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Non-Wood Forest Products of Asia

Knowledge, Conservation and Livelihood

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A. Z. M. Manzoor Rashid · Niaz Ahmed Khan ·
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Editors

Non-Wood Forest Products of Asia

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*In loving memories of our fathers
who worked throughout their life for
forest-dependent and grassroots communities
in different capacities:*

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Foreword

This book provides a wide, but also deep, coverage of global and regional dimensions of non-wood forest products (NWFPs) as a crucial and integral dimension of sustainable development with a particular focus on Asia. This has been a significant gap in research and discourse, making this publication a timely and very valuable resource. It focuses on the ecosystem and human rights issues associated with NWFPs such as fruits and nuts, vegetables, fish and game, medicinal plants, resins, essences and a range of barks and fibres such as bamboo, rattans, and a host of other palms and grasses. Prior work in this area has been ad hoc with little attention to the Asian context. Earlier work highlighted the important role of NWFPs in poverty alleviation for forest dependent people. The scale of the problems and the potential for future governance and development strategies are reviewed in the introductory chapter of this book. The contributions of the three highly regarded editors and contributors are very significant in providing a more systemic approach to the Asian region that also draws on some comparative and global experiences.

More specifically, this book addresses the knowledge and research gap in NWFPs in relation to the integral connection between sustainable ecosystems, uses, livelihoods and the application of traditional knowledge and practices. It goes further to debate and reflects on approaches to comprehensive action on NWFPs, from conservation and livelihood perspectives. This draws on cases and illustrations of relevant knowledge and practices from different parts of Asia and South-east Asia such as Bangladesh, Bhutan, Vietnam, Philippines, Nepal, India and China.

Another contribution to the literature in this area is provided by the discussion and suggestions relating to crucial governance frameworks. Legal and institutional policies are critical in promoting sustainable conservation of biological resources as well as the current and future livelihoods of forest dependent communities. Legal and institutional policies are necessary for the sustainable conservation of biological resources and livelihoods of these communities. Appropriate attention is given to global and regional treaties and principles need to be implemented, enforced, updated and refined in order to face the massive challenge of forest destruction and the deterioration of ecosystems that NWFPs and their dependent communities rely upon.

I commend the contributors for their relentless dedication, work and resilience, undertaken in the face of huge obstacles (research and knowledge gaps, lack of research funding as well as legal, institutional and practical barriers). This book is evidence of their commitment to the public interest in biodiversity conservation and use in harmony with community development, poverty alleviation and livelihoods associated with NWFPs. It is a better future to envision and strive for.

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Preface

Historically, forests and their diverse biological resources have played an indispensable role in ensuring the conservation and sustaining the livelihood of the millions around the world, particularly the forest dependent rural and Indigenous communities. A substantial amount of forest area (1.15 billion hectares) is managed primarily for the production of wood and non-wood forest products (FAO 2020). The forest ecosystem and its multifaceted amenities are now extensively valued in achieving sustainable development goals, particularly in the forestry sector. In this context, generating knowledge on ecosystem services to address adverse impacts of climate change is meant to be the common agenda of the global community.

According to the World Bank (2002), more than 1.6 billion people rely heavily on forests for their livelihoods, of which about 350 million people exclusively depend on forests for their subsistence and income. The forestry sector creates employment for about 12.9 million people with a value addition of US\$ 354 billion (FAO 2007). Thus, the conservation of forest resources is a recognized avenue to the reduction of poverty across the world. The situation is particularly critical in developing countries due to poverty and the rapidly increasing population, leading to a decreasing trend in the availability of livelihood support.

Non-wood forest products, widely dubbed as NWFPs, play a vital role in sustaining the livelihood of forest-dependent people. This form of livelihood supports the local, national and global conservation initiatives by reducing pressure on forests and their resources. Traditionally, a significant number of marginalized communities residing near the forested areas, to a varying extent has dependent on NWFPs for their life and living. On the other hand, NWFPs are also enriched and informed by a diverse range of traditional knowledge and local practices (Hansda, 2009). In this context, there has been a renewal of interests in non-wood forest products, both at regional and global levels. Research on the subject remains generally limited, while the existing studies are somewhat narrowly focused—mostly shedding light on poverty reduction and market dynamics of NWFPs, and confined to specific regions. The knowledge, practices, conservation and sustainability issues of NWFPs in the Asian context were found strikingly limited, hence the need to produce a knowledge repository in the form of a book on the said theme focusing on the Asian context,

one of the major hubs of diversified NWFPs. This book is important for several reasons: (i) notwithstanding the (limited) existing literature, we, however, still await a study that pulls together different strands and dimensions of NWFP by focusing on the nexus between conservation and livelihood from an Asian perspective, a very untouched dimension in the literally and/or scholarly world as a book form; (ii) the general significance of NWFPs for millions of forest dwellers of the world cannot be overemphasized; therefore, any academic pursuit on this subject may be considered worthwhile; and (iii) one clear gap in the existing literature is the focus on the nexus between conservation and livelihood and the traditional knowledge and practices underlying the nexus. This volume aims at addressing the above knowledge gap by bringing a group of prominent researchers, academics and field practitioners under a single platform to debate and reflect on a comprehensive action of NWFPs from a conservation and livelihood perspective drawing on cases and illustrations of relevant knowledge and practices from different parts of Asia. A total of eleven self-contained chapters delineating important aspects of NWFPs representing major Asian countries, including a 'Global-North' experience from Sweden (for the purpose of comparison), have been included in the book.

Enabling legal and institutional policies is critical in promoting sustainable conservation of biological resources and livelihood of the dependent communities. In the backdrop of massive destruction and deterioration of the forests and their major resources, non-wood forest products are receiving growing recognition and playing an applauding role due to their nature and value addition potentials. The introductory Chap. 1 attempts to shed some light on the major legal and institutional policies, particularly from a global perspective, with a view to aware, update and enforce the principles as and where applicable. Significant numbers of conventions, treaties, and protocols (popularly called ICTPs) are being developed and applied as binding and non-binding principles to expedite the process of conservation and sustainable livelihood.

The next Chap. 2 from the North (Sweden) is being considered in this edition with a view to adding further insights into the notion of traditional knowledge from the European national context. How these knowledge and practices are creating conflicting interest with industrial forestry and the possible mechanism for co-existence—constitutes the salient points of discussion in this chapter. Some suggestive measures have also been prescribed to create a win-win scenario between conservation and commercial utilization of forest resources.

The Chittagong Hill Tracts of Bangladesh, popularly known as CHTs, is the country's richest biodiversity hotspot and the treasure house of many NWFPs. Considering the immense potential of the NWFPs of CHTs, Chap. 3 attempts to describe the manifold roles of the NWFPs in promoting food security, health care and related livelihood supports. The significance of traditional ecological knowledge in addressing the depletion, degradation and institutional drawbacks having regards to NWFPs management has also been revealed in the chapter.

India is famous for herbal medicines and their traditional uses. Forest-dependent communities and indigenous people are all widely dependent on traditional medicines for their life and living. This Chap. 4 aims at revealing the ethnobotany of the major

medicinal plants used by the *Tangsa* tribe of Arunachal Pradesh of India. How the ethnobotanical knowledge of various medicinal plants is being preserved and embedded in the cultural and spiritual practices of the *Tangsa* tribe is the salient focus of the chapter.

Mangrove forests are crucial for their multidimensional roles such as biodiversity conservation, ecosystem services and supporting livelihood. The Sundarbans mangrove forest of Bangladesh is not an exception in this regard. Chapter 5 illustrated the utilization, significance and the value chain of the diverse NWFPs produced in Sundarbans mangrove forest. Some policy and sustainable management approaches have also been prescribed to enrich and expand the resources under the sustainability principles and practices.

Bhutan is famous for its environment-friendly development philosophy, and perhaps the only country having Gross National Happiness (GNH) index. Chapter 6 is based on the secondary review of Bhutan's existing contribution of NWFPs to the promotion of GNH. In addition to that, the chapter intended to create connectivity with knowledge, conservation and livelihood aspects of NWFPs in the context of Bhutan.

Bamboo is one of the major and widely popular NWFPs for millions of people, particularly in the South-east Asian countries; hence it is known as 'poor men's timber'. Forest-dependent communities to small and medium scale forest-based enterprises all are heavily dependent on this resource. Considering the immense significance of bamboos in the Philippines, Chap. 7 delineated the role of bamboo in environmental protection and livelihood support in the Philippines. How the government of the Philippines took initiative to promote the bamboo sector for community and economic development are the salient discussant issues of the chapter. Using bamboo to spur income- and job-creating enterprises in bamboo-rich regions of the country by addressing the challenges having regards to knowledge, supply and market information gaps have been reflected in this chapter.

The following Chap. 8 highlighted the significance of NWFPs in Nepal, particularly in the context of provisioning services. How various NWFPs are helping the people residing in remote mountainous regions of Nepal—has been documented in this chapter. Collection of NWFPs from wild and their utilization is supporting the local economy with less or no value addition. It is thus vitally important to shift from the traditional method of harvesting and processing to scientific ones in order to address issues of commercialization of NWFPs, access to the national and international markets, sustainable harvesting, and value addition activities.

Sustainable harvest and use of NWFPs can stimulate forest conservation. Considering this notion in mind, Chap. 9 investigated the NTFP-based product diversity, marketing pattern, challenges in a rapidly changing environment in an urban fringe of north-eastern Bangladesh. The chapter listed major NWFPs and related products and shed some clues for development considering the sustainability issues. Policy interventions, developing coherent marketing channels and supporting potential entrepreneurs—are some of the salient issues in ensuring the sustainability of resources and livelihood.

Vietnam is playing an active role in improving forest conservation by reducing dependency on NWFPs. How a local-level initiative has helped to reduce forest dependency, especially NWFPs, is the salient theme of discussion in Chap. 10. The *Talai* ecotourism venture at the Cat Tien National Park found to have considerably reduced the reliance on NWFPs by the incumbent community. Replication of such interventions demands many derivatives including the following: socio-cultural norms, local institutions, power structures, and ethnic differentiation.

The last Chap. 11 from China documented NWFP's role in poverty alleviation and the environment. The chapter also investigated the role of policy, technology, and market forces in promoting hickory production. Finally, it highlighted the significance of local farmer's cooperatives, government support and the expedition of research and e-commerce initiatives—as the facilitative factor to harness better outcomes.

The above chapters and messages contained herein amply brought home, once again, the crucial significance of NWFPs as a reservoir of knowledge, conservation and livelihood. As editors, we hope this volume will prompt further research and academic investigation in this relatively less explored area of study.

Sylhet, Bangladesh
Dhaka, Bangladesh
Khulna, Bangladesh

A. Z. M. Manzoor Rashid
Niaz Ahmed Khan
Mahmood Hossain

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Abbreviations

APFRN	Asia-Pacific Forest Restoration Network
BFD	Bangladesh Forest Department
BFRI	Bangladesh Forest Research Institute
BLC	Boat Licensee Certificate
CBE	Community-Based Ecotourism
CF	Community Forestry
CHTs	Chittagong Hill Tracts
CMFPN	Chinese Model Forest Partnership Network
CoV	Certification of Verification
E. O.	Executive Order
ERDB	Ecosystem Research and Development Bureau
EU	European Union
FAF	Forest-garden Agroforestry
FAO	Food and Agriculture Organization
GDP	Gross Domestic Products
GNH	Gross National Happiness
HAF	Home Garden Agroforestry
IUCN	The International Union for Conservation of Nature
MAB	Man and Biosphere
NGOs	Non-government Organization
NTFPs	Non-timber Forest Products
NWFPs	Non-wood Forest Products
PBIDC	Philippine Bamboo Industry Development Council
RFC	Relative Frequency Citation
RGOB	Royal Government of Bhutan
TEK	Traditional Ecological Knowledge
TRFK	Traditional Forest-related Knowledge
UV	Use Value
VDF	Village Development Fund
WTO	World Trade Organization

Chapter 1

Legal and Policy Issues of Non-wood Forest Products (NWFPs) for Sustainable Conservation and Livelihoods: A Global Perspective



A. Z. M. Manzoor Rashid , Niaz Ahmed Khan , and Mahmood Hossain

Abstract Forests and the associated biological resources have historically played a crucial role in ensuring environmental conservation and sustaining livelihood especially for the forest dependent rural and Indigenous communities across the globe. Notwithstanding the growing recognition of non-wood forest products (NWFPs) in supporting local livelihood and contributing to environmental conservation, the legal and policy dimensions of NWFPs have received relatively less attention from both the academic and practicing quarters. In this backdrop, this article provides a critical overview of selected aspects and issues of NWFPs with special relations to the implications for community livelihood and conservation. After setting the scene in the introductory section, the second section summarizes the context and current status of the relevant key legal and policy instruments that globally implicate NWFPs and their propagation and utilization. The third section then identifies the important desired features (notably, financial incentives and exemption of taxes to promote NWFPs; secure tenural arrangements) of a ‘supportive policy’ that can facilitate community development and their sustainable livelihood based on NWFPs and related activities. In conclusion, the major challenges and problems are briefly recapitulated. Based on the overall observations and analyses, several recommendations are also made including the following: creating enabling conditions for the conservation and sustainable management of NWFPs; promoting wider stakeholder participation and ‘co-creation’ mechanism in the formulation and execution of the relevant policies; supporting a stable institutional framework (at the country level) with adequate technical and financial capacity; ensuring cross sectoral interaction and coordination; exploring indigenous knowledge and local practices.

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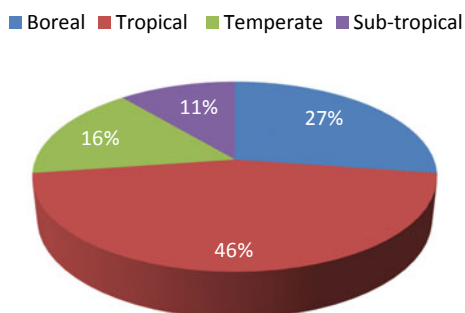
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1.1 Introduction

Historically forests and their diverse biological resources continue to play crucial roles in ensuring the conservation and sustenance of livelihoods around the world. Of particular importance are the forest dependent rural and Indigenous communities (Charles 2021; Ghanbari et al. 2020). Thirty one percent of the global land areas have forest cover which stands at about 4.06 billion hectares (FAO 2020). Based on the climatic domain, the global forest is divided into four types (Fig. 1.1). These forests provide major resources such as timber, fuelwood and non-wood products whereby meeting the local, regional and national demand for ages (FAO 2014). However, the increase of demand has resulted in over extraction, illicit felling, shrinkage and conversion with overall deterioration of this major ecosystem and its services globally (CIFOR 2000; Curtis et al. 2018; Chinedu and Mbee 2013). The growing stock of the forests reduced from 560 million hectares to 557 million hectares between 1990 and 2020 (FAO 2020). Deterioration of forest occurs in various forms particularly in open forest formations with the active involvement of people. Profits and means of subsistence were the basic reasons behind such deterioration of forest resources (Conteras-Hermosilla 2000). Various efforts and interventions have been developed, applied and extended to curb the destruction of forests biological resources and to sustain the livelihood of the communities dependent on its vital resources.

Globally 1.15 billion hectares of forest are primarily managed for the production of wood and non-wood forest products. In addition to that, 749 million hectares are designated as multiple use of forest (FAO 2020). According to 2015 statistics, the value of NWFPs globally stands for 7.71 billion USD. Global Forrest Experts Panel also recognized the contribution of forests to food security and nutrition (FAO 2014). Edible fruits and plants are the major shareholder of NWFPs market (Fig. 1.2) followed by ornamental plants (22%), wild meat (9%), other plants (8%) and honey bees (7%) although they vary greatly from continent to continent. In this context, there has been growing recognition of non-wood forest products (NWFPs) in sustaining local livelihood and contribution to environmental conservation (Melese 2016; Pandey et al. 2016; IUCN 2008). Extraction of NWFPs can have used as an incentive for forest conservation as observed in many studies (Chou 2018). Non-wood

Fig. 1.1 Global forest area by climatic domain 2020
(Source FAO)



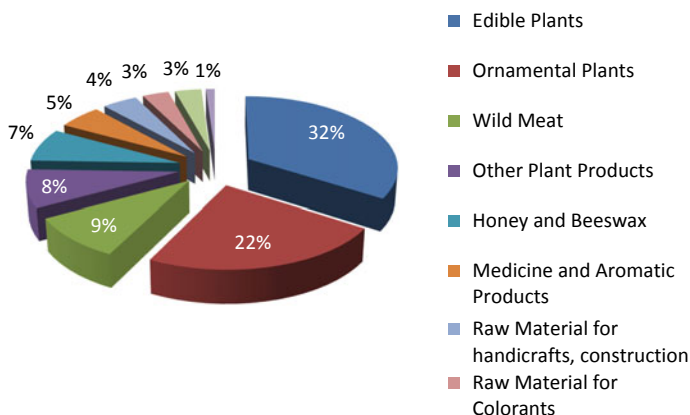


Fig. 1.2 Global NWFP categories based on reported economic value (FAO 2020)

forest products hereinafter called NWFPs are synonymous with non-timber forest products (NTFPs) they both include most of the resources derived from trees and or forest other than timber. However, in defining the terms NWFPs and NTFPs, FAO termed NWFPs as “All products consist of biological origin other than wood, derived from forests, other wooded land and trees outside forests which generally include all woody raw materials while NTFPs in contrast, generally include fuelwoods and small woods” (FAO 1999).

1.2 Policy and Legal Attributes of Conservation and Sustainable Development

The diversified value of NWFPs delivered by forest landscape is crucial for rural livelihood and its economy (Stryamets 2016). Sustainable conservation and livelihood of the local communities are now mutually inclusive and interdependent thus need effective policy and legal support to harness the best possible outcomes (Charles 2021; Rashid et al. 2013). However, this sector is infrequently supported by the forest policy and management interventions. Keeping these attributes in mind, each individual country develops various institutional, legal and policy tools in line with their national development goals to address multiple objectives such as productive functions, protective functions, socio-economic functions and legal, policy and institutional functions (Ghosh and Sinha 2016).

Sustainable forest management principles are being adopted by many countries in their forest related policies and laws. Promoting sustainable and multipurpose use of forest and trees are now at the center stage of their planning and implementation approaches (FAO 2020). Development of forest and biodiversity related

institutional policy and strategic documents are the outcomes of such national development visions that enable active and effective stakeholder participation (Mcdermott et al. 2007). Sustainable conservation of biological resources and their commercial utilization widely depends on the effective formulation and implementation of legal and policy instruments (Mukul et al. 2014).

Country specific institutional and legal policies are being developed with a view to ensuring sustainable management of the forest and other biological resources such as NWFPs. Forest policy, forestry sector master plan, national conservation strategy, national biodiversity strategy and action plan, forest and wildlife acts, protected areas rules are some of the commonly developed policy instruments formulated based on the notions of the international conventions, treaties and protocols (both legally and non-legally binding principles). Commercialization of NWFPs has been widely been promoted by scientists, practitioners, and development partners and most importantly by the individual governments as a means of livelihood improvement (Yildirim and Kose 2013; Belcher et al. 2005). However, local ecological, economic, cultural and political contexts must be taken into consideration while devising such initiatives and implementing any policy related to NWFPs (CBD 2001).

International conventions, treaties, protocols (ICTPs) and related attributes have active and passive influence in determining, prioritizing and endorsing legal and policy mechanisms related to forest management of an individual country (Rashid et al. 2013). This section attempts to synthesize some of the significant institutional and legal instruments that have substantial implications in generating knowledge and practices of NWFPs under the purview of the national forest, environment and biodiversity policies, plans and programs. Intensification of the NWFPs sector and related activities has direct connectivity with the conservation of biological resources. Consequently this sector is getting growing attention and recognition both nationally and globally.

1.3 Key Legal and Policy Instruments Related to NWFPs

Non-wood forest products (NWFPs) are diverse in nature and have significant economic and social impacts although production, trade and consumption related databases are scanty (FAO 2020). The governance of NWFPs is an integral part of sustainable forest management. Collation and standardization of data from various sources are also some potential limiting factors. Effective legal and institutional policies may contribute significantly i.e. conservation, poverty alleviation, economic development through sustainable management as revealed in many studies (Martinez de et. al. 2021; FAO 2020; Weiss et al. 2020).

The Stockholm Declaration-1972 widely dubbed as UNCHE is known to be the first global institutional effort that reiterated the need for common principles to act on preservation and enhancement of the human environment. Among the 26 principles, principle 11 and 12 specifically pointed out the importance of policy implication and resource conservation. With that global commitment, biodiversity conservation and

community development issues developed further momentum. After the UNCHE Conference, Rio Summit 1992 has manifested three interrelated conventions (CBD, UNFCCC and UNCCD) with a view to ensure sustainable development goals of the Agenda 21.

The Convention on Biological Diversity (CBD), is believed to be the most comprehensive legally binding convention that encompassed all ecosystem, species and genetic resources. It has direct relevance to the knowledge generation, conservation and livelihood issues related to NWFPs (Rashid et al. 2014). The convention signifies the importance of formulating policies and their practices taking into account local ecological, economic, cultural and political contexts. Conservation, sustainable use and growth of NWFPs sector largely depends on multidimensional attributes that make it challenging on one side while on the other side it has created potential avenues for the development of the sector that has been reflected through many important articles of the Convention (CBD 2001). To ensure the international exchange of plant and animal genetic resources, conservation and sustainable use of biodiversity, a comprehensive framework is being developed under this convention which may have a direct impact on NWFPs. Developing sustainable management and conservation policies for NWFPs may incur direct and indirect impetus from CBD.

Knowledge management particularly local and indigenous knowledge in respect to NWFPs is another important dimension attracting growing importance for many reasons such as sustaining livelihood, ensuring conservation and management and creating value addition to nature based products. Article 8(j) specifically mentioned indigenous knowledge, innovations and practices whereby contracting parties/state will respect and maintain these virtues rooted in the traditional lifestyle relevant for the conservation and sustainable use of the biological resources. Further implementation involves access to genetic resources and their fair and equitable sharing of benefits from their utilization manifested as one of the three major objectives of CBD. In response to the statement, a legally binding protocol called *Nagoya Protocol* was adopted in 2010 applicable for both user and provider countries. Legal, administrative and policy measures were given utmost importance to derive benefit from genetic resources while valuing customary law, community protocols and procedures. With the development of this protocol, CBD paved the route of conserving and utilizing NWFPs that have a potential role in sustaining community livelihoods.

Another crucial convention developed under the platform of the Rio convention named *United Nations Framework Convention on Climate Change* (UNFCCC) have urged towards taking policies and measures to protect the climatic system under a *common but differentiated responsibilities* by the parties in line with the national and regional development priorities, objectives and circumstances. Environmental, social and economic impacts of climate change and the importance of protecting fragile ecosystems, where NWFPs constitutes a significant portion, are the salient preambles of the Convention (UNFCCC 1992).

The third convention developed during the Earth Summit titled *United Nations Conventions to Combat Desertification* widely dubbed as UNCCD has given particular emphasis to drought prone African countries. NWFPs adhere to sustainable

economic growth, social development and poverty eradication in this region. UNCCD is a convention aware of land degradation, desertification and drought affect to natural resources, food security through coordinated efforts of the international community, national government and local organizations and play a vital role in synchronizing with other relevant international agreements like CBD, UNFCCC (Turpie et al. 2021; UNCCD 1994).

The International Treaty on Plant Genetic Resources for Food and Agriculture is known as *Plant Treaty* approved by the FAO member countries in 2001 intending to establishing international standards for the conservation and exchange of the plant genetic materials. This Treaty is a global initiative among the member countries to address the issues related to plant genetic resources for food and agriculture including issues ignored or unnoticed by the CBD (Baranski 2021). This treaty overcomes the long standing disagreement between different countries, institutions and interest groups hence opening up a promising window for the stakeholders to conserve, manage and utilize NWFPs on a sustainable basis (Marci 2001).

In the backdrop of massive degradation and deterioration of biological resources particularly forest resources, the importance of conservation received extra significance during a meeting of the IUCN members that led to the emergence of a new convention named Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). It is an international agreement between governments. The basic aim of the CITES convention is to protect the species in a manner that will not lead to extinction due to commercial trading. Commercial wildlife trade (whole or parts of the animal) has an extensive global market and the over extraction and utilization resulted in the extinction of many species while numerous became threatened and endangered (Wijnstekers 2018) Wild plant and plant parts having commercial, spiritual and other values have also suffered the same. This reiterated the need for a strong legally binding instrument to halt this fast decline while ensuring commercial utilization of the resources on a sustainable basis. In 1985, with resolution Conf. 5.14, the Conference of Parties recognized the need for greater efforts to enhance the enforcement initiatives having regards to plants listed in the Convention and to bring non-member countries under Convention engaged in trading species listed in CITES Appendices (Wijnstekers 2018).

Member countries may receive legal and policy direction under the purview of the convention in regards to commercial harvesting, sustainable conservation and management of NWFPs, where law enforcement agencies, scientists, practitioners and managers have crucial roles to play. To date, about 38,700 animal and plants species have been listed in the CITES appendices thus the effective implication of the Convention may pose long lasting impact on the conservation of the endangered and threatened species used as NWFPs (CITES 2021).

Ecosystem plays critical roles in poverty reduction, combating climate change and preventing mass extinction of the biological resources. Considering these features, the global community urged the need for putting visible efforts in restoring fragile ecosystem. Keeping in mind the growing deterioration and considering the status of

the community, the United Nations has *declared UN Decade on Ecosystem Restoration (2012–2030)* which is a clear mark of the commitment of the global community to prevent, halt and reverse the declining ecosystem globally.

The *Agenda 2030* adopted by the United Nations in 2015 established 17 development goals as its core elements of development known as Sustainable Development Goals (SDGs). Sustainable forest management is being recognized as an avenue for development manifested in goal 15 called *Life on land* that has ample scope to contribute in achieving other goals provided an effective trade-off mechanism is available (Baumgartner 2019; Swamy et al. 2017). NWFPs are a central element of sustainable forest management and development. Tropical forest and their multiple resources can be used to address the social, cultural and economic dimensions where NWFPs are invaluable (Martinez 2021). Restoring fragile ecosystems, halting biodiversity loss and reversing the degradation process may get substantial impetus from the introduction, conservation and management of NWFPs engaging local communities as experienced in many studies (Martinez de et al. 2021; Jong et. al. 2018). NWFPs can also be used to address three major dimensions related to sustainable development whereby they can play a substantial role in addressing crosscutting goals in addition to SDG 15 Life on land (Table 1.1).

Ensuring access to genetic resources and their fair and equitable sharing of benefits from the utilization of these resources has been determined as one of the three major objectives of CBD. With the development of the Nagoya Protocol, CBD paved the route of conserving and utilizing NWFPs by scoping the rights of Indigenous and local people which is a fairly new development (Borrini-Feyerabend et al. 2004). Based on the subsequent progress with regards to human rights, the *ILO Convention 169* recognized the definition of the Indigenous people and their rights on social, cultural and spiritual values and practices. *UN Declaration on the Rights of Indigenous People* adopted in 2007 added further significance regarding community rights.

Table 1.1 Contribution of NWFPs in achieving various SDGs

Various dimensions of SDG	Potential contribution/roles of NWFPs	Cross cutting SDGs
Social and cultural dimension	1. NWFPs are part of cultural heritage 2. NWFPs contribute to health and well-being 3. NWFPs sustain household economies 4. NWFPs contribute to social integrating gender balance and equality	1, 2, 3, 5 and 10
Environmental dimension	1. NWFPs contribute to sustainable land management 2. NWFPs are instrumental in maintaining high biodiversity value agro-ecosystem and other priority habitats	12, 13 and 15
Economic dimension	1. NWFPs are the potential source of industrial raw material 2. NWFPs as an avenue of trade	8, 9 and 12

In attaining this, sustainable management and conservation of NWFPs may have commendable roles to play provided effective policy support is in place.

1.4 Features of Supportive Policy Related NWFPs

Community development and their sustainable livelihood based on NWFPs and related activities require policy and institutional support. One such provision is financial cooperation in the desired form. Financial incentives and exemption of taxes to promote NWFPs may also help achieve multiple goals and objectives of forestry at large and local communities specifically. Small and medium scale forest based industries may flourish at local level that will also have national impact on many dimensions. However, shifting the paradigm from open access regime to more secure and organized form of tenurial arrangements prescribed were effective in harnessing better outcomes as experienced in Nordic countries (Saastamoinen 1999).

The threats and challenges to NWFPs not only generated due to modification of the physical climate resulting in the loss of wild genetic resource base and yields but also due to the influence of social and economic situation and volatile market behavior. NWFPs and associated practices should be given extra priorities in national forestry policies and programs considering their crucial roles such as generating substantial income, food and medicines for the community along with recreational values to many users and pickers, as NWFPs and their related issues were often found obscure and ignored in the forestry and other policies.

1.5 Way Forward and Conclusion

The problems and prospects of NWFPs vary remarkably by country in general and more among regions hence policies and programs should be formulated and tailored considering the local context and needs. These variations can be experienced in terms of resource availability and the sustainability of their use, traditional user pattern, commercial status and potentials. NWFPs as a means of biological conservation and sustainable livelihood demands many interventions, congenial environment and policy support. In this regard, the following policy features need to be considered globally, regionally and nationally depending on the respective context of the individual stakeholder (Weiss et al. 2020; Robalino et al. 2015; Saastamoinen 1999):

- a. Traditional knowledge, practices, usufruct and ownership rights management and utilization are long practiced traditions. These attributes need to be carefully examined while devising any policy or making any changes.
- b. The structure, growth and dynamics of the NWFPs based markets demands extra contemplation. Despite having significant gaps, the market study is essential,

- firstly to assume the extent of policy interventions needed, secondly for all extension and development purposes.
- c. Revival of NWFPs as a consequence of various social trends are creating growing demands for the nature based products, traditional skill and harvesting methods, healthy and sustainable lifestyle, livelihood options. All of these could be a substantial departure from conventional forestry practices provided new and supportive policy interventions are made available.
 - d. Prevailing structure of economic incentives and disincentives also demands careful investigations with a view to harmonize the process as per global standards taking lessons and best practice of individual countries.
 - e. Research and development (R&D) are integral parts of any policy development and is also applicable for NWFPs sector. R&D helps to identify lesser known species and products whereby value addition and sustainable management aspects can be addressed.
 - f. Development of product and its marketing needs adequate support through a supportive policy. State or institutional support in this regard is imperative and will assist in promoting heterogeneous NWFPs.
 - g. However, specific policy for the NWFPs sector cohesive with forestry and other policies may have enhanced potential to contribute economically, socially and ecologically.

Creating enabling conditions for the conservation and sustainable management of NWFPs is the need of the times. In the milieu of vanishing trends of biological resources, particularly forest resources including NWFPs, effective stakeholder participation, co-creation mechanism in the formulation and execution of the relevant policies are imperative. A stable institutional framework with sufficient technical, financial capacity supported by coherent policy can help achieve desired goals in the NWFPs sector (Weiss 2020). In addition, cross sectoral interactions, indigenous knowledge, practices based on locally generated ideas may add significantly to ensure sustainable conservation, management while addressing community livelihoods.

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