

# Non-timber forest products extracted activities of the upstream Mamberamo basin's traditional communities of West Papua, Indonesia

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**Abstract.** *Rahawarin YY. 2017. Non-timber forest products extracted activities of the upstream Mamberamo basin's traditional communities of West Papua, Indonesia. Asian J For 1: 23-26.* The aim of this study is to find utilization activities of extracting non-timber forest products by local communities on the upstream part of Mamberamo Basin. Survey, observation and semi-structural interview were taken to generate data and information. The result showed that the local communities extracted several of non-timber forest products over the course of their generations to fulfill basic daily necessities. There were several types of non-timber forest products that have been used by local communities either from plants wild animals that living across different types of forest. These activities were lasted for generations so that people called it as a traditional conservation. They are still exist recently and believed to maintain the long-lasting of non timber forest products continuity to keep the availability of traditional food sources for the daily needs over generations.

**Keywords:** Non-timber forest products, local communities, upstream part, Mamberamo basin, traditional conservation pattern

## INTRODUCTION

Forest has two main roles which are for supporting life and backing-up economic activities in many countries. Besides, it has also some multi-function roles, not only to conserve its biodiversity and maintain the ecosystem but also to yield variously benefited and natural products as well as provide a wide range of services especially for surrounding communities. Ecosystem components such as trees, woody vegetation, wild animals and soil will support a better socio-economic condition for the society (Rahawarin 2010a, 2010b).

Tropical forest is known as a place categorized as a very rich of its flora and fauna, and also a region where the sources of flora and fauna are highly abundant which eventually fulfill human needs. For example, timber and non-timber products (NTFPs), agricultural activities, traditional medicine stocks, etc., for the present generation and the year to come (Masripatin 2007). Papua is an area located in the Eastern part of Indonesia which has an area over 421,981 km<sup>2</sup>. The area is very potential due to its rich biodiversity as a source for supporting a sustainable life of traditional communities (Beno et al. 2009).

Tropical rainforest is one of the richest potential biodiversities situated in Papua that spreads out over different gradient of ecosystems. Petocz (1987) and Conservation International (1999) reported that there were about 20,000-25,000 plants species, more less 200,000 species of insects and invertebrates, 330 reptiles and amphibians species, 650 birds species, and 164 mammals species in the land of Papua.

Harvesting forest products by local communities in Papua are not limited solely to the flora but also to the

fauna through a traditional hunting pattern. Study reported by Robinson and Redford (1994) and Robinson and Bodmer (1999) in several tropical areas showed that hunting in the tropical rainforest was not sustainable and wild animals will be very vulnerable due to over-exploitation so that it was directly threatened to extinction.

Pattiselanno (2003) claimed that hunting activities for some wild animals in the tropical rainforest in Papua play an important role and give a significant contribution, not only for protein consumption but also to step up an economic income for traditional households. In order to address the issue, assessing the communities' understanding in the way they extracted forests and wild animals as well as various non timber forest products are necessary to obtain a better concept of extracted patterns and in general uphold conservation and evaluation programs.

## MATERIALS AND METHODS

This study was conducted at the upstream part of Mamberamo river where administratively located in Bernakamp, Taive, and Dabra District of Mamberamo Raya Regency, West Papua. In general, the location indicated by a rigged area dominated by mountains and small rivers flowed to the sea (Figure 1).

Direct field survey, observation technique, and interview were methods that have been applied in this study. Through field survey and observation, primary data from biotic aspect including flora and fauna were taken. Socio-economic and cultural aspects were also monitored through oral survey by asking the communities for some

key questionnaires. To understand the distribution and existence of the flora, some sampling plots are designed in the forests, while for the fauna, enumeration technique was carried out which was based on the preliminary information given by the communities.

Secondary data which consists of biophysical condition from the surrounding forests in which extracted activities carried out by the communities. The secondary data were collected through recording and searching techniques of some previously existed reports/documents that are available from relevant stakeholders.

In order to generate data, surrounding forest communities called Tabruta tribe were involved based on their daily activities on the forests. Additional tools such as manual diameter tape, haga altimeter, binocular camera, documentation tools, and stationeries were used.

Data and information collected through questionnaires, semi-structural interviews, documentations, and temporary plot measurements were analyzed through excel program to generate graphical distribution of flora and fauna potency. Distribution and dominant component of flora and fauna was analyzed using ms excel.

## RESULTS AND DISCUSSIONS

### Distribution of NTFPs and potential fauna

The main distribution of NTFPs was indicated in the upstream of Mamberamo Basin where situated in the lowland forest, some swamp forests, and man-made agricultural area (Figure 1). Based on a report from The County Agricultural Bureau of Mamberamo Raya Regency (2012), the total area is about 317,353Ha in which it is dominated widely by lowland forest (96,68%) from the plateau of Taribu Mountain at Taria Village, Bernakamp village to the mountain of Rotia in the Dabra area. Swamp forest (2,64%) is distributed along the Mamberamo Basin along with the tributary flows up to the Northern part and forms many small lakes. These are subsequently intended for cultivating Mozambique talipia (*Oreochromis mossambica*), gold fish (*Cyprinus carpio*), and freshwater crocodiles (*Crocodylus porosus*). There were an estimation of around 20-25 lakes regularly used to fulfill the household needs. The total area intended for fish and crocodile cultivation is about 1-2Ha. In addition, swamp forests around the upstream of the river are planned for



**Figure 1.** A. The area of Taribu Mountain, B. The area of Rotia Mountain, C-D. The lowland tropical forest view taken during the study in the upstream of Mamberamo river, West Papua, Indonesia

sago (*Metroxylon sagu* Rottb.), and a handful areas intentionally for hunting wild boar (*Sus scrofa*). The locations for sago are quite limited centered surrounding the lowland forest.

The percentage of NTFPs from agriculture sector is only 0.58% in which mainly used for the source of carbohydrate, vegetable, protein, and the protein from catching animals. The total cultivating area for each household is approximately around 0.25-0.5 Ha.

### Types of NTFPs

Based on the observation and previous study indicated by Allen et. al. (2002): Binur and Ohee (2010), there were 22 species of NTFPs found in the upstream of Mamberamo River as noticed at Table 1.

On the other hand, based on the interview, the communities have put NTFPs commodities as top sources for generating income for the households. Those were the extraction of the agar wood and crocodiles skin for accessories. Other products are also increasing the income, however, in limited numbers such as the activities from gardening hunting and fishing.

### Extracted techniques

The communities who live in the upstream of the Mamberamo river are extracted the NTFPs that bank on their traditional ways and beliefs. For example, agar wood yielded from the lowland forest with the common traditional wax or blade by cutting the tree and taking out the resin then it eventually be sold commercially. There were no specific skills needed for management and processing.

Sago trees as the major food for traditional NTFPs communities are extracted by way of simple traditional steps such as cutting down the tree used wax, rinsing with water to disentangle the starch and sago residue, and packing the starch with a traditional bag designed from sago leaves. Beside sago starch for food, the midribs are also potential for traditional housing. Those are used for roof in the house and it has been beneficial to keep generations around the Mamberamo River. Those processes are managed in the traditional way without formal education. Instead, the information just passed from generation to generation within the communities.

**Table 1.** Number, taxonomical and scientific name as well as extracted pattern of various NTFPs in the upstream river of Mamberamo, West Papua, Indonesia

Name of species		Parts of plants	Purposes
English name	Scientific name		
Agarwood	<i>Gyrinops</i> sp.	Resin and tree bark	The resin is traded where as the tree bark is used for walls of houses.
Betel palm	<i>Arecca pinanga</i>	Fruits	For food and sold.
Cananga	<i>Cananga odorata</i>	Stems and bark fiber	Stems are used for construction materials and bark fiber for material and traditional bag (noken).
Crocodile	<i>Crocodylus porosus</i>	Meat and scale, skin	Meat is eaten and scale is sold.
Dammar	<i>Vatica rassak</i>	Sap	To be candles for light.
Figs	<i>Ficus</i> sp.	Tree bark and fiber bark	Tree bark is used for covering the food whereas the bark fiber is intended for traditional bag and clothes.
Fijian longan	<i>Pometia pinnata</i>	Fruits	For food
Gold fish	<i>Cyprinus carpio</i>	Meat	Meat is eaten and sold.
Guava	<i>Zyzigium</i> sp.	Fruits	Used for food.
Masohi	<i>Cryptocarya</i> sp.	Bark	The bark is sold.
Melinjo	<i>Gnetum gnemon</i>	Bark fiber, leaves and fruits	Leaves and fruits are yielded for food. Bark fiber is intended for noken.
Mozambique talipia	<i>Oreochromis mossambica</i>	Meat	Meat is eaten and sold.
Orchid	<i>Dendrobium</i> sp.	All parts of the plant	As decorative plant
Palm	<i>Orania</i> sp.	All parts of plant	Leaves and midribs are used for construction materials whereas steams are used for bow and arrow materials.
Palm	<i>Hydriastele</i> sp.	Stems and all parts plant	Stems are used for construction and hand-made crafts. Palm is used for Home decoration.
Palm	<i>Linospadix</i> sp.	Leaves	Leaves are used for construction.
Rattan	<i>Korthalsia ziiipeli</i>	Stems	Stems are used for materials and construction i.e. chair, table, and fences.
Red fruit	<i>Pandanus</i> sp.	Fruits and leaves	Fruits are extracted for food and leaves are used for housing floor materials.
Sago	<i>Metroxylon</i> sp.	Sago starch, leaves, stems midribs and trunks	Sago starch is commonly used as a staple food and sold; leaves and midrib are used for construction materials; steams are applied for media, sago caterpillar for food protein.
Stinging tree	<i>Laportea indica</i>	Leaves	As traditional medicine.
Wild boar	<i>Sus scrofa</i>	Meat and teeth	Meat is eaten and sold, while teeth are. Used for accessories/ souvenir.
Yellow fruit moonseed	<i>Arcangelesia</i> sp.	Stems	As traditional medicine

Crocodiles hunting activities are carried out by setting the fishing equipment or catching them directly from rivers usually during the evening. The animal then transported to the house in order to take out the skin. The young crocodile's meat is cooked or grilled for consumption. The skin is preserved by pouring it with salt then covered by plastic bag.

Generally, the upstream communities in Mamberamo do not work as fishermen who depend their livelihood on fishing, they do fishing only for fulfilling their daily needs, instead (Polhemus and Richards 2001). Other NTFPs intentionally planted in the surrounding area are *Areca catechu*, taro and cassava that always consume.

### Traditional conservation of NTFPs

With regard to the availability of NTFPs, conservation and preservation action are required. There are a number of solutions in order to keep the benefit of NTFPs while maintaining the future availability for generations to come. It is clear that extracting NTFPs for consumption and small-scale commercial activities are managed in a sustainable ways by considering the potency. Instead of hanging on the nature, the extensive activities and cultivation are mandate to do in the communities. Land management is continually managed for growing some edible crops and domesticated animals. For example, during dry season when level of water in the river is reduced, the communities tend to alter their daily activities into the swamp forests and rivers. On the other hand, during rainy season the communities are focused at the high land to extract NTFPs.

The communities believe that by way of managing the forest and nature in a sustainable way, it will provide a perpetual abundance of benefits from them. Such beliefs that traditional communities carry have been bonded and poured into some traditional regulations and customs. For example, every hunting activity should take permission from the traditional leader. Sumule (1995) and Pattiselano (2006) reported that some areas in Papua which belong to certain ethnic groups or clans, therefore, beside the permit

they also should share some of their hunting product to the communal native holders.

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