Forest Village Community Empowerment through Multi-stake holder Partnership Program to form Sustainable Green Forests and Disaster Preparedness in Garut

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Abstract. The conversion of protected forest areas into horticultural crops occurs rapidly and massively in the upstream areas. This causes environmental damage, environmental pollution, and prone to natural disasters, such as landslide floods and forest fires. Along with the declining carrying capacity of the forest resources, a comprehensive, participatory, and sustainable forest management system with a partnership approach, economic development, environmental sustainability, and stake holder involvement is required. Multi-stake holder Forest Management is one alternative in reducing both forest area conversion and risk of natural disaster. Integrated programs are initiated from the inventory of natural and forest resources, mapping the forest villagers’ socio-economic conditions, joint planning of forest area management by involving stakeholders, implementing community-based environmental awareness raising program, implementing rehabilitation and conservation in critical lands through transfer commodities and location. The technical and social assistance, and jointly-periodically monitoring and evaluation are also implemented as well. These programs have been executed to restore the function of forest area into sustainable forest and disaster alert.

1. Introduction
On September 20, 2016, we were all struck by the natural disaster of flash flooding in Cimanuk River, Garut regency which caused a lot of casualties. The natural disaster was due to massive environmental damage in upstream areas such as land transfer from protected or production forests to horticultural crops and tourist areas expansion.

These environmental degradation conditions are triggered by population growth and socio-economic activities of people living around the more urgent forests and encroaching them. As consequence, land conversion continues to occur. These surely have such positive correlation to the increased damage of the forest environment, environmental pollution, and natural disasters [1,2].

According to Tatar Sunda Environmental Monitoring Board, Landsat imagery analysis in 1994 and 2015 showing upstream of Cimanuk watershed at Mount Mandalagiri. Mount Cikuray, Mount Papandayan, and Mount Darajat experienced the conversion of the area beginning with forest destruction for horticultural agriculture [3]. The amount of critical land in Cimanuk watershed upstream reaches 40%. In addition, the area is also a disaster prone area with a vulnerable zone of land movement in medium to high condition.

It is therefore necessary to immediately rehabilitate and conserve the environment. The efforts to rehabilitate and conserve the environment are such complex and multidimensional issue and require
the handling of various parties in integrated, systematic, and sustainable ways by involving multi-stakeholder.

Existing condition that occurs over communities living both forest and upstream basin areas are not really concerned with management efforts and environmental sustainability. It can be seen from the behaviour of people who are not concerned with cleanliness and health of the surroundings. This condition is caused by ignorance and the increasingly urgent economic needs of the community. They continue to penetrate the protected forest and carry out intensive horticultural farming. [1,2]

To ‘legalize’ their agricultural business, they ensconced to a program of Community Forest Management. However, it is clearly stated by the Community Forest Management Program between PERHUTANI and LMDH that forest villagers have the obligation to plant forest staple crops, integrated-forest filling plants, and coffee cultivation. It also stated that forest villagers who incorporated to KTH and LMDH are not allowed to transfer their management to other parties and extend the established land, as well as not to do intercropping with vegetables and crops. Unfortunately, PERHUTANI as forest area manager cannot give strict sanction to the people who continue venturing forest and do not obey PKS.

Beside land conversion issues, other people's behaviour that triggers environmental destruction and pollution are still lot. One of them is the households who treat waste with less wisdom. For example, throwing the garbage out of place, into the river, or letting them scattered around which leads to build-up of huge waste and pollution. Most people think that waste management is a government affair only. This happens because of ignorance and lack of public knowledge about environmental management, waste management and the potential contained therein in particular.

Based on the above-mentioned premises, the environmental management needs to get the attention from all parties. Government can encourage cooperation effort among stake holders in managing waste, rehabilitation, and conservation of forest environment as preventive effort of disaster management.

If this environmental handling does not get immediate response from various parties, and rely solely on local government efforts, it will result to continuous degradation of forest resources. Moreover, the communities living in forest areas are more unaware of their ‘bad’ activities contribute against the natural disaster.

The beauty of a clean and healthy environment are reflection of the balance of ecosystem, which actually can be initiated when every household in the forest area is aware and concerns to not penetrate the forest, and convert the land to intensive agriculture. Communities living in the forest should participate actively in managing and maintaining environmental hygiene, especially forming waste to the use for life and environment, as well as carrying out environmental rehabilitation and conservation to restore forest function.

2. Research Method

Referring to the issues and social conditions of the community and stake holders, the method implemented is Research & Development to community empowerment, environmental management, and partnership principles. The implemented principle of empowerment is centred on the target community according to the active and sustainable community participation. While the environmental management principle is implemented based on community-based environmental management, rehabilitation and conservation are in forest areas. The partnership principle involves trust, mutual understanding, mutual agreement, and joint programs so that all institutions got the benefit from the program. As for the community-based disaster management program through the Community Centre Disaster Management approach is implemented in a participatory and sustainable way. Strategies of Community-based environmental management program were implemented through:

1. Public awareness efforts on environmental management and health, especially healthy and clean living, and waste management of households, as a first step of disaster prevention and handling;
2. Capacity building of human resources through training both formally and informally. Training is not only about hard skills but also soft skills coaching by familiarizing them to live clean and healthy and maintain the environment, build social capital in the community to remain united in the group, mutual cooperation and care for others so that social solidarity attitude among them can continue to grow;
3. Building institutional in society notably in environmental management. By fostering environmental cadres in communities who are responsive to disaster;
4. The implementation of technology in waste management, home garden utilization as family nutrition source, rehabilitation, and environmental conservation;
5. Empowerment of environmental cadres and forest village community institution in the economic field;
6. The assistance for infrastructure and business capital;
7. The improvement of marketing & partnership network, and;
8. Intensive technical and social assistance from universities.

3. Result and Discussion
The alignment of forest areas that occurred in the upstream is suspected as one that contributes to the occurrence of flash flooding that hit seven districts in Garut regions. This forest area is located within Papandayan Nature and Darajat Forest Reserve at an altitude of 1,750-2,000 m.a.s.l which belongs to the administrative area of Garut Regency, West Java Province. Darajat Forest Area is a highland tropical forest that has a very high biodiversity with a complex ecosystem structure [4].

Based on the observation, the land covered in Mount Darajat Forest is actualized to the form of plant forest with low density. This happens because the number of land conversions from protected forest to horticultural farms is managed conventionally-and intensively by the community. This condition is very harmful to the environment, as it is done by reducing the vegetation of forest trees and plants down, and replaced with horticultural crops. People plant on high slopes. This condition makes the area prone to disasters, such as erosion, landslides, and flooding. The worst environmental conditions were exacerbated by the rapid development of tourist attraction with no regard to the function and spatial plan; which cause the land conversion occurred higher.

3.1. Community-Based Environmental Rehabilitation & Conservation Efforts Darlington has made a Sustainable Green Forest and Disaster Alert
Based on the existing condition, the forest rehabilitation and conservation are needed to increase the carrying capacity of the area to function ecologically, economically, and socially. The efforts made are among others by building a multi-stake holder partnership system within forest management in participatory and sustainable ways. In the early stage through a community-based environmental management program, it manages the waste & environment in an integrated manner, followed by rehabilitation and conservation in critical lands via transferring the agricultural crops into forest commodity and MPTS like trees of genus Toona, Castanopsis Argente, Altingia, avocado, jackfruit, breadfruit, tamarind, pecan etc. It is then followed by the program of location transfer, especially to the community who have PKB PHBM in critical land [5].

To increase community participation, DARLING (Environmental Awareness) program enables sustainable forest areas and disaster preparedness in the initial stage. It is also a sustainable community based environmental management program with the participation of all stake holders [6,7].

The main objective of this program is to improve people’s knowledge, skill, and attitude in environmental management by giving them awareness about clean and healthy life, and also taking account into environmental aspect in every activity. Furthermore, the community is intended to participate in implementing environmental rehabilitation and conservation as a preventive effort to overcome natural disasters.
Darling as the sustainable green forest area and disaster alert is a multi-stake holder synergy program in community-based environmental management, which is giving awareness to the community about clean and healthy life, and taking account into environmental aspect in every activity:

1. Building a community-based environmental management system to improve hygiene, environmental quality, and health of forest villagers;
2. Building multi-stake holder partnerships in community-based environmental management;
3. Improving the knowledge, skills, and attitude over forest village communities in environmental management, particularly in household waste management, rehabilitation and conservation of forest areas;
4. Establishing environmental cadres from communities who will manage the environment sustainably, as well as they become disaster-alert;
5. Managing waste as a resource that can be utilized by the community and economic activity;
6. Utilizing the yard land that can be used as a source of income and family nutrition;
7. Implementing environmental rehabilitation and conservation on critical land.

By implementing the program, it is expected that villagers around the forest can implement clean and healthy lifestyles, manage and reduce the volume of waste that affects cleanliness and healthiness of the environment. In addition, it can also be an economic source or income. Environmental rehabilitation and conservation can rather be executed simultaneously. In consequence, in the long run, community-based environmental management system can be realized in the area, so sustainable green forests and disaster preparedness is a certainty.

Community-based environmental management through Darling to form sustainable forest areas and disaster preparedness is a systematic, holistic, and continuing activity by the community and multi-stakeholder participation. The programs include environmental rescue movement, unionizing environmental cadres, and efforts to carry out environmental conservation by rehabilitating and reforestation over commodities and location transfers, especially on critical lands.

3.2. Community-Based Environmental Management Model
Community-Based Management Model is a synergy between universities in this case, UNINUS and UNIGA (community service program), Star Energy Geothermal Darajat Ltd. (Corporate Social Responsibility program), and local governments, such as PKK Garut Regency, Health Office, Puskesmas, BPLHD, BPBD, Perhutani, District & Village, and forest village community.

![Community Based Management Model](image)

**Figure 1.** Community Based Management Model
3.3. Community-Based Environmental Management Strategy

The Community-Based Environmental Management Program Strategy focuses on forest villagers in participatory and sustainable ways done through ecological and community empowerment approaches, as follows:

- Public awareness efforts on environmental management and health, especially healthy and clean living, and disaster management.
- Capacity building of human resources through training both formally and informally. Training is not only about hard skills, but also soft skill training by familiarizing them to live clean and healthy, as well as maintaining the environment, building social capital in the community to remain united in groups, mutual cooperation and care for others so that social solidarity attitude among them can continue to grow.
- Building institutional in society notably in environmental management. By fostering environmental cadres in communities who are responsive to disaster.
- The implementation of technology in waste management, home garden utilization as family nutrition source, rehabilitation, and environmental conservation.
- Empowerment of environmental cadres and forest village community institution in the economic field;
- The assistance for infrastructure and business capital.
- The improvement of marketing & partnership network.
- Intensive technical and social assistance from universities.

3.4. Implementation of Community-Based Environmental Management Activities

In general, all community based environmental management activities through Darling Program to form sustainable green forest and disaster preparedness are implemented in the following cycle steps.

![Figure 2. Cycle Steps of Darling Program](image-url)

1. **Preparation:**
   - Identification of target communities, i.e.: forest village communities;
• Need assessment of forest villagers on environmental management;
• Synchronization of environmental management program with stakeholders;
• Identification of the community that will be environment cadres;
• Identification of partners for assistants.

2. Planning
• The mapping of needs and issues over environmental management in the community as well as disaster issues;
• Joint planning preparation of program plans and stages of program implementation;
• Program submissions to all partner institutions.

3. Implementation
• Socializing the activity to all stakeholders;
• Developing capacity of environmental cadres and target communities;
• Building community institutions in community-based environmental management;
• Executing Environmental Rescue Movement;
• Socializing to madrasah about sustainable green village and disaster preparedness;
• Providing both facilities and infrastructures;
• Empowering environmental cadres through productive enterprises;
• Providing waste bank;
• Organizing green village competition and green madrasah;
• Conserving environment;
• Assisting community in environmental management.

4. Monitoring and Supervision
• Monitoring is conducted in the entire process of activity at the time when the activity is in progress.
• Supervision is also done on a regular basis. Whenever there is a less optimal work, there should be efforts to improve performance from the implementers.

5. Evaluation
• Formative evaluation is conducted during the process of the activity took place.
• Summative evaluation is done at the end of the activity.
• Joint evaluation is made at the end of the program.

6. Reporting
• Reports are submitted to all partner institutions. They are conducted in the middle and at the end of the program.

3.5. Rehabilitation and Conservation Forest resources Make the area Green forests sustainable and disaster preparedness
Forest Village Community (FVC) is an institution established by PERHUTANI to the people living in the surrounding forest area through joint forest management program. [8] Most FVC formations are top-down, hence forest villagers' participation in forest management is still low. The socio-economic condition of forest villagers is mostly agricultural laborers with low education [9]. In the beginning, farm workers who live in the forest area become members of FVC only to have permission to work on land managed by PERHUTANI. Even some of these members are not aware of the forest management rules listed in the joint forest management program between PERHUTANI and FVC.
Due to the urgent economic needs, farm laborers who planted in protected forests continued to plant horticultural crops. Another problem is farm laborers are having financial issues and powerless to divert their land to large investors. The large investors keep expanding the forest area without considering the joint forest management program rules that has been agreed. On the other hand, the supervisory and controlling function of PERHUTANI's is also very supple. Accordingly, forest degradation continues to occur and the area is prone to natural disasters, such as landslides and floods. Based on the environmental and socio-economic condition of the people living around the forest area, a paradigm-shift from the community and forestry management institution, as well as stake holders are needed. Hence, forest areas can function socially, economically, and ecologically [10].

It is advisable that the direction of forest village community development be prioritized for an environment-based economic improvement. The efforts of Community-based environmental management, rehabilitation, and conservation of forest areas through the plant commodities transfer are one way to improve the skills, knowledge, and attitude of FVC members in reducing the land conversion of forest area. Forest villagers accompanied by universities implement commodities transfer from conventional and intensive horticulture farming to the mixed crops and coffee crops. They would also provide high quality forest and jungle seedlings for the rehabilitation and conservation of the forest areas.

In the commodities & nurseries of MPTS transfer is also implemented LMDH empowerment by enabling the farm workers who live in the forest to organize and manage forest village community institutions in accordance with the roles and functions.

UNINUS through the IBW-CSR [11] program contributes to initiating multi-stake holder partnerships in forest management and facilitating multi-stake holder planning and participation in forest area management and development. Universities also play an essential role in encouraging Perhutani to implement the management and control of forest areas. Therefore PHBM program, especially the commodities transfer can be implemented well in accordance with the PKS and the purpose of CBFM. In addition, universities through the IBW-CSR program facilitate stake holders like the company and Perhutani to participate and contribute in environmental management, especially in empowering communities around the forest. This program is one of Corporate Social Responsibility (CSR) programs in the environmental field. Through the IBW-CSR program, universities are also conducting LMDH empowerment, especially technical and social assistance for improving the skills, knowledge, and attitude of the members in forest area management. It also encourages people living around the forest and stake holders when implementing the forest rehabilitation and conservation that can function ecologically, economically, and socially.

4. Closing
Based on the environmental condition and socio-economic condition of the people living around the forest area, it is necessary to change the paradigm of community and forest management institution, as well as stake holders in forest area management. Thus, the nature of forest areas can function socially, economically and ecologically.

The model of resource management through systematically, participatory, and sustainably multi-stake holder partnerships is one alternative that can be done in reducing land conversion and natural disasters. Integrated programs are initiated from the inventory of natural and forest resources, the socio-economic of forest villagers conditions mapping, joint planning of forest management by involving LMDH and stake holders, environmental awareness programs, rehabilitation and conservation on land through commodity, and location transfers. Technical and social assistance, monitoring, and evaluation are established jointly and periodically. These are done to restore the forest areas function into sustainable green forests and disaster preparedness.

5. Recommendation
It is highly suggested to align forest resource management activities in accordance with the regional development characteristics and activities, notably in community forest village empowerment.
program. It is therefore necessary to develop the partnership’s pattern with other institutions, so that it can also affect both forest resources function and benefit.

The need to improve the skills, knowledge, and attitude of FVC members is fulfilled to master seeding techniques, mix and coffee plants cultivation both in agriculture and off-farm. Therefore, the commodities have high-added value. In line with this need, strengthening community institutions to improve managerial capacity of the board and group members is considered necessary.

The enhancement of intensive facilitation, monitoring, and evaluation in PHBM is better implemented simultaneously and consistently to find out the progress, which is in forms of physical, environmental, social and economic performance. It can be regarded as input materials for future PHBM activities improvement.

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