Istiawan's family can be categorized as a private forest which is a forest owned by individuals, companies or other entities. The development of private forest areas can be a solution in returning the critical land to forest areas in the upstream area of the Puncak region, considering that individuals or companies control many areas in the region. By using the concept of private forests, the landowners in the Puncak area can be encouraged to plant trees on their land so that they can restore it as a function of the forest.

Based on the background, this paper attempts to study the private forestry policy model for critical land rehabilitation in the upstream areas of the Ciliwung river carried out by "Hutan Organik (Organic Forests)" so that it can be an alternative model in rehabilitating or reconstructing critical lands in other upstream areas in Indonesia.

2. Methods of research
To achieve the expected goals, the implementation of this study uses a desk study, a survey of existing conditions and compare them to the previous conditions at the start of the construction of Organic Forests, and in-depth interviews. Desk study is carried out by studying various documents and news about Organic Forests as well as literature related to critical lands, rehabilitation of critical lands and private forests. Other documents studied are various regulations, policies, and news related to critical land and other issues concerning land use in the Puncak area. The researcher also surveyed to find out
the current condition of Organic Forest by visiting directly to the location where the initiative is located and by observing the surrounding environmental conditions. Moreover, the researchers also conducted in-depth interviews with Mr. and Mrs. Bambang Istiawan so that they could obtain information about how the initiative began and the developments that have taken place until now.

3. Results and discussion
The following description will illustrate how Mr. Istiawan's experience in rehabilitating land through his Organic Forest as well as various obstacles and challenges faced so far. Furthermore, it will be explained how the concept of the private forest implemented in the Organic Forest can be a model in rehabilitating critical land in the upstream region of Indonesia.

3.1. Organic Forest as a model of community participation in rehabilitating critical land in the Megamendung area of Bogor: before and after conditions
The current location of Organic Forest was originally a critical land of former tea plantations and chicken farms that have experienced degradation, erosion and soil pollution and had no springs. Critical land conditions at that time can be drawn from environmental damage on the land which has extreme contours from 15 degrees to 80 degrees so that it is shaped like a bowl, there is 1 dead spring, 70% of the area is reeds, vegetation is very little, the condition of the acidity of the soil with a pH value between 2.5 and 4 and no worms were found in the soil. The description of the initial condition in 2001 when Organic Forest can be seen in Figure 1:

![Figure 1. Before Conditions: North and West View at the “Hutan Organik (Organic Forest” location in September 2001 (source: presentation of Mr. Istiawan)](image)

The process of rehabilitating the critical land began by the initiator (Mr. Bambang Istiawan) whose expecting he can spend his old age on the edge of the forest. Unfortunately, the area no longer had a forest, hence he built it at Megamendung. The activities carried out by the initiator are also part of expressions of concern for environmental damage, that it could suppress an increasing the extent of critical land to climate change. Critical land rehabilitation activities were carried out in a self-supporting "voluntary initiative" pattern. Little by little the initiator and his wife bought the land around the area and began to plant trees on the land.

In carrying out the rehabilitation of critical land, the basic principle used by Mr. Istiawan is to learn from nature in the rehabilitation of this ecosystem, so that Natural Forest is a model that must be replicated, where natural forests are formed not because of chemical fertilizers but by organic materials, so that all experimental activities both agriculture and livestock are only using organic methods. The critical land by the initiator is defined as land that has lost fertility, whether it prone to landslides, and whether it difficult to water. The framework used in conducting critical land rehabilitation is by adopting a framework produced from the World Summit on Sustainable Development (WSSD) in Johannesburg 2002 where there are 5 main elements of life that must be
maintained which is include: water and sanitation, energy, health and environment, agriculture, and biodiversity and ecosystem management.

During the first four years (2001-2005) the speed of reforestation processes seems quite good, but there were no significant changes in soil quality. Nevertheless, there has been a significant process of ecosystem improvement in the form of re-functioning of 1 spring and the emergence of 1 other spring even though in this location there is no vein in the soil. Currently (2018), based on observations made it can be seen the condition of vegetation (land cover) in Organic Forest which has been very lush when compared to other locations around it. Moreover, in the artificial forest, there is also the biodiversity of both plants and animals so that it can provide an overview of the improvement of ecosystems in the region.

Thus, it can be said that the initiatives carried out have been able to reconstruct critical land into a forest area again. Finally, the efforts made by Mr. Istiawan were able to bring changes to the condition of the land that he controlled before, it was critical land into a forest area with dense vegetation and had its ecosystem. Until now there is no adequate research to see the true condition of the ecosystems in the artificial forest area. However, from a glimpse of observations made by both Mr. Istiawan and several visitors who documented various biodiversity in the Organic Forests, it has been able to show a changes in ecosystems. Inside the artificial forest area there are also many springs to grow back, and physically there has been no landslide there as before. The description of vegetation from the Organic Forest area compared to other areas around it can be seen in Figure 2 (after conditions):

![Figure 2](image-url)

**Figure 2.** After Conditions: The difference in land cover (vegetation) in “Hutan Organik (Organic Forest)” that looks lush when compared to other locations around it (source: photo from drone taken by the initiator in January 2018)

3.1.1. The key to the success of the Organic Forest initiative. There are at least 4 key successes to achieve success of the initiative undertaken by Mr. Istiawan in developing the "Hutan Organik (Organic Forest)" as follows [5]: (a) a passion, so willing to voluntarily use their own money to acquire land and then plant trees on the land that has been mastered; (b) the existence of good networking with various circles; (c) use the advancement of science and technology and by building a network with some academics from various universities; and (d) learn from nature and then choose the method of planting using frontier trees, a combination of planting, organic methods and planting endemic trees.

3.1.2. Barriers and challenges faced by Organic Forest. There are several barriers and challenges faced by "Organic Forests" in running and maintaining initiatives, namely: (a) availability of land
where land is increasingly limited along with land tenure around the location of initiatives by other parties. Additional land tenure also requires a cost that is not small in line with the increasingly expensive land prices; (b) obstacles in obtaining the legality of the land under control where it is not easy to take care of the land ownership certificate as a result of the location occupied is the former location of the Cultivation Right which until now has no clear status even though the rights have long expired. Under these conditions, land ownership status is only based on the buying and selling process and a certificate from the Village Office. If the problem of land legality can be taken care of it, it will also require a lot of money to take care of it; (c) the construction of new houses or villas around the location also adds to the bad condition of the ecosystem around the location of the initiative. Regarding this matter, at this time around the location of the initiative many new buildings have been built by landowners, and even several housing developers have also begun to enter and try to control the land to be used as residential areas. Related to this, the initiator of Organic Forest also often gets offers to divert the land under its control. Other conditions that occur around the location of the initiative because of unclear land status are the existence of ownership conflicts between landowners over several land locations.

3.2. Private forest as a model in critical land reconstruction in upstream areas in Indonesia

Private forest according to Chaudhary, Uprety and Rimal is the forest which is planted, nurtured, or conserved in any private land owned by an individual [6]. Meanwhile, according to Katani and Babil, private forests are forests on village land held by one or more individuals under the customary rule, and forests on general or village land for which the rights of occupancy have been granted to individuals, groups, corporate bodies or any other organization [7]. Referring to these two definitions, Organic Forest can be categorized as a private forest.

As stated in the introduction section, private forest development like what happened in Organic Forest can be a solution in the effort to rehabilitate or reconstruct critical areas in upstream areas of Indonesia. By using the experience of the success of Organic Forests, both central and regional governments must be able to encourage and facilitate landowners in the upstream areas to plant trees so that critical land could function again as forests.

What is done by Organic Forest is an example of the success of community participation in preserving the environment and an adequate example of how voluntary action can be encouraged to become the main instrument in Indonesia's environmental policy. This voluntary action also needs to be supported by other policy instruments, especially market-based instruments where individuals who carry out activities such as those carried out by the initiator of Organic Forest should be given economic incentives in the form of ease and reduction in the cost of obtaining land ownership certificates in addition to reducing land and building taxes that must be paid.

To ensure that community participation is carried out in line with the government's wishes and plans, it is not counterproductive and sustainable, then the legal certainty of the rights and obligations of the community also needs to be considered through regulatory instruments. Moreover, a collaboration between various stakeholders also needs to be encouraged to produce the best handling and management in addressing various environmental issues. A collaboration needs to be done with the consideration that environmental issues are one of the most important dimensions of human life, their handling and management require collaboration among various stakeholders [8].

In the case of rehabilitation of critical land in the upstream Ciliwung river area, an important and urgent collaboration must be carried out is a collaboration involving the Provincial Government of Special Capital Region of Jakarta which is a downstream region. Together with the current Jakarta leadership, the collaboration is very likely to be carried out adequately by considering that there is one subprogram from Governor Anies Baswedan's mission related to water management, namely cooperating with the surrounding areas of Jakarta for reforestation of upstream catchment areas (forests and mountains) [9]. Collaboration with Jakarta should also be easier by considering that Governor Anies Baswedan is currently also Chair of the Development Cooperation Agency in Jakarta, Bogor, Depok, Tangerang, Bekasi, Cianjur.
4. Conclusions
In closing, it can be concluded that the “Hutan Organik (Organic Forest)” initiated by Mr. Bambang Istiawan is an example of the community participation success in rehabilitating critical land in the upstream area that can be developed as a model in reconstructing critical land in the other upstream areas of Indonesia. To develop this model, both central and local governments must be able to encourage and facilitate the landowners to plant trees on their land. The development of the Organic Forest model also shows that voluntary action can be used as a major instrument in environmental policy in Indonesia and needs to be supported by other instruments, especially market-based instruments and regulatory instruments. Besides that, a collaboration between stakeholders also necessary.

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