International Journal of Forestry and Horticulture (IJFH)
Volume 4, Issue 3, 2018, PP 25-32
ISSN No. (Online) 2454–9487
DOI: http://dx.doi.org/10.20431/2454-9487.0403004
www.arcjournals.org

Local Criteria and Indicators for Non-timber Forest Products Certification in Nepal

Ganesh Paudel[1], Tej Kumar Shrestha[2,7], Chitra Bahadur Baniya[3], Dr. Ram Prasad Lamsal[1], Shanta Ram Baral[1], Dadhi Lal Kandel[4], Bhim Bahadur Kalikote[5], Mohan Shrestha[6], Anish Parajuli[7]

[1]*Department of Forests, Kathmandu, Nepal*

[2]*Khwopa College, Bhaktapur, Nepal*

[3]*Central Department of Botany, Tribhuwan University, Nepal*

[4]*District Forest Office, Palpa, Nepal*

[5]*District Forest Office, Sindhuli, Nepal*

[6]*District Forest Office, Rolpa, Nepal*

[7]*Lumbini Environmental Services Pvt. Ltd., Kathmandu, Nepal*

Corresponding Authors:** ***Tej Kumar Shrestha, *Khwopa College, Bhaktapur, Nepal, Lumbini Environmental Services Pvt. Ltd., Kathmandu, Nepal*

Abstract: *Sustainable management of natural resources is the prime concern of global community while rapid industrialization and unsustainable utilization have decreased world's natural resource in a pace. Forest certification has been emerged as an innovative market-based mechanism to ensure sustainable management of forests however, Non-timber forest products (NTFPs) certification is unable to take its momentum due to absence of local criteria and indicators being the most important factor. A comprehensive study was carried out by reviewing global initiatives for NTFP certification to formulate local level criteria and indicators. Field study was based in Rolpa and Palpa districts of western Nepal where direct field observation and Key Person Interview were conducted. This research proposes 7 criteria and 32 indicators for the NTFP certification for Nepal. Criteria for NTFP certification includes (1) Natural status of NTFPs, (2) Collection system, (3) Research and Development, (4) Domestication and cultivation, (5) Enterprise development and value addition, (6) Marketing, and (7) Awareness. These criteria and indicators are expected to be a useful tool for concerned stakeholders at local level for evaluating sustainability of NTFP.*

Keywords: *Certification, Criteria, Guideline, Indicators, NTFPs*

1. INTRODUCTION

1.1. Certification

The notion of Sustainable Development (SD) has grown after publication of Brundtland Commission report in 1987 as it provides comprehensive definition and urges for SD. Being renewable natural resources and the prevalent widespread deforestation, sustainable forest resource management was taken at the forefront of each nation's national and international policy and negotiation forums. Forest certification is an emerging concept for the sustainable management of forest resources [1]. It encompasses two separate processes of the certification viz. Forest Management Certification (FMC) and the Chain-of-Custody Certification (CoC). FMC verifies whether forest products are obtained from the forest which is being managed in pre-defined standard of forest certification where CoC tracks forest products from extraction to the sale point to ensure that the forest products are originated from certified forest. Certification can be influenced by various factors including better working conditions, benefits, participation, property rights and traditional knowledge [2].

Various initiatives of forest certification are in practice. Forest Stewardship Council (FSC) is an international body accrediting certification organizations for guaranteeing the authenticity of the claims of these organizations for forest certification [3]. FSC has developed the 10 principles and 56

criteria for forest certification in 1993 which are influential for forest certification. These principles and criteria for forest stewardship were amended in 1996, 1999 and 2002. Likewise, the Program for the Endorsement of Forest Certification Schemes (PEFC) Council is also the worldwide organization of forest certification and labeling of forest-based products to promote sustainable forest management. It has developed the international as well as national standards for forest certification.

Non-Timber Forest Products (NTFPs) are important forest products as they possess the characteristics of low volume and high value products. NTFPs resources are assumed to be decreased due to unsustainable way of harvesting [4]. Sustainable management of NTFPs are ensured by controlling illegal and unsustainable harvesting of these NTFPs. If the consumers uses products that are obtained through sustainable management of the resources, then these resources will be conserved and help to ensure sustainability [5, 6]. Sustainable harvesting is also essential to sustain resource base. NTFP certification has been highlighted as a marketing strategy to meet the objective of sustainable management of these resources [7]. Ultimate goal of NTFPs certification is to ensure ecologically sound, socially beneficial and economically viable management and utilization [8]. Recognizing this, NTFP certification has been widely discussed among policy makers, academicians and practitioners in different forums.

In fact, NTFPs certification is a noble idea to ensure its sustainable management. The NTFPs which are harvested sustainably can be certified so that the user is aware of the products they consume are obtained in sustainable way. Detailed ecological information of all the NTFPs species cannot be recognized and not essential. We need to certify the NTFPs species which are important and have considerable demand in the market. NTFPs species with ecological knowledge gap but with traditional knowledge on its regeneration patterns and the harvesting schedule makes certification process convenient [9].

1.2. Review of NTFPs Certification Initiatives

Global initiatives for the NTFPs certification worldwide were reviewed. Brazil was the first country to develop regional standards for the certification of forests lands to obtain forest products other than timber [10] thus, Brazil can be regarded as the pioneer and leading country for NTFPs certification. Forest Steward Council (FSC) certifies NTFPs since 1990s. The Brazilian Institute for Agricultural and Forestry Management and Certification has introduced the community certification along with NTFPs certification. In 2003, World Health Organization (WHO) prepared the WHO guidelines on good agricultural and collection practices (GACP) for medicinal plants [11]. Chapter three of this guideline contains the good collection practices for medicinal plants while the chapter four has the common technical aspects of good agricultural practices for medicinal plants and good collection practices for medicinal plants. Chapter five of this guideline has other relevant issues including ethical and legal considerations and research needs in this sector.

The Guideline of Swiss Import Promotion Programme (SIPPO) promotes the sustainable trade of different products *viz.* technical woods, processed woods, sustainable tourism, value-added textiles, natural ingredients and fish and seafood. In 2005, SIPPO developed the "Guidance manual for organic collection of wild plants". This guideline has details of collection, drying and processing of wild collected materials and purchase, processing and marketing aspects of these products [12]. Recognizing the importance of the certification on the sustainable management of the NTFPs the Rainforest Alliance's NTFP marketing and management project has developed standards for NTFP certification [1]. Organic production of Lemon grass (*Cymbopogan flexuosus*) is certified in Bhutan to supply in the international market [13]. The certification process is successful due to the two private enterprises namely Bio Bhutan and the Dozam Community Forest Management Group (CFMG) in Drametse Gewog.

1.3. NTFP Certification in Nepal

Forest certification program in Nepal was launched in 2005 in Bajhang and Dolakha districts. In Bajhang around 10,450 ha community forests were certified in February, 2005 under FSC group certification [14]. The whole process of certification in Nepal has been facilitated by the Asia Network for Sustainable Agriculture and Bio-resources (ANSAB) in close coordination with the government. ANSAB developed the toolkit for certification of community managed forests in 2010 to facilitate the certification process in Nepal [15].

These above mentioned NTFPs certification initiatives were practiced in various places of the world. In past, the forest certification was regarded as the panacea to curb unsustainable harvesting of forest resources. In Nepal certification process is not taking momentum at present days compared to earlier. The certification process has been regarded as the voluntary rather than the compulsory and legally binding instrument for resource management and utilization. This is a costly process and is not justified because developing nations are unable to afford high amount of money to internal organizations for third party accreditation of the forest. These various factors are responsible for the lower implementation of the NTFPs certification initiatives at global level. There is no blueprint set of criteria and indicators for its certification and different criteria and indicators for NTFPs certification which can be used in different places depending on local bio-physical and socio-economic conditions. Therefore, formulation of local criteria and indicators is an urgent need to facilitate NTFPs certification. In this context, this study was conducted with the objective of developing criteria and indicators for NTFPs certification at local level in Nepal. Local criteria and indicators are important to judge the success of policy and program intervention for enhancing NTFPs. These criteria and indicators can be used by the forest offices from local level and other stakeholders for evaluating sustainability of NTFPs management in the district.

2. MATERIALS AND METHODS

This research is based on literature review, field observation and stakeholders' consultations. Rolpa and Palpa districts (Figure 1) were selected as study sites for this research due to their higher availability of NTFPs. Rolpa is one of the richest districts in terms of number and volume of NTFPs similarly Palpa district is renowned for Tejpat (*Cinnamomum tamala*).

2.1. Literature Review

Literature review was focused on all sorts of articles available from reliable sources. Search engines *viz*. Google Scholar, ISI Web of Science, Science Direct, Scopus of Elsevier, Research gate and Jstore were used with the key words "Non-timber forest products", "Criteria and Indicators", "Certification ", "Global initiatives" and "Local set of criteria and indicators" to explore about formulating the criteria and indicators for the NTFPs certification at global and national level. Besides the peer reviewed journals, other grey literatures *viz*. publications related to NTFPs of the governmental and non-governmental organizations were also reviewed. Research reports, periodicals, and different publications of the Nepal Governmental organizations such as the Ministry of Forests and Environment, Department of Forests, Department of Plant Resources were also reviewed to understand national context of NTFPs certification and its possible criteria and indicators in Nepal. Likewise, publications of the District Forest Office Rolpa and Palpa including the five-year forest management plan, annual report and the NTFP related publications were reviewed to explore the local conditions for NTFP management and its certification.

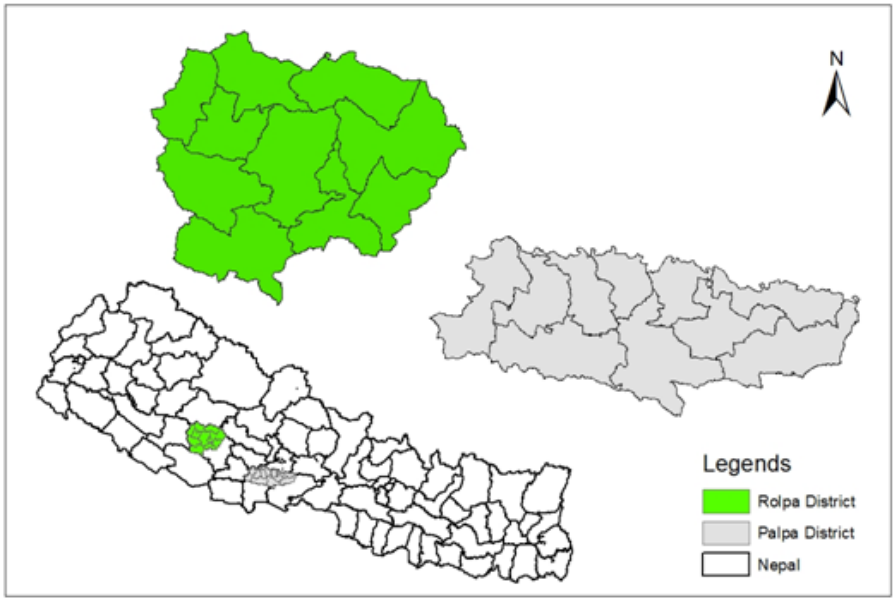

Figure1. *Location map of study area (Rolpa and Palpa districts), Nepal*

2.2. Study Area

Rolpa District

Rolpa is a hilly district approximately 280 km west from Kathmandu lies in Rapti Zone ofProvince No. 5, Nepal. Rolpa extends from $28^0$08'N to $28^0$38'N latitude and $83^0$10'E to $83^0$90' E longitude covering total area of 1,87,150 ha (1,872 sq.km). The altitudinal range varies from 701 to 3639 m above sea level representing from the temperate to sub-alpine climate.

Rolpa is rich in medicinal plants and NTFPs. Important medicinal plants and NTFPs are reported from almost every part of Rolpa. Bojho (*Acorus calamus*), Sarpagandha (*Rauwolfia serpentina*), Titepati (*Artemisia vulgaris*), Amala (*Phyllanthus emblica),* Pipla (*Piper longum*), Harro (*Terminilia chebula*), Barro (*Terminalia bellerica*), Neem (*Azadirachta indica*), Timur (*Zanthoxylum armatum*), Pakhanbed (Bergenia ciliata), Kurilo (*Asparagus recemosus*), Lothsalla (*Taxus walichina*), Panchaule (*Nardostachys grandiflora*) etc. are key NTFPs found in the district (field survey). Locals collect these NTFPs traditionally adopting traditional systems with little knowledge of modern technology for sustainable collection and enhancing the value of products.

Palpa District

Palpa is hilly district that also lies in province No 5 of Nepal. Geographically, it extends from $27^0$34' N to $27^0$57' N latitude and $83^0$15' E to $84^0$22' E longitudes covering total area of 136,595 ha (1366 sq. km). The elevation of district ranges from 152 to 1936 m above mean sea level. Various types of NTFPs and medicinal plants were reported from Palpa district. Kurilo (*Asparagus recemosus*), Tejpat (*Cinnamomum tamala*), Bojho (*Acorus calamus*), Pipla (*Piper longum*), Timur (*Zanthoxylum armatum*), Amliso (*Thysanolena maxima*), Gurjo (*Tinospora sinensis*) etc. are key species available in Palpa. *Cinnamomum tamala* is one of the important species of Palpa. The leaf of this species is called Tejpat and the bark Dalchini. The bark and leaves contain aromatic oil and are used as spices. It is one of the most important sources of income for local people of this district.

2.3. Field Study

Field visit was conducted between January 2018 and June 2018 in both districts to identify local sets of criteria and indicators of NTFPs. These districts were selected for their richness in NTFPs and local people are earning significant amount of income from export of NTFPs. Consultations were conducted in three tiers *viz*. community or village level, district level and national level. To understand the local conditions and verify the information collected during consultation, field observations were also carried out in the field level.

2.4. Consultations

Local consultations were conducted in five locations each from both districts considering the geography and availability of the NTFPs. Those consultations involved government officials from District Forest Office, NTFPs traders, Community Forests, NTFPs collectors and local farmers. Discussion was based on criteria and indicators for NTFPs and the consultation concluded with identification of set of criteria and indicators. Once the consultations were completed at local levels, a sharing workshop was held at district level at both Rolpa and Palpa districts which finalized common set of criteria and indicators for each district. Finally, two sets of drafts criteria and indicators were discussed among experts at meeting organized in Kathmandu and the final criteria and indicators were determined.

3. RESULTS AND DISCUSSION

Local Criteria and Indicator

Based on the literature review, review of official publications, public consultation draft set of criteria and indicators for NTFPs management were developed separately for the Rolpa and Palpa districts. Later these criteria and indicators were intermingled for developing the common set of criteria and indicators. After combining these two sets of criteria and indicators, seven criteria and thirty-two indicators were developed (Table 1).

Table1. *Local criteria and indicators for NTFP certification*

Criteria	***Indicators***
1. Natural status of NTFPs	1.1 Abundance of NTFP species in natural forest 1.2 Level of anthropogenic and natural disturbance 1.3 Vigor and growth of the species 1.4 Diversity of NTFP species
2. Collection system	2.1 Legal procedure of NTFP collection 2.2 Collection following sustainable harvesting amount 2.3 Guidelines for sustainable harvesting of NTFPs 2.4 Harvesting practices viz. selective harvesting, rotational harvesting 2.5 Local indigenous people right over resources (ITK) based on ILO 169
3. Research and Development	3.1 Assessment of NTFPs status 3.2 Research on harvesting technology 3.3 Facility of chemical testing 3.4 NTFPs ecological and biological characteristic exploration
4. Domestication and cultivation	4.1 Identification of potential area for cultivation 4.2 Identification of NTFP species for domestication 4.3 Guidelines for cultivation and domestication 4.4 Nursery establishment and seedling production 4.5 Cultivation practices
5. Enterprise development and value addition	5.1 NTFP based enterprise development 5.2 Community involvement in value addition 5.3 Private sector investment 5.4 Certification and labelling 5.5 Quality of the products 5.6 Government initiatives
6. Marketing	6.1 Accessibility to the market for products 6.2 Market information system 6.3 Availability of alternative markets for products 6.4 Networking of the consumers, producers and traders 6.5 Transportation facility
7. Awareness	7.1 Awareness of people on NTFP conservation 7.2 Training for sustainable harvesting 7.3 Domestication and nursery technique orientation

Criteria developed for the NTFP certification and sustainable management reflected the key areas of interventions required for the NTFP management. These criteria have specific indicators which were measurable to monitor the success in every criterion. Yadav & Dugaya [1] also proposed 17 different criteria for NTFP certification in India in four different aspects *viz*. Policy, legal and institutional framework for sustainable NTFP management, NTFP management plan, strategy and operations for sustainable availability, NTFP value chain and market network and socio-cultural and spiritual benefits. The criteria and indicators developed in this study also encompassed all these similar aspects.

Natural status of NTFPs was identified as one of the criteria for certification of NTFPs. The condition of NTFPs in nature showed whether these species were managed sustainably or not. These indicators proposed for this criterion were abundance of the species, level of anthropogenic pressure, growth and vigor of the species and diversity of NTFPs species. Anthropogenic disturbances *viz*. fire, grazing and other natural disaster have adverse impacts on the growth and survival of the species [16]. Diversity of the NTFP species was important because low diversity of the NTFPs got negative ecological impacts [17]. Participants of the consultations agreed that low diversity leads to focus on limited species due to which over-harvesting occurs.

Collection system plays a vital role in determining the status of NTFPs. In case of community forests community formulates their rules for resource extraction including NTFPs. Community forests have equitable role in income distribution [18] and therefore they usually tries to formulate the fair system for NTFP collection in along with other forest products. Legal procedure of NTFPs collection ensures sustainability but if there was haphazard collection without following the rule there is the risk of over-exploitation. Criteria and Indicators developed by the International Tropical Timber Organizations (ITTO) has also indicator as policies, laws and regulations for governing forests under the criterion

enabling conditions for sustainable forest management [19]. This showed that legal compliance was one of the indicators for the sustainable management of forest resources including NTFP resources. During discussion at the filed level and the district level, forest officials and other concerned stakeholders highlighted these indicators. In every district, in the five-year forest management plan the annual allowable harvest for the NTFP species was specified. Harvesting following this amount ensures the sustainable harvesting and therefore it was also identified as one of the indicators. Guidelines for harvesting and the following of selective harvesting and rotational harvesting were also important for the sustainability of the resources. Rokaya et al. [20] from their study on the *Rheum acumination* and *Rheum australe* reported that selective harvesting and rotational harvesting should be adopted for ensuring the sustainable harvesting for the medicinal plant species.

Research and development needed for sustainable management of resources and therefore it was identified as criterion. Proper assessment of the NTFP resources was the first activity for NTFP development [21]. Harvesting technology effected not only on the NTFP stock and growth but also on the overall ecosystem [22] and therefore it was identified as the indicator. Facility of chemical testing was also important indicator as the value of species can be known only after identifying the chemical constituents in different parts of the species. NTFP species may have different ecological and biological characteristics which determine their survival and growth in the different environment. Better understanding of these characteristics was needed to be explored for the sustainable management of these species.

Domestication and cultivation of some species was essential to obtain economic benefits as they were restricted only in natural condition. This criterion was applicable only for those species which can be cultivated in private land and got a high scope of cultivation. NTFP species needed special environmental requirements viz. altitudinal range, slope, aspect etc. for their survival and therefore identification of potential areas for cultivation was one of the indicators. Cultivation of NTFP species without identification leads to failure of the NTFP development intervention. Domestication of all NTFP species was not feasible and profitable and identification of such species for domestication is necessary [23]. Domestication and cultivation of the NTFP will be successful if the guidelines for cultivation and domestication for species are in place, otherwise this could be a failure due to lack of proper technology. Nursery establishment and seedling production of selected species is needed to cultivate species in the farm and therefore identified as the indicator. Plantations in Nepal have very little survival rate especially due to small size and unhealthy seedlings [24]. Likewise, cultivation practice of the NTFP was also identified as the indicator because this could be failure due to improper cultivation practices.

Enterprise development and value addition were essential to get benefit in terms of income and employment from the NTFP resources. NTFP based enterprise development leads to sustainability of resources as after enterprise development people realize the importance of these resources. Community involvement in enterprise development and value addition increases ownership and public trust of enterprises. Private sector investment was needed along with the community involvement because enterprises run solely by community cannot compete with other private sector in this competitive age of globalization [25]. Certification and labelling and high quality of the products were requisites to gain trust of consumers for enterprises products.

Marketing of the NTFP got positive role in improving food security and income, poverty reduction and enhanced livelihoods [26]. Clear market information system was important as it enabled the consumers and producers to buy and sell their products in appropriate way without unnecessary involvement of third party. During discussion the NTFP traders and farmers highlighted that availability of alternative market was necessary to avoid monopoly market and therefore they suggested making it as an indicator. The good status of networking of the consumers, producers and traders enabled the effective trading of NTFP products. Transportation facility was finalized as the indicator during consultations at field level and later discussions as it determines commercialization for NTFP products. Lack of transportation facility either demotivates the local level collectors and farmers for NTFP collection and cultivation or increases the cost of NTFP trading. Awareness generation among local people regarding NTFP cultivation would be one of the key approaches for rural livelihood improvement through sustainable use of NTFP resources [27]. Training for sustainable harvesting and domestication and nursery technique orientation were also identified as the indicators for certification and sustainable management of NTFPs. Without developing the capacity of local people, NTFP management cannot be sustainable.

4. CONCLUSION

Various certification schemes including FSC, PEFC, GCAP, SIPPO and the country level NTFP certification initiatives have been practiced in the world. Despite these initiatives, wider implementation of NTFP certification is lacking. Various factors are responsible for low level of implementation of the certification schemes which needs to be addressed to accelerate the certification of forests including the NTFPs in future. For assisting certification process and judging the significance of interventions of NTFP development, this study proposes the 7 criteria and 32 indicators for NTFPs certification and sustainable management of NTFP at the district level. The identified criteria are (1) Natural status of NTFPs, (2) Collection system, (3) Research and Development, (4) Domestication and cultivation, (5) Enterprise development and value addition, (6) Marketing, (7) Awareness. Altogether thirty-two indicators are identified and proposed for evaluation on success of the NTFP development intervention and certification at district level.

REFERENCES

[1] Yadav, M., & Dugaya, D. (2013). Non-timber forest products certification in India: opportunities and challenges. Environment, Development and Sustainability, 15(3), 567–586. doi:10.1007/s10668-012-9393-1

[2] Hussain, S. (1999). Tenure in the context of sustainable use fo natural resources in Asia. In J. A. E. Olgethorpe (Ed.), Tenure and Sustainable Use (pp. 21–28). Gland Switerland and Cambridge UK: IUCN.

[3] Forest Stewardship Council. (2002). Forest Stewardship Council principles and criteria. Document.

[4] Pandit, B. H., & Thapa, G. B. (2003). A tragedy of non-timber forest resources in the mountain commons of Nepal. Environmental Conservation, 30(3), 283–292. doi:10.1017/S0376892903000286

[5] Hardner, J., & Rice, R. (2002). Rethinking Green Consumerism. Scientific American, 286(5), 88–95. doi:10.1038/scientificamerican0502-88

[6] Shrivastava, P. (1995). The Role of Corporations in Achieving Ecological Sustainability. Academy of Management Review, 20(4). doi:10.5465/amr.1995.9512280026

[7] Shanley, P., Pierce, A., Laird, S., & Robinson, D. (2008). Beyond Timber: Certification and Management of Non-timber Forest Products. Center for International Forestry Research.

[8] Shanley, P., Pierce, A., Laird, S., & Guillen, A. (2002). Section I: Overview. In P. Shanley, A. Pierce, S. Laird, & A. Guillen (Eds.), Tapping the green market: Certification and management of non-timber forest products (pp. 3–28). London: Earthscan.

[9] Shanley, P., Pierce, A., Laird, S., & Guillen, A. (2002). Section IV: Conclusions and recommendations. In P. Shanley, A. Pierce, S. Laird, & A. Guillen (Eds.), Tapping the green market: Certification and management of non-timber forest products (pp. 3–28). London: Earthscan.

[10] Guedes Pinto, L. F., Stanley, P., Gomes, P. C., & Robinson, D. (2008). Experience with NTFP certification in Brazil. Forests, Trees and Livelihoods, 18(1), 37–54. doi:10.1080/14728028.2008.9752616

[11] World Health Organization. (2003). WHO guidelines on good agricultural and collection practices [GACP] for medicinal plants. World Health Organization.

[12] Muller, S., & Durbeck, K. (2005). Guidance Manual for Organic Collection of Wild Plants. Swiss Import Promotion Programme (SIPPO).

[13] Yangzom, K., Krug, I., Tshomo, K., & Setboonsarng, S. (2008). Market-based Certification and Management of Non-Timber Forest Products in Bhutan: Organic Lemongrass Oil, Poverty Reduction and Environmental Sustainability. ADB Institute Discussion Paper No. 106. Retrieved from https://www.adb.org/sites/default/files/publication/156745/adbi-dp106.pdf

[14] Kandel, P. N. (2007). Effects of forest certification towards sustainable community forestry in Nepal. Banko Janakari, 17(1), 11–16.

[15] ANSAB. (2010). Certification of community managed forests (First edition.). Kathmandu: Asia Network for Sustainable Agriculture and Bioresources.

[16] Shahabuddin, G., & Prasad, S. (2004). Assessing Ecological Sustainability of Non-Timber Forest Produce Extraction: The Indian Scenario. Conservation and Society, 2, 235–250.

[17] Ticktin, T., & Shackleton, C. (2011). Harvesting Non-timber Forest Products Sustainably: Opportunities and Challenges. In S. Shackleton, C. Shackleton, & P. Shanley (Eds.), Non-Timber Forest Products in the Global Context (pp. 149–169). Berlin, Heidelberg: Springer Berlin Heidelberg. doi:10.1007/978-3-642-17983-9_7

[18] Paudel, G. (2015). Forest resource income variation in mid-hills of Nepal: A case study from two CFUGs of Parbat district, Nepal. International Journal of Environment, 12(3), 1–10. doi:http://dx.doi.org/10.3126/ije.v4i3.13224

[19] ITTO. (2016). Criteria and indicators for the sustainable management of tropical forests (p. 82). Yokohama, Japan: International Tropical Timber Organizations.

[20] Rokaya, M. B., Münzbergová, Z., & Dostálek, T. (2017). Sustainable harvesting strategy of medicinal plant species in Nepal – results of a six-year study. Folia Geobotanica, 52(2), 239–252. doi:10.1007/s12224-017-9287-y

[21] Shackleton, C. M., & Pandey, A. K. (2014). Positioning non-timber forest products on the development agenda. Forest Policy and Economics, 38, 1–7. doi:10.1016/j.forpol.2013.07.004

[22] Ruwanza, S., & Shackleton, C. M. (2017). Ecosystem-scale impacts of non-timber forest product harvesting: effects on soil nutrients. Journal of Applied Ecology, 54(5), 1515–1525. doi:10.1111/1365-2664.12891

[23] Leakey, R. R. B., & Simons, A. J. (1998). The domestication and commercialization of indigenous trees in agroforestry for the alleviation of poverty. Agroforestry Systems, 38, 165–176.

[24] Paudel, G., & Acharya, R. (2018). Survival status of young plantations in Parbat district, Nepal. Banko Janakari, (4), 21–26.

[25] Banjade, M. R., & Paudel, N. S. (2008). Economic potential of non-timber forest products in Nepal: myth or reality. Journal of forest and Livelihood, 7(1), 36–48.

[26] Ahenkan, A., & Boon, E. (2010). Commercialization of non-timber forest products in Ghana: Processing, packaging and marketing. Journal of Food, Agriculture and Environment, 8(2), 962–969.

[27] Bhattacharya, P., & Hayat, S. F. (2004). Sustainable NTFP management for rural development: a case from Madhya Pradesh, India. International Forestry Review, 6(2), 161–168. doi:10.1505/ ifor.6.2.1 61.38399

Citation: *G. Paudel et al., "Local Criteria and Indicators for Non-timber Forest Products Certification in Nepal", International Journal of Forestry and Horticulture (IJFH), vol. 4, no. 3, pp. 25-32, 2018. http://dx.doi.org/10.20431/2454-9487.0403004*