Contribution of Non-Timber Forest Product (NTFP) To Households Income In South Tapanuli Regency Indonesia

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Abstract. Non-timber forest product (NTFPs) that provide species are a substantial component of the agroforestry system in southern Tapanuli and contribute to local livelihoods. The aim of our study was to measure the annual economic contribution of NTFPs to local livelihoods. NTFPs such as Theobroma cacao L. Areca catechu, Archidendron pauciflorum, Aleurites moluccana (candlenut), Hevea braziliensis, Arenga pinnata, Cinnamomum sp are mostly collected from natural habit. The study site has contribution value for the utilization of non-timber forest products is 53.04% and provided a moderate increase in income to the people of Marancar Godang Village. The total contribution of NTFPs to annual household income was 2,441,416,000.00 IDR/year/households.

1. Introduction
NTFPs (Non-Timber Forest Products) are defined as anything that is material (non-wood) taken from the forest to be used for economic activities and community welfare in an effort to change the direction of forest management from timber extraction to sustainable forest management. [1] NTFPs are used and managed in complex socio-economic and ecological environments. NTFPs is widely used by traditional forest communities, as the main source of income. Some NTFPs have significant cultural values, such as totems, incense, and other ritual objects, medicine and importantly contribute to people's health and well-being. Examples of NTFPs include fruits and nuts, vegetables, fish, medicinal plants, forest honey, resins, and various bark and fibers such as bamboo, rattan, as well as palms and grasses.

One of the important sources of livelihoods of communities around forests is non-timber forest products (NTFPs). In Indonesia, the socio-economic and cultural life of communities around forests is related to the use of NTFPs [2].

NTFPs can also be referred to as all-natural resources that can be extracted from forest ecosystems and used in households to be marketed or have social, cultural or religious significance [3]. To meet the necessities of life, the majority of rural households in developing countries and most urban households depend on forest products. NTFPs create high economic value and large-scale employment. Non-timber forest products in addition to promoting economic interests among communities can also protect community members against risks or economic shocks by creating informal social protection services. NTFP production, of course, depends on natural resources that are managed sustainably. [4].
This research is done to know the contribution of Non-Timber Forest Products used by Communities in Marancar Godang Village, Marancar District, South Tapanuli Regency. In terms of evaluating progress towards sustainable forest management, information on the status and trends in socio-economic benefits is very important[5].

2. Materials and Methods
The study was carried out in Marancar District (98° 46' 48" - 99° 17' 24" East Longitude and 10° 27' 00" - 10° 59' 24" North Latitude.) located in the Marancar Godang Village, South Tapanuli Regency Indonesia, which is bounded by Batu Horing Village in the North, Aek Pasir in the east, Gapuk Jae village in the South, Batu Horing District in the west. The area is well known for the combination of high rainfall, the predominance of slope 50%, the topography is generally hilly and mountains.

For this study extensive field surveys were made during January - February 2019. Data was collected using rapid rural appraisal and structured interviews of 65 households. Detailed household surveys using interviewing the households directly, in the form of questionnaires on farmers' identity, land ownership, land management methods, selling price of products (non timber forest products-NTFPs), worker and others. Information about NTFP plant species and their use patterns is collected through personal interviews with village heads and other villagers of different age groups and genders.

Percentage of income from non-timber forest products is calculated by comparing the income obtained from non-timber forest products with the total of all respondents' income sources through the following formula:

\[ R = \frac{R_{hr}}{R_t} \times 100\% \]

Information
R = Percentage of income from NTFPs
Rhr = Income from NTFPs
Rt = Total revenue

The contribution of non-timber forest products to the household economy is assessed from the percentage of income earned by respondents from non-timber forest products to total income [5] [6]. The percentage of respondents' income is divided into five classes from very small to very large incomes (Table 1). Each income percentage class shows the state of the respondent's level of income from non-timber forest products.

### Table 1. Percentage of Contribution of Non-Timber Forest Products (NTFPs) to the Household Economy [7].

| No | Percentage of NTFP income contribution | Remarks |
|----|---------------------------------------|---------|
| 1  | 0% - 20%                               | The contribution of income is very small |
| 2  | 21% - 40%                              | The contribution of income is small |
| 3  | 41% - 60%                              | The contribution of income is medium |
| 4  | 61% - 80%                              | The contribution of income is large |
| 5  | 81% - 100%                             | The contribution of income is very large |
3. Result and Discussion

The importance of many NTFPs for rural livelihoods cannot be denied, because a variety of forest products are used as a natural subsidy by rural households across Indonesia. [3]. Non-timber forest products (NTFP) that provide species are a substantial component of the agroforestry system in Sumatra and contribute greatly to local livelihoods [8]. Types and benefits of non-timber forest products with economic value utilized by the community in study in site are *Theobroma cacao* L. *Areca catechu, Archidendron pauciflorum, Aleurites moluccana* (candlenut) *Hevea braziliensis, Arenga pinnata, Cinnamomum sp* (Table 2)

**Table 2. Types and Benefits of Non-Timber Forest Products**

| No | NTFPs                          | Benefit                                      |
|----|--------------------------------|---------------------------------------------|
| 1  | *Theobroma cacao* L.          | Food                                        |
| 2  | *Areca catechu*               | Traditional ceremonies, herbal medicine      |
| 3  | *Archidendron pauciflorum*    | Food, herbal medicine                       |
| 4  | *Aleurites moluccana* (candlenut) | cooking ingredients, hair care, herbal medicine, hair care |
| 5  | *Hevea braziliensis*          | Latex, rubber                               |
| 6  | *Arenga pinnata* (betel nut)  | Sugar palm, palm fiber, processed food       |
| 7  | *Cinnamomum sp*               | Cinnamon, food                              |

NTFPs contribute significantly to the economic benefits of rural households in developing countries in three main ways: first, providing subsistence needs and domestic consumption to increase household income. Secondly, socio-economic mitigation and adaptation to climate change, is an important part of adaptive capacity and, thirdly, contribute to direct monetary benefits through trade [3] [5], [6].

Marancar Godang villagers have a variety of jobs, they not only rely on income only from NTFPs, but the community also relies on income from other jobs such as from farm laborers, entrepreneurs, livestock, and civil servants which can be seen in Table 3.

The collection of NTFPs in the Marancar Godang Village community is traditional economic activity influenced by hereditary habits. The higher the demand for NTFP results, the higher the exploitation of NTFPs themselves.

**Table 3. Household income per year excluding non-timber forest products**

| No | Employment     | Number of Respondents | Income (IDR/year) | Percentage (%) |
|----|----------------|-----------------------|-------------------|----------------|
| 1  | Civil Servants | 8                     | 366,00,000.00     | 6.93           |
| 2  | Entrepreneur   | 14                    | 540,00,000.00     | 24.98          |
| 3  | Farmers        | 32                    | 894,00,000.00     | 41.36          |
| 4  | breder         | 11                    | 361,200,000.00    | 16.71          |
|    | **Total**      | **65**                | **2,161,200,000.00** | **100**        |

Based on the results of the study it can be seen that the largest source of income other than NTFPs in Marancar Godang Village comes from the farmers around 894,000,000 IDR / year (41.36%), while the lowest source of income from breder as much as 361.2 million, IDR / year (16.71%). The total income of outside NTFPs in this study site is 2,161,200,000.00 IDR / year with an average income of each respondent of 2,770,000.00 IDR/month, sourced from agriculture, entrepreneurship, animal husbandry, and civil servant income.
The total income of NTFPs in this study is 2,441,416,000.00 IDR/year with an average income of each respondent in the amount of 3,130,000 IDR/month. The total community income of Marancar Godang Village is 4,602,616,000.00 IDR/year or 5,900,000.00/month with the contribution of NTFPs utilized by 53.04%. (Table 4)

Table 4. Contribution of Economic Value of Non-Timber Forest Products

| Income outside of NTFPs IDR/year/ households. | Income of NTFPs IDR/year/ households. | Total income IDR/year/ households. | NTFPs Contributions |
|----------------------------------------------|---------------------------------------|------------------------------------|--------------------|
| 2,161,200,000.00 | 2,441,416,000.00 | 4,602,616,000.00 | 53.04 (%) |

The contribution of the utilization of Non-Timber Forest Products (HHBK) to the income of the people of Marancar Godang Village is classified as moderate. NTFPs contributed 53.04% and provided a moderate increase in income to the people of Marancar Godang Village.

Through this research can provide a better understanding of socio-economics the contribution that NTFPs can make to livelihoods rural people who depend on forests in Indonesia. Clear, Collection of NTFP is an important tool used to improve the condition of rural households, so that their income can be increased. [4],

Utilization of non-timber forest products collected or cultivated is one of the sources of livelihoods of communities around the forest as both primary and side livelihoods. The existence of NTFPs is believed to be most related to the interests of communities around the forest [5]. NTFPs have been proven to support human survival across generations, and have an impact on increasing the income of people living around forests. For successful community-based forest management in Indonesia, integration between humans, the economy and the preservation of natural resources must be central in every forest policy.

4. Conclusion
Non-timber forest products play an important role in supporting food security and rural livelihoods in developing countries, especially Indonesia. In the study site, NTFPs contributed 53% to the income of communities around the forest. The total community income of Marancar Godang Village is 4,602,616,000.00 IDR/year / households.

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