Education environment society buffer forest Wonoasri Betiri Meru National Park through approach participatory

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Abstract. This research was conducted with the aim to improve the practical understanding of society buffer forest Wonoasri Betiri Meru National Park design with the participation of they directly to carry out various ecological improvement activities by adding the amount of productive endemic vegetation such as durian, langsep, candlenut, grip, Java chili and pepper. Besides that, life skills are improved in order to increase community economic income such as animal feed, raising rangrang ants, herbal medicine making, natural color batik skills with animal and plant theme Meru Betiri National Park such as Javanese eagle motifs, Raflesia flowers, Javanese tiger claws, and so on, and other life skills improvement. The study was conducted for 15 months from 2016 to 2018. The results showed that the provision of environmental education that was designed in a participatory manner in the ecological community of Wonoasri had increased as follows. Soil fertility increased (from less than 1 to 1.3%), the addition of edemic tree stands to 91,824 seedlings, the formation of a land management understanding of 451 land tenure farmers, increased kabon uptake (from 974 tCO2eq to 1,913 tCO2eq), increased oxygen production (from 842t to 871t), plant diversity and Arthropods (from low to medium diversity, H = 1 to H = 2.5). As for aspects of life skills, there was an increase with the formation of 8 economic clusters

1. Introduction
National Park based on the law is a natural conservation area that has an original ecosystem, managed with a zoning system and utilized for research, science, education, supporting cultivation, tourism and recreation. Indonesia has a total of 50 National Parks with a total area of 16,380,491.64 Ha with details of 12,336,950.34 Ha on land and 4,043,541.30 Ha of the sea [5]. East Java is one of the provinces that has national parks, namely Meru Betiri national park, Alas Purwo national park and Baluran national park. Meru Betiri National Park has nine types of ecosystems namely mangrove forest, swamp forest, tropical rain forest, coastal forest, bamboo forest, agricultural fields, sea, plantation, and settlement (Meru Betiri National Park Hall, 2015).

Meru Betiri National Park is located in two districts namely Jember Regency and Banyuwangi Regency. The position of the Meru Betiri National Park is bordered by the Indian Ocean in the southern part and bordered by agricultural areas on the eastern, western and northern boundaries. The Meru Betiri National Park area is almost entirely an area whose components consist of tertiary andesite material which forms a series of low mountains and mountains that are very steep and are covered by dense forest [2].

Meru Betiri National Park is divided into 7 zoning namely: core zone (28,707.7 Ha), jungle zone (20,897.2 Ha), material protection (2,603.0 Ha), utilization zone 273.3 Ha), traditional zone 285.3 Ha), 2,733.5 Ha rehabilitation zone, and special zone (345.0 Ha) [1]. The rehabilitation zone of the Meru Betiri National Park in Wonoasri village, Jember district has an area of 290 Ha with an average tree stand density <16% or 234 stems / Ha and species diversity is still very low (H <1) [3]. In addition, the stratification of the region over the past 15 years is very homogeneous because it only consists of two strata, namely tree stands and agricultural or horticultural crops. The similarity of plant species planted is the main cause of uniformity of plant strata. Compared to the reference ecosystem, the density of 1443 tree trunks / ha and diversity of H> 2.5 and stratification of stands is more complex because it consists of various strata, namely herbs / seedling, bushes, sapling, and trees of various types of plants. The low diversity of plants has an impact on the low diversity of arthropods which is an average of...
0.33 while the soil organic matter content is very low that varies between 0.796 to 0.964% or below 1% [4].

The above conditions have an impact on low carbon sequestration and oxygen production, low soil fertility, high risk of erosion and flooding. This is dominated by tropical rain forests with fairly high rainfall in the region. Rehabilitation areas managed by Meru Betiri National Park involving village communities around the area showed low success. Based on biophysical indicators this area is at a level of severe damage. The restoration of the rehabilitation area is very important because the Meru Betiri National Park's tropical forest has been designated as a World Biosphere Reserve site (Biosphere Reserves) by UNESCO (The United Nations Educational, Scientific and Cultural Organization) has a unique ecosystem with a very high biodiversity.

Restoring the percentage of protected area closure can reduce the risk of flooding and landslides on sloped areas. Environmental Education for the community with a pattern of participation in environmental management based on regional potential is expected to be able to create a diversity of income sources so as to reduce community dependence on the natural resources of the conservation area Meru Betiri National Park.

2. Methods
Researchers take an inventory of Wonoasri villagers into groups directly involved in forest management and communities not directly involved in forest management. Direct involvement was carried out in the form of activities suitable for plants of various types of plants in the Meru Betiri National Park area. This can be exemplified such as planting corn, soybeans, rice, peanuts, long beans, fruit plants, and so on. These suitable planting activities are a source of community livelihood so there is a large dependency between community groups and the area that is the authority of the Meru Betiri National Park. This is a problem because the status of the area managed by the community is a rehabilitation zone or ecosystem recovery zone.

The community management approach is carried out with an integrated approach in the form of environmental education assistance that is implementive by involving them to plant various types of plants in the rehabilitation zone of the Meru Betiri National Park whose function is to increase the amount of vegetation. In addition, other programs are also carried out through community empowerment in the form of increasing life skills in the context of increasing community economic income so that they gradually reduce community dependence on forests. The following are the steps taken include.

a) Restoration of soil fertility in the demonstration plots spread in the Donglo, Bonangan, Bulk Malang and Pletes blocks experienced a total increase of 3% because based on the pre-study results of the rehabilitation area showed very low soil fertility (<1%). This shows that the increase in land fertility is 2% so fertilization efforts need to be made covering an area of 2,104 kg / ha;

b) Breeding and planting of endemic plants in the area (82,745 stems / ha in an area of 255 Ha and 2,000 stems of Java and Pepper peppers in a demonstration plot of 10 Ha);

c) Realization of compilation of memorandum of understanding through socialization activities, group discussion forums and assistance in both the preparation and implementation of collaboration between Meru Betiri National Park and the farming community in conservation-based rehabilitation land management;

d) Increased knowledge and competency of human resources of 200 heads of rehabilitation of farmers working in the Wonoasri Resort through workshops and mentoring for 9 types of creative economic skills within a period of 15 months. This activity is a form of community participatory approach / socio-economic study to increase additional income, namely the cultivation of honey bees, ranggang ants, processed mushrooms and medicinal plants, animal feed, processed chips and banana sales and superior village crafts. This activity ended with a workshop on business management, business and business partnerships and marketing of community processed products;

e) Increased income from the yard and village land through workshops and mentoring of high-economic plant cultivation such as agarwood, durian, Java chili on village land with a density of 6,310 plant stems and in the forest yard with a density of 7,370 plant stems.
3. Results and Discussion

Implementation of the assistance was carried out through several stages, namely preparation, implementation, evaluation and reporting. In the preparation stage held group discussion forum is with the implementing teams. The group discussion forum at the preparatory stage formulated several things including:

a. Discuss licensing and procedures for collaboration with related institutions and persons
b. Formulate a list of the division of team work in accordance with their main tasks and functions.
c. Formulating the implementation time
d. Developing a work roadmap as well as a schedule of activities and targets during the implementation of assistance
e. Compiling a list of requirements of equipment and equipment needed in this activity.

After the preparation phase is carried out, the next step is to carry out the assistance. Following are the steps of the mentoring activities carried out by the team covering:

a. Consolidated the identification of problems faced by residents around Wonoasri village community park. The consolidation process is carried out openly together with community leaders by conducting discussions in order to find joint solutions to the problems encountered.

b. The implementation team gave an introduction to the urgency of using the environment for the survival of the Wonosari village community. In addition, the team also gave an introduction about the urgency of protecting forests which has been regulated in the law in terms of politics and its economic and social impacts.

c. The assistance process is carried out by providing some training to the Wonosari village community by conducting the following sub-activities.

1) Carrying out efforts to restore soil fertility carried out in a participatory manner with the surrounding residents. This soil fertility restoration activity is carried out by reforestation.

2) The second assistance sub-activity was to add 91,824 seedlings of endemic trees. The endemic plant seeds in question are planting durian, langsep, candlenut, pakem and Java chili seeds, each of which amounts to 22,956 seeds.

3) The involvement of 451 farmers who participated in planting a number of seeds that have been provided. This also provides awareness to citizens in general and farmers in particular not to return to encroach on the forest. This is a focal point for building awareness among villagers in Wonosari so that forest sustainability is maintained. Through forest replanting through the provision of endemic seedlings, it is expected to be able to provide natural income fields for residents.

4) The assistance process was also carried out by providing some training to residents, namely training in the last cluster, food clusters, natural batik clusters, ant cultivation clusters, mushroom clusters and herbal beverage clusters. It is hoped that through this training the people will have the skills to fulfill their needs so that dependency on nature and forests can be minimized. This is also one way for citizens to have a sale value to grow productive and superior villages by maintaining local wisdom.

5) Another form of assistance is to form joint business partnerships that are packaged in several related institutions such as cooperatives, MSMEs and so on. This is a crucial action to ensure the controlling of prices and distribution of goods can be managed properly. It is hoped that through this cooperation the people of Wonosari are able to empower themselves under the auspices of the Joint Business Partnership to protect the sale and purchase rights.

Table 1. Research Results

| No | Aspects / Parameters | Initial Conditions | Final Results | Remarks |
|----|---------------------|--------------------|--------------|--------|
| A. | Improvement of Environmental Quality | | | |
| 1. | Soil Fertility (%) | <1 | 1.3 | |
| 2. | Adding endemic tree stands | - | 91,824 | durian (22,956), |
| No | Aspects / Parameters                  | Initial Conditions | Final Results | Remarks |
|----|--------------------------------------|--------------------|---------------|---------|
|    | (seedlings)                           |                    |               | langsep (22,956), candelnut (22,956), grip (22,956), Javanese chili (6,725) farmers |
| 3  | Establishment of land management (land tenure) | 0 451            |               |         |
| 4  | Carbon uptake (tCO₂eq)                | 974 1,913         |               | Tons of CO₂ |
| 5  | Production of Oxygen (t)              | 842 871           |               | Tons O₂  |
| 6  | Keanaragaman plants and arthropods    | H <1 H = 2.5      |               | keragamanan index |

B. Life Skills Improvement

1. The formation of economic clusters (cluster)
   a. Animal cluster
      0 2 Animal silage feed, vermicompost
   b. Food Cluster
      0 2 Processed bananas, typical snacks Meru Betiri
   c. Natural batik cluster
      0 1 Natural coloring batik with the theme of plants and animals Meru Betiri National Park (28 catalogs of batik motifs).
   d. Rangrang ant cultivation cluster
      0 1 Harvested in the form of Kroto (rangrang ant larvae) for bird feed, harvested once every 21 days (price of Rp. 140,000, -/kg)
   e. Processed mushroom cluster
      0 1 Processed crispy oyster mushrooms, etc.
   f. Herbal drinks cluster
      0 1 Sinom, kencur rice, temulawak, etc.
   g. Nursery Cluster
      0 1 Nursery of various fruit plants and various types of trees

2. Establishment of Joint Business Partnership (KUBE)
   0 5 With parties: Disperindag Jember, Cooperative Office, Jember UMKM, Bumdes Dana Asri Sejahtera Wonoasri, Pokdarwis Wonoasri, Desbumi Wonoasri, Market Forum of Cooperatives, Jember UMKM, Bumdes Dana Asri Sejahtera Wonoasri, Pokdarwis Wonoasri, Desbumi Wonoasri, Market Forum online shopee, and Kreanova UNEJ.
4. Conclusions
This research found out that the programs carried out through community empowerment in the form of increasing life skills Meru Betiri. The program are following.

a) Restoration of soil fertility in the demonstration plots spread in the Donglo, Bonangan,
b) Breeding and planting of endemic plants in the area.
c) Realization of compilation of memorandum of understanding through socialization activities,
d) Increased knowledge and competency of human resources of 200 heads of rehabilitation of farmers working in the Wonoasri Resort through workshops and mentoring

e) Increased income from the yard and village land through workshops and mentoring

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