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Sustainable utilization of forests and Non-Timber Forest Products-An over view.

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Abstract: Sustainable forest management has to keep the balance between three main pillars: ecological, economic and socio-cultural. Successfully achieving sustainable forest management will provide integrated benefits to all, ranging from safeguarding local livelihoods to protecting the biodiversity and ecosystems provided by forests, reducing rural poverty and mitigating some of the effects of climate changeForests are the Backbone of the life forms and the life on earth sustained through them, A complex ecosystem consisting mainly of trees that supports a many forms of life. They regulates the whole earth ecosystem by providing various benefits to all living organisms. Besides direct benefits which forests provide in the way of products, it has many indirect beneficial influences which are often overlooked and their value underestimated. The sustainability of NTFP harvest depends on the organs that are harvested but also on the life cycle of harvested species. It is incorrect to suggest that NTFPs can be harvested indefinitely without proper management practices to sustain their yield. Only products without killing the individual plants or animals which are abundant or which regenerate easily , offer good prospect for sustainable management. To generate these values with minimal disturbance of forest ecosystems, NTFPs are increasingly a focus of multiple-use forest management to balance conservation with sustainable economic development. Appropriate strategies should be developed for the preservation and regeneration of the natural resource base as well as to meet the demand on the forest produce.

Key Words: Sustainability, forests, Non-timber Forest Products, seed production system, proper management, domestication.

Introduction

A sustainable forest is a forest that is carefully managed so that as trees are felled they are replaced with seedlings that eventually grow into mature trees. This is a carefully and skillfully managed system.

Sustainable forest management has to keep the balance between three main pillars: ecological, economic and socio-cultural. Successfully achieving sustainable forest management will provide integrated benefits to all, ranging from safeguarding local livelihoods to protecting the biodiversity and ecosystems provided by forests, reducing rural poverty and mitigating some of the effects of climate changeForests are the Backbone of the life forms and the life on earth sustained through them, A complex ecosystem consisting mainly of trees that supports a many forms of life. They regulates the whole earth ecosystem by providing various benefits to all living organisms. Besides direct benefits which forests provide in the way of products, it has many indirect beneficial influences

which are often overlooked and their value underestimated.

The concept of sustainability began to increase in importance at the end of the 1980s and at the beginning of the 1990s with the Brundtland report (1987) and the Conference on Environment and Development held in Rio de Janeiro, Brazil, in 1992 (the so-called Earth Summit), respectively. Nevertheless, the need to preserve natural resources for use by future generations had long been recognised. (Gracia and Diez, 2012)

The sustainable development has been explained by the World Commission on Environment and Development as: Sustainable Development is development that meets the need of the present generation without compromising on the ability of future generations to meet their needs (WCED 1987).

Although there is no universally accepted definition of SFM, the following concepts are
widely accepted: "the process of managing permanent forest land to achieve one or more clearly
specified objectives of management with regard to the production of a continuous flow of desired
forest products and services without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment" (proposed by International Tropical Timber Organization: ITTO, 1992), and "the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems" (proposed by the second ministerial conference for the protection of the forest: MCPFE, 1993).

Adoption of sustainable harvesting practices at right time of harvest showed positive impact on resource conservation, socio-economic status of community, quality of produce and economic returns. It is evident from our study that the **medicinal plant**s collected at right time of maturity following sustainable harvesting practices possess better quality in terms of active ingredients concentration. Harvesting practices/standards are available only for few commercially important species. The sustainable techniques/standards for other important species need to be developed (Shackleton, Pandey, 2014).

Sustainable forest management encompasses the set of relevant Criteria and Indicators (C&I) as measures of sustainability of forest resources in a given regional, national or international context. These C&I for SFM besides measuring sustainability of forests at the national level also envisage effective monitoring at the Forest Management Unit (FMU) level (Yadav et al. 2007).

The sustainability of NTFP harvest depends on the organs that are harvested but also on the life cycle of harvested species. Good collection/harvesting practices of some important **medicinal plant**s like i.e., aonla (*Phyllanthus emblica*), baividang (*Embelia tsjeriam-cottam*), baheda (*Terminalia bellerica*), gudmar (*Gymnema sylvestre*), sarpagandha

(*Rauvolfia serpentina*), kalmegh (*Andrographis paniculata*) and bark of arjuna (*Terminalia arjuna*) have been standardized(Pandey, 2009).

Juan et.al, 2014 assessed the medium-term (10 years) sustainability of NTFP harvesting using *Chamaedorea* palm leaves a major NTFP from Mesoamerica that is highly valued in the international floral industry as a case study. Our study shows that intermediate harvesting levels ($\leq 50\%$ leaf removal) are needed to achieve long-term sustainability of *Chamaedorea* palm leaves. Results of this study have an immediate application for the amendment of the official Mexican law, which enables higher harvesting intensities of *Chamaedorea* leaves, and for the design of sustainable management strategies. Applications of such strategies should consider community-based management, fair markets, regulating norms, as well as a thorough communication among stakeholders.

Fongnzossie *et.al*, 2014., sustainability assessment of Non Timber Forest Products in South-Eastern Cameroon Rainforests identified great potential for market development for some NTFP and argued that the following priority interventions areas should be considered for sustainable NTFP exploitation: optimizing NTFP production through domestication (for both important and threatened species), creating a collectors' network, developing processing technology, supporting the establishment of a conducive policy environment that removes all regulatory bottlenecks to facilitate market integration by primary producers.

The vulnerability of a species depends on the ability of the plant part collected to regenerate rapidly or not. For example, bark extraction, stem cutting or roots harvesting might affect growth rate or end up killing the plant, whereas collection of latex, fruits and leaves will have little effect on the plant (Peters,1994)

On the other hand, periodic collection of fruits will have less effect on plant species population than intensive fruits gathering - the mode of collection (P4) – gathering of fallen plants parts will have lesser effects on the plant than harvesting on standing plant, - the stage of development of the organ collected (P5). Plant organs collected at maturity will have lesser effects than if they were collected earlier (Fongnzossie Evariste, Nkongmeneck Bernard-Aloys)

Baillonella toxisperma Pierre is also listed as "vulnerable" by the IUCN Red List (IUCN Red list,2016). The scoring of vulnerability parameters shows that Baillonella toxisperma Pierre is the most vulnerable species. Factors contributing to high vulnerability of this species included the intensive fruit gathering, the competing use of this tree for timber by logging companies. Intensive fruit gathering for oil extraction have been reported to affect reproduction potential (Schneemann , 1995)

Logging operations involved in its exploitation competes with, or exclude local collectors. Previous ecological assessment of NTFP conducted in Gribé forest also reported lowest population density for *Baillonella toxisperma* Pierre

(0.1 ± 0.1 stems/ha) and poor natural regeneration index (Fongnzossie Fedoung et.al., 2014)

The sustainability of NTFP harvest depends on the organs that are harvested but also on the life cycle of harvested species. Good collection/ harvesting practices of some important medicinal plants like Phyllanthus emblica, Embeica tsjeriam-cottam, Terminalia bellerica,Gymnema sylvestre, Rauvolfia serpentine, Andrographis paniculata, Terminalia arjuna have been standardized (Pandey,2009).

Adoption of sustainable harvesting practices at right time of harvest showed positive impact on conservation, socioeconomic status of community, quality of produce and economic returns, It is evident from our study that the medicinal plants collected at right time of maturity following sustainable harvesting practices possesses better quality in terms of active ingredients concentration. Harvesting practices/standards are available only for other important species need to be developed (Shackleton and Pandey, 2014). Most NTFPs can be harvested in more than one way. Option should be chosen considering the lowest impact on the individual plant or the population remaining.

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It is incorrect to suggest that NTFPs can be harvested indefinitely without proper management practices to sustain their yield. Only products without killing the individual plants or animals which are abundant or which regenerate easily , offer good prospect for sustainable management (Peters 1994)

To generate these values with minimal disturbance of forest ecosystems, NTFPs are increasingly a focus of multiple-use forest management to balance conservation with sustainable economic development. Appropriate strategies should be developed for the preservation and regeneration of the natural resource base as well as to meet the demand on the forest produce include (Rekha et al., 2012) and they include

1 Planting of the species. 2. Maintenance of medicinal plants. 3. Promoting sustainable harvesting. 4.Improved marketing of NTFP by value addition.

Seed Production System (SPS) Conservation of NTFPs is clearly one of the priorities towards which focus is being directed. Preservation, regeneration and maintenance of resource productivity and diversity are understood as NTFP conservation. Seed is an essential, strategic and, relatively inexpensive input with a high rate of return to investment. A SPS is one such technology which caters to supply of large quantity seed requirements for harvest/large scale planting. It could be a natural or an artificial (introduced) stand – the latter introduces maximum genetic diversity in stand. Continuous supply of quality seeds (due to the specific composition of the stand) is ensured from the SPS in addition to germplasm conservation(Rekha et al.,2012)

Riina Jalonen *et.al*, 2018 reported to provide guidance on how to pursue the triple goals of gender equality and social inclusion, environmental integrity, and improved livelihoods through the sustainable use and management of NTFPs from from their experience in two Indian districts – Mandla, in the state of Madhya Pradesh, and Uttara Kannada, in the state of Karnataka .The set of six good practice guidelines address some of these issues through a focus on:

1. Promoting collective sales of NTFPs
2. Fostering gender equity and inclusion in joint forest management
3. Achieving income generation and forest regeneration through the collection of ripe fruit
4. Avoiding tree damage as a result of the collection of NTFPs
5. Effective monitoring of forests to improve management
6. Restoring degraded forest landscapes through planting of valuable trees.

A step-by-step approach to ensure sustainable NTFP management should include 1. Optimizing NTFP production in a new agroforestry system through the domestication of important and depleted NTFP species, 2.Creating a collectors' network and support the establishment and development of a small-scale NTFP enterprise as a viable approach to facilitate information sharing and the development of the value chain of key NTFP. 3.Developing processing of products from NTFP raw materials through capacity building and technology transfer .4.Removing administrative barriers and facilitate market integration by primary producers, 5.Establishing a monitoring system with adequate indicators to track resource flow, legal compliance, transparency and accountability in the secto(Fongnzossie and, Nkongmeneck ,2016)

References:

1.Jorge Martín-Garcíaand Julio Javier Diez (2012). . In book: Sustainable forest management – current research, Chapter: Sustainable Forest Management: An Introduction and Overview, Publisher: InTech, Editors: Jorge Martín García & Julio Diez Casero, pp.3-6

2.Report of the World Commission on Environment and Development Our Common Future. United Nations 1987.

3. Shackleton, C.M. and A.K. Pandey, 2014. Positioning non-timber forest products on the development agenda. Forest Policy Econ., 38: 1-7

4.Yadav,M., Kotwal,P.C., Menaria, B.L (2007) Forest Certification: A Tool for Sustainable Forest Management.

5. Pandey, A.K., 2009. Sustainable harvesting standards and limits: Medicinal plants in central India. Community Forestry, USA., pp:4-10

6. Juan C. Hernández-Barrios, Niels P. R. Anten , Miguel Martínez-Ramos (2014). Sustainable harvesting of non-timber forest products based on ecological and economic criteria. https://doi.org/10.1111/1365-2664.12384

7.Peters CM (1994) Sustainable Harvest of Non-timber Plant Resources in Tropical Moist Forest: An Ecological Primer. biodiversity Support Program, Washington, D.c.

8.Fongnzossie Evariste, Nkongmeneck Bernard-Aloys,(2016) Sustainability Assessment of Non Timber Forest Products in South-Eastern Cameroon Rainforests Applied Ecology and Environmental Sciences, 2016, Vol. 4, No. 3, 66-74 Available online at http://pubs.sciepub.com/aees/4/3/3 ©Science and Education Publishing DOI:10.12691/aees-4-3-3

9. IUCN, 2016. The IUCN Red List of Threatened Species. Version 2015-4. .

10, Schneemann, J. 1995. Exploitation of Moabi in the humid dense forests of Cameroon: harmonization and improvement of two conflicting ways of exploitation of the same forest resource. BOS Nieuwsletter 14 (2): 20-32.

11.Fongnzossie Fedoung, E, Ngansop Tounkam M, Zapfack L, Kemeuze VA, Sonwa DJ, Nguenang GM & Nkongmeneck BA (2014) Density and natural regeneration potential of selected nontimber forest products species in the semi-deciduous rainforest of southeastern Cameroon. African Study Monographs Supplementary Issue, 49: 67-88.6

12. Peters, Charles M.. 1996. *The ecology and management of non-timber forest resources (English)*. World Bank technical paper ; no. WTP 322. Washington, D.C. : The World Bank. http://documents.worldbank.org/curated/en/903431468741392659/The-ecology-and-management-of-non-timber-forest-resources

13.Peters CM (1994) Sustainable harvest of non-timber pl sources in tropical moist forest: an ecological primer. W DC: Biodiversity Support Program.

14. Rekha R. Warrier, R. Anandalakshmi and B. Gurudev Establishment of Seed Production Systems for Non-Timber Forest Products – An Approach to Sustainable Utilisation Forestry Bulletin, 12(2), 2012:29-32.

15. Jalonen, R., Lamers, H., Elias, M. 2018. Guidelines for Equitable and Sustainable Non-Timber Forest Product Management. Bioversity International, Rome.