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Review Article

Contribution of Nontimber Forest Products Earn to Livelihood in Rural Households and the Type of Use: A Systematic Review

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The researcher conducted a review of 83 articles published between 2011 and 2021 to determine the nontimber forest products (NTFPs) income contribution and usage types based on spatial and temporal patterns. The study used a search, synthesis, appraisal, and analysis framework for review. The review included articles that only focused on the contributions of NTFPs for livelihood income and NTFPs usage type, while others not related to these two topics were excluded. For its literature search, more than half of the articles used Google Scholar, followed by Research4life, Scopus/Elsevier, EMBASE, and PubMed, respectively. In this study, excluding papers that (i) did not provide evidence on the income contribution of NTFPs, (ii) did not include articles that did not clearly explain the NTFPs use types, and (iii) were published before 2011, the reviewer was able to reduce the number of included articles (eligibility criteria or inclusion and exclusion criteria). 83 article papers were reviewed for the current review. The majority of the research for this review was carried out in India (19%), Ethiopia (13%), and Nigeria (11%). India was the first of the 17 both Asian and African countries to do research on the NTFPs' contribution to rural household income and type of use. NTFPs contribute significantly to rural household revenue in 17 countries, ranging from a minimum of 9.5% in Zambia to a maximum of 40.19% in Myanmar. The average percentage of revenue from NTFPs across the 17 nations was 23.56%. Wild fruit, wild vegetables, medicinal plants, firewood, and crafts were the five NTFP usage types that were used by people in every country studied. Despite the fact that different countries utilize different types of NTFPs, the most commonly used types of NTFPs do not differ statistically ($P > 0.05$). To prevent overexploitation, those top five NTFPs must be conserved as they gather across the regions. NTFP collection is a significant source of revenue for rural poor and people who live in and around the forest. There are many types of NTFPs in both Asian and African countries. So, this study shows that the rural people depend on the forest product and get many benefits from the forest especially in the NTFP usage type. In order to secure livelihood stability in this global biodiversity hotspot and to preserve plant and animal diversity, the cultivation and scientific harvesting of NTFPs are urgently required. It is necessary to increase capacity by teaching NTFP users how, when, and how much to harvest.

1. Introduction

The terms "minor forest products" and "nonwood forest products" are also used to describe the nontimber forest products (NTFPs) [1]. NTFPs are biological products harvested from wild biodiversity in natural and anthropogenically modified environments by humans other than high-value timber [2, 3].

Examples of NTFP definitions include

(i) "All products obtained from plants of forest origin and host plant species yielding products in association with insects and animals or their parts and items of mineral origin except timber may be defined as minor forest products (MFP) or nonwood forest products (NWFP) or NTFP [4]." For the

many individuals who use these resources to fulfill their fundamental requirements, minor forest products—all animal, plant, and other forest products aside from timber—are significant [5].

(ii) "NWFP are defined as goods of biological origin other than wood derived from forests, other wooded lands, and trees outside forests [3, 4]."

(iii) "NTFPs encompass all biological materials other than timber, which are extracted from forests for human use [3]."

The term NTFPs refers to forest products other than timber, including fuel wood and small woods, while NWFPs refer to forest products that do not contain any fuel wood and small wood [6]. There are about 2.4 billion hectares of woody and nonwoody forest products in the world, accounting for approximately 60% of forest cover [6]. NTFPs provide livelihoods for about 2 billion rural and urban poor people in the world. There is no question that they are among the most valuable plant resources for food security today and in the future [5, 7].

In general, NWFPs fall into the following three categories:

(i) In traditional medicine and as raw materials for pharmaceuticals, plants are used as medicines.

(ii) There is a wide range of products derived from plants, such as foods (nuts, fruits, mushrooms, gums, and syrups), food additives (spices, herbs, flavorings, and sweeteners), fibers (such as bamboo and rattan), barks (such as cork), fragrances, ornamental pods and seeds, resins, and oils.

(iii) Various products that come from animals, such as bushmeat, game, skins, hides, and trophies, wild honey, beeswax, and edible insects [6, 8]. As mentioned previously, NWFPs include a wide variety of categories, including plants, animals, and microorganisms, but all are free from any wood part of the forest.

In addition to providing food, fuel, fiber, fodder, construction materials, medicine, and income, NTFPs also preserve traditional knowledge [2, 4, 9]. Globally, about 1 billion people depend on forests for their livelihoods and food [10], and around 300 million of these people are heavily dependent on nontimber forest products [11]. According to estimates, NTFPs provide a quarter of rural household income in developing nations [12]. NTFPs are widely used in medicine [13–15] and nutrition [16, 17] in tropical and low-income countries. The use of animal parts was common among various cultures in ceremonial practices as well as a source of protein for rural and forest dwellers [18]. Bushmeat from wild animals in the forest is an important source of protein for rural and forest-dwelling communities [19]. Through frequent, direct eating of cultivated items, usage as famine foods and safety nets during difficult times, or income from selling them, NTFPs at the family level boost global nutrition [1, 16, 20–23]. One in six people worldwide rely on wild foods, which are a subset of NTFPs and include bushmeat, insects, honey, fungi, wild vegetables, and wild edible fruits (WEFs) [24]. Particularly for vulnerable groups such as the poor and undernourished children, wild edibles can offer an open access source of food and revenue [2, 25]. Evidence suggests that the poor are disproportionately dependent on NTFPs in certain situations [26]. In the review study on the revenue contributions of NTFPs, rural people are mostly poor and malnourished, so NTFPs are relatively free, especially in the wild, and the groups mentioned above are more benefited than those with alternative income sources. Generally, poor people have little bargaining power because they lack market access, inadequate human capital, insufficient productive capital, and weak institutions [27]. According to estimates from the UN's Food and Agriculture Organization (FAO), the world's forest industries provide close to 1% of the global GDP and use 0.4% of the global labor force [28].

Forest conservation is facilitated by increasing the value of NTFP earned by local people in addition that NTFPs harvesting is more sustainable then the timber harvesting [27]. In contrast to timber extraction or agriculture, NTFP production has often been considered more harmonious with biodiversity conservation [27]. So that the higher livelihood outcomes are associated with lower environmental outcomes and NTFP is likely to join the development and conservation of natural forest [29]. However, the outcome depends on the production system used. NTFP extraction from a natural forest can have a low impact on the local ecology and biodiversity at the landscape and species levels [4]. The sustainable development goals (SDGs) present an opportunity, according to the study, to increase emphasis on the livelihood benefits of NTFPs and make this invisible contribution obvious [30]. The article then discusses the consequences for the significance of NTFPs and usage type [28].

In this review, articles published before 2011 are not included since the rate of articles published before 2011 was very low, and even in some years, no related research has been conducted. Additionally, the article may not represent the NTFPs' current importance because it was published so many years ago. In this review, articles were published both in Asian and African countries since the research related to the topic was conducted on both continents. The 17 countries that were chosen met the requirements by having both the topic-related article and more than one article that were studied.

1.1. Objectives

(i) To understand the contribution of nontimber forest products (NTFPs) to rural livelihoods

(ii) To identify the types of NTFPs that people use

2. Methodology

2.1. Search and Information Sources. The literature was retrieved and coded using the PRISMA technique [31]. The review used the search phrases "Non-Timber Forest

Product* OR Non-Wood Forest Product* OR Minor Forest Product" in combination with (using the Boolean operator AND and OR) livelihoods to thoroughly search the papers on Google Scholar, Research4life, Scopus/Elsevier, Research Gate, EMBASE, and PubMed. Although there are many databases for searching, authors only use the databases mentioned above to look for articles because the results for searching the same word in several databases did not differ significantly from one another. The NTFPs usage type is also present. In order to present the most recent and pertinent information, this review only included articles that were published in 2011 and after. Records included the publication's title, abstract, keywords, authors, country, NTFPs' income contribution, NTFPs' usage category, and publication year.

2.2. Data Collection Process and Article Screening. Author, year, title, journal, abstract, keywords, study goal, research techniques, and data source were among the information that was extracted. The context of the keywords used in each article's abstract and the subsequent step's screening of articles were both analyzed. Through this procedure, articles could be separated into two categories: those that are essentially related to the sort of NTFPs and their contribution to livelihood and those that are not (for example, if the research area is not NTFPs and livelihoods or if the subject of the study is not associated with income contributions and NTFPs use type). The eligibility assessment was then carried out separately on the remaining articles by carefully reading the entire texts of the chosen papers. Although the review seeks to cover articles with titles that exactly match, it only contains 83 articles that do so and meet the review's criteria (Figure 1). The published papers that were included were all written in English. Because writers felt that they did not accurately depict the precise contributions of NTFPs revenue contributions and use kinds in each country, conference papers, review publications, and reports were disregarded. Additionally, some reports, conference papers, and reviews—particularly the conventional ones—are not peer reviewed. By excluding papers that (i) did not provide evidence on the income contribution of NTFPs, (ii) did not include articles that did not clearly explain the NTFPs use types, and (iii) were published before 2011, the reviewer was able to reduce the number of included articles (eligibility criteria or inclusion and exclusion criteria). While reading the titles of the publications, the researchers quickly recognized a number of articles and rejected them, even though the titles of the articles contained NTFPs. The majority of the papers were difficult to determine by simply reading the titles, so the researchers were taken to read in-depth. After a rough selection, the remaining articles were thoroughly reviewed through to the end; several of them were then excluded because they met the exclusion criteria. The remaining articles were then labeled as "articles that fulfill the criteria." Generally, the titles, abstracts, introductions, findings, discussions, and conclusions of the publications were read before choosing which to include and which is exclude. Finally, for this systematic review, 83 articles covering the topic of NTFPs that use type and income contributions as the primary concern were chosen as the targeted sources. Then, the researcher went on to meticulously study each of these papers and code them. Nontimber forest products (NTFPs) and revenue contributions for livelihoods are labeled as authors, year, study area/country, year of publication (Figure 2), allover NTFP income contributions for livelihoods (Figure 3), and NTFP use kinds (Table 1).

2.3. Data Analysis. This study classified the chosen articles according to a number of characteristics in order to address research question 1 (How NTFPs contributed in the overall income of the livelihoods?). First, an analysis of publications connected to related studies was carried out on a yearly and regional level. The income contributions from NTFPs were then examined. What are the NTFPs use types? Is the second research question that was addressed, and the types of NTFPs usage types were analyzed. Although some NTFP types are prevalent in nearly all of the chosen countries, others were prevalent in one region but not in another.

Excel was used to store and code all of the captured data and/or variables. After coding in IBM SPSS Statistics 26, frequency analysis and cross-tabulation were used to assess the distribution depending on the published year, and country, as well as the NTFPs use type. In addition to codding and storing the data, the 2019 version of Excel was also used to create graphs of the income getting from NTFPs among studied countries and the type of NTFPs. The complete graphs of correlations between the recorded variables were also created by using R-studio. The results were then examined, followed by a discussion of them. Following the research's collection of the data, the results were written down and discussed. The recommendation and conclusion were composed last.

3. Results

83 article papers were reviewed for the current review. The summary of the selection variable can be found in Table 1. Despite having the keyword "NTFPs and Livelihood" in their titles, abstracts, or keywords, 450 records were excluded because they were unrelated to the review subjects, despite the literature search using databases and search engines providing 1000 results. 467 items were eliminated after meticulously screening the entire texts of the remaining 550 articles because they did not match the eligibility requirements. 83 papers really were available at the end. For its literature search, more than half of the articles used Google Scholar, followed by Research4life, Scopus/Elsevier, EMBASE, and PubMed, respectively. The findings demonstrate the development of NTFPs and livelihood studies throughout time. Research on the types of NTFPs used and how they affect income and way of life rose considerably between 2011 and 2021 (Figure 2). This illustrates that interest in the different ways that NTFPs are used and how they affect income and way of life has grown dramatically over time.

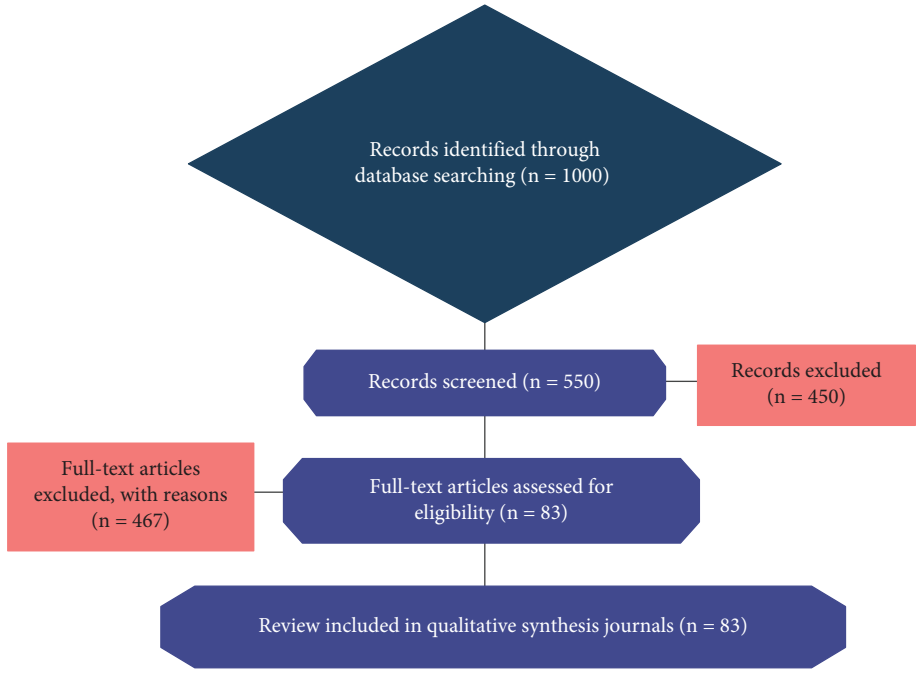

Figure 1: Flow chart of the review article selection process.

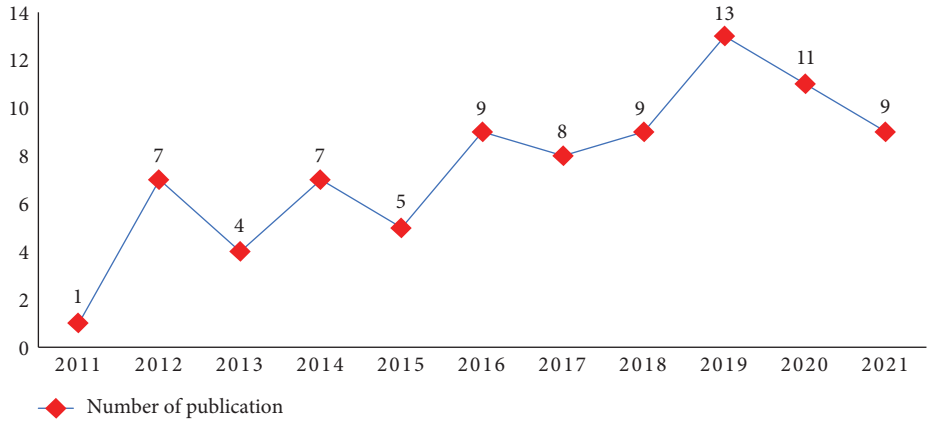

Figure 2: Number of articles published from 2011 to 2021 in 17 countries.

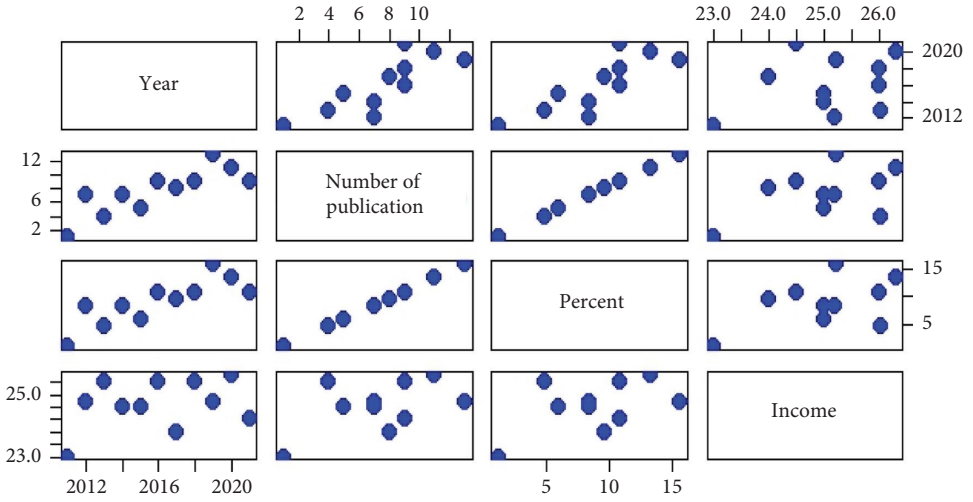

Figure 3: Entire matrix of correlations among variables.

Table 1: Variables/items recorded.

Countries	Years	Income from NTFPs (%)	NTFPs use type in each countries	References
Bangladesh	2021	33.4	Wild fruit, wild vegetables, medicinal plants, firewood, wild honey, wild meat, traditional sticks, weaving material, religious value, bamboo, rettan, grazing, and grass	[32–37]
	2016	19		
	2016	27		
	2014	35		
	2012	21		
	2012	9		
Benin	2019	25	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, grazing, and grass	[28, 29]
	2013	12.84		
Cameroon	2020	16.3	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, religious value, bamboo, rettan, grazing, and grass	[38–42]
	2020	21		
	2019	35		
	2018	47		
	2012	25.6		
Ethiopia	2021	23.1	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, religious value, wood utensils, spice, liana, bamboo, rettan, mushroom, grazing, grass, wild fish, toothbrushes, and sweep	[43–53]
	2020	26		
	2020	13.1		
	2020	17.46		
	2019	29.34		
	2019	20.17		
	2017	44.7		
	2016	21.4		
	2014	47		
	2014	30		
	2014	25		
Ghana	2020	21.3	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, religious value, wood utensils, spice, bamboo, grazing, grass, wild fish, and toothbrushes	[26, 54, 55]
	2019	32.69		
	2016	20		
India	2021	20	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, religious value, wood utensils, spice, liana, bamboo, rettan, mushroom, grazing, grass, wild fish, toothbrushes, and sweep	[8, 56–69]
	2020	20		
	2019	45		
	2019	40		
	2019	30		
	2018	24.31		
	2017	35		
	2016	25		
	2016	6		
	2015	31.67		
	2015	18		
	2013	25.05		
	2012	33		
	2012	15		
	2012	15		
	2012	10		
Indonesia	2020	25	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild meat, religious value, wood utensils, spice, bamboo, grazing, grass, and toothbrushes	[70–72]
	2018	25		
	2016	36		
Kenya	2019	41	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, religious value, wood utensils, spice, liana, bamboo, rettan, mushroom, grazing, grass, wild fish, toothbrushes, and sweep	[73–76]
	2018	45		
	2018	27.8		
	2015	6		
Myanmar	2018	36	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, wood utensils, spice, bamboo, rettan, mushroom, grazing, grass, wild fish, and toothbrushes	[77, 78]
	2016	44.37		
Nepal	2021	15	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, religious value, wood utensils, spice, liana, bamboo, rettan, mushroom, grazing, grass, wild fish, toothbrushes, and sweep	[79–82]
	2020	26.08		
	2019	32		
	2019	20		

Table 1: Continued.

Countries	Years	Income from NTFPs (%)	NTFPs use type in each countries	References
Nigeria	2021	22	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, religious value, wood utensils, spice, liana, bamboo, rettan, mushroom, grazing, grass, wild fish, toothbrushes, and sweep	[7, 83–89]
	2020	33		
	2018	27		
	2017	40		
	2017	40		
	2017	20		
	2014	12		
	2014	24		
	2013	20		
South Africa	2019	15	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, religious value, wood utensils, spice, grazing, grass, wild fish, and toothbrushes	[90–92]
	2017	22		
	2015	22.7		
Tanzania	2018	20.1	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, religious value, wood utensils, spice, bamboo, rettan, mushroom, grazing, grass, wild fish, and toothbrushes	[93–95]
	2016	36		
	2013	15		
Thailand	2021	13.2	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, wood utensils, bamboo, grazing, grass, wild fish, and toothbrushes	[96–99]
	2021	10		
	2018	23		
	2017	7.2		
	2015	25		
Vietnam	2021	25	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, wood utensils, bamboo, grazing, grass, wild fish, and toothbrushes	[100–102]
	2020	7		
	2019	16		
Zambia	2017	10	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, religious value, wood utensils, spice, liana, bamboo, grazing, grass, wild fish, toothbrushes, and sweep	[103]
	2014	9		
Zimbabwe	2021	15	Wild fruit, wild vegetables, medicinal plants, firewood, crafts, wild honey, wild meat, traditional sticks, weaving material, religious value, wood utensils, spice, liana, bamboo, grazing, grass, wild fish, toothbrushes, and sweep	[104, 105]
	2011	23		

Regarding geography, it was discovered that research on NTFPs and use type was carried out in a number of different nations. In terms of the spatial scales taken into account in the studied publications, part of the research included an analysis at the local scale (community, village, or district level), whereas other papers took state and national levels into account. The majority of the research for this review was carried out in India (19%), Ethiopia (13%), and Nigeria (11%), respectively (Figure 4). The amount of research on NTFPs is growing continuously, and there is a linear link between the number of publications and the year (Figure 3), which mean the years increase the number of publication also increase. India was the first of the 17 countries to do research on the NTFPs' contribution to income and type of use, which means the research studied related to this topic is highest in India than the other countries. Ethiopia came in second. In other words, Ethiopia was the country where the majority of the articles that meet the requirements for this evaluation were discovered next to India. Other countries' lower NTFP utilization does not necessarily mean they do not use NTFPs; rather, it may simply be that there are not enough studies on this topic. Nearly every nation on earth uses NTFPs in significant economic ways, but most lack adequate scientific research, which is why this evaluation only includes such nations.

NTFPs contribute significantly financially to livelihoods, especially for the poor who rely on the forest for their primary source of sustenance and who reside nearby. According to the review's findings, NTFPs contribute significantly to national revenue in 17 countries in both African and Asian continents, ranging from a minimum of 9.5% in Zambia to a maximum of 40.19% in Myanmar. In addition to other forms of livelihood income, such as crop production and other farming activities, Ethiopia receives 27.02 percent of its revenue from NTFPs in rural areas, according to the articles that have been recorded in our nation on average (Figure 5). By combining the revenue received from NTFPs in different articles, this systematic evaluation provides more realistic information than a single article on the income contributions of NTFPs for rural households and the type of usage. The average percentage of revenue from NTFPs across the 17 nations that were analyzed was 23.56%, which suggests that NTPFs contribute 23.56% of the countries' total livelihood income. Because the research was carried out in various parts of the country and NTFPs vary from one district to the others, even within a single country, different authors' estimate of income for the same years fluctuate greatly. This is the one of the reasons the researchers conducted this review. The percentage of the articles, or the income of one country relative to the other countries, is likewise shown in Figure 5. Even though Myanmar had

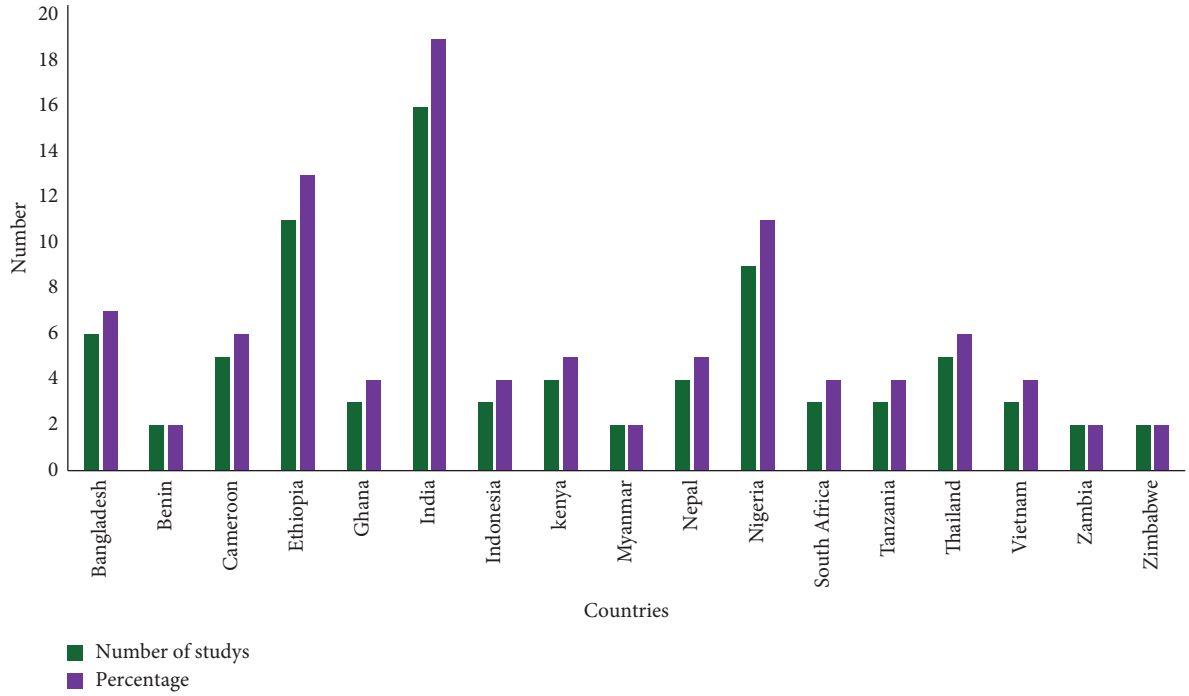

Figure 4: Conducted research among different nations with their percentages (studied more than once).

fewer articles studied, it nonetheless received greater amounts of income from NTFP than the other countries on a per-article basis.

Use types for NTFPs are displayed in Figure 5. The main uses of NTFPs are listed as follows: firewood, crafts, wild fish, toothbrushes, traditional sticks, weaving material, medicinal plants, religious value, mushroom, bamboo, rettan, liana, sweep, wild meat, wild vegetables, wild fruit, wild honey, grazing, grass, wood utensils, and spice. The study reveals that there are different uses of NTFPs in both African and Asian countries. Different rural people use various non-wooden forest products, particularly those that reside close to forests. The existence of a wide variety of NTFPs was shown in this review by studies from many nations; however not all NTFPs use kinds were found in any one publication/country. While there were a wide variety of NTFP usage types, some were commonly used across the different countries. Namely, Wild fruit (79), Wild vegetables (75), Firewood (75), Medicinal plants (74), and Crafts (70) were the five NTFP usage types that were used by people almost in all country studied (Figures 6 and 7). In other words, 79 out of the 83 reviewed articles mentioned wild fruit as an NTFP, and only 4 articles did not include wild fruits as NTFPs in their studies. Contrarily, just 13 publications identify sweep as an NTFP and the rest 70 articles do not indicate so.

There are numerous uses for NTFPs, including those for firewood, wild meat, wild vegetables, wild fruit, wild honey, traditional sticks, weaving materials, medicinal plants, religious purposes, and wood utensils, among others. However, wild fruits, wild vegetables, medicinal plants, firewood, and crafts are some of the NTFPs that were commonly used by the people across the studied regions. The reviewer looked at the differences between the five most common NTFP usage types (Table 2). Despite the fact that different countries utilize different types of NTFPs, the most commonly used types of NTFPs do not differ statistically ($P > 0.05$) (Table 2), which indicates that people in the study regions use the top five NTFPs in the same manner. In terms of usage, wild fruits were the most common form of NTFP, followed by wild vegetables, medicinal plants, and firewood, in that order.

4. Discussion

The current study's goal was to perform a thorough evaluation of the pertinent literature on the types of nontimber forest products (NTFPs) utilized and their income contributions to rural livelihoods. NTFPs play a significant role in the subsistence and livelihood of indigenous populations that live near or in the forest of the Arunachal Pradesh, India [65]. Humans harvested or hunted for food the majority of forest items that were made from nonwood [65]. The study identified the historic trend, regions, the income contribution of NTFPs, and the type of use of NTFPs in addition to giving an up-to-date comprehensive picture. This evaluation demonstrates that in 2019, there has been a significant increase in the number of articles published in research progress, reaching 13 articles, followed by 11 articles in 2020. Among the study regions included in the report, India, Ethiopia, and Nigeria rank as the top three in terms of the research activity. According to the study's findings, wild fruit is the most prevalent type of NTFP because it appears in almost all of the publications that were published. Due to the authors' ignorance of other languages, the review articles only include writing in English, which might cause prejudice. This conclusion suggests that during the past few years, these countries have exerted significant efforts to boost

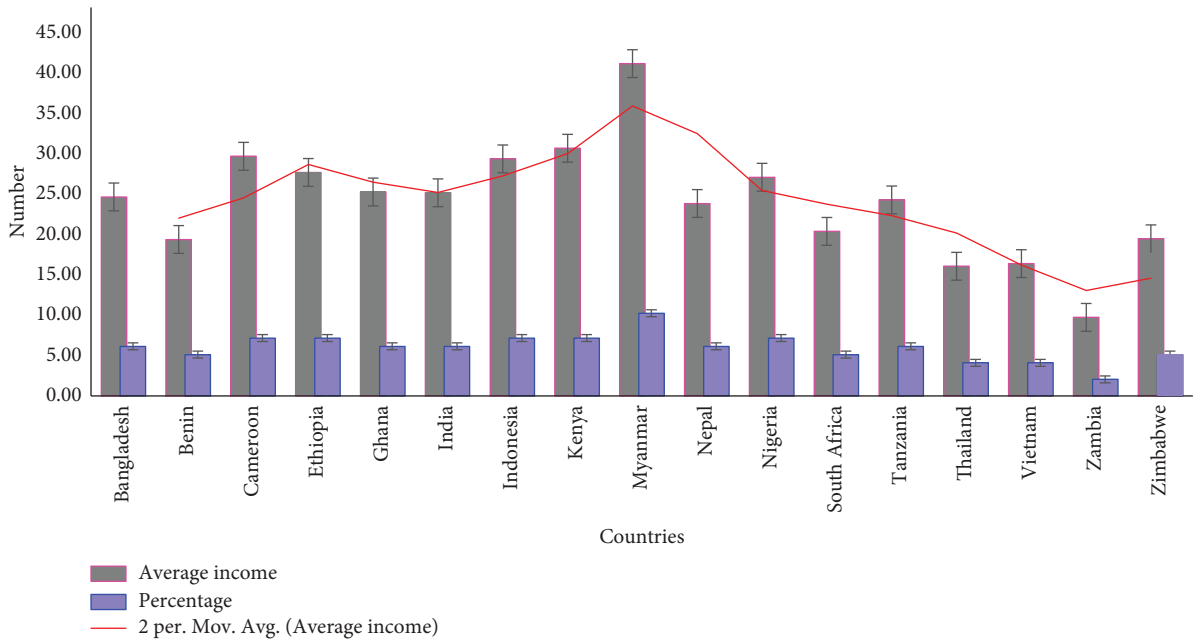

Figure 5: Income contribution of the NTFPs.

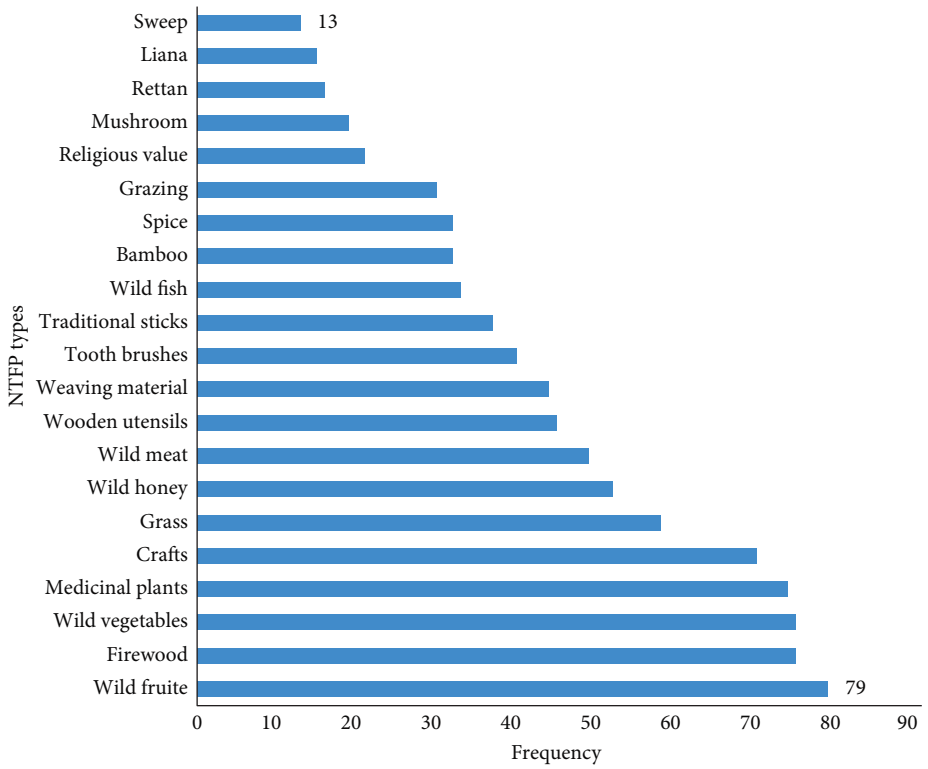

Figure 6: NTFPs use types. NB: NTFP kinds found in the articles are shown in the graph, from a total of 83 articles. (e.g., 79 out of 83 articles obtained wild fruit as NTFP, while only 13 out of 83 articles obtained sweep as NTFP, which was the lowest).

NTFPs revenue contributions and their use kinds. Among the most popular NTFPs, wild edible fruits (WEFs) are significant sources of food, medicine, and revenue for their users [2]. The majority of rural residents, especially those who live near forests, rely on the forests for both their domestic requirements for food, fodder, fiber, and medicines as well as their income by selling some or all of their collection [65]. Forests have several uses than just generating wood and nonwood products. NTFPs are necessary to ensure sustainable development on a global scale [6]. They offer answers to issues such as eradicating poverty, environmental sustainability, food security and agriculture, energy, clean

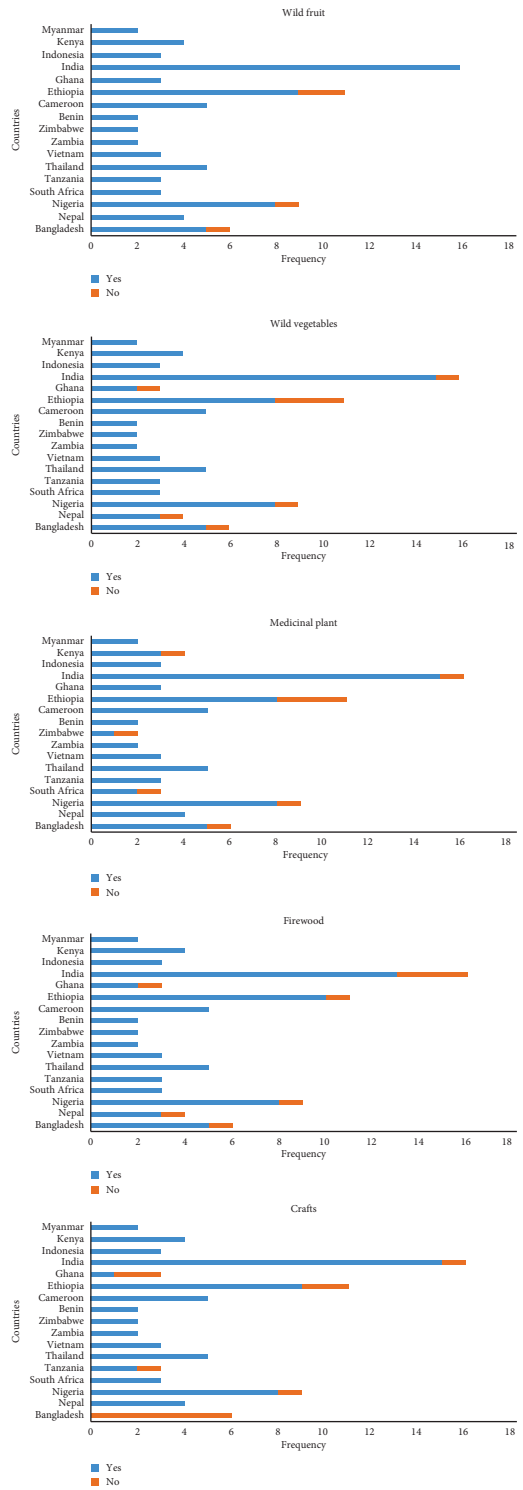

Figure 7: The five most used types of NTFPs among 17 countries. NB: yes means the NTFP type was obtained from the total articles among the countries, and no means the NTFP type was not obtained from the total articles among the countries.

water and watershed protection, biodiversity preservation, mitigating and adapting to climate change, battling desertification and land degradation, and disaster risk reduction [6]. The primary source of healthcare for 80% of the people in developing nations is medicine derived from forests [6]. For the development of green economies and green industries, forests are essential. In especially for vulnerable groups of people such as women and indigenous tribes, forests provide indirect but dependable resources to sustain rural livelihoods. Forests also directly and practically contribute to food security. 200 million people, including many indigenous people, directly depend on forests for their

Table 2: Country * NTFPs use type crosstabulation.

Countries	Top five NTFPs use type									
	Wild fruit		Firewood		Wild vegetables		Medicinal plants		Crafts	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
India	16	0	13	3	15	1	15	1	15	1
Ethiopia	9	2	10	1	8	3	8	3	9	2
Nigeria	8	1	8	1	8	1	8	1	8	1
Bangladesh	5	1	5	1	5	1	5	1	0	6
Cameroon	5	0	5	0	5	0	5	0	5	0
Thailand	5	0	5	0	5	0	5	0	5	0
Kenya	4	0	4	0	4	0	3	1	4	0
Nepal	4	0	3	1	3	1	4	0	4	0
Indonesia	3	0	3	0	3	0	3	0	3	0
South Africa	3	0	3	0	3	0	2	1	3	0
Tanzania	3	0	3	0	3	0	3	0	2	1
Vietnam	3	0	3	0	3	0	3	0	3	0
Benin	2	0	2	0	2	0	2	0	2	0
Ghana	3	0	2	1	2	1	3	0	1	2
Myanmar	2	0	2	0	2	0	2	0	2	0
Zambia	2	0	2	0	2	0	2	0	2	0
Zimbabwe	2	0	2	0	2	0	1	1	2	0
Total	79	4	75	8	75	8	74	9	70	13
Chi-square (χ^2), P =	0.88		0.93		0.80		0.67		0.12	

NB: yes means the NTFPs use type found in the article and no means the NTFPs use type not found in the articles, and the use was not reported in the article does not mean it is not a use in that country, it my due to lack of the research study.

life, and more than 1.6 billion people worldwide—nearly a quarter of the world's population—rely on them for food, medicines, and fuel in addition to their employment and livelihoods [6]. More than 80% of the terrestrial biodiversity in the planet is found in forests [6, 65]. Forests are essential sources of biodiversity, energy, water, livelihoods, and other ecosystem services that are necessary for society to function [91]. The bulk of the world's freshwater, which is essential for human survival and the production of food among other things, is provided by wooded catchments in addition to contributing to livelihood [91]. Forests can assist delay or stop soil erosion and lock in soil moisture in order to stop desertification and provide protection from flooding. Forests that are strong and resilient are essential for reducing climate change and preparing for it. Despite the fact that at the moment about 10% of global greenhouse gas emissions are estimated to come from deforestation, forests have the potential to absorb and store about one tenth of the projected anthropogenic carbon emissions for the first half of this century into their biomass, soils, and products as the second largest carbon storehouse after the oceans [6, 65].

5. Conclusion and Recommendations

Nontimber forest product (NTFP) collection is a significant source of revenue for rural poor and people who live in the forest. In order to secure livelihood stability in this global biodiversity hotspot and to preserve plant and animal diversity, the cultivation and scientific harvesting of NTFPs are urgently required. In addition to meals, spices, herbs, fodder, fibers, perfumes, seeds, resins, and oils, nonwood forest products (NWFPs) also include medicinal plants and raw materials for pharmaceutical products, as well as animal-based goods including bushmeat, hides, honey, beeswax, and edible insects, but it does not incorporate fuel wood and other small wood parts unlike NTFPs. The cascading principle, which states that NTFPs should be used in the following priority order: NTFPs, extending their service lives, reuse, recycling, bioenergy, and disposal, should be accepted and put into practice in order to improve NTFP utilization putting in place regulations on building construction and public procurement that support the market for nontimber forest products made lawfully and responsibly in order to expand their accessibility to consumers by any concerned body. Market for NTFPs should be made lawfully and responsibly. Measures should be taken by the private sector to find ethical and sustainable products, such as sustainability certification. More effective protection is required for forests with high carbon reserves and conservation importance.

Implementation of payment systems for ecological services, such as biodiversity preservation, watershed management, and climate mitigation (via REDD + projects) helps in removing harmful incentives, such as those that encourage the use of bioenergy or excessive deforestation for agricultural expansion. Support for reforestation and afforestation initiatives that prioritize the thorough restoration of natural forest landscapes while taking into account local conditions and communities as opposed to the development of monoculture plantations that are inappropriate for local ecosystems and climates. Finally, the researchers suggest that assistance for reforestation and afforestation programs is helpful for improving forest conservation and biodiversity, as well as payment systems

for ecological services. Therefore, such payment schemes for the forest residents are made possible by governmental, nongovernmental, and other relevant agencies.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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