

## Local knowledge-based conservation partnerships in the Tengger tribe community in Poncokusumo and Senduro East Java Province, Indonesia

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### Abstract

The Tengger tribe community has local knowledge of using forest products, especially non-timber ones. The use of non-timber forest products from the Bromo Tengger Semeru National Park (TNBTS) area has various uses, including food, medicine, and traditional rituals. The local knowledge of the Tengger tribe community in the use of non-timber forest products (NTFPs) can be used as a reference in determining the types of non-timber forest products that can be developed in conservation partnership programs in the context of community empowerment. This research aims to analyze the types of non-timber forest products that can be implemented in conservation partnership programs in the context of community empowerment. The research was conducted in July – September 2023, in 3 (three) villages located in 2 (two) districts, namely Ngadas village (Enclave), Poncokusumo District, Malang Regency, as well as Ranupani (Enclave) and Argosari villages (TNBTS buffer villages), Senduro District, Lumajang Regency.. The method used is descriptive qualitative, with data collection techniques, namely semi-structured interviews, documentation studies, and observations. Data analysis in this research uses Miles and Huberman analysis. The technique used to select informants was purposive sampling. Snowball sampling was used to select informants. To find out the types of non-timber forest products that are utilized and can be implemented in conservation partnerships based on local knowledge of the Tengger tribe community, informants were used, namely traditional community leaders and ordinary people in the villages of Ngadas about 10 people, Ranupani about 10 people and Argosari about 15 people.

Based on the research results, information was obtained that the types of non-timber forest products that are utilized and can be implemented in conservation partnerships are based on local knowledge of the Tengger tribe community. They consisted of the families Asteraceae (3 species), Fabaceae (1 species), Schizophyllum (1 species), Auriculariaceae (1 species), Apiaceae (2 species), Apocynaceae (1 species), Melastomataceae (1 species), Acoraceae (1 species), Lauraceae (1 species) and Fabaceae (1 species), with various uses, including for food, medicine and for traditional ritual purposes.

**Keywords:** National Park; Local wisdom; Tengger; Tribe

### 1. Introduction

In order to change the current paradigm of forest management in Indonesia, which prioritizes the community as the subject of development, the government has issued new regulations regarding the management of conservation areas. The Regulation was launched by the Directorate General of Conservation of Natural Resources and Ecosystems of the

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Ministry of Environment and Forestry Number: 6 of 2018 (P.6 /KSDAE/SET/Kum.1/6/2018). It concerns Technical Instructions for Conservation Partnerships in Nature Reserve Areas and Nature Conservation Areas which aims to accommodate community empowerment and collaboration activities in managing conservation areas or what is known as Conservation Partnerships.

Conservation partnerships are cooperation between area management units or permit holders in conservation areas and local communities based on the principles of mutual respect, mutual trust, and mutual benefit (Perdirjen KSDAE Number: P.6/KSDAE/SET/Kum.1/6/2018, chapter 1, part one, article 1). It is essential to build partnerships with communities to preserve natural resources. The existence of communities living around conservation areas must be seen as partners in protecting natural resources, namely by using responsible utilization patterns. Conservation partnerships are expected to be the most appropriate approach in involving communities as partners in managing conservation areas. Conservation partnerships resolve tenure issues and are a solution to improving community welfare. The benefits of conservation partnerships for the community are realizing independence and improving community welfare by helping and supporting the community economy through community empowerment.

Implementation of conservation partnerships includes conservation partnerships in the context of community empowerment where communities can utilize traditional zones. Community empowerment is an effort to develop community independence and welfare by increasing knowledge, attitudes, skills, behavior, abilities, and assistance, and utilizing resources through establishing policies, programs, activities, and assistance that are in accordance with the essence of problems and priority needs of the community (Perdirjen KSDAE Number: P.6/KSDAE/SET/Kum.1/6/2018, chapter 1, part one, article 1 and part three, article 3; chapter II, part four, article 17, and chapter III, part two, article 29).

Forms of conservation partnerships in the context of empowering local communities can be in the form of providing access, namely collecting non-timber forest products, cultivating traditional plants, traditional hunting for unprotected species, traditional use of limited water resources for unprotected species, limited community natural tourism and cooperation between permit holders in conservation areas with local communities (Perdirjen KSDAE Number: P.6/KSDAE/SET/Kum.1/6/2018).

Bromo Tengger Semeru National Park (TNBTS) in East Java, is a nature conservation area that has a native ecosystem, managed with a zoning system that is used for research, science, education, supporting cultivation, cultural tourism, and recreation purposes. TNBTS was designated as a national park based on the Decree of the Minister of Forestry Number: 278/Kpts-VI/1997 dated 23 May 1997 with an area of 50,276.20 hectares. Administratively, TNBTS is located in Malang Regency (18,692.96 Ha), Pasuruan Regency (4,642.52 Ha), Probolinggo Regency (3,600.37 Ha), and Lumajang Regency (23,340.35 Ha). Based on the Decree of the Directorate General of Natural Resources and Ecosystem Conservation Number: SK355/KSDAE/SET/KSA.0/8/2019 dated 19 August 2019, the management zone in TNBTS consists of: core zone (17,028.67 Ha), jungle zone (26,871.36 Ha); utilization zone (1,293.96 Ha); traditional zone (3,140.35 Ha); and rehabilitation zone (1,907.24 Ha); religious, historical and cultural zones (4.13 Ha) and special zones (30.49 Ha). The existence of TNBTS is very important to maintain the process of preserving flora and fauna as well as the balance of the ecosystem.

As a conservation area, TNBTS is inseparable from problems, including the collection of wood and non-timber forest products by communities in and around the area, who have used forest resources for generations. This can certainly have a negative impact on forest sustainability. Therefore, to overcome these problems and refer to the Director General of KSDAE Regulation Number: P.6/KSDAE/Kum.1/6/2018, TNBTS has implemented a conservation partnership program in the context of community empowerment with the Tengger tribe community in the area. Ngadas village, Poncokusumo District, Malang Regency and Ranupani village, Senduro District, Lumajang Regency, both of which are Enclave villages (villages within the TNBTS area) as well as Argosari village, Senduro District, Lumajang Regency which is in the TNBTS buffer area, with The aim is to improve the welfare of the Tengger tribe community in the Enclave villages and TNBTS buffer areas, and it is hoped that the Tengger tribe community will participate in maintaining the TNBTS forest area so that it remains sustainable. This conservation partnership is expected to be able to synergize economic and ecological aspects in the TNBTS area.

The Tengger tribe is a tribe that lives in the highlands around the Bromo-Semeru mountain area which is located in the Probolinggo Regency, Pasuruan Regency, Lumajang Regency and Malang Regency, with the main livelihood as traditional farmers growing potatoes, cabbage, and leeks. Most of the Tengger people live in the TNBTS buffer village area and some live in the TNBTS area (Enclave), namely the villages of Ngadas and Ranupani, which existed long before TNBTS was designated as a National Park.

Non-timber forest products are biological forest products, both vegetable and animal, along with derivative and cultivated products, except wood originating from forests (Permenhut No: P.35/Menhut-II/2007). In the use of non-timber forest products, regulations, and management are needed that are able to ensure forest sustainability and accommodate the use of forest resources within the TNBTS area. Through conservation partnerships in the context of community empowerment, the Tengger tribe community is given access to traditional cultivation. The traditional cultivation in question is the cultivation of medicinal plants and the cultivation of plants for daily needs.

Respecting cultural and traditional values is a new way of managing conservation areas as an effort to find a conservation area management model that is based on local traditional and cultural values, and geopolitical and socio-economic changes that occur around conservation areas [1]. The economic activities of a country or region cannot be separated from local culture. In local culture, there is local wisdom which is an important value in community culture. Each place has its own identity in interpreting local wisdom. This identity and culture are the strengths in developing the creative economy [2]. Empowering the community requires paying attention to local wisdom and not shifting the social and cultural values that the community has had for generations [3]. Conservation area management patterns accommodate the interests of local communities in forest management as much as possible, or conservation area management is developed through local wisdom that grows and develops in the community [4]. Local knowledge is part of local wisdom. Respecting local knowledge is one of the important things in community development. In this way, community empowerment based on local wisdom can be carried out by respecting the local knowledge possessed by the community.

The Tengger tribe community has long utilized natural biological resources, especially plants, as materials to fulfill their daily needs. As indigenous people who inhabit the Bromo and Semeru mountain areas, the Tengger tribe people have local wisdom in the form of local knowledge passed down from generation to generation from their ancestors who previously depended on forest resources for their livelihood. The local knowledge of the Tengger tribe community in the use of forest resources, especially the use of non-timber forest products, is a potential that can be used in community empowerment.

The effectiveness of managing the TNBTS area cannot be separated from the role of the Tengger tribe community in managing the conservation area. The role of the Tengger tribe community in utilizing non-timber forest products based on their local knowledge is an important part of managing the TNBTS area. Information regarding the types of non-timber forest products used based on local knowledge of the Tengger tribe community can be used as a basis for preparing community empowerment plan (RPM) documents from the conservation partnership program. Thus, to find out the types of non-timber forest products that are used based on local knowledge of the Tengger tribe community and can be implemented in a conservation partnership program, it is necessary to carry out a study.

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## 2. Material and Methods

The method used is descriptive qualitative, with data collection techniques namely semi-structured interviews, documentation studies, and observations. The technique used to select informants was purposive sampling. Snowball sampling was used to select informants.

To find out the types of non-timber forest products that are utilized and can be implemented in conservation partnerships based on local knowledge of the Tengger tribe community, informants were used, namely traditional community leaders and ordinary people in the villages of Ngadas as many as 10 people, Ranupani as many as 10 people and Argosari as many as 15 people. The data analysis in this research uses [5] analysis, which consists of (a) Data Collection, (b) Data Reduction, (c) Data Display, and (d) Conclusion Drawing/Verification.

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## 3. Result and Discussion

The Tengger tribe community has local knowledge of using forest products, especially non-timber ones. The use of non-timber forest products originating from the TNBTS area has various uses, including food, medicine, and traditional rituals. The local knowledge of the Tengger tribe community in the use of non-timber forest products can be used as a reference in determining the types of non-timber forest products that can be developed in conservation partnership programs in the context of community empowerment.

The conservation partnership allows communities around the TNBTS area, especially the Tengger tribe community in the villages of Ngadas, Ranupani, and Argosari, to gain legal access to the traditional zone. Because the function of determining traditional zones in the TNBTS area is to facilitate the use of non-timber forest products which have been

carried out by communities around the TNBTS area for a long time and have been passed down from generation to generation. The use of non-timber forest products through a conservation partnership scheme is expected to be able to improve the standard of living of the community and to establish good cooperation in area management between TNBTS and communities around the area so that forests in the TNBTS area remain sustainable.

From the results of interviews with informants, it is known that there are 13 types of non-timber forest products in the TNBTS area, which are utilized and can be implemented in conservation partnerships based on local knowledge of the Tengger tribe community. The types of non-timber forest products that are utilized and can be implemented in conservation partnerships based on local knowledge of the Tengger tribe community can be seen in Table 1.

**Table 1** Types of non-timber forest products that are utilized and can be implemented in conservation partnerships based on local knowledge of the Tengger tribe community

No	Local name	Latin name	Family	Utilization
1.	Edelweis	<i>Anaphalis javanica</i>	Asteraceae	Tengger traditional ritual offerings
2.	Edelweis	<i>Anaphalis longifolia</i>	Asteraceae	Tengger traditional ritual offerings
3.	Edelweis	<i>Anaphalis viscida</i>	Asteraceae	Tengger traditional ritual offerings
4.	Klanding/ Kemlandingan gunung	<i>Albizia lophanta</i>	Fabaceae	Foodstuffs
5.	Jamur grigit	<i>Schizophyllum commune</i> Fr.	Schizophyllum	Foodstuffs
6.	Jamur kuping	<i>Auricularia auricula</i>	Auriculariaceae	Foodstuffs
7.	Adas	<i>Foeniculum vulgare</i> Mill.	Apiaceae	Medicinal ingredients
8.	Purwaceng	<i>Pimpinella pruatjan</i>	Apiaceae	Medicinal ingredients
9.	Pulosari	<i>Alyxia reinwardtii</i> L.	Apocynaceae	Medicinal ingredients
10.	Senggani	<i>Melastoma polyanthum</i> Burm f.	Melastomataceae	Medicinal ingredients
11.	Dringu	<i>Acorus calamus</i> L.	Acoraceae	Medicinal ingredients
12.	Krangean	<i>Abrus laevigatus</i> L.	Lauraceae	Medicinal ingredients
13.	Pronojiwo	<i>Eushresta horsfieldii</i> (Lesch.) Benn	Fabaceae	Medicinal ingredients

The types of non-timber forest products listed in Table 1 are types of non-timber forest products that have been used for generations by the Tengger tribe community in the villages of Ngadas, Ranupani, and Argosari with various uses, including for food, medicine, and traditional ritual purposes (two of them are presented in Figure 1).



**Figure 1** Types of non-timber forest products

The results of research conducted by [6], explored medicinal plants used by the Tengger community based on local knowledge of the community in Poncokusumo District, Malang, East Java Province, Indonesia, namely, among others, pulosari (*Alyxia reinwardii* L.) part of which used are leaves, fruit and stems, efficacious for treating asthma and dysentery; dringu (*Acorus calamus* L.) the parts used are leaves and rhizomes, efficacious for treating asthma, TB cough and swelling; tanalayu (*Anaphalis javanica* (Reinw.) Schulzh) and tanalayu (*Anaphalis longifolia* (Bl) DC) the parts used are the whole plant, used for rituals; Ear fungus (*Auricularia polystrica* (Montagne) Saccardo.) The part of the plant used is the fruit, which is efficacious for increasing vitality; Clanding (*Albitzia lophanta* (Wild.) Bth) parts used are fruit and seeds, efficacious for increasing vitality; senggani (*Melastoma polyanthum* BL) the part used is the leaves, efficacious as a medicine for high blood pressure; grigit fungus (*Schizophyllum alneum* (L.) Schr); (*Schizophyllum commune*) the part used is the fruit body, efficacious for increasing vitality; fennel (*Foeniculum vulgare* Mill.) parts used are the whole plant, used for stimulant medicine, fever, cough and asthma treatment; purwoceng (*Pimpinella pruacan* Molkenb) the part used is the whole plant, efficacious for increasing male vitality and treating diabetes mellitus; pronojiwo (*Eushresta horsfieldii* (Lesch.) Benn) parts used stems and seeds, efficacious for increasing vitality, treating stomach problems and impotence.

The types of non-timber forest products used by the Tengger tribe community in the villages of Ngadas, Ranupani, and Argosari as listed in Table 1 are commodities that can be developed in the conservation partnership program in the context of community empowerment in the villages of Ngadas, Ranupani, and Argosari by giving access to traditional cultivation in traditional zones. The aim is not only to improve the welfare of the Tengger tribe community in the Ngadas and Ranupani Enclave villages as well as Argosari village which is a buffer village for TNBTS, it is also an effort to conserve biodiversity and preserve Tengger traditional culture.

Traditional cultivation as stated in Director General Regulation No. 6 of 2018, is defined as the activity of cultivating (developing) certain types of plants (medicinal plants and plants for daily needs) and unprotected wild animals in traditional zones/blocks using simple techniques that have been known or practiced for generations or according to local wisdom community. Traditional cultivation includes cultivation of medicinal plants, namely native species in conservation areas that are not protected; and cultivation of plants for daily needs, including (1) Rattan group; (2) Grain group; (3) Group of flowers; (4) Group of leaves; (5) Forest bamboo; (6) Fruits; (7) Tubers; (8) Sago; (9) Nipah; (10) Sugar palm; and (11) Fungi.

Cultivation of edelweiss as one of the non-timber forest products found in the TNBTS area has been carried out by the conservation partnership group in Argosari village, Senduro District, Lumajang Regency, after signing a conservation partnership cooperation agreement in 2020. There is awareness of the risk of extinction of edelweiss flowers and the

need for them. Edelweiss flowers for traditional ritual purposes encourage the conservation partnership group in Argosari village to carry out cultivation.

For the Tengger tribe, edelweiss is an obligatory flower used to carry out traditional rituals and cannot be replaced by other flowers. The Tengger tribe people call the edelweiss flower the wilted tana flower. Tana wilt comes from Sanskrit which means it doesn't wither easily. For the Tengger people, the edelweiss flower is a symbol of fertility. The philosophy is, if you put it in the ground, the soil's fertility will never be lost, whereas if you put it in water, the spring will continue to flow forever.

In the Bromo Tengger Semeru National Park area there are 3 (three) types of edelweiss that grow, namely *Anaphalis javanica*, *Anaphalis longifolia*, and *Anaphalis viscida*, where each type has different growth. *Anaphalis javanica* takes 1.5 to 2 years to flower, *Anaphalis longifolia* can flower 1 year after planting, while *Anaphalis viscida* takes longer, about 2 years to flower. *Anaphalis javanica* is a type of edelweiss that is designated as a protected plant through the Minister of the Environment Regulation Number 92/2018 concerning protected plant and animal species.

Edelweiss conservation efforts by TNBTS actually started in 2006, starting with activities to identify types of edelweiss in the TNBTS area. It has been identified that there are 3 (three) types of edelweiss that grow in the TNBTS area, namely *Anaphalis javanica*, *Anaphalis longifolia*, and *Anaphalis viscida*. In order to support the preservation of Edelweiss in the TNBTS area, including efforts to utilize it, TNBTS created a concept for developing Edelweiss under the name Land of Edelweiss. The TNBTS land of Edelweiss concept is divided into 2 (two) main things, namely the development of Edelweiss habitat within the TNBTS area in the context of protecting and preserving biodiversity and the TNBTS Edelweiss village in the buffer area for sustainable use packaged in community empowerment. In 2008-2013, the TNBTS Center conducted trials planting edelweiss in Wonotoro village, Sukapura District, Probolinggo, and Ranu Regulo Regencies, but it was not successful due to frost. At the beginning of 2014, trials of edelweiss cultivation began to be carried out at the Tengger Laut Pasir resort using naturally plucked seeds (F0), and at the end of 2014, the TNBTS Center succeeded in cultivating edelweiss starting from seeds (F1) resulting from naturally plucked seeds. In 2015-2016, trials and socialization of edelweiss planting in buffer village areas were carried out in 7 (seven) elementary schools (SD) and 1 (one) junior high school (SMP) in Sukapura District, Probolinggo Regency which were packaged in the Edelweiss Education Park. In 2016, the Minister of Environment and Forestry appreciated this success by inaugurating an Edelweiss park at TNBTS and instructed the involvement of buffer village communities in Edelweiss conservation efforts which also preserve Tengger culture and improve the community's economy. In 2017, the TNBTS Edelweiss village concept was launched at the TNBTS tourism services players' connection forum. As a result, Ngadisari village, Sukapura District, Probolinggo Regency and Wonokitri village, Tosari District, Pasuruan Regency are willing to become TNBTS edelweiss villages. Receiving a positive response from the community, in 2018 the Directorate General of KSDAE KLHK designated the TNBTS Edelweiss Village program as a national role model. Until now, edelweiss cultivation is still carried out by the Hulun Hyang conservation farmer group in Wonokitri village. Due to the success of the Hulun Hyang group in cultivating edelweiss, Wonokitri village was then used as a place for members of the Argosari village conservation partnership group to practice edelweiss cultivation techniques.

Apart from having cultural value, non-timber forest products found in the TNBTS area as listed in Table 1 have economic value that can be used as a business opportunity and can be developed in conservation partnerships in the context of empowering the Tengger tribe community so that they can support the economic improvement of the Tengger tribe community who live there. in the villages of Ngadas, Ranupani and Argosari. Communities can utilize non-timber forest products in the TNBTS area as an alternative livelihood.

Purwoceng (*Pimpinella pruatjan*) is one of the non-timber forest products in the TNBTS area that has high economic value. [7] stated that Purwoceng (*Pimpinella pruatjan* Molk or *Pimpinella alpine* KDS) is an endemic plant in mountainous areas such as the Dieng plateau in Central Java, Mount Pangrango in West Java, and mountainous areas in East Java. Parts of the plant, especially the roots, are efficacious as an aphrodisiac (increasing sexual desire), a diuretic (stimulating the urinary tract), and a tonic (increasing body stamina).

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#### 4. Conclusion

Types of non-timber forest products that are utilized and can be implemented in conservation partnerships based on local knowledge of the Tengger tribe community consist of the families Asteraceae (3 species), Fabaceae (1 species), Schizophyllum (1 species), Auriculariaceae (1 species), Apiaceae (2 species), Apocynaceae (1 species), Melastomataceae (1 species), Acoraceae (1 species), Lauraceae (1 species) and Fabaceae (1 species). with various uses, including for food, medicine, and for traditional ritual purposes.

### *Recommendation*

TNBTS needs to conduct trials on cultivating the fungus grigit (*Schizophyllum commune* Fr.), fennel (*Foeniculum vulgare* Mill.), purwaceng (*Pimpinella pruatjan*), pulosari (*Alyxia reinwardtii* L.), dringu (*Acorus calamus* L.), kranglean (*Abrus laevigatus* L.) and pronojiwo (*Eushresta horsfieldii* (Lesch.) Benn) before implementing the conservation partnership program in the context of community empowerment in the Tengger tribe community in the villages of Ngadas, Ranupani and Argosari.

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### **Compliance with ethical standards**

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#### *Disclosure of conflict of interest*

The authors declare no conflict of interest regarding the publication of this paper

#### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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