Food and Agriculture Organization of the United Nations

NON-WOOD FOREST PRODUCTS
22
ISSN 1020-3370

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Food and Agriculture Organization of the United Nations

Rome, 2017

Recommended citation:
Sorrenti, S. 2017. *Non-wood forest products in international statistical systems*. Non-wood Forest Products Series no. 22. Rome, FAO.

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ISBN 978-92-5-109602-4

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Preface

At the very core of FAO's mandate, embedded in Article One of FAO's constitution, is the objective of collecting, analysing, interpreting and disseminating information relating to nutrition, food and agriculture – including forest products. The FAO Forestry statistics programme has been compiling and reporting statistics on the production, trade and consumption of forest products in its annual yearbook since 1947, with the aim of assisting member countries to improve information on the forestry sector, monitor its contribution to national and rural economies and support associated decision-making on the best ways to manage forest resources. The bulk of this data, however, has focussed on wood products. Data collection on non-wood forest products (NWFPs) has not been systematic for several reasons: (1) the use of NWFPs is often confined to the informal sector and is thus very difficult to capture through formal statistics; (2) the wide variety of products and species that could potentially fall into this umbrella category is extremely vast; and (3) convergence on a universal definition of NWFPs has not yet materialized. As a result, to this day, systematic data collection on NWFPs continues to be difficult.

This report seeks to begin addressing this issue by reviewing international statistics on NWFPs through three main international statistical classifications: the Harmonized System (HS), the Central Product Classification (CPC) and the International Standard Industrial Classification (ISIC). It discusses specific issues linking major NWFPs across the three reference systems, as well as how countries deal with these issues. It proposes ways for improving the international classification systems and presents some of the main NWFPs. Each product group is fully described in the annexes, which provide information on where it is situated in the existing international classifications, as well as production and international trade data sources.

The intention of this paper is not to reinvent a statistical system of NWFPs, but rather to provide information on NWFPs in the existing statistical systems so that users – in other words national/regional/international statistical agencies and industries – can compile information on NWFPs according to their assessment needs. This report does not provide an exhaustive list and description of all NWFPs, but does show some of the main products. This document attempts to provide a picture, based on available data, which can be a starting point for improving statistics on NWFPs.

Acknowledgements

This report was produced under the overall guidance of the FAO Forestry Department, specifically under the technical supervision of Adrian Whiteman, to whom the author is profoundly grateful. Thanks also to Yanshu Li who provided contributions and comments which helped improve many of the previous drafts of the report. The constructive comments and contributions of C. L. Chowdhary, Örjan Jonsson, Walter Kollert, Andrey Kushlin, Arvydas Lebedys, Giulia Muir, Eva Müller, Valentina Ramaschiello and Enrico Vidale are also gratefully acknowledged.

Acronyms and Abbreviations

CIFOR	Center for International Forestry Research
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPC	Central Products Classification[1]
CN	Combined Nomenclature
EUROSTAT	Statistical Office of the European Communities
FAO	Food and Agricultural Organization of the United Nations
FRA	Global Forest Resources Assessments[2]
HS	The Harmonized Commodity Description and Coding System[3]
IBGE	Instituto Brasileiro de Geografia e Estatística
ICs	International Classifications
ISIC	International Standard Industrial Classification of All Economic Activities[4]
KOSIS	Korean Statistical Information Service
MAFF	Ministry of Agriculture, Forestry and Fisheries (Japan)
NWFP	Non-wood forest product
PRODCOM List	List of Products of the European Community
SNA	System of National Accounts
SOFO	State of the World‘s Forests (FAO biannual report)
UNECE	The United Nations Economic Commission for Europe
UNSD	United Nations Statistics Division
WCO	World Custom Organization
WHO	World Health Organization

[1] Current version 2.1 (2015). Next: to be defined.
[2] Carried out by FAO every five years. The last took place in 2015, the next in 2020.
[3] Current version 2017 edition. Next: 2022 edition.
[4] Current version Rev. 4 (2008). Next: to be defined.

Executive Summary

Non-wood forest products (NWFPs) such as nuts, mushrooms, herbs, spices, aromatic plants and game have been used for food, health and cultural purposes for millennia, yet there is a tendency to underestimate their role because they are poorly represented in international statistics, as in most cases their use and trade are confined to the informal sector. Recent studies show that NWFPs still form the basis of lives and livelihoods in many parts of the world and play a much more significant role in food and nutritional than previously thought (FAO, 2016; Rowland *et al.,* 2016; Ickowitz *et al.,* 2014). For this reason, the FAO Forestry Statistics Programme has taken renewed interest in addressing the existing data gap on NWFPs to provide a sound evidence evidence base for decision making regarding their use. As a point of departure, a systematic review of NWFPs in the existing international classification systems used for the collection and dissemination of data on production, trade and economic activities was initiated in an effort to ultimately improve data collection on NWFPs. A number of reports, journal articles, working papers, statistical publications and databases were also reviewed. Experts were invited over a period of four months (July to October 2016) to provide suggestions to help improve the study. A selection of "major" NWFPs were identified, including: edible mushrooms and truffles; forest berries; maple products; edible nuts; bamboo and rattan; cork; bark; latexes; gums and resins; hides; skins and trophies; game meat and edible insects. Although some important product categories were excluded from this initial review, the study should be seen as a first step towards improving data collection on what is an extremely vast category of products.

Not surprisingly, the report found that data on international trade and production of NWFPs is partial and not comparable across countries and over time. A major difficulty for statistics gathering is that NWFPs are often classified under agricultural categories without any distinction between wild and farmed produce. Nevertheless, many NWFPs – such as maple products, cork, bamboo and rattan, gums and resins – are recognizable under a wide range of categories in the three international schemes, the Harmonized Commodity Description (HS), the Central Products Classification (CPC) and the International Standard Industrial Classification of All Economic Activities (ISIC), with the HS enabling the highest level of product detail. This is a good basis for improving data on NWFP production and trade. The report also found that information is available in national databases to varying degrees, with countries reporting on products that have value to them. Thailand, for example, is the only country that has detailed codes (four) on edible insects, likely due to the growing economic importance of rearing insects in the country over the past two decades; Canada and the United States of America have rich databases on maple products; Finland gathers statistics on wild edible mushrooms and wild berries; Japan collects data on a suite of "minor forest products", including mushrooms.

The findings suggest that there is scope to improve data collection by further clarifying terminology and classification issues and strengthening collaboration with the United Nations Statistics Division (UNSD) and the World Customs Organization (WCO) who are responsible for revising classification of products, as well as with other agencies such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)[5]. They also point to the conclusion that no matter how well these methodologies are refined, these figures will only capture a part of the picture, leaving out many products that are traded informally, produced for subsistence or for cultural purposes. Targeted household surveys are needed to complement these figures and are recommended to capture the full value of NWFPs.

[5] CITES has developed specific codes for detecting and monitoring protected species against over-exploitation through international trade.

1 Introduction

The contribution of forests to food security, nutrition, community health, energy, employment and in tackling climate change is clearly recognized at international, national and local levels, namely in the Sustainable Development Goals and the Paris Agreement. The socioeconomic benefits of forests, including the role of non-wood forest products (NWFPs) for generating income, food and nutritional security, basic human needs, and improving quality of life were recently documented by FAO in the State of World's Forest 2014 report (SOFO 2014). The report estimates that NWFPs generated US$88 billion in 2011, that about 76 million tonnes of food from the forest were consumed on average in the same year. Moreover, the report suggests that forest products contribute to the provision of shelter for about 1.3 billion people and to human health through the use of medicinal plants that originated in forests. WHO (2002) estimates, in addition, that in 2011 around 2.8 billion people in China, India and Africa used traditional medicines, many of which originated in forests.

Nevertheless, understanding the real contribution of forest products to lives and livelihoods is incredibly problematic without better data. SOFO (2014) for instance suggests that current figures on NWFP use and value should be considered an underestimate. It calls for more concerted efforts to improve the availability and quality of international statistics on NWFPs for evidence-based decision-making. While data on wood products often features in official statistics, there is very limited available information on many NWFPs, especially food items, since few countries systematically monitor and collect data on these resources. Even when information is available, it is often partial or fragmented and lacks comparability across countries and over time. Moreover, vast differences in terminology and definitions make it very difficult to assess trends and make cross-country comparisons. This imbalance has led to an underestimation of existing and potential socioeconomic benefits, as well as of the full economic contribution of forests.

The current report is FAO's attempt to start bridging the data gap by analyzing NWFPs in the framework of international classification systems, which are a set of reference classifications internationally agreed upon and adopted by the vast majority of countries. By providing standardized definitions, descriptions and categories, international classifications (ICs) ensure data accuracy and enable comparability across countries. They have been designed to be used as they are or adapted to national requirements or sectors.

In order to address the challenge, a systematic review was conducted on the existing three major ICs used for the collection and dissemination of data on production, trade and economic activities: the Harmonized Commodity Description and Coding System (HS), the Central Product Classification (CPC) and International Standard Industrial Classification of All Economic Activities (ISIC). It is important to mention that HS codes are also largely used in reporting of international wildlife trade[6]. In this report, major NWFPs are tracked in the three main international reference systems and a number of study reports, journal articles, working papers, and international/regional/national statistical publications and databases were reviewed. Based on this re-view, suggestions are made to improve data collection on NWFPs, with supporting evidence for further discussions and revisions of international classification systems.

The report is structured into five sections. The first is intended to set the "boundary" around NWFPs, drawing attention to the terminology debate and FAO definitions. The second describes what a statistical classification is and how the three international classifications of products and economic activities – HS, CPC

[6] As a result of cooperation between the Secretariat of WCO and CITES, specific codes have been developed for detection and monitoring of CITES-listed species. Some of them include NWFPs such as medicinal plants, wild animals and associated products. The issue of legal versus illegal products, although significant (particularly in view of cooperation with CITES), is beyond the scope this report.

and ISIC – work. The third and the fourth outline the location of NWFPs in these systems and make suggestions about how they can be improved. Finally, each product group is fully described in the annexes where details on classifications, assessment and data on production and trade are provided.

2 Non-wood forest products: terminology and definitions[7]

The debate on what qualifies as a non-wood forest product and which term is better suited has arguably been running in circles since "NTFP" was first coined by de Beer and McDermott in 1989[8]. The proliferation of terms now in use – such as NWFPs, NTFPs, non-wood goods and benefits, by-products of forests, accessory forest products, alternative forest resources, secondary forest products, minor forest products, wild products, natural products, mountain products, non-timber and grassland products and sustainably produced forest products – is testimony to the lack of harmonization that persists in research and academia, international and national governmental/intergovernmental bodies and in national legal frameworks and associated legislation. Even more problematic are related definitions. At the core of this challenge are several issues, including, but not limited to, differing opinions on and approaches to: the inclusion (or exclusion) of wood; drawing the line between wild and domesticated species; the inclusion of "services" (and how to define this subcomponent); including both animal- and plant-based products; scale and definitions of the sub-components of the terms, particularly the definition of "forest". While the merits of one term versus another are beyond the scope of this study, it is clear that the lack of convergence on terminology and definitions has undermined communication, reporting, data collection (trade and resource inventory) and in turn, policy making.

It is important to note that FAO has consistently employed the term NWFPs after taking several steps to reach a harmonized definition through the organization of global and regional expert consultations with stakeholders around the world. From the very first consultations held in Bangkok, Thailand (1991), Arusha, Tanzania (1993) and Santiago, Chile (1994) – however, it became clear that reaching a common definition would be challenging, as evidenced by the slightly different definitions adopted in each region which were not surprisingly "tailored" towards countries in those specific regions. The first global consultation occurred in 1995 in Yogyakarta, Indonesia, bringing together 120 participants from 26 countries. At the meeting, stakeholders agreed on a working term and definition: "NWFPs consist of goods of biological origin other than wood, as well as services, derived from forests and allied land uses" (FAO, 1995)[9].

A fundamental difference between de Beer and McDermott's "NTFP" and NWFP – among the most common terms used today – was and still is the exclusion of fuelwood and small woods used for domestic tools and equipment in the latter. Indeed, FAO proposed a clear distinction between wood and non-wood forest products as a basis for building a classification system. The term was further revisited by FAO in 1999 when the Organization acknowledged that little progress had been made to clarify terminology for NWFPs:[10]

> *Non-wood forest products consist of goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests.*

In this last effort, the somewhat controversial term "services" was removed and FAO provided clarification regarding the term's subcomponents ("non-wood", "forest" and "product").

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[7] This section is based on Muir, G. & Vantomme, P. (forthcoming). NWFPs: Moving beyond terminology.
[8] De Beer, J.H. & McDermott, M. 1989. The Economic Value of NTFPs in South East Asia. The Netherlands Committee for IUCN. Amsterdam *in* Belcher, B.M. 2003. *International Forestry Review* 5 (2).
[9] http://www.fao.org/docrep/x2450e/x2450e0d.htm#fao forestry
[10] http://www.fao.org/docrep/x2450e/x2450e0d.htm#fao forestry

It is evident from the vast array of terms and definitions used that different individuals, institutions and countries opt for different terms depending on their needs and objectives, as affirmed by a number of authors over the years (FAO, 1999; Belcher, 2003; Vantomme, 2000). One must point out that even within FAO, however, when countries report to the Global Forest Resources Assessment (FRA), a slightly different definition is used:

> *Goods derived from forests that are tangible and physical objects of biological origin other than wood.*

This working definition is quite different from the above as products collected from trees outside forests, other wooded land and agricultural production systems are excluded, as clarified in the explanatory notes:

1. Generally includes non-wood plant and animal products collected from areas defined as forest (see definition of forest).
2. Specifically includes the following regardless of whether from natural forests or plantations:
- gum arabic, rubber/latex and resin;
- Christmas trees, cork, bamboo and rattan.
3. Generally excludes products collected in tree stands in agricultural production systems, such as fruit tree plantations, oil palm plantations and agroforestry systems when crops are grown under tree cover.
4. Specifically excludes the following:
- woody raw materials and products, such as chips, charcoal, fuelwood and wood used for tools, household equipment and carvings;
- grazing in the forest;
- fish and shellfish.

3 Statistical classification system

A statistical classification is defined by the United Nations Statistics Division (UNSTAT) as a "set of discrete, exhaustive and mutually exclusive observations that can be assigned to one or more variables to be measured in the collation and/or presentation of data". They provide a common framework for grouping, organizing and disseminating information, and allow the comparability of data across countries and over time. In addition to its primary statistical purpose, information can also serve to support institutional and private-sector decision-making, monitor resources, and assist evaluation and assessment studies.

In general, statistical classifications are arranged either in a flat or in hierarchical structure. Flat classifications have only one level, i.e. a listing of categories. Hierarchical classifications, instead, are structured with different levels of aggregation ranging from the broadest to the most detailed level. Categories of a classification, either flat or hierarchical, need to be mutually exclusive and exhaustive i.e. each member of a population can only be allocated to one category without duplication or omission (FAO, Global Strategy, UN, 2015). Each category in a classification has a descriptor and a code comprised of one or more numerical or alphabetical characters. The meaning and the boundaries of each category are clearly given in the explanatory notes, which describe the categories and/or list what they include and exclude.

International or reference classifications are those developed by an international agency and accepted by the vast majority of countries. Reference classification may serve as models for the development or revision of other classifications. Countries or regions may develop their classification either by adopting the international classification and adding further details, or relating their system to a certain level of the international standard. Such developments allow for the data of an individual country/region to be comparable at global level and ensure better statistics at international level (FAO, Global Strategy, UN, 2015). Links

between reference classifications and national/regional adaptations should be defined by correspondence table which describe how a category in one classification is related to the other classification. This facilitates comparison of data compiled with the different systems.

At an international level, many classifications have been developed according to a wide range of purposes. In this report the focus is on the existing three major ICs used for the collection and dissemination of data on production, trade and economic activities: the Harmonized Commodity Description and Coding System (HS), the Central Product Classification (CPC) and International Standard Industrial Classification of All Economic Activities (ISIC).

3.1 The Harmonized Commodity Description and Coding System (HS 2017)

The HS is a goods nomenclature developed and maintained by the World Customs Organization (WCO). It is a system primarily and universally used for determining customs tariffs and for the collection of international trade statistics. The current version is dated January 2012, and the next will come into force in January 2017.

The HS nomenclature is governed by the International Convention on The Harmonized Commodity Description and Coding System. There are currently 151 contracting parties to this Convention but more than 200 customs administrations apply it worldwide.

The HS nomenclature comprises three elements: heading and subheading texts and codes; the section, chapter and subheading notes; and the general rules for the interpretation of the harmonized system. The WCO provides two additional tools for the use and interpretation of the nomenclature: the explanatory notes and the classification opinions. These five instruments can be briefly described as follows:

1. The heading and subheading texts and codes form the commodity list included in the system. The current version has a structure based on 21 sections, 97 chapters, 1 224 headings and 5 205 subheadings. The most detailed level of the HS – the subheading – is identified by a six-digit code: the first two digits indicate the chapter; the second two the headings; and the last two the subheadings.

2. The section, chapter and subheading notes appear at the beginning of sections and chapters. They provide the definition, exclusion and specifications of the classification for a certain set of goods.

3. The general rules for the interpretation of the harmonized system illustrate and provide a step-by-step basis for the classification of goods in the harmonized system.

4. The explanatory notes are official interpretations of the HS (five volumes) that contain detailed explanations on the scope of the headings and subheadings; they provide technical descriptions of the goods concerned, and practical guidance for their classification and identification.

5. The classification opinions contain a list of some of the more important and/or difficult classification decisions made by the Harmonized System Committee and adopted by the WCO.

The underlying principle of the classification requires that the HS enables customs officers to classify commodities into unambiguous categories based on objective criteria. The main criteria used were: classification according to raw or basic material; degree of processing; function; and economics activities. In addition, the industrial origin criterion was taken into account when compatible with the main criteria. This

means that, ideally, each subheading of the HS should contain only goods that are normally produced by a single industry.

Exceptions in the applicability of the industrial origin criterion occur for many reasons. In some cases, it is impossible for customs officers to distinguish the industrial origin of goods on the basis of their physical properties (for example, it can be difficult to distinguish between raw furskins of rabbits that were hunted or trapped and those that derive from meat processed in slaughterhouses). In other cases, a distinction could lead to categories that are not significant in international trade.

3.2 The Central Products Classification

The CPC is the product nomenclature developed and maintained by the United Nations Statistics Division (UNSD). It is a general framework for the international comparison of various kinds of products' statistics and serves as a standard reference in the harmonization process of international economic classifications. It provides a basis for recompiling statistics from their original classification into a standard system for data collection and dissemination of statistics. It covers goods as well as services.

Products in the CPC are classified into categories according to their physical properties and intrinsic nature, as well as their industrial origin. The criterion of industrial origin means that each subclass of the CPC includes goods or services that are predominantly produced in a specific ISIC class or classes. The "physical properties and intrinsic nature" of goods refers to the same principle used in the HS, since the CPC categories for transportable goods (sections 0–4) are constructed by aggregating one or more headings or subheadings of the HS.

The CPC has a five-digit hierarchical structure organized in sections (identified by the first digit), divisions (second digit), groups (third digit), classes (fourth digit) and subclasses (fifth digit). The content of categories is clarified in the explanatory notes.

The current version is *Ver* 2.1 and was released in August 2015. The classification is provided along with the correspondence tables between the CPC 2.1 and the HS 2017 and ISIC Rev. 4 (UNSD Classification Registry, 2015). The CPC 2.1 also includes an official annex developed by FAO called *CPC expanded for agricultural statistics*. The structure provides additional detail on primary agricultural products (including crops, livestock and primary livestock derived products, such as hides and skins) and is obtained by adding two digits beyond the lowest level of the CPC.

3.3 The International Standard Industrial Classification of All Economic Activities

The ISIC is developed and maintained by the UN. It covers productive activities as defined by the production boundary of the System of National Account (SNA)[11]. It provides a set of activity categories to be used for collection and dissemination of statistics according to such categories.

Activities are structured in a hierarchy of mutually exclusive categories of four levels. The highest level has an alphabetical code and divides all economic activities into 21 categories. Sections are further divided into 88 divisions identifiable by a two-digit code, 238 groups identified with three-digit codes and 419 categories identified by a four-digit code.

[11] "Production is an activity carried out under the responsibility, control and management of an institutional unit, in which labour and assets are used to transform inputs of goods and services into outputs of other goods and services" (United Nations, 2009).

The content and scope of each category is clearly given in the explanatory note, which provides a detailed description of the boundary.

The ISIC classification is constructed following a production-oriented or supply-based concept. In principle, similarity of activities is determined by the inputs of goods, services and factors of production, the process and technology of production, the characteristics of the outputs and the use to which outputs are applied. The weights assigned to these types of criteria may vary from one category to another and between different levels of the classification.

4 NWFPs in international statistical systems

This section describes how NWFPs are considered and where they are located in the HS 2017, CPC Ver.2.1 and ISIC Rev.4, as well as in some national classification systems.

4.1 NWFPs in HS 2017

NWFPs are scattered under a wide range of categories in the HS 2017. However, at subheading level (six-digits), many of them have been well specified (for example, different species of edible nuts, natural cork, bamboo and rattan used for plaiting, natural gums and latexes). On the other hand, some NWFPs cannot be properly identified in the system – mushrooms and truffles (fresh or chilled, provisionally preserved and processed) are covered by two items – one includes the *Agaricus* spp. and one of undefined, "Other than Agaricus mushrooms". Animal products that include meat, hides, skins, trophies and furskins, although specified by species, do not have any other features that distinguish products derived from wild forest animals from those of wild farm-reared animals.

One of the reasons that NWFPs cannot be easily identified in this system is that the HS 2017 classifies commodities mainly based on physical characteristics and is therefore not sufficiently detailed to identify the origin of seemingly identical products (NWFPs or products from agriculture or horticulture). For example, the subheading "Mushrooms other than Agaricus" is a broad category that includes many kinds of mushrooms, either collected from forests or cultivated, so it is not sufficiently detailed to identify forest mushrooms. It is important to understand the relevance of each one of them in the NWFP statistics. Once detected, the products can be separated from other items in the category and assigned their own code.

Some countries or regions have, according to their needs, developed more detailed categories (more than six digits) for NWFPs in their national extended versions of HS nomenclature. Here are some examples of how China, Thailand and the European Union deal with certain NWFPs in their more detailed trade codes (8-digits or more) under the common 6-digit codes used in HS.

Case 1. China

Many NWFPs are classified according to an eight-digit system based on species, genus or use. The NWFPs for which China provides a more detailed classification than the international HS include a wide variety of food products, gums and resins, and raw vegetable materials for different uses. In fact, the class of "Mushrooms other than *Agaricus*" is further specified through separate codes for each major species in the country. These include some commonly cultivated species such as shiitake (*Lentinula edodes)*, winter mushrooms (*Flammulina velutipes*) and paddy straw (*Volvariella* spp.), and some that are collected in the wild such as *Boletus edulis*, *Tricholoma mongolicum Imai* and Sungmo. The broad class of "Vegetables not elsewhere classified" is expanded through detailed codes for forest products such as bamboo shoots (fresh, in brine and dried) and dried wild brake. Other food NWFPs provided at higher classification levels include

edible nuts. Nuts that are not categorized in the international HS but are specified in China's HS are gingko nuts and pine nuts. Furthermore, the international HS item of "Other natural gums, resins and gum resins" is further specified by four detailed codes that identify gum tragacanth, asafoetida, pine resin and olibanum/myrrh/dragon's blood. Finally, in addition to bamboo and rattan, detailed trade code identifies other vegetable materials for plaiting providing a separate code for raw vegetable material for tanning or dyeing.

Case 2. Thailand

Thailand developed codes that identify products at the 11-digit level. The classification provides many detailed codes relevant to NWFPs: bamboo shoots have a specific code depending on whether they are processed, fresh or dried; the class of gums and resins is expanded with codes for lac, damar, balsams, kobuak powder, catechu, gum benjamin and tragacanth; the class of latexes (balata gutta-percha and similar) is further specified by a code for jetulong; vegetable materials other than bamboo and rattan that are used for plaiting are reeds and osier; two other vegetable products identified at detailed level are nipa leaves (for rolling cigarettes) and barks (for tanning). Furthermore, Thailand is one of the very few cases providing detailed codes for edible insects, identifying house crickets, grasshoppers and bamboo caterpillars. This is not surprising and likely due to the fact that insect rearing has emerged as a significant economic activity in the country over the past two decades (FAO, 2013b).

Case 3. European countries

Derived from the HS, the Combined Nomenclature (CN) is the European Union's classification system for externally traded goods (both intra- and extra-community) and those with a customs tariff. The nomenclature is revised each year and published in the Official Journal of the European Union. Each CN subheading has an eight-digit code – the first six relate to the headings and subheadings of the HS nomenclature, while the seventh and eighth identify the CN subheadings. Some NWFPs (mostly food products) can be identified through the additional two digits. Forest fresh mushrooms such as Chanterelles (*Cantharellus cibarius* Fries and *Cantharellus friesii* Quélet) and Boletus have a product code, edible pine nuts and pecans have a detailed code, and game meat has a code under the HS subheading of "Meat not elsewhere classified". This CN subheading includes furred game – fallow deer, roe-deer, chamois or izard (*Rupicapra rupicapra*), moose or elk, goat-antelope, antelope, gazelles, bears and kangaroos – and feathered game (wild pigeons, wild geese, wild duck, partridges, pheasants, woodcock, snipe, grouse, ortolans and ostriches).

4.2 NWFPs in the CPC

Products in the CPC are classified according to their physical properties and intrinsic nature, as well as their industrial origin. The CPC provides a group for NWFPs under the section of agriculture, forestry and fishery products[12].

Section	0	Agriculture, forestry and fishery products
Division	03	Forestry and logging products
Group	**032**	**Non-wood forest products**

[12] This group was proposed by FAO as a revision of CPC 1.1 and adopted CPC version 2.

The group is divided into five classes that further specify four subclasses. Below is an overview of the group.

Class	**0321**	**Natural gums and resins, gums-resins and oleoresins**
Subclass	03211	Balata, gutta-percha, guayule, chicle and similar natural gums in primary forms or in plates, sheets or strip
Subclass	03219	Lac, resins, balsams, natural gums and other resins n.e.c.
Class	**0322**	**Natural cork, raw or simply prepared**
Subclass	03220	Natural cork, raw or simply prepared
Class	**0323**	**Wild edible products**
Subclass	03230	Wild edible products
Class	**0324**	**Parts of plants, without flowers or flower buds, and grasses, mosses and lichens, suitable for ornamental purposes**
Subclass	03241	Christmas trees
Subclass	03249	Other parts of plants, without flowers or flower buds, and grasses, mosses and lichens, suitable for ornamental purposes
Class	**0325**	**Vegetable materials of a kind used primarily for plaiting or as stuffing or padding; raw vegetable materials of a kind used primarily for dyeing or tanning; vegetable products n.e.c.**
Subclass	03250	Vegetable materials of a kind used primarily for plaiting or as stuffing or padding; raw vegetable materials of a kind used primarily for dyeing or tanning; vegetable products n.e.c.

The explanatory notes clarify that wild edible products classified under this group are edible products that exist only in the wild. If they are also cultivated (farmed), they should be classified under the agricultural division. This requirement of exclusive existence in the wild implies that:

1) many NWFPs are classified under the agricultural division and, consequently, are not accounted for in international statistics as they cannot be properly identified;

2) the same products could be classified in different categories in different countries, depending on how they were acquired.

The former makes it difficult to separate NWFPs from other products in the statistics, while the latter makes international comparison and compilation of NWFP statistics difficult.

As a result, although there is an individual group for NWFPs in the current CPC, they also exist in other groups or divisions. Many species of mushrooms, nuts and fruit, even if collected in the forests, are counted as agricultural products. A similar problem arises when classifying wild meat; as it matches several classes of meat products specified according to species, data compiled following these categories are not sufficient to identify the origin of the meat – whether it is wild, farmed or somewhere in between e.g. wildlife farming.

Similar to the HS 2017, some classes are not further detailed at subclass level. These categories are broad and cannot provide clear and detailed information on some NWFPs. This problem affects, in particular, classes 0325 ("Vegetable materials of a kind used primarily for plaiting or as stuffing or padding; raw vegetable materials of a kind used primarily for dyeing or tanning; vegetable products n.e.c.") and 0323 ("Wild edible products").

It should be noted that the current general FAO definition of NWFPs includes goods derived from trees outside forests[13]. This means that products such as fruit, nuts and rubber are considered NWFPs, irrespective of the production system, forest or agriculture. Consequently, in addition to the CPC categories mentioned above, further categories of agricultural products match the FAO definition of NWFPs. This implies further problems in drawing a clear boundary between NWFPs and agricultural products.

4.3 NWFPs in the ISIC Rev. 4

The ISIC classification is constructed following a production-oriented or supply-based concept. In principle, similarity of activities is determined by the inputs of goods, services and factors of production, the production process and technology used, the characteristics of the outputs and the use to which the outputs are applied. The ISIC classifies the gathering of NWFPs in natural or planted forests. The explanatory note clarifies the extent of the group.

Section: A – Agriculture, forestry and fishing

Division: 02 – Forestry and logging

These activities can be carried out in natural or planted forest

Group: 023 – Gathering of non-wood forest products

Class: 0230 – Gathering of non-wood forest products

[13] The FAO definition of trees outside forest in the *Global forest resources assessment 2010* is as follows: "Trees outside forests' refers to trees found on lands that are not categorized as 'forest' nor as 'other wooded land'. They include trees (isolated, linear and groups or stands of trees and tree systems) found in rural landscapes (e.g. on farms, in fields, pastures and various forms of horticulture and agroforestry systems, in hedges, along roads and streams) and in urban settings (e.g. on private or public lands and along streets)".

This class includes the gathering of non-wood forest products and other plants growing in the wild.

This class includes:
- gathering of wild growing materials:
  · mushrooms, truffles;
  · berries;
  · nuts;
  · balata and other rubber-like gums;
  · cork;
  · lac and resins;
  · balsams;
  · vegetable hair;
  · eelgrass;
  · acorns, horse chestnuts;
  · mosses and lichens.

This class excludes:

- managed production of any of these products (except growing of cork trees), see division 01;
- growing of mushrooms or truffles, see 0113;
- growing of berries or nuts, see 0125;
- gathering of fire wood, see 0220.

Furthermore, it has a class for hunting activities that is relevant to NWFPs:

Section: A – Agriculture, forestry and fishing

Division: 01 – Crop and animal production, hunting and related service activities

Group: 017 – Hunting, trapping and related service activities

Class: 0170 – Hunting, trapping and related service activities

This class includes:
- hunting and trapping on a commercial basis;
- taking of animals (dead or alive) for food, fur, skin or for use in research, in zoos or as pets;
- production of fur skins, reptile or bird skins from hunting or trapping activities;
- land-based catching of sea mammals such as walrus and seal

This class excludes:
- production of fur skins, reptile or bird skins from ranching operations, see group 014
- raising of game animals on ranching operations, see 0149
- catching of whales, see 0311

- production of hides and skins originating from slaughterhouses, see 1010
- hunting for sport or recreation and related service activities, see 9319
- service activities to promote hunting and trapping, see 9499.

Although the classification clearly distinguishes between the two activities of gathering NWFPs and growing crop products, there is no one-to-one association between activities and NWFPs, thus the ISIC is not appropriate for analysing products at any detailed level.

4.4 Other criteria used to classify NWFPs at the national level

Since there is currently no universally accepted classification of NWFPs, the concepts and methods used in reporting vary across countries, reflecting different ideas, principles and country priorities. Due to the high degree of heterogeneity of such products across regions, most countries report a selected list, based mainly on local importance. In some countries, NWFPs are reported differently in national statistical systems depending on their origin (forest or non-forest); in others, their statistics are reported by the agency traditionally responsible for them for administrative purposes. Below are some country examples that illustrate the variability in reporting.

4.4.1 Japan

The Japan Forestry Agency of the Ministry of Agriculture, Forestry and Fishery produces annual reports. Forestry production includes NWFPs that are both grown and gathered in the wild. Data on forest products released in the statistical yearbook classify forest production into two main groups: logs and minor forest products. Data on logs are based on the Survey on Lumber, conducted by the Statistics Department of the Ministry of Agriculture, Forestry and Fisheries (MAFF); data on minor forest products are based on the Special Forest Products Basic Data survey, conducted by MAFF's Forestry Agency. The yearbook category of minor forest products is detailed as follows: bamboo wood; paulownia wood; charcoal; fuel wood; shiitake mushrooms (dried or fresh); nameko mushrooms; enokitake mushrooms; oyster mushrooms; bunashimeji mushrooms; maitake mushrooms; chestnuts; bamboo shoots; wasabi horseradish; crude urushi lacquer. Further datasets on special forest products include the production of matsutake mushrooms and log bedding for growing shiitake mushrooms.

4.4.2 Republic of Korea

Korean Official Statistics provide data on forest products via the Statistical Information Service (KOSIS) database. Statistics are detailed and comprise a wide variety of products, including those picked in forests (pine mushrooms, edible plants, medical plants, etc.) and those cultivated in mountains (chestnuts, pine nuts, edible plants, etc.). Jujubes, walnuts, bitter persimmons and plants for landscape uses are also included in reports on NWFPs.

4.4.3 Brazil

The Brazilian Institute of Geography and Statistics (IBGE) provides the result of an annual survey on the amount and value of production obtained through exploitation of natural forest resources, called plant extraction. The survey covers forest products that are found in natural stands – that is, those that grow independently of any human interference/management (thus effectively "wild"). Products from planted forests

are investigated in other surveys. Thus, forest products are investigated in different surveys according to the state (native or cultivated) in which they grow. The information collected is then presented according to a classification based on product use. Categories include the following:

- latexes;
- non-elastic gums;
- wax;
- fibres;
- tanning materials;
- oleaginous products, food products;
- aromatic, medicinal, dyeing material.

Products included in each category are fully described in the methodological notes of the survey. Furthermore, these products are coded in a comprehensive nomenclature of products from the agricultural and fisheries sectors. The nomenclature (ProdList) is harmonized with the existing international classifications of products and activities, and is designed to standardize the nomenclature of products used in the IBGE surveys. The ProdList definition relies on the following principles:

- Continuity with the list of products used in the different surveys conducted by IBGE.
- Harmonization with the Mercosur Common Nomenclature (national classification for external trade), the FAO commodity list and the CPC. The association is provided, along with the list of products.
- Listing products according to the National Classification of Economic Activities, i.e. agriculture, forestry, forest exploitation, fishing and related services.

5 NWFPs in existing classification systems and specific recommendations for improvements

Location of major NWFPs in international classification systems

This section shows the results of analyses carried out by tracking NWFPs in international classification systems, and makes suggestions for possible improvements. Table 1 provides an overview of the existing codes of NWFPs at the most detailed level in the existing international reference classification of products: the HS 2017, the CPC Ver.2.1 and ISIC Rev.4. The table provides a list of products and describes where they can be found in existing classifications. It does not provide an exhaustive list of all NWFPs, but does show some of the main products.

Table 1. NWFPs in ISIC Rev.4, HS 2017, CPC Ver.2.1

Product	Correspondences		
	ISIC Rev.4	HS 2017	CPC Ver.2.1
Plant-based products			
Food			
- Mushrooms and truffles	**ex**0230; **ex**1030	**ex**0709.51/ **ex**59; **ex**0711.51/ **ex**59; **ex**0710.80; **ex**0712.31- **ex**39; **ex**2001.90; **ex**2003.10/ **ex**90;	ex01270;ex03230; ex21330;ex21319;**ex**21330;**ex** 21340;**ex**21393;**ex**21397
- Forest berries	**ex**0230; **ex**1030; **ex**1073	**ex**0810.10/20/30/40/90; **ex**0811.10/20/90; **ex**0812.90; **ex**0813.40//**ex**50;**ex**2006.00; **ex**2008.80; **ex**2008.93; **ex**2008.97; **ex**2008.99;	**ex**01351; **ex**01353; **ex**01354; **ex**01355; **ex**21493; **ex**21496; **ex**21419; **ex**23670; **ex**21499;
- Wild edible nuts	**ex**0230; **ex**1030	**ex**0801.21/.22/.31/.32; 0802.11/.12/.21/.22/.31/.32/.41/.42/.51/.52/ .61/.62/.70/.80/.90; **ex**1207.99; **ex**2001.90;	**ex**03230; ex21419; ex21422-24; ex21429; **ex**21493; **ex**21495; **ex**21496; **ex**21499.
- Bamboo shoots	**ex**0230; **ex**1030	**ex**0709.99; **ex**0711.59; **ex**0710.80; **ex**0712.39; 2001.90; 2005.91	**ex**01290; **ex**21330; **ex**21319;**ex**21399
- Wild edible fruits	**ex**0230; **ex**1030; **ex**1073	**ex**0810.60/70;**ex**0810.90; **ex**0812.90;**ex**0813.40/.50;**ex**2006;**ex**2008. 97; **ex**2008.99	**ex**03230; **ex**01319**;ex**01359; **ex**21496; **ex**21499; **ex**21419; **ex**23670
- Maple syrup/sugar	**ex**1072	1701.20	**ex**23530
Raw materials for medicine, perfumery and aromatic products			
- Bark	**ex**0230	**ex**1211.90	**ex**01930
- Leaves	**ex**0230	**ex**1211.90	**ex**01930
- Ginseng roots	**ex**0230	**ex**1211.20	**ex**01930
- Other roots and part of plants	**ex**0230	**ex**1211.90	**ex**01930
Raw materials for colorants and dyes			
- Bark, Roots, Stems, stalks, leaves and flower, gall nuts	**ex**0230	**ex**1404.90	**ex**03250
- Other	**ex**0230	**ex**1404.90	**ex**03250
Exudates			
- Latex	**ex**0230	4001.30	03211
- Gums and Resins	**ex**0230	1301.20/**ex**90	**ex**03219
- Lac	**ex**0230	**ex**1301.90	**ex**03219
Other plant products			
- Bamboo	**ex**0230	1401.10	**ex**03250
- Rattan	**ex**0230	1401.20	**ex**03250
- Cork	**ex**0230	4501.10/.90; 4502	03220;31921;
- Bark	**ex**0230	**ex**1401.90	**ex**03250
- Christmas trees	**ex**0129	**ex**0604.20	03241
- Ornamental plants	**ex**0230	**ex**0604.20/90	03249
Animal-based products			
- Hides skins trophies			
--Hides and skins	**ex**0170	**ex**4101.20/**ex**.50/**ex**.90; **ex**4102.10/**ex**.21/**ex**.29;**ex**4103.30/**ex**.90	**ex**02951/**ex**02952/**ex**02953/ **ex**02954
--Fur skins	**ex**0170	**ex**4301.10/**ex**.30/**ex**.60/**ex**.80/**ex**.90	**ex**02955; **ex**02959
--Trophies	n/a	**ex**0506.90;**ex**0507.10/**ex**.90;**ex**9601.10/**ex**. 90	**ex**39110
- Wild honey	**ex**0230	**ex**0409	**ex**02910
- Beeswax	**ex**0230	**ex**1521.90	**ex**02960

(*Continued on next page)*

Product	Correspondences		
	ISIC Rev.4	HS 2017	CPC Ver.2.1
Wild meat - Edible insects	**ex**0170	**ex**0208.90	**ex**21170
- Game meat	**ex**0170	**ex**0201.10/**ex**.20/**ex**.30;**ex**0202.10/**ex**.20/**ex**.30; **ex**0203.11/**ex**.12/**ex**.19;**ex**0203.21/**ex**.22/**ex**.29; **ex**0204.10/**ex**.21/**ex**.22/**ex**.23/**ex**.30/**ex**.41/**ex**.42/**ex**.43/**ex**.50; **ex**0205.00; **ex**0208.10/**ex**.30/**ex**.50/**ex**.60/**ex**.90; **ex**0210.11/**ex**.12/**ex**.19/**ex**.20/**ex**.91/**ex**.93/**ex**.99	**ex**21111; **ex**2; **ex**21113; **ex**21114; **ex**21115; **ex**21116; **ex**21117; **ex**21118; **ex**21119; **ex**21131; **ex**21132; **ex**21133; **ex**21134; **ex**21135; **ex**21136; **ex**21137; **ex**21138; **ex**21139; **ex**21170

Note: The term "ex" indicates a partial correspondence between the products under the table categories and those of ISIC/HS/CPC.

The table highlights that all animal-based products are partially associated across all of the international systems. The HS and the CPC make no distinction between animal products derived from ranching activities (agricultural products) and those deriving from their natural habitat (forestry products). The ISIC, however, has one specific code (0170) for these activities, even though it is intended for the production of several items, foods, skins, fur skins, reptile or bird skins, and the catching of sea mammals.

Another problem that arises concerns the CPC group of vegetable NWFPs. In particular, the subclasses of wild, edible products (03230) and vegetable materials (03250) cover broad varieties of NWFPs. The first item is intended for products that exist exclusively in the wild, and the second is for plant products that have many uses: plaiting, stuffing, padding, dyeing and tanning, and also comprises all other vegetable products not categorized in the classification. These two classes are undefined and cover the majority of products that exist in the wild. It is evident, therefore, that there is a need for further breakdown levels to provide classes for detailed statistics.

Finally, the table shows that the HS provides more specific codes for NWFPs than the other two classifications. In particular, bamboo products, rattan, nuts and exudates are fairly well specified and recognizable at the most detailed level.

Key results and recommendations

1. **Mushrooms and truffles.**

The CPC classifies forest mushrooms depending on whether they are exclusively collected in the wild or if they are also grown. In the first case, they are identified as wild edible NWFPs; if not, they are classified as agricultural products. Other categories are then provided for mushrooms and truffles that are prepared or preserved in a certain way (provisionally preserved, dried, frozen, soaked in vinegar or preserved by another method).

CPC classes/subclasses need to be redefined to establish a clearer boundary between agricultural and forest mushrooms. The following definition is proposed:

- Agricultural mushrooms (classed under the agricultural division): *cultivated mushrooms*.
- Forest and other mushrooms and truffles (new subclass under the forestry division of other edible products that exist only in the wild*): mushrooms and truffles collected in the wild or cultivated on live trees*.

Subclasses should also be further defined in terms of species. For agricultural mushrooms, the following should be considered: *Agaricus* spp., *Pleutorus* spp., *Volvariella volvacea*, *Lyophyllum shimeji*, *Hypsizygus spp., Ustilago msydis, Lentinus edodes, Flammolina velutipes, Ganoderma spp., Auricularia spp., Pholiota nameko* and *Tremella fuciformis*. For the new subclass of wild edible mushrooms, the following should be considered: *Cantharellus cibarius, Boletus spp., Tricholoma matsutake, Morchella spp., Tuber spp.* and other types of edible mushrooms and truffles gathered from non-forest land (*Terfezia spp. and Tricholoma mongolicum Imai*). For a comprehensive explanation of species proposed, see Annex 1.

The species proposed should also be used to clarify the classes of mushrooms in the HS that separate *Agaricus* from all other species. The economic importance of some forest species is supported by evidence of the international trade value given by countries that identify, through a detailed code, species such as *Boletus spp., Tricholoma matsutake, Tricholoma mongolicum Imai* and *Cantharellus cibarius* (see Annex 1).

2. Forest berries. Both CPC and HS provide categories for fresh and prepared or preserved berries. The existing classifications present two problems. One is that, under the CPC, some types of berries are classified differently in different countries, depending on whether they are exclusively collected in the wild or cultivated or both. Secondly, neither classification is developed in sufficient detail to clearly identify nor separate wild-gathered forest berries from other cultivated berries.

The explanatory note of the agricultural class of berries and other fruits should clearly describe the dual origin of berries specified at the most detailed level. It should be stated that the different species/genera are both grown and gathered in the wild.

Item 0323, described as "Other wild edible products", should be expanded with the introduction of a subclass of wild, edible berries, so that wild-gathered forest berries can be identified separately from other wild, edible products. This will give more clarity to the class of wild edible products.

3. Wild edible nuts. Both classifications provide categories for in-shell nuts (primary products of agriculture in the CPC), shelled nuts, processed nuts and oleaginous fruits – a category intended to classify fruits and nuts used for the extraction of edible or industrial oils. Detailed codes are provided for in-shell and shelled nuts at species level. Focusing on primary products (in-shell nuts), both classifications identify almonds, cashew nuts, chestnuts, hazelnuts, pistachios, walnuts and Brazil nuts. The HS also provides codes for in-shell macadamia nuts, kola and areca nuts. All species listed in the classifications are cultivated and gathered in the wild, each according to a variable level of proportionality in each country.

Under the CPC, when a product is cultivated and gathered in the wild, it is classified as an agricultural product; therefore, all species mentioned above are deemed agricultural nuts. When a product exists exclusively in the wild, it is classified under the category of wild, edible products. To distinguish between agricultural and forest products, a clarification of the two categories can be made. First, an explanatory note on the agricultural class of in-shell nuts should clearly describe the double origin of nuts specified according to species, whether they are collected in the wild or derive from managed production. Second, the class of wild edible products should be further defined by a subclass of wild edible nuts. Additionally, in both classifications, other forest species of economic importance, such as pine nuts, should be identified at the most detailed level. This proposal is justified by international trade values extracted from data provided by the national extended versions of the HS of European Union countries, Belarus, China, Egypt, Georgia, Oman, Pakistan, Qatar, Russian Federation, Turkey and Saudi Arabia, which have a detailed code for pine nuts (see *Annex 7*). Further investigations are also required to get a better understanding of the importance of other edible nuts that are not specified.

Nuts are also included in the oil seed and oleaginous fruits categories, which aim to classify fruits that are used to make edible or industrial oils. Both classifications have a residual class that includes karité nuts

(*Vitellaria paradoxa*, formerly *Butyrospermum parkii*), tung nuts (*Aleurites fordii*), and other nuts and seeds. Further investigations are required to understand the importance of the species listed in this category to assign them a detailed code.

4. Bamboo shoots. These have a detailed classification only in the HS under the section for prepared foodstuffs. All other categories that classify bamboo shoots are residual classes that group the product with other vegetables. To better identify the product, both classifications need to separate bamboo shoots from the residual categories in which they appear. For fresh, provisionally preserved and dried bamboo shoots, their high international trade value – as evidenced by countries that have developed separate codes for them – highlights their importance. Other evidence lies in the large volumes of production recorded in statistical datasets for some countries, for example China (see *Annex 4*).

5. Maple sugar and syrup. While the HS provides a detailed code (170220) that exactly identifies each of these two products, the CPC classifies each one as a part of a class that encompasses refined cane or beet sugar, in solid form, that contains added flavoring or coloring. The products can also be identified separately, further dividing the class. At present, the two most important producers of maple sugar and syrup (Canada and the United States of America) have developed three separate, detailed (seven digit) codes for maple syrup, maple butter and maple sugar in the North American Product Classification System (NAPCS 2012) (see *Annex 2*).

6. Bark. Both the CPC and the HS classify bark by means of two criteria: one according to its primary use; the other considers bark as a by-product of the wood processing industry. Bark as a NWFP concerns categories designed according to the use.

Bark used in perfumery or pharmaceuticals inherits the HS heading 12.11, which is described as "Plants and parts of plants (including seeds and fruits), of a kind used primarily in perfumery, in pharmacy, or for insecticidal, fungicidal or similar purposes, fresh or dried, whether or not cut, crushed or powdered". The category does not separate bark from other parts of plants, but the explanatory notes clarify the subject of the heading and lists, by species and part of species, the products that are included (Elder, *Sambucus nigra*: flowers and bark; Sassafras, *Sassafras officinalis*: bark, roots and wood, etc.). In the CPC, this class is covered by the agricultural section and it is not possible to identify forest products separately. Thus, it is necessary to refine the explanatory notes of the CPC class of plants used in pharmaceuticals and perfumery with a description of products that are the output of cultivated plants and plants gathered in the wild.

Bark used for plaiting, dyeing and tanning. The CPC group of NWFPs comprises a broad class (03250) of vegetable materials used for such purposes and those not categorized in the classification. The class is defined through an HS heading/subheading clarifying that the plaiting material includes the bark of several varieties of lime (*Tilia* species), and the bark for dyeing and tanning includes oaks of various kinds (including the black oak quercitron and the second bark of the cork oak): chestnut, silver birch, sumach, young fustic, wattle, mimosa, mangrove, hemlock and willow. (For a more comprehensive description of species included, see *Annex 11*.) The class comprises a wide variety of NWFPs and is not able to provide detailed statistics on forest products. Therefore, it is proposed to split the CPC class 0325 into three subclasses that separate the vegetable materials according their use, as follows:

- plaiting, or as stuffing or padding;
- dyeing or tanning;
- vegetable products n.e.c.

Bark should be listed as one of the products included in the new subclass of dyeing and tanning materials.

7. Latexes. Latexes identified in the classification systems are grouped into two categories. One is designed for natural rubber that includes "the liquid secreted principally by rubber trees, in particular, by *Hevea brasiliensis*". The other is intended for balata, gutta-percha, guayule, chicle and similar natural gums. In the HS, the two classes are under the chapter of "Rubber and articles thereof", while the CPC makes a distinction between natural rubber, which is considered an agricultural product, and other rubber-like products, which are covered by a detailed code in the forestry section.

Although rubber is mostly obtained by cultivating rubber trees, in some countries it is also collected in the wild. At a national level, official figures are released by the Brazilian Institute of Geography and Statistics (IBGE), which annually provides the quantity and value of *Hevea brasiliensis* latex, both in liquid and coagulated form, extracted from natural forest. Furthermore, field studies detect the importance of wild collection in some African countries.

In order to make the CPC class of rubber exhaustive of all products included and allow further expansion for wild collection, it is proposed to provide a description of the different origins of the product, whether from an agricultural or a forest system. However, the subclass of balata, gutta-percha, guayule, chicle and similar natural gums requires other specifications (see *Annex 8*).

8. Gums and resins. This category of products is well defined in both classifications. The CPC provides a detailed category (03219) of "Lac, resins, balsams, natural gums and other resins" under the NWFP group. Detailed definitions are provided through the reference to the HS that has two codes for gum arabic and other lac; natural gums, resins, gum resins and oleoresins. The explanatory note clearly specifies the products included, provides definitions and lists species. The main products included are the following:

> *1. Gum arabic (from various acacias) (sometimes also called Nile gum, Aden gum, Senegal gum); gum tragacanth (obtained from certain varieties of Astragalus); basra gum; Anacardium (gum of the cashew nut tree); Indian gum; certain so-called 'indigenous' gums various species of Rosaceae, such as cherry, plum, apricot, peach or almond trees.*
>
> *2. Fresh oleoresins (liquid) of the pine (including turpentine), fir or other conifers (crude or refined), as well as conifer resins (galipot, etc.) which are dried on the incision on the tree and which contain vegetable waste*
>
> *3. Copal (India, Brazil, Congo, etc.), including fossil copal; kauri gum; damar; mastic; elemi; sandarac; dragon's blood.*
>
> *4. Gamboge; gum ammoniac; asafoetida; scammony; euphorbia; galbanum; opoponax; olibanum or incense; myrrh; acaroid; guaiacum.*
>
> *5. Gum benzoin; styrax or storax (solid or liquid); tolu balsam; Peruvian balsam; Canada balsam; copaiba balsam; Mecca balsam; thapsia.*
>
> *6. Cannabis resin (crude or purified) obtained from the Cannabis plant (Cannabis resin is a narcotic drug).*

Further investigation is required to understand the statistical relevance of each single product of the list for an eventual proposal of a new code (see *Annex 9*).

9. Bamboo and rattan. The CPC classifies bamboo and rattan under a broad class (0325) of NWFPs. The class is intended for (undefined) vegetable materials that have various uses such as plaiting, stuffing, pad-

ding, dyeing and tanning. A split is therefore needed and should distinguish vegetable materials used primarily for plaiting as a separate CPC subclass. Then, the explanatory notes should clearly list bamboo and rattan as products included in the new subclass. This would be consistent with the HS – it provides two detailed codes for bamboo and rattan respectively under the heading "Vegetable materials used primarily for plaiting" – and will make the class more exhaustive.

Bamboo and rattan have many other codes as they are considered as wood products, wood charcoal and manufactured products. For all of these references, see *Annex 4*.

10. Cork. Cork is a well-defined product in both classifications. Codes at the most detailed level are provided for cork in all of its forms: natural, semi-processed and processed. It is linked to NWFPs when natural, raw or simply prepared. This is the way the CPC defines the product at class level under the group of NWFPs. No further specifications at subclass level are provided. The CPC description inherits the HS definition, which says:

> "*Raw cork is presented in curved slabs as stripped from the cork tree. Natural cork, simply prepared includes cork which has been surface scraped or otherwise cleaned …the cracker outer layer remaining, or with the edges cleaned to remove parts unsuitable for use (trimmed cork)*." (Subheading note 1 to Chapter 45).

No further specifications for the product are required (see *Annex 3*).

11. Hides, skins and trophies. The CPC defines hides and skins as fresh or preserved, raw hides and skins of bovine, equine, sheep or lambs and goats or kids, and each typology has a code at the most detailed level. The explanatory notes clarify the species from which hides and skins are derived by cross-references to the subclasses of living animals. The CPC also provides a residual class of "Other raw hides and skins", which includes hides and skins of reptiles, birds, fish, swine and peccaries; and mammals, such as deer, chamois, dog, elk, gazelle, reindeer and roebuck. Similar categories are provided by the HS, but further principles beyond the species are considered (such as weight, the process they may have undergone, etc.). (For a more comprehensive description, see *Annex 10*).

Raw furskins have a detailed code (02955) defined by the HS heading 4301. The HS explanatory note clarifies that:

> "*Furskins are regarded as raw and falling in this heading not only when in the natural state, but also if cleaned and preserved from deterioration, e.g. by drying or salting (wet or dry). The fur may also be 'pulled' or 'shared', i.e. the coarse hairs extracted or cut down, or the skin surface may be 'fleshed' or 'scraped'*."

Under this heading, the HS provides detailed codes for raw furskins of mink, fox and lamb (Astrakhan, Broadtail, Caracul, Persian and similar lamb, Indian, Chinese, Mongolian or Tibetan). All other kinds of furskins are covered by the residual category of "Other furskins".

Both classifications include pelts from either wild or farm-reared animals. The explanatory notes of the two classifications should be redefined, with a clear indication of the origin of the animal (farm-reared or wild) used to produce the hides, skins and furskins. This way, the classifications can be expanded with further subclasses of wild animal hides, skins or furskins if the evidence from statistical data indicates a need. This is the case of the Russian sable (*Martes zibellina*), one of most valuable furskins. It is coded in the HS national classification of the Russian Federation, with a value of exports in 2013 of US$181 million.

Under the HS chapter on products of animal origin, there are two headings that classify parts of animals that can be considered as raw material for trophies. Heading 0506 includes bones and horn-cores; heading 0507 includes ivory, tortoise-shell, whalebone and whalebone hair, horns, antlers, hooves, nails, claws and beaks. The CPC provides a code (39110) for "Raw offal, inedible", which represents a broad category, including:

> "*Skins and other parts of birds, with their feathers and down, not further worked than cleaned, disinfected or treated for preservation; feather powder and waste; bones, horns, hooves, teeth, turtle shells, ivory and the like, unworked or simply prepared.*"

12. Edible insects. In both the HS and the CPC, edible insects fit the residual category of "Other meat", subheading 020890 and subclass 21170, respectively.

While the explanatory notes of the HS clarify that the category of live animals also includes insects, the CPC needs a clearer description by making reference to the existing category of live insects (butterflies, beetles, moths, silk-worms, larvae, scorpions, worms and leeches), and should mention the inclusion of insects, whether farmed or gathered in the wild.

At a national level, Thailand is the only country that provides specific codes for edible insects. In the national extended version of HS, three expansions of the international HS "Other meat" (020890) identify house crickets, grasshoppers and bamboo caterpillars (see *Annex 6*).

13. Wild meat. The current international HS and CPC include categories for fresh or processed meats of bovine, swine, ovine, equine, poultry and other kinds. Detailed levels specify species and the specific cut of the meat. Game meat is scattered across these categories with no differentiation as to whether they are wild or farmed. It has been proposed that the distinction between agricultural and forestry products should be retained to clarify the CPC explanatory notes on the two classes relevant to game meat – "Meat of mammals" and "Other meat and edible offal" – with the following descriptions:

- The meat of animals directly harvested from the wild through hunting or trapping activities (ISIC 0170-Hunting, trapping and related service activities).
- The meat produced through the rearing and breeding of animals (ISIC 014 – Animal production).

The class will be more exhaustive and allow further expansions of meat of wild game if required. The identification of major hunted species belonging to other subclasses/subheadings requires further investigation (see *Annex 5*). It is important to note that these figures do not take into account wild meat for subsistence (also referred to as bushmeat); more targeted household surveys are needed to fill this data gap.

Other NWFPs. The products described in the section are not comprehensive of all existing NWFPs. Other products, such as fodder, honey, wax and tropical fruits are omitted for two main reasons: the first is that some products have a small volume and are collected in only a few countries; the second is that, in some cases, it is quite difficult to establish a clear boundary between agriculture and forestry. This latter issue is linked to terminology and definitions, and requires further research and vetting among experts to resolve. However, all of these products can continue to be reported at higher digit levels in countries where they are important.

6 Conclusions and next steps

The importance of forests in contributing to food security, nutrition, community health, energy and employment is clearly recognized at international, national and local levels. However, there is a major data gap in current global NWFP statistics. Even when information is available, it is often partial or fragmented and lacks comparability across countries and over time. This imbalance has led to an underestimation of existing and potential socioeconomic benefits, and, furthermore, of the full economic contribution of forests.

This report found, however, that NWFPs are recognizable under a wide range of categories in the three international schemes HS, CPC and ISIC, although with varying levels of detail. The HS enable the highest level of product detail and provides more specific codes than the other two classifications which in most cases, include NWFPs as a part of a larger product category. In the CPC, particularly important classes such as those of wild edible products and raw vegetable materials do not have a detailed code by which to identify products within that class. Similarly, the ISIC identifies specific groups of NWFPs but intended for the production of several items.

NWFPs, moreover, are often classified under agricultural categories without any distinction between wild and farmed produce. Therefore a clear boundary between agriculture and forest products is needed for the purposes of gathering statistics, especially for the identification of food items. For the CPC this could be based on the source of production (also making this compatible with the ISIC), although such a distinction could not be made so easily within the HS apart from using species as proxies for wild or cultivated production.

Some NWFPs are classified in broad residual categories which cover a wide variety of products. It is essential to understand the importance of forest items included in these residual categories and eventually to categorize them under a separate code. Nonetheless, some of major groups of products are well-specified, i.e. maple products, cork, bamboo and rattan, gums and resins.

In this complex picture of NWFPs, statistics practitioners are recommended to adopt the internationally agreed framework of statistical standards. The guidance on NWFPs outlined in this report is suggested as a starting point for data collection and compilation. Details on products and suggested improvements allow users to collect and compile internationally comparable data according to their priority needs.

It must be said that national statistics on NWFP production often refer to the marketed production and do not include the quantity used for self-consumption or sold/exchanged through informal sector transactions. Consequently, the amount of wild harvested production will be much higher than the existing data sources show. This magnitude can be captured through targeted household surveys.

The findings of this report suggest the need for further actions to be undertaken in the medium to long term to improve NWFPs statistics, including:

- Further clarify definition and classification issues.
- Improve awareness of and collaboration with national statistical agencies, trade associations, CITES national management authorities and related entities regarding data collection on NWFPs and associated terminology challenges.
- In order to harmonize the data, strengthen collaboration between FAO and the international agencies responsible for the maintenance, updating and revision of reference classification of products, UNSD and WCO.

- Compile and present existing FAO data on NWFPs under the improved reference classification systems.
- Work on developing methodologies to capture, estimate and analyse statistics on NWFPs' informal sector and self-consumption.
- Facilitate capacity development and knowledge exchange between FAO and statistics end-users.

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8 Annexes

8.1 Edible mushrooms and truffles

Description

Mushrooms and truffles are the fleshy and edible part of several species of fungi. They grow either above ground (including on trees) or underneath and are typically found in forests. Many types of mushrooms are traditionally considered NWFPs, but of those produced and traded, the majority are commercially cultivated species rather than fungi collected in the wild.

Although mushrooms and truffles are found all over the world, species that are harvested in significant quantities tend to grow in a limited number of countries, and there is considerable regional variation in the importance of different species and types. Consequently, the availability of data and species covered in national and international statistics is likely to vary between countries and regions.

Existing classification

Central Product Classification (CPC Ver.2.1)

The CPC classifies mushrooms and truffles in one of two sections, depending on whether they are a food product (prepared or preserved) or an agriculture and forestry product. In the latter case, they occupy one class under "Agricultural products" and one under "Forestry products as wild, edible products" (code 0323). The classification separates wild, edible products from cultivated products. The explanatory note states that if the wild, edible products are cultivated as well as growing in the wild, they should be classified as agricultural products.

Prepared and preserved mushrooms occupy four different classes, depending on the specified process used – provisionally preserved, kept in vinegar, dried or otherwise prepared. Regarding the first three of these processes, mushrooms are included with other vegetables listed in the explanatory notes, so cannot be identified by a specific code; mushrooms that are otherwise prepared have a subclass code.

Section	**0**	**Agriculture, forestry and fishery products**
Division	01	Products of agriculture, horticulture and market gardening
Group	012	Vegetables
Class	0127	Mushrooms and truffles
Subclass	**01270**	**Mushrooms and truffles**
Division	03	Forestry and logging products
Group	032	Non-wood forest products
Class	0322	Other wild, edible products
Subclass	**03220**	**Other wild, edible products** *This subclass includes:* *- edible products that exist only in the wild.* *This subclass does not include:* *- edible products that exist in the wild and are also grown (controlled), cf. the corresponding subclass of division 01*
Section	2	Food products, beverages and tobacco; textiles, apparel and leather products
Division	21	Meat, fish, fruits, vegetables, oils and fats

Group	213	Prepared and preserved vegetables, pulses and potatoes
Class	2131	Frozen vegetables, pulses and potatoes
Subclass	**21319**	**Other vegetables and pulses, frozen**
Class	2133	Vegetables provisionally preserved
Subclass	**21330**	**Vegetables provisionally preserved** *The subclass is defined through the HS heading 0711(includes mushrooms and truffles)*
Class	2134	Vegetables, pulses and potatoes, preserved in vinegar or acetic acid
Subclass	**21340**	**Vegetables, pulses and potatoes, preserved by vinegar or acetic acid** *This subclass includes vegetables and pulses, preserved in vinegar or acetic acid, such as: mushrooms*
Class	2139	Other prepared and preserved vegetables, pulses and potatoes
Subclass	**21393**	**Dried potatoes and other dried vegetables** *The subclass is defined through the HS heading 0712* It includes *Agaricus, Auricularia* spp., *Tremella* spp. and other mushrooms and truffles
Subclass	**21397**	**Mushrooms and truffles, otherwise prepared or preserved**

Harmonized Commodity Description and Coding System (HS 2017)

The HS identifies mushrooms and truffles in Chapters 7 and 20. The first includes edible vegetables, roots and tubers, and distinguishes between fresh, provisionally preserved and dried mushrooms. The second classifies prepared vegetables, fruit, nuts or other parts of plants. Both chapters define mushrooms, separating the genus *Agaricus* from other species. Only the heading dried mushrooms, in addition to the genus *Agaricus*, defines two other species – *Auricularia spp*. and *Tremella spp*.

Chapter	**7**	**Edible vegetables and certain roots and tubers**
Heading	**07.09**	**Other vegetables, fresh or chilled**
		- Mushrooms and truffles:
Subheading	0709.51	-- Fresh or chilled mushrooms of the genus *Agaricus*
Subheading	0709.59	-- Other
Heading	**07.10**	**Other vegetables (uncooked or cooked by steaming or boiling in water), frozen**
Subheading	0710.80	Other vegetables
Heading	**07.11**	**Vegetables provisionally preserved (for example, by sulphur dioxide gas, in brine, in sulphur water or in other preservative solutions), but unsuitable in that state for immediate consumption**
		- Mushrooms and truffles:
Subheading	0711.51	-- Mushrooms of the genus Agaricus
Subheading	0711.59	-- Other
Heading	**07.12**	**Dried vegetables, whole, cut, sliced, broken or in powder, but not further prepared**

		- Mushrooms, wood ears (*Auricularia* spp.), jelly fungi (*Tremella* spp.) and truffles
Subheading	0712.31	-- Mushrooms of the genus Agaricus
Subheading	0712.32	-- Wood ears (*Auricularia* spp.)
Subheading	0712.33	-- Jelly fungi (*Tremella* spp.)
Subheading	0712.39	-- Other
Chapter	**20**	**Preparations of vegetables, fruit, nuts or other parts of plants**
Heading	**20.03**	**Mushrooms and truffles prepared or preserved otherwise than in vinegar or acetic acid**
Subheading	2003.10	- Mushrooms of the genus Agaricus
Subheading	2003.90	- Other

Assessment

The current classifications exhibit two main problems. The first is that some types of mushrooms may be classified differently among countries under the CPC, depending on whether they are exclusively collected in the wild or cultivated. Secondly, neither classification is developed in sufficient detail to enable mushrooms and truffles gathered in forests and trees to be identified separately from other types.

Proposed definition and classification

To avoid misclassification under the CPC and retain the distinction between agricultural and forestry products, it is recommended that the two CPC classes/subclasses be redefined as follows:

- Agricultural mushrooms (class): cultivated mushrooms.
- Forest and other mushrooms and truffles (new subclass of other wild, edible products that exist only in the wild): mushrooms and truffles collected in the wild or cultivated on live trees.

For greater clarity, any mushroom or truffle included in one or the other of these subclasses should also be defined by species. These two subclasses (based on species) could also then be used:

- to redefine dried vegetables in the CPC;
- as the basis of an expansion of the HS six-digit codes from the current two codes to four codes (*Agaricus spp*.; other agricultural mushrooms; forest mushrooms and truffles; and other mushrooms and truffles).

Based on current mushroom collection and cultivation practices, these species groups might include the following.

Table 2. Suggested species groups for expanded classification of mushrooms and truffles

Species and classification	Common name(s)	National code(s), definitions and other comments
Agricultural mushrooms		
- *Agaricus* spp.		

Species and classification	Common name(s)	National code(s), definitions and other comments	
- *Agaricus* spp.	*A. bisporus:* button mushroom; common mushroom; white mushroom; cultivated mushroom; table mushroom; champignon mushroom; Portobello mushroom; crimini mushroom *A. campestris:* field mushroom; meadow mushroom	*Agaricus* is the most common cultivated mushroom genus in the world. *A. bisporus* and *A. campestris* are the most common edible species in this genus. The species group is already coded at the six-digit HS level, and this is used by most countries.	
		HS six-digit code:	0709.51 (dried) 0712.31
- Other agricultural mushrooms			
- *Pleurotus* spp.	*P. ostreatus:* oyster mushroom; abalone; tree oyster mushroom; grey oyster mushroom; straw mushroom; flat mushroom; hiratake; píng gū; nấm sò; nấm bào ngư; chippikkoon; sadafi. *P. eryngii:* king trumpet mushroom; French horn mushroom; king oyster mushroom; boletus of the steppes; trumpet royale; cardoncello; xìng bào gū; cì qín gū; cì qín cè ěr; saesongi peoseot; eringi. *P. citrinopileatus:* golden oyster mushroom; tamogitake. *P. cornucopiae:* branched oyster mushroom.	Pleurotus is the second most common cultivated mushroom genus after Agaricus. Originally a mushroom growing on trees, it is now more commonly cultivated on other substrata. Common names can refer to different species (within the genus) in different countries. The species group is defined at the eight-digit HS level in some countries and individual species within the group may also be defined at the 10 digit level (e.g. in Republic of Korea).	
		Republic of Korea HS	0709.59.40.10 (dried) 0712391040
- *Volvariella volvacea*	Paddy straw mushroom; straw mushroom; căogū; kabuteng saging; het fang; nấm rơm	Third most common cultivated mushroom in the world. Commonly cultivated in East and Southeast Asia.	
		China HS	0709.59.40

Species and classification	Common name(s)	National code(s), definitions and other comments	
			(dried) 07123930
- *Lyophyllum shimeji*	Hon-shimeji	The most common type of cultivated shimeji mushroom - usually grown in a mixture of sawdust and grain. No known statistical coding at present.	
- *Hypsizygus spp.*	*H. tessellates:* brown beech or brown clamshell mushroom; Buna-shimeji. (Also known as H. marmoreus). *H. ulmarius:* elm oyster; Shirotamogidake	Other common types of shimeji mushrooms. No known statistical coding at present.	
- *Ustilago maydis*	Corn smut; Mexican truffle	Mostly produced in Mexico. No known statistical coding at present.	
- *Lentinus edodes*	Shiitake; sawtooth oak mushroom; black forest mushroom; black mushroom; golden oak mushroom; oakwood mushroom	*L. edodes* is the fourth most commonly produced mushroom in the world, with production focused in East Asia, Australia and North America. It can be cultivated on a variety of substrates, but shiitake are often grown on logs or sawdust. Included as a forest product in Japan's forestry production statistics.	
		China HS	0709.59.20
		Republic of Korea HS	0709.59.20 (dried) 0712.39.1020
		Japan (import) HS	0709.59.020
- *Flammulina velutipes*	Enokitake; winter mushroom; golden needle mushroom; lily mushroom; velvet foot; velvet stem	Mostly found in East Asia (China, Korea, Japan). Although often cultivated, it usually grows on wood. Included as a forest product in Japan's forestry production statistics.	
		China HS	0709.59.30
		Republic of Korea HS	0709.59.50

Species and classification	Common name(s)	National code(s), definitions and other comments	
- *Ganoderma spp*	Lingzhi or ling chi mushroom; reishi mushroom	Several species of this genus (*G. lucidum, G. tsugae* and *G. sichuanense*) are cultivated on logs or woodchips in East Asia and North America.	
		Republic of Korea HS	0709.59.30 (dried) 0712.39.1030
- *Auricularia spp.*	*A. polytricha:* Cloud ear fungus; black fungus; black Chinese fungus (or mushroom); wood ear fungus; wood fungus; ear fungus or tree ear fungus; bok née; jamur kuping; tenga ng daga; yún'ěr; máomù'ěr; ara-ge-ki-kurage *A. auricula-judae:* Jew's ear; wood ear; jelly ear	Widely collected in China and also reportedly used in Ghana, Poland, Mozambique and Indonesia.	
		HS 0712.32	
- *Pholiota nameko*	Nameko; huázĭ mó; o-pyo-nok; o-pya-ta; butterscotch mushroom	Cultivated and collected in Russian Federation, East Asia and North America. Included as a forest product in Japan's forestry production statistics. No known statistical coding at present.	
- *Tremella fuciformis*	Snow fungus; silver ear fungus; white jelly mushroom; yín ěr; xuě ěr; bái mù ěr; shiro kikurage; nấm tuyết; ngân nhĩ	Cultivated in China, usually on a substrate of sawdust.	
		HS 0712.33	
Other wild edible products			
- Forest and other mushrooms and truffles			
- *Tuber* spp. (truffles)	*T. magnatum:* White truffle; Piedmont Truffle; trifola d'Alba *T. borchii:* Whitish truffle.	Mostly collected in southern Europe, but native truffle species are found elsewhere and some of the more valuable species have been cultivated in North America, Australia and New Zealand.	

Species and classification	Common name(s)	National code(s), definitions and other comments	
	T. melanosporum: Black truffle; Périgord truffle; French black truffle; truffe de Périgord. *T. aestivum:* Summer truffle; St. Jean truffle; Burgundy truffle; truffe de Bourgogne; tartufo nero di Fragno; scorzone; trufa de verano; svart sommartryffel; (also known as *T. uncinatum*) *T. brumale:* Winter truffle *T. indicum:* Chinese truffle *T. macrosporum:* Garlic truffle *T. oregonense:* Oregon white truffle *T. lyonii:* Pecan truffle		
		EC CN 2014	0709.59.50
		China HS	0709.59.60
- *Cantharellus cibarius*	Chanterelle; golden chanterelle; girolle	Common in northern Europe and North America, but also found in Asia and Africa. Forest mushroom, not generally cultivated	
		EC CN 2014	0709.59.10
- *Boletus* spp.	*B. edulis:* porcini; penny bun; porcino; cèpe; cep *B. aereus:* negro's head *B. pinophilus or B. pinicola:* Cèpe des pins; pine tree cep *B. reticulates:* Cèpe d'été; summer cep	Widely distributed across Europe, Asia and North America, and introduced elsewhere. Forest mushroom, not generally cultivated.	
		EC CN 2014 China HS (also Russian Federation, Belarus, Ukraine)	0709.59.30 (dried) 0712.39.50

Species and classification	Common name(s)	National code(s), definitions and other comments	
- *Tricholoma matsutake*	Matsutake, Sungmo, pine mushroom. (Also known as *T. nauseosum*)	Cultivated and collected in East and Southeast Asia, North America and northern Europe. Included as a forest product in Japan's forestry production statistics.	
		China HS	0709.59.10
		Republic of Korea HS	0709.59.10
		Japan (import) HS	0709.59.011
- *Morchella* spp.	Morels	Collected in Europe and North America. No known statistical coding at present.	
- Other wild forest mushroom species n.e.c.	Other types of edible mushrooms that are not cultivated but are collected from forests.	May include: *Sparassis crispa*; *Cantharellus tubaeformis* (tube chanterelle, yellow-leg); *Clitocybe nuda* (Blewit or Blewitt); *Cortinarius caperatus* (gypsy mushroom); *Craterellus cornucopioides* (trompette de la mort, horn of plenty); *Grifola frondosa* (maitake); *Gyromitra esculenta* (false morel); *Hericium erinaceus* (lion's mane mushroom); *Hydnum repandum* (Sweet tooth fungus, hedgehog mushroom, urchin of the woods); and *Lactarius deliciosus* (saffron milk cap)	
- **The following could be grouped as "Other wild mushrooms and truffles".** Other types of edible mushrooms and truffles that are not cultivated but are collected from land other than forests			
- *Terfezia* spp.	Desert truffles; domalan; keme; terfez; terfas; fagga; faq'h; terfase; kamaa (or kima/chima); faqah; zubaydi; turmas; papas crias; mahupu; dombal; khalasi; zubaidi	Desert truffles are endemic to arid and semi-arid areas of North Africa, the Mediterranean Region and Near East. No known statistical coding at present.	
- *Tricholoma mongolicum Imai*	NA	Collected in Mongolia.	
		China HS	0709.59.50

Species and classification	Common name(s)	National code(s), definitions and other comments
- Other wild mushroom and truffle species n.e.c.		May include: *Lyophyllum decastes* (fried chicken mushroom; Hatake-shi-meji).

An analogous distinction based on species could be applied for dried mushrooms. In this case, the existing subclass of "Dried vegetables" could become a new class and be included in the "Prepared and preserved vegetables, pulses and potatoes" group, with the same label of "Dried vegetables" and its subclasses defined by species, as suggested in Table 2.

Existing data sources

Production

Agricultural production statistics usually provide data on cultivated mushrooms. Information on species such as *Agaricus spp*., shiitake and oyster mushrooms are commonly traceable in the crop production statistics of many countries. Forest statistics, however, hardly provide any data on wild mushroom production, as few countries systematically collect data on these products. Below are some available official figures on the production of forest mushrooms.

Japan: The *Statistical Yearbook of Japan* provides data on the production of minor forest products, which include shiitake, nameko, enokitake, oyster, bunashimeji and maitake mushrooms. In addition to these species, the Forestry Agency also includes the production of matsutake. Table 3 provides these figures.

Table 3. Production of forest mushrooms in Japan (tonnes)

	Year					
	2000	**2005**	**2010**	**2011**	**2012**	**2013**
Shiitake mushroom						
Dried	5 236	4 091	3 516	3 696	3 705	3 499
Fresh	67 224	65 186	77 079	71 254	66 476	67 946
Nameko mushroom	24 942	24 801	27 261	25 426	25 816	23 383
Enokitake mushroom	109 510	114 542	140 951	143 189	134 097	133 647
Oyster mushroom	8 546	4 074	2 535	2 082	1 883	2 290
Bunashimeji mushroom	82 414	99 787	110 486	118 006	122 276	117 363
Maitake mushroom	38 998	45 111	43 446	44 453	43 251	45 453

Source: http://www.stat.go.jp/english/data/nenkan/65nenkan/1431-08.htm

China: In 2011, China's mushroom production was estimated at about 26 million tonnes in fresh weight, which accounts for 80 percent of the world's production (Zhang *et al*., 2014); the most important species are those widely cultivated, as shown in Table 4.

Table 4. Top six species of mushrooms produced in China, years 2007 – 2011 (1 000 tonnes)

Year	Oyster	Shiitake	Blackfungus	Velvet foot	Bottom mushroom	Hairy jew ear
	Pleurotus ostreatus	***Lentinula edodes***	***Auricularia polytricha***	***Flammulina velutipes***	***Agaricus Bisporus***	***Auricularia polytricha***
2007	4 146	2 885	1 113	1 178	2 507	1 441
2008	4 340	3 090	1 000	1 360	1 910	630 000
2009	4 429	3 435	2 697	1 568	2 181	890 000
2010	5 599	4 276	2 896	1 848	2 206	1 258
2011	5 633	5 018	3 461	2 493	2 462	1 435

Source: Wu *et al*., 2013

China is also a big producer of wild mushrooms. The *China Forestry Statistical Yearbook 2011* reports that forest mushroom production was 1 867 204 tonnes in dry weight. The Southwest China Region is the richest area for wild mushrooms, with several valuable wild species such as *Tricholoma matsutake, Dictyophora, Dictyophora duplicate, Dictyophora rubrovalvata, Cordyceps sinensis, Morchella conica, Termitomyces albuminosus, Termitomyces aurantiacus* and *Termitomyces macrocarpus*.

Poland: The Central Office of Statistics provides an annual report on forestry. It includes data on the procurement of forest mushrooms, including the following species: Chanterelle, Xerocomus, Boletus, Suillus, Tricholoma, red pin, honey fungus, false morel, Leccinum and other forest mushrooms.

Finland: data on wild, edible mushrooms are available since 1980. They have been disseminated by the *Finnish Statistical Yearbook of Forestry* until 2014 and by the first e-yearbook on food and natural resources statistics in 2015. The following table reports on market supply and picking income of forest mushrooms during 2010 – 2014. Data refers to the following species: *Boletus pinophilus, Boletus reticulatus, Cantharellus cibarius, Lactarius rufus, Lactarius trivialis, Lactarius utilis*, other.

The table does not include self-consumption nor outdoor market trade. Such kind of use has been two to six times that of commercial picking during the first decade of the 2000s, as stated by the Natural Resources Institute Finland.

European Union: The Eurostat agricultural statistical database provides data on crop products. The nomenclature used for reporting crop statistics defines the cultivated mushroom item as "Cultivated mushrooms such as table mushrooms (*Agaricus bisporus L.),* shiitake (*Lentinula edodes*) and oyster mushrooms (*Pleurotus ostreatus*)". The *Eurostat Handbook for Annual Crop Statistics* clearly states that the "production of wild mushrooms is not collected".

Table 5. Market supply of forest mushrooms in Poland

Year	Unit	Value
2010	Tonnes	8 374
	USD 1 000	18 349
2011	Tonnes	10 096
	USD 1 000	18 314
2012	Tonnes	16 351
	USD 1 000	27 960
2013	Tonnes	10 564
	USD 1 000	17 833
2014	Tonnes	9 471
	USD 1 000	20 473

Source: http://stat.gov.pl/

Table 6. Market supply of forest mushrooms in Finland

Year	Unit	Value
2010	Tonnes	900
	USD 1 000	3 715
2011	Tonnes	700
	USD 1 000	2783
2012	Tonnes	200
	USD 1 000	771
2013	Tonnes	300
	USD 1 000	1 195
2014	Tonnes	500
	USD 1 000	1 329

Sources: TNS Gallup Ltd. Food and Farm Facts in http://www.metla.fi/julka-isut/metsatilastollinenvsk/

The PRODCOM list, used for the collection and dissemination of statistics on the production of manufactured goods, reports two codes for processed mushrooms:

> **10391350** – Dried mushrooms and truffles, whole, cut, sliced, broken or in powder, but not further prepared.
> **10391730** – Prepared or preserved mushrooms and truffles (excluding prepared vegetable dishes and mushrooms and truffles dried, frozen or preserved by vinegar or acetic acid)

Both categories include agricultural and forest mushrooms. Values and volumes sold are provided in Table 7.

Table 7. Value and volume sold in EU countries, 2015

	Prodcom 10391350			**Prodcom 10391730**	
	1 000 USD	tonnes		1 000 USD	tonnes
Belgium	n.a.	n.a.	Belgium	n.a.	n.a.
Bulgaria	7 710	632	Bulgaria	5 343	2 332
Czechia	n.a.	n.a.	Denmark	n.a.	n.a.
Germany	n.a.	510	Germany	23 965	8 350
Spain	816	23	Ireland	n.a.	n.a.
France	38 939	1 343	Greece	1 318	301
Italy	33 767	1 187	Spain	11 0458	51 349
Lithuania	60	1	France	n.a.	n.a.
Poland	2 160	237	Italy	21 1953	42 924
Romania	6 640	989	Lithuania	318	144
Other countries	0	0	Hungary	2 119	1 658
			The Netherlands	20 0386	10 5761
			Poland	23 670	10 344
			Romania	2 797	635
			Finland	6 135	992
			United Kingdom	8 176	1 734
			Croatia	2809	312
			Other countries	0	0

Source: Eurostat. n.a.: confidential and national estimated data not reported by Eurostat.

Overall, all of the above-mentioned national/regional data on forest mushroom production refer to marketed production; the quantity used for direct consumption is excluded. Consequently, the amount of wild-harvested production will be much higher than reflected in existing data sources.

International trade

According to HS 2017, mushrooms are classified at subheading level into four categories:

- fresh or chilled mushrooms;
- provisionally preserved (e.g. by sulphur dioxide gas) but unsuitable for immediate consumption;
- dried mushrooms, whole, cut, sliced, broken or in powder, but not further prepared;
- prepared or preserved otherwise than by in vinegar or acetic acid.

As forest mushrooms are mostly commercialized, fresh or dried, Table 7 shows international trade data by such HS categories.

Table 8. Top five exporters and importers of fresh or chilled Agaricus (HS 070951), 2015

Exporter	Value (1 000 USD)	Quantity (Tonnes)	Share of exp quantity (%)	Importer	Value (1 000 USD)	Quantity (Tonnes)	Share of imp quantity (%)
Poland	341 549	207 136	41.1	**UK**	277 315	104 328	20.6
Netherlands	137 452	55 841	11.1	**Germany**	162 800	70 043	13.8
Canada	125 709	31 556	6.3	**USA**	142 547	40 585	8.0
Ireland	110 980	32 043	6.4	**Belarus**	69 387	49 296	9.7
Belgium	38 017	19 302	3.8	**France**	48 045	22 698	4.5
World	947 671	503 498	100	**World**	105 1290	507 306	100

Source: Global Trade Atlas

Table 9. Top five exporters and importers of fresh or chilled mushrooms other than Agaricus (HS 070959), 2015

Exporter	Value (1 000 USD)	Quantity (Tonnes)	Share of exp quan-tity (%)	Importer	Value (1 000 USD)	Quantity (Tonnes)	Share of imp quan-tity (%)
China	151 008	50 363	29.6	**Germany**	92 665	20 902	11.0
Italy	60 327	2 694	1.6	**France**	73 319	21 818	11.5
Netherlands	54 267	17 484	10.3	**Japan**	59 131	3 578	1.9
Poland	37 080	15 080	8.9	**UK**	55 284	21 432	11.3
Rep. of Korea	36 167	14 688	8.6	**Italy**	52 661	10 162	5.3
World	644 036	169 875	100.0	**World**	717 660	190 498	100.0

Source: Global Trade Atlas

Table 10. Top five exporters, importers and global reporting of dried Agaricus (HS 071231), 2015

Exporter	Value (1 000 USD)	Quantity (Tonnes)	Share of exp quantity (%)	Importer	Value (1 000 USD)	Quantity (Tonnes)	Share of imp quantity (%)
Netherlands	20 872	6 284	58.8	**USA**	12 740	1 250	13.8
Germany	7 832	380	3.6	**Germany**	10 832	730	8.1
Poland	4 645	1 240	11.6	**Malaysia**	8 327	1 299	14.4
Pakistan	4 331	42	0.4	**Hong Kong SAR**	7 239	810	9.0
India	3 640	69	0.6	**Netherlands**	5 671	1 921	21.2
World	59 503	10 678	100	**World**	73 526	9 046	100

Source: Global Trade Atlas

Table 11. Top five exporters, importers and global reporting of dried mushrooms other than Agaricus (HS 071232/33/390), 2015

Exporter	Value (1 000 USD)	Quantity (Tonnes)	Share of exp quantity (%)	Importer	Value (1 000 USD)	Quantity (Tonnes)	Share of imp quantity (%)
China	2 172 951	121 565	88.7	**Viet Nam**	798 321	47 236	39.7
Germany	30 437	1 069	0.8	**Hong Kong SAR**	153 725	23 234	19.5
Hong Kong SAR	22 496	5 363	3.9	**Japan**	90 954	7 487	6.3
Poland	13 395	1 025	0.7	**Thailand**	73 469	10 963	9.2
France	11 744	528	0.4	**France**	36 388	1 467	1.2
World	2 341 790	137 078	100	**World**	1 415 373	118 963	100

Source: Trademap.

The above tables underline the importance of the mushroom industry in China (89 percent of dried and 30 percent of exported and fresh mushrooms other than Agaricus); the country relies on a broad variety of species, some of which have been introduced into the national HS classification. The three forest species include: Boletus, Sungmo and *Tricholoma Mongolicum Imai*. The following highlights China's HS expansion for mushrooms.

Table 12. China's HS code expansion for fresh, frozen, provisionally preserved and dried mushrooms

07095910 Sungmo fresh	**07115911 Sungmo in brine**
07095920 Shiitake fresh	07123910 Shiitake dried
07095930 Winter Mushroom fresh	07123920 Winter mushroom dried
07095940 Paddy Straw fresh	07123930 Paddy Straw dried
07095950 *Tricholoma Mongolicum Imai* fresh	**07123940 Dried *Tricholoma Mongolicum Imai***
07095960 Truffle fresh	**07123950 Dried Cepe (*Boletus edulis*)**
07108010 Sungmo frozen	
07108040 Boletus frozen	

Source: Customs tariff and tax schedule of the People's Republic of China: 2012 Edition.
In bold forest mushrooms.

Table 13. China's exports of selected forest mushrooms and truffles

HS Code	Description	2013		2014		2015	
		USD (1 000)	Quantity (Tons)	USD (1 000)	Quantity (Tons)	USD (1 000)	Quantity (Tons)
07095910	Sungmo, Fresh Or Chilled	42,486	777	39,015	662	30,491	536
07108010	Sungmo, Frozen	13,406	704	14,223	732	8,268	429
07115911	Sungmo, In Brine	2,206	87	2,266	95	669	35
07108040	Boletus, Frozen	35,309	6,435	24,287	4,342	25,068	4,958
07123950	Dried Boletus (porcini)	29,362	1,200	21,801	764	16,482	714
07095950	Tricholoma Mongolicum Imai, Fresh Or Chilled	196	277	219	286	368	329
07123940	Dried Tricholoma Mongolicum Imai	12	1	86	7	0	0
07095960	Truffle, Fresh Or Chilled	8,337	3,085	5,911	2,167	7,730	2,495

Source: Global Trade Atlas

European Union level: the Combined Nomenclature provides further codes for some forest species related to subheading 070959 of other fresh or chilled edible mushrooms and truffles:

- 0709 59 10 Chanterelles

  This subheading covers only Chanterelles or Girolles (egg mushroom), generally of the colour of egg yolk, of the species Cantharellus cibarius Fries and Cantharellus friesii Quélet. Similar edible kinds, such as the false Chanterelle (Clitocybe aurantiaca) and the horn of plenty (Craterellus cornucopioides), which are sometimes used as a substitute for truffles in cold meats, fall under subheading 0709 59 90.

- 0709 59 30 Flap mushrooms

  This subheading covers only flap or boletus mushrooms of the Boletus genus and, in particular, the common flap mushroom or cep (Boletus edulis).

- 0709 59 50 Fresh or chilled truffles.

The above can be considered as forest products. Their international trade value and quantity are given in the following tables.

Table 14. EU-28 trade value of selected fresh mushrooms (1 000 USD), 2015

CN Code	Description	Export value		Import value	
		Extra EU	Intra EU	Extra EU	Intra EU
07095910	Chanterelles	6 394	65 314	60 838	50 001
07095930	Flap mushrooms	4 326	36 913	4 594	45 740
07095950	Truffles	34 064	46 459	2 448	35 468

Source: Eurostat, International trade database.

Table 15. EU-28 trade of selected fresh mushrooms (tonnes), 2015

CN Code	Description	Export quantity		Import quantity	
		Extra EU	Intra EU	Extra EU	Intra EU
07095910	Chanterelles	566	8 129	10 292	6 313
07095930	Flap mushrooms	319	4 498	684	5 927
07095950	Truffles	67	296	44	839

Source: Eurostat, International trade database.

Chile: Country level data for forest mushrooms are disseminated by the Chilean Forest Institute. It reports non wood forest products production, exports and prices. NWFPs exports are provided by a list of 19 products and four of them are forest mushrooms. The following table shows exports data for the period 2010 – 2015.

Table 16. Forest mushrooms exports in Chile, 2010-2015.

Year	*Boletus*		*Morchella*		*Lactarius*		*Others, not specified*	
	Value (1 000 USD)	Quantity (tons)	Value (1 000 USD)	Quantity (tons)	Value (1 000 USD)	Quantity (tons)	Value (1 000 USD)	Quantity (tons)
2010	12,475	5,350	1,669	33	1,655	951	1,585	382
2011	9,504	3,583	1,574	14	1,631	1,023	3,145	1,302
2012	6,519	2,208	2,264	20	693	475	3,484	1,991
2013	5,962	1,781	1,024	3	656	430	3,206	2,127
2014	6,036	1,666	4,756	72	349	177	4,067	1,835
2015	3,938	1,368	2,007	54	1,884	889	4,237	2,100

Source: Chilean Statistical yearbook of forestry 2016

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8.2 Forest berries

Description

Forest berries are small and fleshy edible fruits produced by different species and genera of forest plants. Although considered NWFPs, most berries have been domesticated and the vast majority of those produced and traded are commercially grown rather than gathered in the wild.

When collected from a forest, a large part is used for self-consumption or is sold through informal sector transactions. Therefore, the overall amount of forest berries production is hardly captured by official statistics. Nonetheless, for those countries where forests are managed not only from an economic perspective, but also from a social and environmental point of view, some statistics are available.

Existing classification

Central Product Classification (CPC Ver.2.1)

The CPC classifies berries into two sections, depending on whether they are a food product (prepared or preserved) or an agriculture and forestry product. In the latter case, they occupy two distinct classes, one under "Agricultural products" and another under "Forestry products as wild, edible products". When considered an agricultural product, berries are assigned a subclass level with five detailed (six-digit) codes specifying different types of berries. When considered forest products, berries occupy the class of wild edible products along with all other products fitting the class (mushrooms, truffles ...) and any further detailed codes of the class is provided. The distinction between berries as agricultural product and forest berries is clarified by the explanatory note of wild edible products*: This subclass does not include edible products that exist in the wild and are also grown (controlled), cf. the corresponding subclass of division 01.*

Prepared and preserved berries occupy three different classes, depending on the specified process used - drying, preservation by sugar, or other preparation. All of these categories include berries as well as nuts and other fruits and do not provide any specific detailed codes.

Section	**0**	**Agriculture, forestry and fishery products**
Division	01	Products of agriculture, horticulture and market gardening
Group	013	Fruits and nuts
Class	0135	Berries and other fruits
Subclass	**01351**	- ***Currants and gooseberries***
Subclass	**01353**	- ***Raspberries, blackberries, mulberries and loganberries***
Subclass	**01354**	- ***Strawberries***
Subclass	**01355**	- ***Other berries; fruits of the genus Vaccinium***
Division	03	Forestry and logging products
Group	032	Non-wood forest products
Class	0322	Other wild, edible products
Subclass	**03220**	- ***Other wild, edible products***

Section	2	Food products, beverages and tobacco; textiles, apparel and leather products
Division	21	Meat, fish, fruits, vegetables, oils and fats
Group	214	Prepared and preserved fruits and nuts
Class	2141	Dried fruit
Subclass	21419	Other dried fruit, n.e.c. *This subclass includes other dried fruit, including:* - *apples, dried; apricots, dried; avocados, dried; bananas and plantains, dried;* ***berries, dried;*** *dates, dried; figs, dried; guavas, dried; mangoes, dried; melons, dried; oranges, grapefruit or other citrus fruit, dried; papayas, dried; peaches, dried; persimmons, dried; pineapple, dried; plums, dried; pomegranates, dried;* ***mixtures of nuts or dried fruit.***
Class	2149	Other prepared and preserved fruits and nuts (except by sugar)
Subclass	**21493**	- ***Fruits and nuts, uncooked or cooked, frozen***
Subclass	**21496**	- ***Fruits and nuts, provisionally preserved, not for immediate consumption***
Subclass	**21499**	- ***Other prepared and preserved fruits and nuts, n.e.c.***
Division	23	Grain mill products, starches and starch products; other food products
Group	236	Cocoa, chocolate and sugar confectionery
Class	2367	Sugar confectionery (including white chocolate), not containing cocoa; vegetables, fruits, nuts, fruit-peel and other parts of plants, preserved by sugar
Subclass	23670	Sugar confectionery (including white chocolate), not containing cocoa; vegetables, fruits, nuts, fruit-peel and other parts of plants, preserved by sugar This subclass includes: - *sugar confectionery (including white chocolate), not containing cocoa* - ***vegetables, fruits, nuts, fruit-peel and other parts of plants, preserved by sugar (drained, glacé or crystallized)***

Harmonized Commodity Description and Coding System (HS 2017)

The HS classifies berries in Chapter 8 - Edible fruits and nuts; peel of citrus fruit or melons – and in Chapter 20 - Preparations of vegetables, fruit, nuts or other parts of plants. Chapter 8 provides detailed codes (six-digit) for fresh and frozen berries while two broad residual categories include provisionally preserved and dried berries along with nuts and other fruits.

Prepared berries in Chapter 20 consist of sugar-preserved and otherwise prepared or preserved products. While sugar-preserved berries cannot be distinguished from other sugar-prepared vegetables and nuts, the

heading of otherwise preserved fruits and nuts is further divided into four subheadings, two of them specifying strawberries and cranberries (*Vaccinium macrocarpon*, *Vaccinium oxycoccos, Vaccinium vitis-idaea*), respectively.

Chapter	**8**	**Edible fruits and nuts; peel of citrus fruit or melons**
Heading	08.10	Other fruit, fresh
Subheading	**0810.10**	- ***Strawberries***
Subheading	**0810.20**	- ***Raspberries, blackberries, mulberries and loganberries***
Subheading	**0810.30**	- ***Black, white or red currants and gooseberries***
Subheading	**0810.40**	- ***Cranberries, bilberries and other fruits of the genus Vaccinium***
Subheading	**0810.90**	- ***Other***
Heading	08.11	Fruit and nuts, uncooked or cooked by steaming or boiling in water, frozen, whether or not containing added sugar or other sweetening matter.
Subheading	0811.10	- ***Strawberries***
Subheading	**0811.20**	- ***Raspberries, blackberries, mulberries, loganberries, black, white or red currants and gooseberries***
Subheading	**0811.90**	- ***Other***
Heading	08.12	Fruit and nuts, provisionally preserved (for example, by Sulphur dioxide gas, in brine, in Sulphur water or in other preservative solutions), but unsuitable in that state for immediate consumption.
Subheading	**0812.90**	- ***Other***
Heading	08.13	Fruit, dried, other than that of headings 08.01 to 08.06; mixtures of nuts or dried fruits of this Chapter.
Subheading	**0813.40**	- ***Other fruit***
Subheading	**0813.50**	- ***Mixtures of nuts or dried fruits of this Chapter.***
Chapter	**20**	**Preparations of vegetables, fruit, nuts or other parts of plants**
Heading	20.06	Vegetables, fruit, nuts, fruit-peel and other parts of plants, preserved by sugar (drained, glacé or crystallised).
Subheading	**2006.00**	**Vegetables, fruit, nuts, fruit-peel and other parts of plants, preserved by sugar (drained, glacé or crystallised).**
Heading	20.08	Fruit, nuts and other edible parts of plants, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elsewhere specified or included.
Subheading	**2008.80**	- ***Strawberries***
Subheading	**2008.93**	- ***Cranberries -Vaccinium macrocarpon, Vaccinium oxycoccos, Vaccinium vitis-idaea***
Subheading	**2008.97**	- ***Mixtures***
Subheading	**2008.99**	- ***Other***

Assessment

The existing classifications present two problems. One is that, under the CPC, some types of berries are classified differently in different countries, depending on whether they are exclusively collected in the wild or cultivated. Secondly, neither classification is developed in sufficient detail to clearly identify nor separate wild-gathered forest berries from other cultivated berries.

Proposed definition and classification

To avoid misclassification under the CPC but retain the distinction between agricultural and forestry products, it is recommended that the two CPC classes/subclasses be defined as follows:

- The explanatory note of the agricultural class of berries and other fruits should clearly describe the dual origin of berries specified at the most detailed level. It should be stated that the different species/genera are both grown and gathered in the wild.
- Item 0323, described as "Other wild edible products", should be expanded with the introduction of a subclass of wild, edible berries, so that wild-gathered forest berries can be identified separately from other wild, edible products. This will give more clarity to the class of wild edible products.

Existing data sources

Production

Data on berries production are available in national and international agricultural databases, as it is mostly produced as an agricultural crop. Information on different types of berries as well as on crop management is also available. Data on forest berries production, instead, are regularly released and updated only for a limited number of countries. Essentially, some of the Northern and Eastern European countries, where picking wild berries is an important forest-related activity, regularly collect and disseminate reliable data. Further data not reported here, however, can be found in *ad hoc* studies and scientific literature.

It has to be noted that all of the following national data on forest berries production refer to marketed production; the quantity used for direct consumption and informal market is excluded. Consequently, wild-harvested production may be really much higher than shown here.

Finland: Forestry statistics were regularly collected and disseminated in the *Finnish Statistical Yearbook of Forestry* until 2014, and by the first e-yearbook on food and natural resources statistics in 2015. The yearbook reports not only on wood production but also on recreation, tourism, berry and mushroom picking, hunting and reindeer husbandry. The table below shows wild berries data by species for the last available year.

Table 17. Market supply and picking income of wild berries in Finland, by species and region, 2013

	Market supply (1 000 kg)				
	Cowberry *Vaccinium vitis-idaea*	Bilberry *Vaccinium myrtillus*	Cloudberry *Rubus chamaemorus*	Others	Total
Western Finland	5 605	720	1	8	6 333
Eastern Finland	2 490	1 611	2	6	4 109
Oulu region	1 535	745	2	1	2 283
Lapland	1 116	1 933	142	52	3 243
Whole country	**10 746**	**5 008**	**146**	**67**	**15 968**

Picking incomes (USD 1 000)					
	Cowberry *Vaccinium vitis-idaea*	Bilberry *Vaccinium myrtillus*	Cloudberry *Rubus chamaemorus*	Others	Total
Western Finland	8 313	1 430	11	45	9 798
Eastern Finland	3 987	3 235	28	35	7 285
Oulu region	2 485	1 440	23	12	3 959
Lapland	1 747	3 802	1 612	78	7 240
Whole country	**16 531**	**9 908**	**1 673**	**169**	**28 281**

Source: TNS Gallup Ltd. Food and Farm Facts in Finnish Statistical Yearbook of Forestry, 2014. The "Others" items include crowberry (*Empetrum nigrum*), cranberry (*Vaccinium oxycoccos*), artic brumble (*Rubus articus*) and raspberries (Rubus idaeus). Note: the yearbook also reports an estimate of the amount and value of self-consumption and outdoor market trade not captured by the above table. The estimate spans over a range of 2 – 9 times that of commercial picking. More recent data, but not reported by species, have been released by the e-yearbook.

Poland: The Central Statistical Office of Poland annually releases data on forest fruits including berries. Forest fruits are defined as follows: *Fruits on the area of forest and nearby area covering elder, rose dog, mountain ash, hawthorn, blackthorn, wild apple, cone of juniper, fruits of European Filbert and sea buck-thorn and other forest fruits.*

Table 18. Value and quantity of marketed fresh forest fruits.

Year	Unit	Value
2010	Tonnes	8 374
	USD 1 000	18 419
2011	Tonnes	10 096
	USD 1 000	18 984
2012	Tonnes	16 351
	USD 1 000	35 502
2013	Tonnes	10 564
	USD 1 000	15 727
2014	Tonnes	9 471
	USD 1 000	21 363

Source: http://stat.gov.pl/

Lithuania: The forestry and hunting database of the Lithuanian Official Statistics Portal make available information on many non-wood forest products, among which forest berries by species. Purchase data for the last available three years are in the following table.

Table 19. Quantity of marketed berries in Lithuania, 2010-2012

Species	Year	Purchase of berries (kg)
Mountain cran-berry	2010	16 593
	2011	446 409
	2012	141 951
Bilberry	2010	1 072 451
	2011	1 169 647
	2012	1 494 352
Cranberry	2010	128
	2011	449
	2012	261
Sea buckthorn	2010	8 595
	2011	349 685
	2012	577
Forest Straw-berry	2010	14
	2011	2 791
	2012	230
Other	2010	87
	2011	836
	2012	---
Total	2010	1 097 868
	2011	1 969 817
	2012	1 637 371

Source: http://osp.stat.gov.lt/en/rodikliai51

The item *Other* includes Chokeberries, Rowan and Forest Raspberry.

Czech Republic: The Czech Statistical Office provides data on gathering of wild foods, honey and wax in the framework of the material flow accounts. The following table shows forest berries data for the last available five years.

Table 20. Gathering of wild berries in the Czech Republic, 2010-2014 (in tonnes)

	2010	2011	2012	2013	2014
Gathering of blueberries	9 400	8 900	6 800	13 400	7 300
Gathering of raspberries	2 100	2 100	3 400	2 800	2 100
Gathering of brambleber-ries	1 800	2 300	3 200	1 600	1 500
Gathering of cranberries	300	1 100	300	400	600
Gathering of elderberries	700	2 300	2 200	1 900	1 900

Source: https://www.czso.cz/csu/czso/material-flow-accounts-selected-indicators-2014

International Trade

Data reported under the HS do not provide a distinction between the agricultural and wild harvest part of international trade. The wild harvest component, however, account for a small fraction of overall trade. This section presents trade data reported under those HS subheadings most relevant to forest berries: Fresh Cranberries, bilberries and other fruits of the genus Vaccinium (0810.40) and Cranberries - *Vaccinium macrocarpon, Vaccinium oxycoccos, Vaccinium vitis-idaea*, prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, n.e.s. (2008.93).

Table 21. Top 5 exporters, importers and global reporting of Cranberries, Blueberries and other fruits of the genus *Vaccinium* (HS 801040), 2015.

Exporter	Value (1 000 USD)	Quantity (Tonnes)	Share of exp. quantity (%)	Importer	Value (1 000 USD)	Quantity (Tonnes)	Share of imp. quantity (%)
Chile	434 355	87 240	23.7	**USA**	712 326	187 100	51.3
Spain	208 232	27,179	7.4	**UK**	221 734	29 958	8.2
Canada	182 361	106 888	29.0	**Canada**	169 462	37 596	10.3
USA	181 775	42 161	11.4	**Netherlands**	169 430	22 744	6.2
Netherlands	155 793	17 307	4.7	**Germany**	126 652	18 877	5.2
World	1 718 792	368 869	100	**World**	1 898 648	365 051	100

Source: Global Trade Atlas

Table 22 - Top 5 exporters, importers and global reporting of HS 200893 - Cranberries (*Vaccinium macrocarpon, Vaccinium oxycoccos, Vaccinium vitis-idaea*), 2015

Exporter	Value (1 000 USD)	Quantity (Tonnes)	Share of exp. quantity (%)	Importer	Value (1 000 USD)	Quantity (Tonnes)	Share of imp. quantity (%)
USA	247 241	74 405	64.2	**Netherlands**	90 465	23 766	22.1
Netherlands	101 557	13 213	11.4	**Mexico**	33 889	9 933	9.2
Canada	48 476	13 348	11.5	**Canada**	32 644	11 148	10.4
Germany	15 309	3 417	3.0	**USA**	30 362	7 742	7.2
Chile	14 935	6 354	5.5	**Germany**	29 936	8 221	7.6
World	450 287	115 808	100	**World**	387 167	107 468	100

Source: Global Trade Atlas

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8.3 Maple products

Description

Maple products are made from the sap of maple trees that is boiled to turn it into syrup, the main maple product. Other maple sap-derived products are sugar and butter. Sugar maple, from *Acer saccharum L.*, which is native to the hardwood forests of northeastern Canada, is the main source of maple syrup, but other species are tapped, such as Black Maple (*Acer nigrum L.*), Silver Maple (*Acer saccharinum L.*) and Red Maple (*Acer rubrum L.*).

The production of syrup and sugar is concentrated in North America, with Canada being the world leading producer, followed by the United States of America.

Existing classification

Maple syrup and sugar are classified as food products in the CPC, although they are coded together with other refined cane or beet sugar. However, in the HS, syrup and sugar are identified by two six-digit codes under the chapter on sugars and sugar confectionery.

Central Product Classification (CPC Ver.2.1)

Section	**2**	**Food products, beverages and tobacco; textiles, apparel and leather products**
Division	23	Grain mill products, starches and starch products; other food products
Group	235	Sugar and molasses
Class	2353	Refined cane or beet sugar, in solid form, containing added flavouring or colouring matter; maple sugar and maple syrup
Subclass	**23530**	Refined cane or beet sugar, in solid form, containing added flavouring or colouring matter; **maple sugar and maple syrup.**

Harmonized Commodity Description and Coding System (HS 2017)

Chapter	17	Sugars and sugar confectionery
Heading	17.02	Other sugars, including chemically pure lactose, maltose, glucose and fructose, in solid form; sugar syrups not containing added flavouring or colouring matter; artificial honey, whether or not mixed with natural honey; caramel.
Subheading	**1702.20**	**Maple Sugar and Maple Syrup**

Assessment

The HS clearly defines maple sugar and maple syrup at the most detailed level. The CPC, however, is not able to clearly distinguish between maple products (forest products) and other refined cane or beet sugar (agricultural products).

Proposed definition and classification

For a precise classification, forest products in the CPC class 2353 should be split as follows:

- refined cane or beet sugar, in solid form, containing added flavouring or colouring matter (subclass);
- maple syrup and maple sugar (subclass).

These levels will allow separate monitoring and analysis of the forest resource value (the sap of various maple trees) and the value of agricultural resources (sugar cane and beet) consistently with the HS 2017 subheadings for sugars.

Existing data sources

Production

Statistics for the production of maple syrup and sugar are available for the two main producers: Canada and the United States of America. The NAPCS has been developed by statistical agencies of Canada, Mexico and the United States in order to provide a common standard for products.

Canada: Maple products are identified in the North American Product Classification System (NAPCS 2012) which has been developed by the statistical agencies of Canada, Mexico and the United States of America in order to provide a common standard for products. The Canada's central statistical office provides the NAPCS Canada 2012 variant for agricultural goods which makes available five detailed codes for maple products:

Table 23. NAPCS variant for agricultural goods: maple products codes

115	Other crop products
11513	Other miscellaneous product
115136	Maple syrup and other maple products
……	……
115136111	**Maple syrup**
115136211	**Maple butter**
115136222	**Maple sugar**
115136231	**Maple sap**
115136241	**Other maple products, n.e.c.**

Source: Statistics Canada

Statistics on production volumes and values of maple products are disseminated by the Central Statistical Office and National Forestry Database on annual basis. The following table reports production data for 2011 – 2015.

Table 24. Canada maple products production quantity and value, 2011-2015

	2011	2012	2013	2014	2015
Maple products expressed as syrup (tonnes)	51 383	47 201	60 409	57 002	53 528
Gross value of maple products (1000 USD)	342 715	304 723	396 179	343 919	279 939

Source: Statistics Canada. Cansim Table 001-0008 - Production and farm value of maple products, annual. Maple products such as taffy, sugar and maple butter have been converted to syrup equivalent. (accessed: November 13, 2016)

Further data on maple taps derives from the agriculture census, every five years. The next release is scheduled for May, 2017.

Table 25. Canada, maple taps

	1991	1996	2001	2006	2011
Number of farms reporting	8 765	9 546	10 305	9 731	10 847
Number of taps	18 297 386	23 026 708	33 680 376	38 075 953	44 440 024
Average number per farm reporting	2 088	2 412	3 268	3 913	4 097

Source: Statistics Canada. Cansim table 004-0009. (accessed: November 13, 2016)

United States of America: Data on maple products are periodically released by the National Agricultural Statistics Service. Detailed and updated data on production, value, prices, taps, yield, season and trade are provided at national and state level. A summary of production and value over the past five years is shown in Table 26.

Table 26. US maple products production quantity and value

	2011	2012	2013	2014	2015
Maple syrup production (tons)	9 231	7 955	11 242	10 427	10 962
Value of production (1 000 USD)	67 939	57 882	79 117	72 760	NA

Source: USDA, Sugar and Sweeteners Yearbook Tables. (accessed: November 13, 2016)

International Trade

Data on the international trade of maple products, commodity HS code 170220 – Maple sugar and maple syrup – are summarized in Table 27. Canada is the major world supplier of maple products, with export valued at 281 million USD in 2015. The main Canadian export market is the United States that accounts for 64% of total exports. Other destinations are Germany (8%), Japan (6%), UK (5%), Australia (4%), France (3%) and other destinations accounting for the residual part (8%).

Table 27. Top five exporters, importers and global reporting of maple products (HS 170220), 2015

Exporter	Value (1 000 USD)	Quantity (tonnes)	Share of exp. quantity (%)	Importer	Value (1 000 USD)	Quantity (tonnes)	Share of imp. quantity (%)
Canada	280 956	42 190	81.8	**USA**	177 821	26 821	48.3
USA	26 400	5 382	10.4	**Japan**	26 566	2 955	5.3
Germany	7 920	819	1.6	**Germany**	20 070	2 707	4.9
Netherlands	7 077	704	1.4	**UK**	17 816	3 150	5.7
Denmark	5 746	631	1.2	**Australia**	13 238	2 429	4.4
World	337 909	51 557	100	**World**	338 655	55 502	100

Source: Global Trade Atlas

Table 28. Canada export destinations (HS 170220), 2015

Destination	Exported quantity (tonnes)	Share of total export (%)	Cumulative Share (%)
US	26 839	63.6	63.6
Germany	3 549	8.4	72.0
Japan	2 665	6.3	78.3
UK	2 285	5.4	83.8
Australia	1 615	3.8	87.6
France	1 488	3.5	91.1
Other countries	3 749	8.9	100

Source: Global Trade Atlas

References

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8.4 Edible nuts

Description

Nuts are referred to as a large heterogeneous group of fruits with hard-shelled seeds or drupes, produced by trees, shrubs and herbaceous plants that belong to several genera and species. This broad group contains species that produce indehiscent fruit.

Although some types of nuts can be considered exclusively agricultural products (such as almonds and pistachios), some can be cultivated and gathered from forest areas, depending on the country. For example in Brazil, cashew nuts are both collected in wild forest areas and cultivated; Nigeria has a long tradition of cultivating and trading the fruit of *Cola acuminate* and *Cola nitida* (Asogwa, Anikwe and Mokwunye, 2006; and Asogwa *et al*., 2012); and other West African countries collect kola nuts in the forest (Wangel and Blomkvist, 2013). Other species, such as Brazil nuts, are difficult to cultivate and are therefore mostly collected in the wild.

Overall, agricultural nuts are harvested in a large number of countries, transactions are properly recorded and statistics are widespread. Data on forest species, however, are collected in a smaller number of countries, and the availability of official statistics is extremely variable.

Existing classification

Central Product Classification (CPC Ver.2.1)

The CPC classifies edible nuts as an agricultural and a food product. Under the agricultural section, edible nuts are covered by two groups, described respectively as "Fruits and nuts" and "Oleaginous fruits". A detailed specification based on species is available at subclass (five-digit) level. Detailed categories are available also for semi-processed (shelled) nuts, and prepared and preserved nuts.

Section	**0**	**Agriculture, forestry and fishery products**
Division	01	Products of agriculture, horticulture and market gardening
Group	013	Fruits and nuts
Class	0137	Nuts (excluding wild edible nuts and groundnuts), in shell
Subclass	**01371**	**Almonds, in shell**
Subclass	**01372**	**Cashew nuts, in shell**
Subclass	**01373**	**Chestnuts, in shell** *This subclass includes:* *- chestnuts, nuts of Castanea* *This subclass does not include:* *- Chinese water chestnuts, Eleocharis dulcis, cf. 01290* *- water chestnuts, Trapa natans, cf. 01379* *- shelled chestnuts, cf. 21429* *- horse chestnuts, cf. 39120*
Subclass	**01374**	**Hazelnuts, in shell**
Subclass	**01375**	**Pistachios, in shell** *This subclass includes:* *- pistachios, seeds from the fruit of Pistacia vera*

Subclass	**01376**	**Walnuts, in shell**
Subclass	**01377**	**Brazil nuts, in shell**
Subclass	**01379**	**Other nuts (excluding wild edible nuts and groundnuts), in shell** *This subclass includes:* *- areca nuts (betel nuts)* *- water chestnuts, Eleocharis dulcis* *- water caltrops, Trapa natans* *- kola nuts* *- ginkgo nuts* *- macadamia nuts* *- pecan nuts* *- pignolia nuts* *- pine nuts* *This subclass does not include:* *- Chinese water chestnuts, Eleocharis dulcis, cf. 01290* *- wild edible nuts, cf. 03230* *- shelled nuts, cf. 2142*
Group	**014**	**Oilseeds and oleaginous fruits**
Class	0146	Coconuts, in shell
Subclass	01460	Coconuts, in shell This subclass includes: - coconuts, *Cocos nucifera,* in the shell, i.e. the inner shell (endocarp) or the outer shell (mesocarp or exocarp) This subclass does not include: - shelled coconuts, cf. 21429
Class	0149	Other oleaginous fruits
Subclass	**01499**	**Other oleaginous fruits, n.e.c.** This subclass includes: - karite nuts, *Butyrospermum parkii* - tung nuts, *Aleurites fordii* - jojoba, *Simmondsia californica* - tallow tree seeds, *Sapium sebiferum* - kapok seeds, *Ceiba pentandra* (yield also fibres) - perilla, *Camellia japonica* - neem seed tree, *Azadirachta indica* - mohwa seeds, *Bassia latifolia* - oiticica tree, *Licania rigida* - karanja - pungam seeds

Section	**2**	**Food products, beverages and tobacco; textiles, apparel and leather products**
Division	21	Meat, fish, fruits, vegetables, oils and fats
Group	214	Prepared and preserved fruits and nuts

Class	**2142**	**Shelled nuts**
Subclass	**21421**	**Groundnuts, shelled**
Subclass	**21422**	**Almonds, shelled**
Subclass	**21423**	**Hazelnuts, shelled**
Subclass	**21424**	**Cashew nuts, shelled**
Subclass	**21429**	**Other shelled nuts** This subclass includes: - shelled nuts, whether fresh or dried (desiccated), such as: · coconuts · brazil nuts · cashew nuts · chestnuts · pistachios · macadamia nuts · betel nuts · ginkgo nuts · pecan nuts · water chestnuts · kola nuts · pine nuts (*Pinus pinea*)
Class	2149	Other prepared and preserved fruits and nuts (except by sugar)
Subclass	**21493**	**Fruits and nuts, uncooked or cooked, frozen**
…….	……..	…….
Subclass	**21495**	**Nuts, groundnuts and other seeds, roasted, salted or otherwise prepared, n.e.c.**
Subclass	**21496**	**Fruits and nuts, provisionally preserved, not for immediate consumption**
Subclass	**21499**	**Other prepared and preserved fruits and nuts, n.e.c.**

Harmonized Commodity Description and Coding System (HS 2017)

The HS classification of edible nuts lists in-shell and shelled species under the chapter on edible fruit and nuts. The chapter on oleaginous fruits provides other categories for classified fruit and nuts that are used for the extraction of edible or industrial oils. Other detailed (six-digit) categories identify more processed, edible nuts; for example frozen, provisionally preserved but unsuitable for human consumption, prepared or preserved.

Chapter	**8**	**Edible fruit and nuts; peel of citrus fruit or melons**
Heading	08.01	Coconuts, Brazil nuts and cashew nuts, fresh or dried, whether or not shelled or peeled
		- Coconuts :
Subheading	0801.11	-- Desiccated
Subheading	0801.12	-- In the inner shell (endocarp)
Subheading	0801.19	-- Other

		- Brazil nuts :
Subheading	0801.21	-- In shell
Subheading	0801.22	-- Shelled
		- Cashew nuts :
Subheading	0801.31	-- In shell
Subheading	0801.32	-- Shelled
Heading	**08.02**	**Other nuts, fresh or dried, whether or not shelled or peeled.**
		- Almonds :
Subheading	0802.11	-- In shell
Subheading	0802.12	-- Shelled
		- Hazelnuts or filberts (*Corylus spp.*) :
Subheading	0802.21	-- In shell
Subheading	0802.22	-- Shelled
		- Walnuts :
Subheading	0802.31	-- In shell
Subheading	0802.32	-- Shelled
		- Chestnuts (*Castanea spp.*) :
Subheading	0802.41	-- In shell
Subheading	0802.42	-- Shelled
		- Pistachios :
Subheading	0802.51	-- In shell
Subheading	0802.52	-- Shelled
		- Macadamia nuts :
Subheading	0802.61	-- In shell
Subheading	0802.62	-- Shelled
Subheading	0802.70	**- Kola nuts (*Cola spp.*)**
Subheading	0802.80	**- Areca nuts**
Subheading	0802.90	Other
Chapter	**12**	**Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder.**
Heading	12.02	Ground-nuts, not roasted or otherwise cooked, whether or not shelled or broken.
		- Other :
Subheading	1202.41	-- In shell
Subheading	1202.42	-- Shelled, whether or not broken
Heading	12.07	Other oil seeds and oleaginous fruits, whether or not broken
Subheading	1207.10	Palm nuts and kernel
Subheading	1207.99	-- Other
		Nuts included cover *inter alia* **Beech nuts, Candlenuts** (e.g. touloucouna nuts), **Physic** (pulza) nuts, **Shea nuts** (Karite nuts), **Tung nuts**.

Chapter	20	Preparations of vegetables, fruit, nuts or other parts of plants.
Heading	20.08	Fruit, nuts and other edible parts of plants, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elsewhere specified or included.
Subheading	2008.11	- Nuts, ground-nuts and other seeds, whether or not mixed together: -- **Ground-nuts**

Assessment

The CPC presents two main problems. The first is that some species may be classified differently according to country, depending on whether they are exclusively collected in the wild or are cultivated. Secondly, when the same species is both cultivated and collected in the wild in a country, it is classified as an agricultural product, regardless of its origin.

The HS classifies nuts following a processing criterion, from primary products (nuts in shell) to a first-degree of processing (shelled nuts) to more advanced processing (from provisionally preserved but unsuitable for human consumption to preserved products). Moreover, in-shell and shelled nuts are subdivided into species, but this is insufficient to clearly detect forest nuts.

Proposed definition and classification

To avoid misclassification under the CPC but retain the distinction between agricultural and forestry products, it is recommended that the two CPC classes/subclasses be refined as follows:

- The explanatory note on the agricultural class of in-shell nuts should clearly describe the dual origin of nuts that are specified at the most detailed level. It should be stated that the different species (cashews, almonds, pistachios, hazelnuts, walnuts) are both grown and gathered in the wild.
- Item 0323, described as “Other wild edible products”, should be expanded with the introduction of a subclass of wild, edible nuts, so that the latter can be identified separately from other wild, edible products. This will give more clarity to the class of wild edible products.

Additionally, in both classifications, other forest species of economic importance, such as pine nuts, should be identifiable at the most detailed level by a separate code. This importance can be determined by their international trade value, which is indicated by data provided by the national HS classifications of European countries, Belarus, China, Egypt, Georgia, Korea, Oman, Pakistan, Qatar, Russian Federation, Turkey and Saudi Arabia, which have a detailed code for pine nuts.

Existing data sources

Production

Data on the production of nuts are usually included in the agricultural statistics, and can be collected from national statistics offices at local and national level. Table 29 gives a global overview of nut production. Data has been extracted from the FAOSTAT agricultural production database and using the FAO Commodity list codes.

Table 29. Primary nuts world production by year (1 000 tonnes)

FAOSTAT Code	Item name	2008	2009	2010	2011	2012	2013
221	Almonds, with shell	2 480	2 457	2 597	3 013	3 005	2 918
226	Areca nuts	1 074	1 102	1 087	1 096	1 341	1 224
216	Brazil nuts, with shell	91	101	105	110	107	108
217	Cashew nuts, with shell	4 039	4 029	3 966	4 401	4 354	4 440
220	Chestnut	1 791	1 899	1 965	1 935	2 003	2 009
225	Hazelnuts, with shell	1 069	775	855	742	916	859
263	Karite nuts (sheanuts)	813	738	718	678	680	660
224	Kola nuts	257	292	280	297	295	294
223	Pistachios	806	817	947	938	1 024	917
275	Tung nuts	431	429	496	500	494	468
222	Walnuts, with shell	2 425	2 649	2 944	3 308	3 426	3 458

Source: FAOSTAT. http://faostat3.fao.org/

The main findings on national production data involve Brazil, Italy and Korea.

Brazil: the Brazilian Institute of Geography and Statistics (IBGE) provides the results of an annual survey on the amount and value of production obtained through the exploitation of natural forest resources, called plant extraction. The survey includes forest products that are found in natural stands – that is to say, those that grow without any human input. The food products include cashew nuts (*Ancardium occidentale*) and Brazil nuts (*Bertholletia excelsa*) (see Table 30).

Table 30. Production quantity and value of forest nuts in Brazil, 2011-2015

	Cashew nuts		Brazil nuts	
	tonnes	1 000 USD	tonnes	1 000 USD
2011	3 179	2 281	42 152	41 436
2012	3 054	2 063	38 805	35 014
2013	2 931	1 880	38 300	33 395
2014	2 489	1 864	37 499	33 807
2015	2 280	1 473	40 643	32 250

Source: Instituto Brasileiro de Geografia e Estatística. http://www.ibge.gov.br/

Italy: The Italian National Institute of Statistics (ISTAT) provides historical data on non-wood forest products. Data cover the period from 1934–2010. Chestnuts and pine-nut collection data for the most recent years are in Table 31.

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Table 31 - Collection of edible nuts in Italy, 2006-2010 (in tonnes)

	Chestnuts	Pine nuts
2006	52 610	970
2007	44 720	560
2008	33 580	380
2009	43 800	140
2010	51 300	630

Source: Italian National Institute of Statistics http://www.istat.it/

Republic of Korea: the National Forest Service of Korea releases official data for chestnuts, walnuts and pine nuts by its statistical database. The most recent data are presented in Table 32.

Table 32. Production of edible nuts in the Republic of Korea, 2009-2013

Item		Unit	2009	2010	2011	2012	2013
Chestnut	Quantity	tonnes	75 911	68 630	64 586	62 345	64 184
	Value	1 000 USD	110 855	116 988	128 791	158 178	133 241
Walnut	Quantity	tonnes	1 222	1 061	1 070	1 151	1 282
	Value	1 000 USD	12 263	13 633	14 589	20 888	21 756
Pine Nut	Quantity	tonnes	2 751	6 720	5 712	1 548	2 435
	Value	1 000 USD	29 111	43 065	37 058	10 021	17 430

Source: Korea Forest Service. http://kosis.kr/

International Trade

This section presents international trade data on Brazil nuts, the only species of those classified in the HS that are mostly gathered in the wild.

Table 33. Top five exporters, importers and global reporting of Brazil nuts, fresh or dried, in shell (HS 080121), 2015

Exporter	Value (1 000 USD)	Quantity (tonnes)	Share of exp quantity (%)	Importer	Value (1 000 USD)	Quantity (tonnes)	Share of imp quantity (%)
Brazil	17 188	18 417	75.7	**Peru**	6 343	5 526	56.0
Spain	3 487	3 795	15.6	**USA**	2 927	896	9.1
Netherlands	2 958	359	1.5	**Spain**	2 788	1 303	13.2
Italy	1 210	149	0.6	**Italy**	2 360	642	6.5
Bolivia	1 188	817	3.4	**Netherlands**	1 440	274	2.8
World	27 985	24 339	100	**World**	20 305	9 871	100

Source: Global Trade Atlas

Table 34. Top five exporters, importers and global reporting of Brazil nuts, fresh or dried, shelled (HS 080122), 2015

Exporter	Value (1 000 USD)	Quantity (tonnes)	Share of exp quantity (%)	Importer	Value (1000 USD)	Quantity (tonnes)	Share of imp quantity (%)
Bolivia	190 839	24 813	61.2	**USA**	72 833	8 940	21.8
Peru	34 338	4 288	10.6	**Germany**	59 201	6 890	16.8
Brazil	24 504	3 065	7.6	**UK**	59 185	7 246	17.6
Germany	23 393	2 327	5.7	**Netherlands**	39 428	4 358	10.6
Netherlands	14 277	1 617	4.0	**Australia**	11 069	1 363	3.3
World	313 525	40 535	100	**World**	323 284	41 092	100

Source: Global Trade Atlas

At a national level, many countries have added further codes to identify an important forest species: pine nuts. Table 35 and Table 36 shows these codes and trade data values for most important countries, respectively.

Table 35. Pine nuts trade code by country/region

Country/region	HS expanded code	Description
China	08029030	Pine nuts, shelled
Egypt	0802900010	Pine nuts, fresh or dried, unshelled
EU (CN 2016)	08029050	Pine nuts fresh or dried, whether or not shelled or peeled
Georgia	08029050000	Pine nuts, fresh or dried, whether or not shelled or peeled
Oman	08029011	Pine nuts in-shell
Oman	08029012	Pine nuts shelled
Pakistan	08134030	Pine nuts (chilgoza)
Qatar	08029011	Pine nuts in-shell
Qatar	08029012	Pine nuts, shelled
Russian Federation	0802905000	Pine nuts fresh or dried, whether or not shelled or peeled
Saudi Arabia	08029011	Pine nuts, in-shell
Saudi Arabia	08029012	Pine nuts, shelled
Rep. of Korea	0811903000	Frozen pine nuts
Turkey	080290500011	Pine nuts, fresh or dried, whether or not shelled or peeled

Source: Global trade atlas; Trade Map

Table 36. Pine nuts export and import values, 2013-2015 (1 000 USD)

Country	Code	Export			Import		
		2013	2014	2015	2013	2014	2015
China	08029030	212 315	234 068	258 349	26 953	53 440	64 841
EU 28 intra trade	08029050	152 238	155 560	118 234	152 436	150 964	104 967
EU 28 extra trade	08029050	19 837	18 880	13 867	215 611	167 924	229 374
Turkey	080290500011	25 300	21 741	40 379	3 931	530	919
Russian Federation	0802905000	1 966	8 278	8 346	2 650	139	0

Sources: Eurostat, Global Trade Atlas

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8.5 Bamboo and rattan

Description

The common name "bamboo" is used to describe a large group of grass that comprises more than 1 400 different species distributed around the world (with the exception of Europe). The *FAO Forest Resource Assessment* (FAO, 2010) estimated that the world forest area of bamboo covered a total of about 31.5 million hectares in 2010, more than half of which was located in Asia, and had grown by 11 percent since 1990.

Bamboo is considered a major non-wood forest product and is widely used as a substitute for wood. In recent decades, the bamboo sector has expanded from producing handicrafts and plaiting materials to an industry producing woven articles and new, value-added bamboo-based products. Overall, bamboo is used in housing, crafts, pulp, paper, panels, boards, veneer, flooring, roofing, fabrics, oil, gas, charcoal, vinegar, fodder, pigments, medicine and food.

Rattan refers to the 600 species of the palms family; its geographic distribution covers the equatorial zones of Africa and Asia, spanning an elevation between zero and 3 000 m. Like bamboo, rattan is a multipurpose forest resource used in construction, the production of mats, baskets, tools, handles, hats, traditional toys, musical instruments and furniture, and is also a source of food.

According to the International Network for Bamboo and Rattan (INBAR), bamboo products can be classified into the following five categories:

- bamboo and rattan raw materials;
- bamboo shoots;
- bamboo and rattan woven products; and
- industrialized bamboo products.

Existing classification

Central Product Classification (CPC Ver.2.1)

Bamboo products can be found under three sections of the CPC Ver.2.1: one representing agricultural and forestry products; one related to processed food products; and the third for transportable goods.

Section	**0**	**AGRICULTURE, FORESTRY AND FISHERY PRODUCTS**
Division	01	Products of agriculture, horticulture and market gardening
Group	012	Vegetables
Class	0129	Vegetables, fresh, n.e.c.
Subclass	**01290**	**Vegetables, fresh, n.e.c.**
Division	03	Forestry and logging products
Group	032	Non-wood forest products

Class	0325	Vegetable materials of a kind used primarily for plaiting or as stuffing or padding; raw Vegetable materials of a kind used primarily for dyeing or tanning; vegetable products n.e.c.
Subclass	**03250**	**Vegetable materials of a kind used primarily for plaiting or as stuffing or padding; raw vegetable materials of a kind used primarily for dyeing or tanning; vegetable products n.e.c.** This subclass is defined through the following headings/subheadings of the HS 1401, 1404.90. (They include *bamboo and rattan and other products).*

Section	**2**	**FOOD PRODUCTS, BEVARAGES AND TOBACCO; TEXTILES, APPAREL AND LEATHER PRODUCTS**
Division	21	Meat, fish, fruits, vegetables, oils and fats
Group	213	Prepared and preserved vegetables, pulses and potatoes
Class	2131	Frozen vegetables, pulses and potatoes
Subclass	**21319**	**Other vegetables and pulses, frozen**
Class	2133	Vegetables provisionally preserved
Subclass	**21330**	**Vegetables provisionally preserved**
Class	2139	Other prepared and preserved vegetables, pulses and potatoes
Subclass	**21393**	**Dried potatoes and other dried vegetables**
Subclass	**21399**	Other vegetables and pulses, preserved other than by vinegar,:acetic acid or sugar, n.e.c. *Includes: tomatoes, cucumbers and gherkins, carrots cabbage, chick peas,* ***bamboo shoots,*** *garlic, lentils, olives, onions, peppers, spinach, sweet corn, vegetable mixes.*
Subclass	**21340**	**Vegetables, pulses and potatoes, preserved by vinegar or acetic acid** *Includes: cucumbers, gherkins, artichoke hearts, asparagus,* ***bamboo shoots****, beans, scallions, eggplants, cabbages, carrots, cauliflowers, celery, fruits of the genus Capsicum, maize, corn, sweet corn, mushrooms, mustard pickles, onions, olives.*

Section	**3**	**OTHER TRANSPORTABLE GOODS, EXCEPT METAL PRODUCTS, MACHINERY AND EQUIPMENT**
Division	**31**	**Products of wood, cork, straw and plaiting materials**
Group	312	Wood continuously shaped along any of its edges or faces; wood wool; wood flour; wood in chips or particles
Class	3121	Wood, continuously shaped along any of its edges or faces (including strips and friezes for parquet flooring, not assembled, and beadings and mouldings)

Subclass	**31212**	**Wood, continuously shaped along any of its edges or faces (including strips and friezes for parquet flooring, not assembled, and beadings and mouldings) of bamboo**
Group	314	Boards and panels
Class	3145	Plywood, veneer panels and similar laminated wood of bamboo
Subclass	**31450**	**Plywood, veneer panels and similar laminated wood of bamboo**
Group	319	Other products of wood; articles of cork, plaiting materials and straw
Class	3192	Articles of cork and straw or other plaiting materials; basketware and wickerwork
Subclass	**31923**	**Manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork** *This subclass is defined through the following headings/subheadings of the HS: 4601, 4602.* (They include bamboo and rattan).
Division	**32**	**Pulp, paper and paper products; printed matter and related articles**
Group	321	Pulp, paper and paperboard
Class	3211	Pulps of wood or other fibrous cellulosic material
Subclass	**32113**	**Mechanical wood pulp; semi-chemical wood pulp; pulps of fibrous cellulosic material other than wood** *This subclass is defined through the following headings/subheadings of the HS: 4701, 4705, 4706.* (They include bamboo and rattan)
Class	3219	Other paper and paperboard products
Subclass	**32199**	**Other paper, paperboard, cellulose wadding and webs of cellulose fibres, cut to size or shape; cigarette paper, in booklets or tubes, or in rolls of a width not exceeding 5 cm; other articles of paper pulp, paper, paperboard, cellulose wadding or webs of cellulose fibres** *This subclass is defined through the following headings/subheadings of the HS: 4813.10, .20, 4822, 4823.20 - .90.* (Includes bamboo).
Division	**34**	**Basic chemicals**
Group	345	Miscellaneous basic chemical products
Class	3451	Wood charcoal
Subclass	**34510**	**Wood charcoal** *This subclass is defined through the following headings/subheadings of the HS: 4402.* (Includes bamboo).
Division	**38**	**Furniture; other transportable goods n.e.c.**
Group	381	Furniture
Class	3811	Seats
Subclass	**38112**	**Seats, primarily with wooden frames** *This subclass is defined through the following headings/subheadings of the HS: 9401.40 - .69.* (Include bamboo or rattan).

Class	3814	Other furniture n.e.c.
Subclass	**38140**	**Other furniture n.e.c.** *This subclass is defined through the following headings/subheadings of the HS: 9403.20, .50 - .89, 9610*. (Include bamboo or rattan).

Harmonized Commodity Description and Coding System (HS 2017)

The HS classifies bamboo and rattan products in five different sections, two of which refer to bamboo as a food product, while the other three cover industrialized bamboo (wood, paper, manufactured articles and furniture).

Bamboo as food product

Chapter	**7**	**Edible vegetables and certain roots and tubers**
Heading	07.09	Other vegetables, fresh or chilled
Subheading	**0709.99**	**Other** *The vegetables of this heading include: […] ,**bamboo shoots**, […]*
Heading	07.10	Other vegetables (uncooked or cooked by steaming or boiling in water), frozen.
Subheading	**0710.80**	**Other vegetables**
Heading	07.11	Vegetables provisionally preserved (for example, by sulphur dioxide gas, in brine, in sulphur water or in other preservative solutions), but unsuitable in that state for immediate consumption.
Subheading	**0711.90**	**Other vegetables; mixtures of vegetables.**
Heading	07.12	Dried vegetables, whole, cut, sliced, broken or in powder, but not further prepared.
Subheading	**0712.90**	**Other vegetables; mixtures of vegetables.**
Chapter	**14**	**Vegetable plaiting materials; vegetable products not elsewhere specified or included**
Heading	14.01	Vegetable materials of a kind used primarily for plaiting (for example, bamboos, rattans, reeds, rushes, osier, raffia, cleaned, bleached or dyed cereal straw, and lime bark).
Subheading	**1401.10**	**Bamboos**
Subheading	**1401.20**	**Rattans**
Chapter	**20**	**Preparations of vegetables, fruit, nuts or other parts of plants**
Heading	20.01	Vegetables, fruits, nuts and other edible parts of plants, prepared or preserved by vinegar or acetic acid
Subheading	**2001.90**	**Other** *The heading covers only those products of chapter 7 […]*

Heading	20.05	Other vegetables prepared or preserved otherwise than by vinegar or acetic acid, not frozen, other than products of heading 20.06
Subheading	**2005.91**	**Bamboo shoots**

Industrialized bamboo

Chapter	**44**	**Wood and articles of wood; wood charcoal**
Heading	44.02	Wood charcoal (including shell or nut charcoal), whether or not agglomerated
Subheading	**4402.10**	**Of bamboo**
Heading	44.09	Wood (including strips and friezes for parquet flooring, not assembled) continuously shaped (tongued, grooved, rebated, chamfered, V-jointed, beaded, moulded, rounded or the like) along any of its edges, ends or faces, whether or not planed, sanded or end-jointed.
Subheading	**4409.21**	**(Non-coniferous) Of bamboo**
Heading	44.12	Plywood, veneered panels and similar laminated wood
Subheading	**4412.10**	**Of bamboo**
Heading	44.18	Builders' joinery and carpentry of wood, including cellular wood panels, assembled flooring panels, shingles and shakes.
		- Assembled flooring panels
Subheading	**4418.73**	**- - Of bamboo or with at least the top layer (wear layer) of bamboo**
		- Other
Subheading	**4418.91**	**- - Of bamboo**
Heading	44.19	Tableware and kitchenware, of wood
		- Of bamboo
Subheading	**4419.11**	**- - Bread boards, chopping boards and similar boards**
Subheading	**4419.12**	**- - Chopstick**
Subheading	**4419.19**	**- - Other**
Heading	44.21	Other articles of wood
		- Other
Subheading	**4421.91**	**- - Of bamboo**
Chapter	**46**	**Manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork**
Heading	46.01	Plaits and similar products of plaiting materials, whether or not assembled into strips; plaiting materials, plaits and similar products of plaiting materials, bound together in parallel strands or woven, in sheet form, whether or not being finished articles (for example, mats, matting, screens).
		- Mats, matting and screens of vegetable materials:

Subheading	**4601.21**	**- - Of bamboo**
Subheading	**4601.22**	**- - Of rattan**
Heading	46.02	Basketwork, wickerwork and other articles, made directly to shape from plaiting materials or made up from goods of heading 46.01; articles of loofah. - Of vegetables materials:
Subheading	**4602.11**	**- - Of bamboo**
Subheading	**4602.12**	**- - Of rattan**
Chapter	**47**	**Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard**
Heading	47.06	Pulps of fibres derived from recovered (waste and scrap) paper or paperboard or of other fibrous cellulosic material. - Other
Subheading	**4706.30**	**- - Of bamboo**
Chapter	**48**	**Paper and paperboard; articles of paper pulp, of paper or of paperboard**
Heading	48.23	Other paper, paperboard, cellulose wadding and webs of cellulose fibres, cut to size or shape; other articles of paper pulp, paper, paperboard, cellulose wadding or webs of cellulose fibres - Trays, dishes, plates, cups and the like, of paper or paperboard
Subheading	**4823.61**	**- - Of bamboo**
Chapter	**94**	**Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated name-plates and the like; prefabricated buildings.**
Heading	94.01	Seats (other than those of heading 94.02), whether or not convertible into beds, and parts thereof. - Seats of cane, osier, bamboo or similar materials
Subheading	**9401.52**	**- - Of bamboo**
Subheading	**9401.53**	**- - Of rattan**
Heading	94.03	Other furniture and parts thereof. - Furniture of other materials, including cane, osier, bamboo or similar materials
Subheading	**9403.82**	**- - Of bamboo**
Subheading	**9403.83**	**- - Of rattan**

Assessment

The HS enables the detection of all products related to the bamboo and rattan industry; products can be clearly identified in all of its forms, from raw material to processed goods. They are well defined and identified as plaiting materials. Regarding bamboo as food products, only one detailed code exists for processed bamboo shoots; the item refers to shoots prepared or preserved in items other than vinegar or acetic acid, not frozen. All other unprocessed or processed forms in which bamboo shoots are traded (fresh, dried, frozen, provisionally preserved, etc.) are not specifically recognizable because they are part of the wide residual categories of "Other vegetables".

The CPC does not clearly identify at detailed level bamboo and rattan as a NWFP. Bamboo shoots form parts of residual categories of "Other vegetables", whether fresh or dried, provisionally preserved or processed. As vegetable materials, they fit a broad class in the non-wood forest group that is intended for (undefined) vegetable materials aimed at a variety of uses, such as plaiting, stuffing, padding, dyeing and tanning.

Proposed definition and classification

Regarding the HS classification, no problems are detected in tracking bamboo products. INBAR has already established the importance of international trade of other new bamboo products, and has proposed additional HS codes that have been approved by the World Customs Organization. Ten new codes will come into operation in 2017. These are related to Chapter 44 ("Wood and articles of wood; wood charcoal") and Chapter 94 ("Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated name-plates and the like; prefabricated buildings").

Further developments should be considered for bamboo shoots due to the importance of this product in many countries. Evidence from large-values trade data can be checked in those countries that already have separate codes for bamboo shoots (see "International trade" section).

Analogous considerations should be taken into account for further CPC development on bamboo shoots. In addition, the CPC group of NWFPs should be further specified at subclass level. Currently, the class 0325, which describes the forest product as "Vegetable materials of a kind used primarily for plaiting or as stuffing or padding; raw vegetable materials of a kind used primarily for dyeing or tanning; vegetable products n.e.c.", is not further subdivided. It is recommended that bamboo and rattan be defined as vegetable materials used primarily for plaiting. Therefore, the class should be divided as follows in order to be consistent with the HS and make the class more exhaustive.

- *(Subclass)* Vegetable materials of a kind used primarily for plaiting
- Of bamboo
- Of rattan
- Other

Existing data sources

Production

Bamboo and rattan are important forest resources in many Asian countries in particular. Reliable statistics on these productions are often available (especially for bamboo shoots) and can be extracted from different

sources such as national statistical offices, national and local forest institutions, special studies, etc. For example, useful and reliable data from China can be extracted from the *China Forestry Statistical Yearbook*, which provides annual data on the quantity of bamboo shoots produced (581 871 tonnes – dry – in 2011). Other figures have been provided by Ruiz Pérez (2014), who analysed the production trends of bamboo culms and shoots during the period 1991–2011.

Other national data sources include the Korean Statistical Database, which provides statistics of forest products, including bamboo and bamboo shoots, and the *Japan Statistical Yearbook*, which provides data on bamboo wood and shoots.

International trade

At present, there are three detailed HS codes for classifying bamboo and rattan as NWFPs. Two of these belong to the category designated to vegetable materials used primarily for plaiting and includes bamboo (whether or not split, sawn lengthwise, cut to length, rounded at the ends, bleached, rendered non-inflammable, polished or dyed, or not), split osier, reeds and the like, rattan cores, and drawn or split rattans. Another detailed code covers bamboo shoots that are preserved by other means than in vinegar and are not frozen.

International trade value and quantity data provided under these three codes (14010 bamboo, 140120 rattan and 200591 preserved bamboo shoots) are given in Table 37 to 41.

Table 37. Top five exporters, importers and global reporting of bamboo for plaiting (HS 140110), 2015.

Exporter	Value (1 000 USD)	Quantity (tonnes)	Share of exp. quantity (%)	Importer	Value (1 000 USD)	Quantity (tonnes)	Share of imp. quantity (%)
China	72 888	108 089	87.8	**India**	23 379	20 974	13.9
Netherlands	3 829	2 144	1.7	**USA**	19 437	20 359	13.5
Hong Kong SAR	1 574	1 393	1.1	**Netherlands**	14 541	14 669	9.7
Germany	1 483	497	0.4	**Italy**	8 798	10 221	6.8
Thailand	1 276	4 694	3.8	**UK**	8 225	6 729	4.4
World	88 244	123 074	100	**World**	128 844	151 248	100

Sources: Global Trade Atlas; Trademap. http://www.trademap.org/

Table 38. Top five exporters, importers and global reporting of rattan for plaiting (HS 140120), 2015

Exporter	Value (1 000 USD)	Quantity (tonnes)	Share of exp. quantity (%)	Importer	Value (1 000 USD)	Quantity (tonnes)	Share of imp. quantity (%)
Singapore	9 930	3 689	45.9	**China**	32 034	29 948	72.5
China	6 520	981	12.2	**Singapore**	7 065	3 016	7.3
Philippines	2 519	2 491	31.0	**Egypt**	3 668	570	1.4
Hong Kong SAR	1 212	135	1.7	**USA**	3 119	484	1.2
Malaysia	633	496	6.2	**Germany**	2 253	213	0.5
World	21 802	8 045	100	**World**	65 819	41 317	100

Sources: Global Trade Atlas; Trademap. http://www.trademap.org/

Table 39. Top five exporters, importers and global reporting of prepared bamboo shoots (HS 200591), 2015

Exporter	Value (1 000 USD)	Quantity (tonnes)	Share of exp. quantity (%)	Importer	Value (1 000 USD)	Quantity (tonnes)	Share of imp. quantity (%)
China	277 615	151 708	88.4	Japan	133 601	73 015	44.7
Thailand	10 104	8 083	4.7	USA	26 115	24 690	15.1
Netherlands	4 801	4 352	2.5	Germany	9 476	12 543	7.7
France	3 210	848	0.5	UK	7 478	7 129	4.4
Greece	3 143	959	0.6	Netherlands	6 631	7 043	4.3
World	311 113	171 602	100	World	220 821	163 491	100.0

Source: Global Trade Atlas.

At national level, many Asian countries have added further codes to precisely identify bamboo shoots when they are traded in forms other than that specified at international level. They have recognized the importance of bamboo shoots when traded fresh, dried and provisionally preserved, and thus provide further codes for them by expanding the residual categories in which they are included. Tables 7–9 show the international trade values and quantities of these expansions.

Table 40. Export and import values of HS expansion of 070999 - Other fresh or chilled vegetables, 2015 (in 1 000 USD).

Country	HS code	Description	Export	Import
China	07099910	Bamboo shoots, fresh or chilled	6 826	--
Thailand	07099900001	Bamboo shoots	4 866	8
Hong Kong SAR	07099910	Bamboo shoots, fresh or chilled	9	123
Taiwan PoC	0709999011	Bamboo shoots, fresh or chilled	114	--

Source: Global Trade Atlas. Special value: -- not reported

Table 41. Export and import values of HS expansion of 071080 - Other vegetables, uncooked or cooked by steaming or by boiling in water, frozen, 2015 (in 1 000 USD)

Country	HS code	Description	Export	Import
Rep. of Korea	0710803000	Bamboo Shoots	3	--
Taiwan PoC	0710809010	Bamboo Shoots, Frozen	22	--

Source: Global Trade Atlas. Special value: -- not reported

Table 42. Export and import values of HS expansion of 071190 - Other vegetables provisionally preserved but unsuitable in that state for immediate consumption, 2015 (in 1 000 USD)

Country	HS code	Description	Export	Import
China	07119031	Bamboo Shoots, In Brine	7 533	643
Rep. of Korea	0711903000	Bamboo Shoots	--	217
Taiwan PoC	0711909014	Bamboo Shoots, Provisionally Preserved	73	0

Source: Global Trade Atlas. Special value: -- not reported

Table 43. Export and import values of HS expansion of 071290 - Other dried vegetables, 2015 (in 1 000 USD).

Country	HS code	Description	Export	Import
China	07129010	Dried Bamboo Shoots	23 076	587
Japan	071290010	Dried Bamboo Shoots	--	32 824
Thailand	07129090001	Dried Bamboo Shoots	241	1 858

Source: Global Trade Atlas- Special value: -- not reported

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8.6 Cork

Description

Cork is produced from the thick outer bark of cork oak trees (*Quercus suber*). Cork oak trees are geographically distributed in the Mediterranean basin, the coastal regions of southwest Europe (France, Italy, Portugal and Spain) and northwest Africa (Algeria, Morocco and Tunisia). Harvesting occurs in spring or summer, when the trees are in full leaf. Cork is used mainly for stoppers, but also for flooring and wall coverage, heels and soles for shoes, textile fibre and other purposes.

Existing classification

Cork is present under two classes in the CPC Ver.2.1: one in the non-wood forest products and one related to transportable goods. In both cases, it is defined at the most detailed level (five digits). For international trade, Chapter 45 of the HS covers natural and agglomerated corks in all of its forms.

Central Product Classification (CPC Ver.2.1)

Section	**0**	**Agriculture, forestry and fishery products**
Division	03	Forestry and logging products
Group	032	NWFPs
Class	0322	Natural cork, raw or simply prepared
Subclass	**03220**	**Natural cork, raw or simply prepared** The subclass is defined through the HS 4501.10 (natural cork, raw or simply prepared)
Section	**3**	**Other transportable goods, except metal products, machinery and equipment**
Division	31	Products of wood, cork, straw and plaiting materials
Group	319	Other products of wood; articles of cork, plaiting materials and straw
Class	3192	Articles of cork and straw or other plaiting materials; basketware and wickerwork
Subclass	**31921**	**Natural cork, debacked or roughly squared, or in blocks, plates, sheets or strips crushed, granulated or ground cork; waste cork**
Subclass	**31922**	**Articles of natural cork; agglomerated cork and articles thereof**

Harmonized Commodity Description and Coding System (HS 2017)

Chapter 45 in Section IX – "Wood and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other planting materials; basketware and wickerwork" – is dedicated to cork.

Chapter	45	Cork and articles of cork
Heading	**45.01**	**Natural cork, raw or simply prepared; waste cork; crushed, granulated or ground cork**
Subheading	4501.10	- Natural cork, raw or simply prepared
Subheading	4501.90	- Other

Heading	**45.02**	**Natural cork, debacked or roughly squared, or in rectangular (including square) blocks, plates, sheets or strips (including sharp-edged blanks for corks or stoppers)**
Subheading	4502.00	Natural cork, debacked or roughly squared, or in rectangular (including square) blocks, plates, sheets or strips (including sharp-edged blanks for corks or stoppers)
Heading	**45.03**	**Articles of natural cork**
Subheading	4503.10	- Corks and stoppers
Subheading	4503.90	- Other
Heading	**45.04**	**Agglomerated cork (with or without a binding substance) and articles of agglomerated cork**
Subheading	4504.10	- Blocks, plates, sheets or strips, tiles of any shape; solid cylinders, including discs
Subheading	4504.90	- Other

Assessment

Cork is well defined under both classifications. Codes at the most detailed level are provided, allowing the identification of products from the entire cork industry, from raw to processed. Cork as a NWFP is clearly detectable, meaning no further specification is required.

Existing data sources

Production

Most important producer countries are located in the Mediterranean basin. Portugal is the most important producer worldwide followed by Spain, Morocco, Algeria, Tunisia, Italy, and France. Production is highly concentrated in Portugal and Spain, which combined account for 80 % of world production (Table 44).

Table 44. Global cork production

	Production (tonnes)	Share (%)	Cumulative share (%)
Portugal	100 000	49.6	49.6
Spain	61 504	30.5	80.2
Morocco	11 686	5.8	86.0
Tunisia	9 915	4.9	90.9
Algeria	6 962	3.5	94.4
Italy	6 161	3.1	97.4
France	5 200	2.6	100
	201 428	100	

Source: FAO, 2010 in APCOR's Cork yearbook 2016.

Below are some further sources and data that are available for cork production in this region.

Tunisia: CTP (2009) is the national product classification, the reference base for statistics production on consumption, national and international trade and production. It is the national version of the European

Classification of Products by Activities (CPA). Cork is situated under two sections in this system: "Agricultural and forestry products" and "Manufactured products".

A	Agriculture, forestry and fishery products (section)
02	Forestry products and services (division)
023	Other forestry products (group)
0232	Cork (class)
0231	**Natural cork, raw or simply prepared (class)**
02310	**Natural cork, raw or simply prepared (subclass)**
C	Manufactured products
16	Products of wood and cork, except furniture; articles of straw and plaiting materials (division)
162	Articles of wood, cork, straw and plaiting (group)
1629	Other products of wood, articles of cork, straw and plaiting materials, handicraft (class)
16292	Articles of cork, straw and plaiting (class)
162921	**Natural cork, debacked or roughly squared, or in blocks, plates, sheets or strips; cork, crushed, granulated or ground; waste cork (subclass)**
162922	**Articles of natural cork (subclass)**
162923	**Blocks, plates, sheets, strips, slabs, cylinders, of cork agglomerated (subclass)**
162924	**Agglomerated cork; articles of agglomerated cork n.e.c. (subclass)**

According to FAO's Forest Resource Assessment (2010), cork production in Tunisia was 6 962 tonnes in 2005.

Algeria: National statistics are provided on the basis of the Algerian Classification of Activities and Products classification system (NPA 2000), in which cork is classified under two sections: "Agricultural and forestry products" and "Manufactured products".

A	Agriculture and forestry products (section)
AA	Agriculture and forestry products (subsection)
02	Forestry production (division)
020	Silvicultural products (group)
0203	Natural cork, raw (class)
02030	Natural cork, raw (category)
020300	**Natural cork, raw (subcategory)**
D	Manufactured products (section)
DD	Wood products (subsection)
20	Wood products (division)
205	Other products of wood, cork or twisting (group)
2052	Other products of wood, cork or twisting (class)
20520	Other products of wood, cork or twisting (category)
205201	**Natural cork, debacked (subcategory)** **Includes: natural cork, debacked, squared or cubed, plates, sheets or strips** **Excludes: natural cork, raw (020300)**
205202	**Articles of natural cork (subcategory)** **Includes: stoppers, decorative plates, etc. of natural cork**
205203	**Semi-finished of agglomerated cork (subcategory)** **Includes: blocks, plates, sheets, strips, etc. of agglomerated cork**
205204	**Articles of agglomerated cork (subcategory)** **Includes: stoppers, decorative plates, etc. of agglomerated cork**

According to data on production provided by the Ministère de l'Agriculture et du Développement Rural, Direction Générale de Forêts, cork production in 2013 amounted to 6 605 tonnes.

Italy: The National Institute of Statistic (ISTAT) provides historical data on removals of NWFPs. Time series data are available from 1934 to 2010 and include non-wood products from other wooded lands. Data on cork are provided, separating gentle from hard cork.

European Union: Data for processed cork are provided by the Prodcom list.

Table 45. PRODCOM codes and description for processed cork

Prodcom Code	Description
16292130	Waste cork; crushed, granulated or ground cork (excluding natural cork, raw or simply prepared)
16292150	Natural cork, debacked or roughly squared, in rectangular or square blocks, plates, sheets or strips
16292250	Corks and stoppers of natural cork
16292290	Articles of natural cork, others
16292320	Corks and stoppers, of agglomerated cork, for sparkling wine v.q.p.r.d. (including those with discs of natural cork)
16292350	Corks and stoppers, of agglomerated cork, for wine (excluding for sparkling wine v.q.p.r.d.)
16292380	Agglomerated cork – blocks, plates, sheets and strips, tiles of any shape, solid cylinders or discs, including agglomerated expanded cork or burnt cork (excluding corks and stoppers)
16292400	Agglomerated cork; other articles of agglomerated cork, n.e.c.

Source: Eurostat. http://ec.europa.eu/eurostat/web/prodcom/data/excel-files-nace-rev.2

Table 46. Production value of manufactured cork goods in EU (1 000 USD), 2015

Prodcom code	Spain	France	Italy	Hungary	Portugal	Finland	UK
16292130	26 854	na	14 478	0	167 221	0	0
16292150	52 066	0	na	0	147 780	0	0
16292250	55 643	140 092	66 148	0	625 134	0	0
16292290	10 565	na	970	0	62 281	0	0
16292320	64 462	41 302	39 539	0	97 193	0	0
16292350	68 232	na	56 664	0	167 067	0	0
16292380	na	na	na	1 736	173 192	271	615
16292400	3 612	750	2 065	0	64 850	0	na

Source: Eurostat. http://ec.europa.eu/eurostat/web/prodcom/data/excel-files-nace-rev.2

International trade

This section shows an overview of cork trade values for both raw and processed cork (Table 47) and provides detailed country data for the most relevant codes to cork as a NWFP (Table 48 and Table 49).

Table 47. Global cork international trade values, 2015 (1 000 USD)

HS Code	Description	Export value	Import value
4501	Natural cork, raw or simply prepared; waste cork; crushed, granulated or ground cork	121 139	191 894

4502	Natural cork, debacked or roughly squared, or rectangular (or square) blocks, plates, sheets or strips, and sharp-edged blanks for corks or stoppers	52 471	30 432
4503	Articles made of natural cork	646 812	688 204
4504	Agglomerated cork and articles thereof	737 658	672 163

Sources: Global Trade Atlas, Trade Map.

Table 48. Top five exporters, importers and global reporting of natural cork (HS 450110), 2015.

Exporter	Value (1 000 USD)	Quantity (tonnes)	Share of exp quantity (%)	Importer	Value (1 000 USD)	Quantity (tonnes)	Share of imp quantity (%)
Spain	23 857	9 355	43.8	**Portugal**	96 769	41 728	65.5
Portugal	9 795	5 282	24.7	**Spain**	14 221	15 921	25.0
USA	7 822	679	3.2	**China**	6 944	2 320	3.6
Italy	6 923	4 515	21.1	**Belgium**	2 713	1 108	1.7
Morocco	1 132	1 312	6.1	**Italy**	1 968	754	1.2
World	51 261	21 365	100	**World**	126 374	63 711	100

Sources: Global Trade Atlas, Trade Map.

Table 49. Top five exporters, importers and global reporting of waste cork; crushed, granulated or ground cork (HS 450190), 2015.

Exporter	Value (1 000 USD)	Quantity (tonnes)	Share of exp quantity (%)	Importer	Value (1 000 USD)	Quantity (tonnes)	Share of imp quantity (%)
Portugal	41 834	34 467	42.1	**Portugal**	17 272	24 384	43.4
Spain	16 766	35 999	44.0	**Spain**	11 846	10 370	18.5
Morocco	5 172	7 380	9.0	**France**	7 970	3 097	5.5
Italy	2 307	2 570	3.1	**Germany**	5 219	2 170	3.9
Algeria	1 624	727	0.9	**Italy**	4 418	3 676	6.5
World	69 879	81 800	100	**World**	65 513	56 172	100

Sources: Global Trade Atlas, Trade Map.

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8.7 Bark

Description

Bark is a multipurpose non-wood forest product; it is harvested worldwide, with plenty of varieties used for different applications: medicinal use (i.e. the bark of *Cascara sagrada*, or *Rhamnus Purshiana*, Cinchona, Persea), dyes (i.e. the bark of *Terminalia elliptica*, *Alnus* spp.), as raw material for tanning (from the bark of different species of acacia) and also has a decorative use.

Despite the wide availability of information on its widespread use, both in ancient and recent times, structured statistics on production and trade are hardly available.

Existing classification

Central Product Classification (CPC Ver.2.1)

In the CPC, bark is classified under two sections: Section 0 of "Agriculture, forestry and fishery" products, and Section 3 of "Other transportable goods, except metal products, machinery and equipment" in the wastes and scraps division.

The agricultural division includes bark used in perfumery, pharmaceuticals or insecticidal, fungicidal or similar products. The definition of bark comprised in this category derives from HS heading 12.11. It includes the bark and other parts of plants listed in the explanatory note (see the detailed classification below).

The forest division includes the bark as a non-wood raw material used mainly for dyeing and tanning. The explanatory notes clarify the classification via cross-references to the HS classification (see the detailed classification below).

Finally, Section 3 places bark in the class of wood wastes and scrapes. This is divided into two subclasses to distinguish between agglomerated and non-agglomerated wood wastes and scraps.

Section	**0**	**Agriculture, forestry and fishery products**
Division	**01**	**Products of agriculture, horticulture and market gardening**
Group	019	Forage products; fibre crops; plants used in perfumery, pharmaceuticals or insecticidal, fungicidal or similar products; beet, forage plant and flower seeds; natural rubber; living plants, cut flowers and flower buds; unmanufactured tobacco; other raw vegetable materials
Class	0193	Plants and parts of plants used primarily in perfumery, pharmaceuticals, or insecticidal, fungicidal or similar products
Subclass	**01930**	**Plants and parts of plants used primarily in perfumery, pharmaceuticals or for insecticidal, fungicidal or similar products** This subclass is defined through the following headings/subheadings of the HS: **1211**, 1302.11
Division	**03**	**Forestry and logging products**
Group	032	Non-wood forest products

Class	0325	Vegetable materials of a kind used primarily for plaiting, or as stuffing or padding; raw vegetable materials of a kind used primarily for dyeing or tanning; vegetable products n.e.c.
Subclass	**03250**	**Vegetable materials of a kind used primarily for plaiting, or as stuffing or padding; raw vegetable materials of a kind used primarily for dyeing or tanning; vegetable products n.e.c.** **This subclass is defined through the following headings/subheadings of the HS: 1401, 1404.90**
Section	**3**	**Other transportable goods, except metal products, machinery and equipment**
Division	39	Wastes or scraps
Group	392	Non-metal wastes or scraps
Class	3928	Sawdust, wood waste and scrap
Subclass	**39282**	**Agglomerated wood waste and scrap in forms other than pellets**
Subclass	**39283**	**Non-agglomerated wood waste and scrap**

Harmonized Commodity Description and Coding System (HS 2017)

The HS has three chapters to classify bark. Chapter 12 classifies bark at subheading level (six digits) in the category of parts of plants used primarily in perfumery, pharmaceuticals or for insecticidal, fungicidal or similar purposes.

Chapter 14 is related to vegetable materials and covers bark under two headings: one is for materials used primarily for plaiting and comprises various types of bark, among which are lime, baobab, willow or poplar; the other categorizes all vegetable materials not elsewhere classified. This last heading includes bark as "Raw material used for dyeing and tanning", and as "Other vegetable products", such as the bark of *Quillaia saponaria* (see the detailed classification below).

Chapter 44 includes wood and articles of wood. Within this chapter, bark is classified as a wood waste or scrap and not usable as timber, and is included under the subheading of "Other sawdust and wood waste and scrap, whether or not agglomerated in logs, briquettes, pellets or similar forms".

Chapter	**12**	**Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder**
Heading	12.11	Plants and parts of plants (including seeds and fruits), of a kind used primarily in perfumery, pharmaceuticals or for insecticidal, fungicidal or similar purposes, fresh or dried, whether cut, crushed or powdered or not
Subheading	1211.90	Other This heading covers vegetable products of a kind used primarily in perfumery, pharmaceuticals or for insecticidal, fungicidal or similar purposes. They may be in the form of whole plants, mosses or lichens, or of parts (such as wood, **bark**, roots, stems, leaves, flowers, petals, fruits and seeds), or in the form of waste resulting from mechanical treatment. They remain in the heading whether fresh or dried, whole, cut, crushed, ground, powered (where appropriate), grated or hulled. Products under this heading impregnated with alcohol remain classified here.

		Plants and parts (including seeds and fruits) of trees, bushes, shrubs or other plants are classified here if they are of a kind used directly for the purposes specified above, or for the production of extracts, alkaloids or essential oils suitable for those purposes. On the other hand, the heading excludes seeds and fruits of a kind used for the extraction of fixed oils. The explanatory note also clarifies the subject of the heading listing, by species and part of species, the products that are included (i.e. Elder, *Sambucus nigra*: flowers and bark; Sassafras, *Sassafras officinalis*: bark, roots and wood, etc.). The list is not exhaustive of all products that can be classified under this heading. The following list mentions the species included in the list because of their bark. - **Angostura** (*Galipea officinalis*): Bark - **Cascara sagrada** *(Rhamnus purshiana*): Bark - **Cascarilla** (*Croton eluteria*): Bark - **Cinchona**: Bark - **Cocillana** (*Guarea rusby*i): Bark - **Condurango** (*Marsdenia condurango*): Bark - **Cube (Barbasco or timbo)** (*Lonchocarpus nicou*): Bark and roots - **Elder** (*Sambucus nigra*): Flowers and bark - **Frangula**: Bark - **Hamamelis (witch hazel)** (*Hamamelis virginiana*): Bark and leaves - **Quassia** (*Quassia amara* and *Picraena excelsa*): Wood and bark - **Sassafras** (*Sassafras officinalis*): Bark, roots and wood - **Slippery elm** (*Ulmus fulva*): Bark - **Viburnum** (*Viburnum prunifolium*): Roots and bark - **Yohimba** (*Coryanthe johimbe*): Bark
Chapter	**14**	**Vegetable plaiting materials; vegetable products not elsewhere specified or included**
Heading	14.01	Vegetable materials of a kind used primarily for plaiting (for example bamboos, rattans, reeds, rushes, osier, raffia, cleaned, bleached or dyed cereal straw, and lime bark)
Subheading	1401.90	Other *The heading covers inter alia, the inner bark (bast) of several varieties of lime (Tilia species). The fibres of this bark are very strong and are used in ropes, packing cloth and coarse matting, and also for tying plants*
Heading	1404	Vegetable products not elsewhere specified or included
Subheading	1404.90	Other *It includes raw vegetables materials of a kind used primarily in dyeing or tanning. Such products are used primarily in dyeing or tanning directly, or in the preparation of dyeing or tanning extracts. The materials may be untreated, cleaned, dried, ground or powdered (whether or not compressed). The following are the most important.* ***Bark: Oaks of various kinds (including the black oak, quercitron, and the second-bark of the cork oak), chestnut, silver birch, sumach, young fustic, wattle, mimosa, mangrove, hemlock and willow.*** ***Quillaia bark (soap bark or Panama bark, Quillaia saponaria)***

Chapter	44	Wood and articles of wood; wood charcoal
Heading	44.01	Fuel wood, in logs, billets, twigs, faggots or similar forms; wood in chips or particles; sawdust and wood waste and scrap, whether or not agglomerated in logs, similar forms briquettes, pellets or similar forms. - Sawdust, wood waste and scrap, whether or not agglomerated in logs, briquettes, pellets or similar forms:
Subheading	4401.39	-- Other *This heading covers wood waste and scrap that is not usable as timber. These materials are used in particular for pulping (manufacture of paper) and to make particle board and fibreboard, and also as fuel. Such waste and scrap includes saw mill or planing mill rejects; manufacturing waste; broken planks; old crates unusable as such;* ***bark*** *and shavings (whether or not agglomerated in logs, briquettes, pellets or similar forms); other waste and scrap of joinery and carpentry; spent dyewood and tanning wood or bark. The heading also includes wood waste and scrap segregated from construction and demolition waste and not usable as timber. However, wood articles thus segregated and suitable for reuse as such (e.g. beams, planks and doors) are classified under their appropriate headings.*

Assessment

Both the CPC and the HS classify bark by means of two criteria: one is according to its primary use, and the other considers bark as one of the by-products of the wood-processing industry.

When the bark is classified according to its use, the CPC provides a subclass of NWFPs that includes bark as plaiting, dyeing or tanning material, but single product specifications are not available. For other purposes, such as perfumery, pharmaceuticals, or for insecticidal or fungicidal products, bark is considered an agricultural product, even though some species are harvested in the wild (CIFOR, 2014) and play an important role, such as the anti-cancer agent taxol, which is extracted from the bark of *Taxus brevifolia*.

The HS specifies in the explanatory notes the species of bark and their different uses. In some cases one can surmise that the bark is from the forest, but in general, the use for which the bark is intended does not allow a distinction between agricultural and forest bark.

Overall, the two classifications are not developed in sufficient detail to enable bark from forests to be distinguishable from bark derived from cultivated species.

Proposed definition and classification

To avoid misclassification under the CPC and retain the distinction between products of agriculture and forestry, it is recommended that the CPC subclasses be redefined by splitting class 0325 into three subclasses that make a distinction in the uses of vegetable materials:

- Vegetable materials of a kind used primarily for plaiting or as stuffing or padding.
- Raw vegetable materials of a kind used primarily for dyeing or tanning.
- Vegetable products n.e.c.

For greater clarity, the explanatory notes should describe products with a mention to the parts of plants employed for the different uses (leaves, roots, bark).

Furthermore, it is recommended that the explanatory note of the CPC class of plants used in pharmaceuticals and perfumery be redefined to include a description of products that derive from both agriculturally grown plants and those gathered in the wild.

Existing data sources

Production

A few datasets provide information about groups of products that include bark.

India: The forest sector report of India[14] provides some information on bark as well as the National Medicinal Plant Board of India[15].

Brazil: The Brazilian Institute of Geography and Statistics (IBGE) provides the result of an annual survey on the amount and value of production obtained through exploitation of natural forest resources and silviculture. It includes data on production and values of Acacia, Angico and Barbatimão bark.

International trade

The HS does not provide specific codes for bark but classifies the product under various subheadings of vegetable products depending on the use for which they are intended. Some countries have expanded these classes to have specific classes for types of bark.

Table 50. National HS codes for bark

Country or Region	Flow	HS National codes	Description	Unit of measure
Canada	I	1211909010	Bark, nes, of a kind used primarily in pharmaceuticals	-
India	I/E	12119031	Cascara sagrada bark	kg
EU	I/E	12119050	Cinchona bark, fresh or dried, whether or not cut, crushed or powdered	-
Indonesia	I/E	121190241	Cinchona bark, containing by weight >= 3% of cinchona	-
	I/E	121190249	Cinchona bark, containing by weight < 3% of cinchona	-
Malaysia	I/E	1211909710	Bark of persea (*Persea Kurzii Kosterm*) in crushed or powdered form	
Thailand	I	12119097000	Bark of persea (*Persea Kurzii Kosterm*)	-
Chile	I/E	14049010	Quillay (*Quillaja Saponaria*) barks	

[14] http://www.icfre.org/FSRI-REPORT_English.pdf
[15] http://www.nmpb.nic.in/

Indonesia	I/E	1404902010	Barks used primarily for tanning	-
Singapore	I/E	14049020	Barks for tanning	-
Republic of Korea	I/E	1404902010	Bark of paper mulberry	-
Republic of Korea	I/E	1404902020	Bark of *Edgeworthia Papyriferu*	-

Source: Global Trade Atlas

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8.8 Latexes

Description

Latex is the milky substance secreted by the lactiferous channels of many plants. The major commercial source of natural latex is extracted by tapping *Hevea brasiliensis*, known as the rubber tree, of the Euphorbiaceae family. It is native to the Amazon rainforest and propagated mainly to the tropical forests of South and Southeast Asia.

Other latex-like products of commercial importance are:

- balata, a product of the coagulation of the latex produced by certain species of the Sapotaceae family, mainly *Manilkara bidentata*, found in Central and South America and in the Caribbean;
- gutta-percha, which is dried latex from various species of the Sapotaceae family (*Palaquium gutta*, *P. oblongifolium*, *P. borneense*, *P. Treubii* and *Payena Leerii*) indigenous to Southeast Asia, particularly those found in the Malay and Indonesian archipelagos;
- chicle gum, extracted from the latex of *Parthenium argentatu*, which is indigenous to Central America and widely cultivated for its fruits in tropical America, India, Sri Lanka, Malaysia, Thailand, Philippines and other Asian countries;
- guayule gum, which is derived from the latex of *Parthenium argentatum Gray* of the Asteraceae family, native to Mexico.

Further latexes of local importance, especially in some African countries, are derived from *Landolphia* spp.

Since latex is used in many industries in the production of tyres, health instruments, toys, balloons, gloves and condoms, statistical data on production and trade are available at national and international level.

Existing classification

Central Product Classification (CPC Ver 2.1)

The CPC classifies latexes under both agricultural and forest products. The agricultural division is designated to classify the latex (also called natural rubber) of *Hevea brasiliensis*, a widely cultivated species that also grows in the Amazon rainforest. It is classified at subclass level (five digits) in its raw or semi-manufactured state. The forest division is for latexes extracted exclusively from natural forest species. They are classified at subclass level (five digits) in the group of NWFPs.

Section	**0**	**Agriculture, forestry and fishery products**
Division	01	Products of agriculture, horticulture and market gardening
Group	019	Forage products; fibre crops; plants used in perfumery, pharmacy, or for insecticidal, fungicidal or similar purposes; beet, forage plant and flower seeds; natural rubber; living plants, cut flowers and flower buds; unmanufactured tobacco; other raw vegetable materials
Class	0195	Natural rubber in primary forms or in plates, sheets or strip
Subclass	**01950**	**Natural rubber in primary forms or in plates, sheets or strip**
Section	0	Agriculture, forestry and fishery products
Division	03	Forestry and logging products
Group	032	Non-wood forest products

Class	0321	Natural gums and resins, gums-resins and oleoresins
Subclass	**03211**	**Balata, gutta-percha, guayule, chicle and similar natural gums in primary forms or in plates, sheets or strip**

Harmonized Commodity Description and Coding System (HS 2017)

The HS classifies latexes in the chapter on rubber and articles thereof, where "rubber means the following products, whether or not vulcanized or hard: natural rubber, balata, gutta-percha, guayule, chicle and similar natural gums".

Chapter	**40**	**Rubber and articles thereof**
Heading	40.01	Natural rubber, balata, gutta-percha, guayule, chicle and similar natural gums, in primary forms or in plates, sheets or strip.
Subheading	4001.10	- Natural rubber latex, whether or not pre-vulcanised
		- Natural rubber in other forms:
	4001.21	- - Smoked sheets
	4001.22	- - Technically specified natural rubber (TSNR)
	4001.29	- - Other
	4001.30	**- Balata, gutta-percha, guayule, chicle and similar natural gums**

Assessment

Latexes collected in forests are well specified, and the CPC and the HS allow their classification at the maximum detailed level. A problem arises in the case of natural rubber, a product that mostly comes from cultivated areas but in some regions is collected in the forest. Thus, the classification systems need to be refined to retain the distinction between agricultural and forest natural rubber.

Proposed definition and classification

It is recommended that the CPC class of natural rubber be refined through the explanatory note. A clear description of the different origins of the product – agriculturally grown or found wild in the forest – should be introduced. This would address the need for an exhaustive category and allow expansions if needed.

Existing data sources

Production

Figures on rubber production are available in agricultural databases at international and national level, as it is mostly produced as an agricultural crop. However, they have been omitted here because rubber is not considered a forest product.

The marketed production of rubber obtained from forests is regularly monitored by the Brazilian Institute of Geography and Statistics (IBGE), which provides the results of the annual survey on the amount and value of production obtained through the exploitation of natural resources, or plant extraction. The figures refer to products extracted from natural forests.

Table 51. Brazil, annual production of latex (*Hevea brasiliensis*) from natural, 2011-2015 (tonnes)

	2011	2012	2013	2014	2015
Hévea (latex coagulated)	2 856	2 143	1 760	1 446	1 447
Hévea (liquid latex)	149	194	198	93	52

Source: Instituto Brasileiro de Geografia e Estatística. http://www.ibge.gov.br/

Table 52. Brazil, annual production value of latex (*Hevea brasiliensis*) from natural forest, 2011-2015 (1 000 USD)

	2011	2012	2013	2014	2015
Hévea (latex coagulated)	4 641	3 073	2 933	2 147	1 452
Hévea (liquid latex)	256	343	628	308	122

Source: Instituto Brasileiro de Geografia e Estatística. http://www.ibge.gov.br/

Figures on the production of latexes other than agricultural rubber are available in the FAOSTAT database under the code provided by the FAO commodity list (0839). The item is described as "Natural gums" and is defined as "Extracted from the latex of trees of various species. Although similar to rubber in many ways, natural gums are usually less elastic." It includes the following:

Table 53. FAO item code 0839, natural gums.

Scientific name	Common name
Manilkara bidentata	Balata
Manihot glaziovii	Ceara
Achras zapota	Chicle gum
Parthenium argentatum	Guayule
Palachium gutta	Gutta-percha
Dieva costulana	Jelutong

FAOSTAT item 0839 corresponds to the following CPC and HS codes:

Table 54. Correspondence between FCL code 0839 and CPC and HS

Classification	Item code	Item description
CPC Ver.2.1	03211	Balata, gutta-percha, guayule, chicle and similar natural gums in primary forms or in plates, sheets or strips
HS 2017	4001.30	Balata, gutta-percha, guayule, chicle and similar natural gums

Table 55. Production of natural gums in Brazil, Guyana and Mexico, 2009-2013

	2009	2010	2011	2012	2013
Brazil	60	55	60	65	60
Guyana	500	500	500	500	500
Mexico	31 794	32 097	38 243	47 639	51 397

Source: FAOSTAT. Note: The Mexican figure is official, while figures for Guyana and Brazil are FAO estimates.

International trade

Table 56 show international trade data of gutta-percha, guayule, chicle and similar natural gums (HS code 4001.30).

Table 56. Top five exporters, importers and global reporting of Balata, Gutta-Percha, Guayule, Chicle and Similar Natural Gums, 2015

Exporter	Value (1 000 USD)	Quantity (tonnes)	Share of exp quantity (%)	Importer	Value (1 000 USD)	Quantity (tonnes)	Share of imp quantity (%)
Singapore	4 229	753	18.4	Singapore	1 851	761	17.6
Indonesia	2 423	826	20.2	Japan	1 392	139	3.2
Thailand	1 888	1 478	36.2	Rep. of Korea	1 304	154	3.6
South Africa	1 337	362	8.9	Italy	876	405	9.4
United States	1 183	272	6.7	France	642	31	0.7
World	13 310	4 083	100	World	10 340	4 313	100

Sources: Global Trade Atlas, Trade Map.

Some countries have recognized the importance of specific sources of latexes by adding a further digit to separate them from the general category of latexes (400130). Table 57 reports these expanded codes and description by country.

Table 57. Expanded HS code 400130 (Balata, gutta-percha, guayule, chicle and similar natural gums)

Country	HS national code	Description
Indonesia	4001301900	Jetulong in other form
Indonesia	4001301100	Jetulong in primary form
Malaysia	400130190	Gutta-percha: in plates, sheets or strips
Malaysia	400130910	gutta-percha and jelutong: in plates, sheets
Malaysia	400130990	gutta-percha and jelutong: in plates, sheets or strips
Malaysia	4001309990	jelutong: in primary forms: in plates, sheets or strips
Malaysia	400130110	Gutta-percha: in plates, sheets or strips
Malaysia	4001301120	Jelutong: in primary forms: pressed but not refined
Malaysia	400130291	Jelutong: in plates, sheets or strips: raw
Malaysia	400130292	Jelutong: in plates, sheets or strips: pressed
Malaysia	4001309190	jelutong: in primary forms: gutta-percha
Mexico	40013001	Guta-percha
Panama	40013010	Goma chicle
Singapore	40013019	Other jetulong
Rep. of Korea	4001301000	Chicle gum
USA	4001300010	Gutta-percha and guttas nesoi
USA	4001300020	Chicle

Sources: Global Trade Atlas

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8.9 Gums and resins

Description

True gums are carbohydrate polymers that are formed in plants, usually as a result of a process called gummosis. If gums are pure, they are either colourless or have a yellow or brown tint. They are also odourless and tasteless. Some are soluble in water, producing sticky substances, and some swell without melting to form jellies. Gum arabic is the main commercial gum exudate. This gum is mainly obtained from *Acacia senegal* and some from the related species *A. seyal*, *A. laeta*, *A. polyaccantha* and *A. mellifera*. Acacias are widespread in the sub-Saharan region, from Senegal across to Somalia, and along the West African coastline from Sudan to South Africa. Gum arabic from *A. senegal* and *A. seyal* is a food additive (Acacia gum 414) recognized by the Codex Alimentarus (WHO and FAO). Other commercial plant gums are: gum tragacanth (*Astrangalus gummifer* and other species of that genus) and karaya gum (*Sterculia urens*).

Natural resins are polymeric materials produced through secretions from some types of plants, particularly conifers, or other tropical plants that exude them when the bark is somehow incised. They are distinguishable from gums because of their insolubility in water. Resins comprise the following types:

Oleoresins and balsams. These are vegetable exudates that, when subjected to distillation, release the volatile oil, leaving a residue that constitutes the resin itself; oleoresins that contain benzoic and cinnamic acids partially free are called balsams, which are generally extracted from conifers. Turpentine is an important commercial oleoresin, obtained almost exclusively from coniferous trees of the genus *Pinus*; it is a volatile oil distilled from pine resin, which itself is obtained by tapping living trees. The solid material left behind after distillation is known as rosin. Turpentine, rosin and derivatives are known as gum naval stores. Traditionally, turpentine was used as a solvent or cleaning agent, and is today still used in the pharmaceutical industry.

Hard resins. This group includes resins that completely solidify when they come into contact with the air. The exudate can be derived from living or fossilized trees. Important commercial resins, such as the copals and damars, belong to this group.

Gum-resins. These are a natural mixture of gums and resins, and often essential oils. They are partly soluble in water and have a distinctive odour and taste. They are mainly obtained from plants that grow in dry and arid regions, especially species of the Umbelliferae and Burseraceae.

Existing classification

Central Product Classification (CPC Ver.2.1)

The CPC classifies natural gums and resins under the non-wood forest products group at the subclass (five-digit) level. The subclass is defined through the HS subheadings related to these products.

Section	**0**	**Agriculture, forestry and fishery products**
Division	03	Forestry and logging products
Group	032	Non-wood forest products
Class	0321	Natural gums and resins, gums-resins and oleoresins
Subclass	**03219**	**Lac, resins, balsams, natural gums and other resins n.e.c.**

Harmonized Commodity Description and Coding System (HS 2017)

For international trade, gums and resins are identified by two six-digit codes under Chapter 13 that are applied to lac, gums, resins and other vegetable saps and extracts.

Chapter	**13**	**Lac; gums, resins and other vegetables saps and extracts**
Heading	13.01	Lac; natural gums, resins, gum-resins and oleoresins (for example balsams)
Subheading	**1301.20**	**Gum Arabic**
	1301.90	**Other**

The explanatory note clearly specifies the products included in this heading and distinguishes between the following:

Lac. *A resinous substance produced on several kinds of tropical trees by an insect belonging to the same family as the cochineal and the kermes. The most commercial varieties include: stick lac, seed lac shellac and refuse lac. The note clearly describes each of these varieties.*

Natural gums, resins, gum resins and oleoresins. *These are vegetable secretions that may solidify on contact with the air. The note clearly describes true gums, resins, gums resins and oleoresins, and lists the principal products:*

1. *Gum Arabic (from various acacias, sometimes also called Nile gum, Aden gum, Senegal gum); gum tragacanth (obtained from certain varieties of Astragalus); Basra gum; Anacardium (gum of the cashew nut tree); Indian gum; certain so-called "indigenous" gums, various species of Rosaceae, such as cherry, plum, apricot, peach or almond trees.*
2. *Fresh oleoresins (liquid) of the pine (including turpentine), fir or other conifers (crude or refined), as well as conifer resins (galipot, etc.), which are dried on the incision on the tree and contain vegetable waste.*
3. *Copal (India, Brazil, Congo, etc.), including fossil copal; kauri gum; damar; mastic; elemi; sandarac; dragon's blood.*
4. *Gamboge; gum ammoniac; asafoetida; scammony; euphorbia; galbanum; opoponax; olibanum or incense; myrrh; acaroid; guaiacum.*
5. *Gum benzoin; styrax or storax (solid or liquid); tolu balsam; Peruvian balsam; Canada balsam; copaiba balsam; Mecca balsam; thapsia.*
6. *Cannabis resin (crude or purified) obtained from the Cannabis plant (Cannabis resin is a narcotic drug).*

The notes also clarify the processing level within which natural gums, resins, gum resins and oleoresins can be classified under this heading: "*May be crude, washed, purified, bleached or powdered. They are, however, excluded when they have been subjected to processes such as treatment with water under pressure, treatment with mineral acids or heat treatment."*

Assessment

Gums and resins are well specified. The existing classifications allow proper identification and definition of these products. The explanatory notes extensively describe the products and allow further specifications.

Existing data sources

Production

Statistical information on the production of gums and resins is difficult to obtain because few countries release official figures. This is the case in many African countries that are the main producers of gum arabic. UNCTAD reports that the three main producers of this product are Chad, Sudan and Nigeria, which produce 95 percent of gum arabic exported to the world market. However, some figures are provided by national statistics offices. Table 58 and Table 59 respectively cover Sudanese and Nigerian data on gum arabic production.

Other reliable national data exist for a few countries, for example the Indian Institute of Natural Resins and Gums and the *China Statistical Yearbook*, which provide the national data summarized below.

Table 58. Gum Arabic production in Sudan, 2012-2013 (1 000 tonnes)

	2012	2013
Heshab Gum	6.7	33.4
Talh Gum	21.3	39.6
Liban Gum	1.9	2.2
Kakamot Gum	0.6	0.8
Total	30.4	76

Source: Central Bank of Sudan

Table 59. Estimated production of gum Arabic plantation in Nigeria 2009-2012 (1 000 tonnes)

	Production
2009/10	23.7
2010/11	24.06
2011/12	23.04

Source: Nigeria National Bureau of Statistics

India. The Indian Institute of Natural Resins and Gums provides an annual report containing statistics on lac; natural resins and gums. India produces lac, resins and gums of commercial importance, such as lac, rosin, guar gum (*Cyamopsis tetragonolobus L.*), karaya gum (*Sterculia urens*), dhawada gum (*Anogeissus latifolia*), salaigum (*Boswellia serrata*), char /piyar gum (*Buchanania lanzan Spreng.*) and babool gum (*Acacia nilotica*). Table 60 gives an overview of data on production, however, detailed statistics on production, trade and processing of natural gums and resins are available in the report.

Table 60. Natural gums and resins production in India, 2013-2014 (tonnes)

	2013 -2014
Guar Gum	1 129 478
Pine Resin	7 900
Karaya Gum	258
Lac	21 008
Other Gum	1 669
Total	1 160 314

Source: Indian Institute of Natural Resins and Gums. http://ilri.ernet.in/~iinrg/

China. Pine resin production is provided by the *China Statistical Yearbook*. It reports on the output of the major forest products, including pine resin. The most recent data are given in Table 61.

Table 61. Pine resin production in China (tonnes)

Year	2010	2011	2012	2013	2014
Pine resin	1 115 711	1 156 612	1 215 065	1 307 747	1 309 520

Source: *China Statistical Yearbook*

International trade

Table 62. Top five exporters, importers and global reporting of Gum Arabic (HS 130120), 2015

Exporter	Value (1 000 USD)	Quantity (tonnes)	Share of exp. quantity (%)	Importer	Value (1 000 USD)	Quantity (tonnes)	Share of imp. quantity (%)
France	128 974	39 069	24.1	**France**	82 701	46 876	43.4
Sudan (North + South)	118 200	77 733	48.0	**USA**	53 280	17 131	18.5
Chad	29 748	15 795	9.8	**India**	29 640	41 602	5.5
UK	21 528	4 333	2.7	**Germany**	19 603	6 951	3.9
USA	14 428	3 342	2.1	**UK**	17 149	6 188	6.5
World	358 264	161 979	100	**World**	358 432	162 776	100

Source TradeMap. http://www.trademap.org/

Major exporter countries for gum arabic were Sudan and France, with 48 and 24 percent respectively (Table 62); top destinations were European countries and India. Europe's role is of particular importance; some countries, especially France and the UK, make high profits on their re-exports. Gum arabic is first imported raw from producing countries in Africa, and is then re-exported in both raw and processed form.

Table 63. Top 5 exporters, importers and global reporting of Other Lac; natural gums, resins, gum-resins and oleoresins (HS 130190), 2015

Exporter	Value (1 000 USD)	Quantity (tonnes)	Share of exp. quantity (%)	Importer	Value (1 000 USD)	Quantity (tonnes)	Share of imp. quantity (%)
India	63 348	10 760	9.7	**India**	103 852	25 293	43.4
Indonesia	35 598	35 670	32.1	**USA**	34 602	4 323	18.5
Thailand	25 126	9 557	8.6	**France**	24 010	3 224	5.5
USA	21 773	5 662	5.1	**China**	23 659	6 926	3.9
Germany	19 852	1 754	1.6	**Germany**	21 421	2 928	6.5
World	318 375	111 250	100	**World**	473 839	146 949	100

Source TradeMap. http://www.trademap.org/

In 2015, exports of other gums and resins (commodity 130190) were dominated by Eastern countries, especially India (Table 63), which, like many other countries, has developed further codes for commodity 130190 (see Table 64).

Table 64. Indian codes for HS code 130190 "Other gums and resins"

1301 90 Other:	
Natural gums	
1301 90 11	Asian gum
1301 90 12	African gum
1301 90 13	Asafoetida
1301 90 14	Benjamin ras
1301 90 15	Benjamin cowrie
1301 90 16	Karaya gum
1301 90 17	Tragacanth
1301 90 18	Storax
1301 90 19	Other
Resins	
1301 90 21	Copal
1301 90 22	Dammar batu
1301 90 29	Other
Gum resins	
1301 90 31	Myrrh
1301 90 32	Oilbanum or frankincense
1301 90 33	Mastic gum
1301 90 34	Xanthium gum
1301 90 39	Other
Oleoresins	
1301 90 41	Of seeds
1301 90 42	Of fruits
1301 90 43	Of leaves
1301 90 44	Of spices
1301 90 45	Of flowers
1301 90 46	Of roots
1301 90 49	Other
1301 90 99	Other

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8.10 Hides, skins and trophies

Description

Hides, skins and furskins (or pelts) are products of animals that are either ranched or gathered in the wild through hunting or trapping. The majority of global production and trade (85 percent) originates from farmed animals rather than wild animals[16]. As reported by the International Fur Trade Federation, the most common traded wild skins are grey fox (*Urocyon cinereoargenteus* and *Pseudalopex griseus*), red fox (*Vulpes vulpes*); nutria (*Myocastor coypus*, mainly from South and North America); North American beaver (*Castor canadensis*); coyote (Canis latrans); marten (*Martes americana*); mink (*Mustela vison*); raccoon (*Procyon lotor*); musquash (*Ondatra zibethica*); Russian sable (*Martes zibellina*); Russian and Chinese squirrel (*Sciurus vulgaris*); ermine (*Mustela erminea*); kolinsky (*Mustela sibirica*); Chinese weasel (*Mustela nivalis*) and New Zealand Opossum (*Trichosurus vulpecula*).

Statistics for production and trade of skins from wild animals are scarcely available, as few countries provide reliable data on these products; however, indirect data from other sources, such as slaughterhouses or hunting data, can be used to provide estimates.

Existing classification

Central Product Classification (CPC Ver.2.1)

In the CPC, hides and skins are classified under animal products and are defined at class level (four digits) as "Raw hides, skins and furskins". They are further specified at subclass level (five digits) by a distinction based on the animal species; these are defined in the explanatory notes through cross-references to the live animal subclasses.

Section	0	Agriculture, forestry and fishery products
Division	02	Live animals and animal products (excluding meat)
Group	029	Other animal products
Class	0295	Hides, skins and furskins, raw
Subclass	**02951**	**Raw hides and skins of bovine animals** This subclass includes: - raw hides and skins (fresh or preserved, but not further prepared) of bovine animals of class 0211
Subclass	**02952**	**Raw hides and skins of equine animals** This subclass includes: - raw hides and skins (fresh or preserved, but not further prepared) of equine animals of class 0213
Subclass	**02953**	**Raw hides and skins of sheep or lambs**
Subclass	**02954**	**Raw hides and skins of goats or kids** This subclass includes: - raw hides and skins (fresh or preserved, but not further prepared) of goats and kids, animals of subclass 02123
Subclass	**02955**	**Raw furskins**
Subclass	**02959**	**Raw skins of other animals**

[16] International Fur Trade Federation, no date.

This subclass includes:
- raw hides and skins (fresh or preserved, but not further prepared) of:
  - reptiles
  - birds
  - fish
  - swine and peccaries
  - mammals, such as:
    - deer
    - chamois
    - dog
    - elk
    - gazelle
    - reindeer
    - roebuck

Trophies can be classified under subclass 39110, which also includes the skins of birds with feathers, which are excluded from the class of raw hides, skins and furskins.

Section	3	Other transportable goods, except metal products, machinery and equipment
Division	39	Wastes or scraps
Group	391	Wastes from food and tobacco industry
Class	3911	Raw offal, inedible (including pigs' bristles, horse hair, animal guts, bird skins, feathers, bones and ivory)
Subclass	**39110**	**Raw offal, inedible (including pigs' bristles, horse hair, animal guts, bird skins, feathers, bones and ivory)**

This subclass includes:
- pigs', hogs' and boars bristles and hairs (including waste), whether or not dyed or bleached
- bristles and hairs of horses and other animals
- guts, bladders and stomachs of animals other than fish, whole or in pieces
- tripes, inedible
- skins and other parts of birds, with their feathers and down, not further worked than cleaned, disinfected or treated for preservation
- feather powder and waste
- bones, horns, hooves, teeth, turtle shells, ivory and the like, unworked or simply prepared (but not cut to shape), including powder and waste
- dead animals, unfit for human consumption
- other animal products used in the preparation of pharmaceutical products
- other animal products, unfit for human consumtion, such as:
· blood (dried, liquid, meal or powder)
· sinews and tendons
· insect eggs
· larvae, chrysalides
· dried worms
· furskin waste

This subclass does not include:
- semen:
· bovine, cf. 02411
· other, cf. 02419
- embryos, cf. 02420
- natural sponges of aquatic animal origin, cf. 04920
- tripes, edible, cf. 2115
- guts, bladders and stomachs of fish, cf. 21299

Harmonized Commodity Description and Coding System (HS 2017)

The HS has two chapters to classify hides, skins and furskins: Chapter 41 specifies hides and skins, while Chapter 43 categorizes furskins. Both specify the products by the process they may have undergone. Consequently, at heading level (four digits), a distinction can be made between hides, skins and furskins that are raw, tanned and further prepared after tanning. As this factsheet concerns NWFPs, the focus is on hides, skins and furskins traded in raw form.

Raw hides (the skins of the larger quadrupeds[17]) and skins are classified under Chapter 41 and cover three headings that specify one or more animal species – the first is related to bovine or equine, the second to skins of sheep or lambs, and the third is the "Other" heading.

At subheading level (six digits), the classification follows different criteria depending on the animal species mentioned above: hides and skins of bovine or equine animals are classified based on the part of the animal (whole or not) and the weight of the hide or skin; raw sheep or lamb skins are classified depending on whether they are woolen or shaven; the "Other" group classifies according to species (swine, reptiles and "Others", as clarified in the explanatory notes).

Raw furskins are classified in Chapter 43 and take up one heading. They are defined at subheading level (six digits) by species and the part of the animal used. Thus, subheadings refer to raw furskins of mink or lamb (Astrakhan, Broadtail, Caracul, Persian and similar lamb, Indian, Chinese, Mongolian or Tibetan), whole, with or without the head, tail and paws.

The general note for this chapter states that some furskins and articles of furskin can originate from species of wild animals that are close to extinction, or that may soon be if trade is not regulated. Such species are listed in the appendices of the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington Convention).

Chapter	41	Raw hides and skins (other than furskins) and leather.
Heading	**41.01**	**Raw hides and skins of bovine (including buffalo) or equine animals (fresh, or salted, dried, limed, pickled or otherwise preserved, but not tanned, parchment-dressed or further prepared), whether or not dehaired or split.**

[17] This is the definition reported in the explanatory note of Chapter 41.

Subheading	4101.20	- Whole hides and skins, unsplit, of a weight per skin not exceeding 8 kg when simply dried, 10 kg when dry-salted, or 16 kg when fresh, wet-salted or otherwise preserved.
	4101.50	- Whole hides and skins, of a weight exceeding 16 kg
	4101.90	- Other, including butts, bends and bellies
		This heading covers raw hides and skins of (whether or not the hair has been removed) of bovine animals (including buffalo) (i.e. animals of heading 01.02, see Exp. Note to that heading) or equine animals (horses, mules, asses, zebras, etc).
		These raw hides and skins maybe fresh (green) or temporarily preserved by salting, drying, liming, pickling or any other method to prevent putrefaction in the short term. They may also be cleaned, split or scraped, or may have undergone a tanning (including pre-tanning) process which is reversible, but not subjected to any other tanning or equivalent process (such as parchment-dressing) nor further prepared.
Heading	**41.02**	**Raw skins of sheep or lambs (fresh, or salted, dried, limed, pickled or otherwise preserved, but not tanned, parchment-dressed or further prepared), whether or not with wool on or split, other than those excluded by Note 1 (c)[18] to this Chapter.**
Subheading	4102.10	- With wool on
		- Without wool on :
	4102.21	-- Pickled
	4102.29	-- Other
		*This heading covers raw skins of sheep or lambs whether or not with wool on. It **does not**, however, **cover** skins with wool on of Astrakhan, Broadtail, Caracul or similar lambs (i.e. lambs of a variety similar to Caracul or Persian but known by different names in various parts of the world), Indian, Chinese, Mongolian or Tibetan lambs.*
		These raw hides and skins may be fresh (green) or temporarily preserved by salting, drying, liming, pickling or any other method to prevent putrefaction in the short term. The may also be cleaned, split or scraped, or may have undergone a tanning (including pre-tanning) process which is reversible, but not subjected to any other tanning or equivalent process (such as parchment-dressing) nor further prepared.
Heading	**41.03**	**Other raw hides and skins (fresh, or salted, dried, limed, pickled or otherwise preserved, but not tanned, parchment-dressed or further prepared), whether or not dehaired or split, other than those excluded by Note 1 (b)[19] or 1 (c) to this Chapter.**

[18] The note 1 (c) states that Chapter 41 does not cover "hides or skins, with the hair or wool on, raw, tanned or dressed (Chapter 43); the following are, however, to be classified in Chapter 41, namely, raw hides and skins with the hair or wool on, of bovine animals (including buffalo), or equine animals, of sheep or lambs (except Astrakhan, Broadtail, Caracul, Persian or similar lambs, Indian, Chinese, Mongolian or Tibetan lambs), of goats or kids (except Yemen, Mongolian or Tibetan goats and kids),of swine (including peccary), of chamois, of gazelle, of camels (including dromedaries), of reindeer, of elk, of deer, of roebucks or of dogs."

[19] Note 1(b) states that Chapter 41 does not cover: "bird skins or part of bird skins, with their feathers or down, of heading 05.05 or 67.01.

Subheading	4103.20	- Of reptiles
	4103.30	- Of swine
	4103.90	- Other
		The heading covers: *(A) All raw hides and skins without hair or dehaired, **other than** those of **heading 41.01** or **41.02**. The heading includes birdskins from which the feathers and down have been removed, and fish skins, reptile skins and dehaired skins of goats and kids (including Yemen, Mongolian or Tibetan goats and kids).* *(B) Raw hides and skins, from which the hair has not been removed, of the following animals only:* *(1) Goats and kids (**other than** Yemen, Mongolian or Tibetan goats and kids.* *(2) Swine including peccary.* *(3) Chamois, gazelle and camels (including dromedaries).* *(4) Elk, reindeer, roebucks and other deer.* (5) *Dogs.* *These raw hides and skins may be fresh (green) or temporarily preserved by salting, drying, liming, pickling or any other method to prevent putrefaction in the short term. The may also be cleaned, split or scraped, or may have undergone a tanning (including pre-tanning) process, which is reversible, but not subjected to any other tanning or equivalent process (such as parchment-dressing) nor further prepared*
Chapter	43	Furskins and artificial fur; manufactures thereof
Heading	**43.01**	**Raw furskins (including heads, tails, paws and other pieces or cuttings, suitable for furriers' use), other than raw hides and skins of heading 41.01, 41.02 or 41.03.**
Subheading	4301.10	- Of mink, whole, with or without head, tail or paws
	4301.30	- Of lamb, the following: Astrakhan, Broadtail, Caracul, Persian and similar lamb, Indian, Chinese, Mongolian or Tibetan lamb, whole, with or without head, tail or paws
	4301.60	- Of fox, whole, with or without head, tail or paws
	4301.80	- Other furskins, whole, with or without head, tail or paws
	4301.90	- Heads, tails, paws and other pieces or cuttings, suitable for furriers' use This heading covers the raw (not tanned or dressed) skins with the hair or wool on, of all animal except the following, which fall under the heading 41.01, 41.02 or 41.03. Furskins are regarded as raw and fall under this heading not only when in the natural state, but also if cleaned and preserved from deterioration, e.g. by drying or salting (wet or dry). The fur may also be “pulled” or “shared”, i.e. the coarse hairs extracted or cut down, or the skin surface may be “fleshed” or “scraped”. Pieces of furskin and parts such as head, tails and paws, in the raw state, are also classified under this heading, unless it is clearly waste material not suitable for furriers’ use, in which case they are excluded (heading 05.11).

Trophies can be classified under the chapter on products of animal origin. Two headings of the chapter classify parts of animals that can be considered raw material for trophies. When these materials are worked or have been made into articles, they appear under the chapter on miscellaneous manufactured articles.

Chapter	5	Products of animal origin, not elsewhere specified or included.
Heading	**05.06**	**Bones and horn-cores, unworked, defatted, simply prepared (but not cut to shape), treated with acid or degelatinised; powder and waste of these products.**
Subheading	0506.10	- Ossein and bones treated with acid
Subheading	0506.90	- Other.
Heading	**05.07**	**Ivory, tortoise-shell, whalebone and whalebone hair, horns, antlers, hooves, nails, claws and beaks, unworked or simply prepared but not cut to shape; powder and waste of these products.**
Subheading	0507.10	- Ivory; ivory powder and waste
Subheading	0507.90	- Other. It includes: *(A)* ***Ivory.*** *Throughout the Nomenclature, the term 'ivory' is regarded as covering the bony substance that constitutes tusks of elephant, hippopotamus, walrus, narwhal or wild boar.; the horns of the rhinoceros; the teeth of any land or marine animal.* *(D)* ***Horns, antlers, hooves, nails, claws and beaks.*** *The horns may be presented with or without their cores and their frontal bones. Antlers are branched horns of deer, elk, etc.*
Chapter	96	Miscellaneous manufactured articles
Heading	**96.01**	**Worked ivory, bone, tortoise-shell, horn, antlers, coral, mother-of-pearl and other animal carving material, and articles of these materials (including articles obtained by moulding).**
Subheading	9601.10	- Worked ivory and articles of ivory
Subheading	9601.90	- Other

Assessment

The current classifications are not able to distinguish hides, skins and furskins of farmed animals from those of wild animals that lived in the forest. There is no mention of the animal origin in the structure of the classifications or in the explanatory notes. Therefore, criteria such as those used in both classifications are insufficient to distinguish between forest and farm products.

Proposed definition and classification

Skins, hides or furskins can be defined as NWFPs when they originate from animals hunted in the wild. This definition allows a boundary to be set between agricultural and forestry products, thus avoiding an overlap between categories in the classification systems.

To avoid misclassification and ensure a clear distinction between agricultural and forest products, it is recommended that the explanatory notes of the two classifications be redefined, with a clear indication of the origin of the animal used in the production of the hides, skins and furskins. This will allow an expansion of the classifications, with further subclasses for wild animal hides, skins or furskins if the evidence from statistical data indicates a need.

Moreover, in the CPC, in order to accurately identify these products and establish a connection between classified animals and their origin, a correspondence to the skins, hides or furskins produced from activity of hunting and trapping should be introduced. This activity is coded in the classification system of industrial activities ISIC rev.4 by the class code 0170. As specified by the explanatory note of ISIC, this class includes:

- hunting and trapping on a commercial basis;
- taking of animals (dead or alive) for food, fur, skin or for use in research, in zoos or as pets;
- production of fur skins, reptile or bird skins from hunting or trapping activities.

This class also includes:
land-based catching of sea mammals, such as walrus and seal.

This class excludes:
- *production of fur skins, reptile or bird skins from ranching operations, see group 014;*
- *raising of game animals on ranching operations, see 0149;*
- *catching of whales, see 0311;*
- *production of hides and skins originating from slaughterhouses, see 1010;*
- *hunting for sport or recreation and related service activities, see 9319;*
- *service activities to promote hunting and trapping, see 9499.*

Existing data sources

Production

A few statistics on skins of wild animals exist. The main findings on national production data involve the United States of America, Canada and the Russian Federation.

United States of America. The US Furbearer Conservation Technical Workgroup of the Association of Fish and Wildlife Agencies (AFWA), in conjunction with state wildlife agencies, produces statistics on fur harvesting. Different data sources – such as fur buyer, dealer and trapper reports, pelt-tagging records and periodic trapper questionnaires – are used to compile these statistics. Statistics are available starting from 1970 and comprise 28 types of animal, all provided by region, state, year and species[20].

Canada. The Department of Statistics of Canada provides data on the number and value of wildlife pelts produced. Although the annual census survey used for collection is at present inactive, statistics for the period 2000–09 are available[21].

Other data on wild fur are provided by the fur Institute of Canada[22], which reports that the furs of more than 25 wild species are traded in Canada, the most common being muskrat (28 percent), beaver (21 percent), marten (13 percent), squirrel (9 percent) and raccoon (5 percent).

Russian Federation. Indirect data from hunting statistics are useful to estimate the production of sable fur (*Martes zibellina*), a valuable fur produced mainly in the Russian Federation. Even though sables can be

[20] Data available at www.fishwildlife.org/index.php?section=furbearer_management&activator=27
[21] Statistics Canada. Cansim table 003-0013
[22]http://fur.ca/

farmed, a huge part may be considered as wild. Hunting data provided by the Federal State Statistics Service includes records on sables harvested/shot per hunting season.

International trade

Even though the HS does not distinguish between hides, skins and furskins from farmed or wild animals, some countries have developed further codes for the international trade of wild furskins. Table 65 and Table 66 reports these codes as well as trade data for 2015.

Table 65. HS national expanded codes for HS 4301

Country or Region	Flow	HS National expanded code	Description	Unit of measure
Canada	Import	4301100010	Whole ranch mink raw furskins	No.
	Import	4301100020	Whole **wild** mink raw furskins	No.
	Export	43011010	Raw mink furskins, whole, **ranch**	No.
	Export	43011020	Raw mink furskins, whole, **wild**	No.
USA	Import	4301100010	Furskins of **wild** mink, raw, whole, with or without head, tail or paws	No.
	Import	4301100020	Mink furskins nesoi, raw, whole, with or without head, tail or paws	No.
	Export	4301100000	Mink furskins, raw, whole, with or without head, tail or paws	No.
EU	Imp/Exp	43018050	Raw furskins of **wild** felines, with or without head, tail or paws (this includes in particular furskins of cheetah, jaguar, lynx, panther or leopard and puma)	---
Russian Federation	Export	4301807020	Skins of sable	No.

Source: Global Trade Atlas

Table 66. Trade data for HS 4301 expansion, 2015 (Values in 1 000 USD, quantity in number of traded unit).

Country	Flow	HS Code	2013		2014		2015	
			Value	Quantity	Value	Quantity	Value	Quantity
Canada	Exp.	43011020	8 218	179 706	2 184	84 856	613	41 654
Canada	Imp.	4301100020	988	60 754	796	45 191	450	34 287
Russian Federation	Exp.	4301807020	180 993	696 961	84 575	554 523	56 966	457 456
USA	Imp.	4301100010	5 812	88 062	3 373	65 591	69	2 862

Source: Global Trade Atlas, Trade Map.

An overview of global international trade data of raw furskins (regardless of the animal origin) is provided in Table 67, showing export and import data of HS international. Since there is no worldwide accepted unit of measurement for data given in terms of number (pieces) or weight, Table 67 only shows values.

Table 67. International trade values of raw furskins, 2015 (1 000 USD)

HS Code	Description	Exported value	Imported value
430110	Raw furskins of mink, whole, with or without heads, tails or paws	4 392 864	3 437 838
430130	Raw furskins of lamb, the following : Astrakhan, Broad-tail, Caracul, Persian and similar lamb, Indian, Chinese, Mongolian or Tibetan lamb, whole, with or without head, tail or paws	13 992	22 485
430160	Raw furskins of fox, whole, with or without head, tail or paws	341 164	169 526
430180	Other furskins, whole, with or without head, tail or paws	187 598	205 379
430190	Heads, tails, paws and other pieces or cuttings, suitable for furriers' use	2 940	1 941

Source: Global Trade Atlas

References

Association of Fish & Wildlife Agencies. 2015. National Fur Harvest Database. (available at: http://www.fishwildlife.org/index.php?section=furbearer_management&activator=27)). Accessed: November 2016.

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Global Trade Atlas (GTA). (available at http://www.gtis.com/). Accessed November 2016.

Ministry of Natural Resources and Environment of the Russian Federation. (available at: https://www.mnr.gov.ru/english/).

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8.11 Game meat

Description

In the context of non-wood forest products, the term "game meat" is often called "bushmeat"[23] and is used to refer to the meat of animals living in the wild. These can be mammals (from cats to gorillas), reptiles, amphibians and birds, and can vary by region. In this context, the collection of wild game has different meanings, mainly depending on the socioeconomic conditions of the area in which game is gathered (Glover, 2014). In fact, in developing economies, bushmeat represents an important source of forest income and plays an essential role in food security. On the other hand, in advanced economies, the collection of wild food is often considered a recreational activity and its value is mainly linked to its cultural benefits (Schulp, Thuiller and Verburg, 2014).

Although many case studies have shown the different purposes and socioeconomic benefits of game meat collection among different social groups, the exact value of game trade is not easy to estimate at national levels for two reasons. The first can be connected to the existence of many site-specific case studies that are useful but not sufficient to extrapolate data at national level; the second is that a great proportion of game is traded in informal marketing (Schulp, Thuiller and Verburg, 2014; Cifor, 2014) and is not captured by official statistics.

In order to fill the data gap a joint UNECE/FAO survey on game meat production and trade in the UNECE has been launched. The first results are expected in spring 2017.

Existing classification

Central Product Classification (CPC Ver.2.1)

In the CPC, meat and meat products constitute a section of food products structured in classes that can refer to meat processing and preservation. Edible meat and offal are defined at class level (four digits) according to the degree of processing and the kind of animal processed. Thus, categories of fresh or processed mammals, poultry and other kinds of meat exist. The subclass level (five digits) refines the classes of animals by reference to species.

The structure of the group is quite clear: classes relate to mammals and poultry classified as fresh, frozen and prepared; the same structure is used for edible offal; and, finally, a residual class of "Other meat" comprises meat and offal of all other animals not categorized.

Below is an overview of classes and subclasses of edible meat products that points out, in the case of fresh or chilled meat of mammals, the cross-references to other subclasses that detail the classification in terms of the animal species.[24]

[23] For insects, see Annex 12.
[24] N.B. Analogous cross-references exist for subclasses of frozen meat and edible offal, but these are omitted here to provide as clear a structure of meat products as possible. For further reading, see the explicatory notes of the CPC.

Section	2	Food products, beverages and tobacco; textiles, apparel and leather products
Division	21	Meat, fish, fruits, vegetables, oils and fats
Group	**211**	**Meat and meat products**
Class	**2111**	**Meat of mammals, fresh or chilled**
Subclass	**21111**	**Meat of cattle**, fresh or chilled It includes meat of cattle, animals of subclass 02111, fresh or chilled. The subclass 02111 includes: cattle, species of bos, mainly bovis, taurus, indicus, grunniens, gaurus, grontalis and sondaicus, known under many different names: ox, zebu, yak, gaur, gayal, banteng, etc.
Subclass	**21112**	**Meat of buffalo**, fresh or chilled Meat of buffalo, animals of subclass 02112, fresh or chilled the subclass 02112 includes: buffalo, species of Bubalus, mainly bubalus, ami, depressicornis, nanus (buffalo, Indian buffalo, water buffalo, carabao, and pygmy buffalo); caffers, African buffalo, species of Syncerus; bisons, species of Bison, American and European
Subclass	**21113**	**Meat of pigs**, fresh or chilled *This subclass is defined through the following headings/subheadings of the HS: 0203.11–.19: Meat of swine fresh or chilled (whether domestic or wild)*
Subclass	**21114**	**Meat of rabbits and hares**, fresh or chilled Meat of rabbits and hares, animals of subclass 02191. It includes rabbits, *Oryctolagus cuniculus,* hares, species of Lepus.
Subclass	**21115**	**Meat of sheep**, fresh or chilled *This subclass is defined through the following headings/subheadings of the HS: 0204.10–.23: Meat of lamb and other sheep fresh or chilled (whether domestic or wild).*
Subclass	**21116**	**Meat of goat**, fresh or chilled Meat of goat, animals of subclass 02123, fresh or chilled. *This subclass is defined through the following headings/subheadings of the HS: 0104.20: Domestic or wild goat*
Subclass	**21117**	**Meat of camels and camelids**, fresh or chilled Meat of camels and camelids, animals of subclass 02121, fresh or chilled. The subclass 02121 includes: - Bactrian camels, *Camelus ferus or bactrianus* - Arabian camels, dromedaries, *Camelus dromedarius* - camelids, species of Lama, such as: * alpaca, *glama pacos* * llama, peruano * guanaco, huanacus * vicuña, vicugna
Subclass	**21118**	**Meat of horses and other equines**, fresh or chilled *This subclass is defined through the following headings/subheadings of the HS: 0101: Horses, asses, mules, hinnies.*
Subclass	**21119**	**Other meat of mammals**, fresh or chilled Meat of animals of subclass 02129, ruminants other than cattle, buffalo, camelids, goats and sheep, fresh or chilled. It includes: - deer - antelopes

		- serows and gorals, Nemorhaedus - chevrotains - musk deer Meat of animals of subclass 02192, mammals other than ruminants, equines, swine and rabbits and hares, fresh or chilled. It includes: - primates - whales and other mammals of the order Cetacea - manatees and dugongs, animals of the order Sirenia - mice, rats, squirrels, hamsters and other rodents, Rodentia, - kangaroos, opossums and other marsupials - dogs, foxes, wolves and other canids, Canidae, - seals, walruses, sea lions and other pinnipeds, Pinnipedia - cats, lions, leopards and other felines, Felidae - elephants, members of Elephantidae - minks, otters, weasels, badgers and other Mustelidae - bears, polar bears, pandas, Ursidae - other mammals n.e.c.
Class	**2112**	**Meat of poultry, fresh or chilled**
……	**…….**	**……**
Class	**2113**	**Meat of mammals, frozen**
…….	…….	.....
Class	**2114**	**Meat of poultry, frozen**
…….	……..	.....
Class	**2117**	**Other meat and edible offal, fresh, chilled or frozen**
Subclass	**21170**	**Other meat and edible offal, fresh, chilled or frozen** - meat and edible offal of reptiles, fresh, chilled or frozen - meat and edible offal of birds other than poultry, fresh, chilled or frozen, such as: * pigeons * feathered game * grouses * ostriches * partridges * pheasants * quails * wild ducks * wild geese
Class	**2118**	**Preserves and preparations of meat, meat offal or blood**
Subclass	……..	.....

The HS classifies meats suitable for human consumption in Chapter 2. At heading level (four digits), distinction can be made between fresh or processed meats of bovine, swine, ovine (sheep or goats), equine (horses, asses, mules or hinnies), poultry and other kinds of meat. The explanatory notes indicate whether the meat has a domestic or a wild origin. A further specification is pointed out in the explanatory note of bovine meat, which mentions a cross-reference to the species.

At subheading level (six digits), the meat of bovine, ovine and swine is classified following a criterion based on the cut of the animal traded, notably carcass, half-carcass or other cuts. Bovine species are further specified under the "Live bovine" category. Equine meat is not further divided and comprises meat of domestic or wild animals. Poultry meat, however, explicitly refers to the meat of domestic birds – fowls, turkeys, ducks, geese or guinea fowl. Lastly, "Other meat" is classified along with some indications on species.

Chapter	**2**	**Meat and edible meat offal**
Heading	**02.01**	**Meat of bovine animals, fresh or chilled**
Subheading	0201.10	Carcasses and half-carcasses
Subheading	0201.20	Other cuts on the bone
Subheading	0201.30	Boneless
Note: The heading covers fresh or chilled meat of domestic or wild bovine animals under heading 01.02.		
Heading	**02.02**	**Meat of bovine animals, frozen**
Subheading	0202.10	Carcasses and half-carcasses
Subheading	0202.20	Other cuts on the bone
Subheading	0202.30	Boneless
Note: the heading covers frozen meat of domestic or wild bovine animals of heading 01.02 Live bovine animals under heading 01.02 include: (1) animals of the genus Bos, including the common ox (*Bos Taurus*), the Zebu or humped ox (*Bos indicus*), and the Watussi ox; (2) animals of the genus Bubalus, including the Indian or water buffalo (*Bubalus bubalus*), the Asiatic buffalo or arni (*Bubalus arni*), and the Celebese anoa or pygmy buffalo (*Bubalus depressicornis* or *Anoa depressicornis*); (3) the Asiatic oxen of the genus Bibos, such as the gaur (*Bibos gaurus*), the gayal (*Bibos frontalis*) and the banteng (*Bibos sondaicus*); (4) the African buffaloes of the genus *Syncerus*, such as the dwarf buffalo (*Syncerus nanus*) and the large Caffrarian buffalo (*Syncerus caffer*); (5) the Tibetan yak (*Poephagus grunniens*); (6) animal of the genus Bison, i.e. the American bison (*Bison bison*) or buffalo, and the European bison (*Bison bonasus*); (7) the beefalo (a cross between a bison and a domestic beef animal).		
Heading	**02.03**	**Meat of swine, fresh, chilled or frozen**
- Fresh or chilled:		
Subheading	0203.11	-- Carcasses and half-carcasses
Subheading	0203.12	-- Ham, shoulder and cuts thereof, on the bone
Subheading	0203.19	-- Other
- Frozen:		

Subheading	0203.21	-- Carcasses and half-carcasses
Subheading	0203.22	-- Ham, shoulder and cuts thereof, on the bone
Subheading	0203.29	-- Other

Note: The heading covers fresh, chilled or frozen meat of pigs and other swine, whether domestic or wild (e.g. wild boar).

Heading	**02.04**	**Meat of sheep or goats, fresh, chilled or frozen**
Subheading	0204.10	Carcasses and half-carcasses of lamb, fresh or chilled
- Other meat of sheep, fresh or chilled:		
Subheading	.....	.....
Subheading	.....	.....
Subheading	.....	.....
Subheading	.....	.....
- Other meat of sheep, frozen:		
Subheading	.....	.....
Subheading	.....	.....
Subheading	.....	.....
Subheading	.....	.....
Heading	**02.05**	**Meat of horses, asses, mules or hinnies, fresh, chilled or frozen**
Subheading	.....	.....
Heading:	**02.06**	**Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled or frozen**
Subheading	.....	.....
Heading	**02.07**	**Meat and edible offal, of the poultry of heading 01.05, fresh, chilled or frozen**
Subheading	.....	.....
Heading	**02.08**	**Other meat and edible meat offal, fresh, chilled or frozen**
Subheading	0208.10	Of rabbits or hares
Subheading	0208.30	Of primates
Subheading	0208.40	Of whales, dolphins and porpoises (mammals of the order Cetacea); of manatees and dugongs (mammals of the order Sirenia); of seals, sea lions and walruses (mammals of the suborder Pinnipedia)
Subheading	0208.50	Of reptiles (including snakes and turtles)
Subheading	0208.60	Of camels and other camelids (Camelidae)
Subheading	0208.90	Other
Heading 02.10	**02.10**	Meat and edible meat offal, salted, in brine, dried or smoked; edible flours and meals of meat or meat offal
Subheading	.....	.....

Assessment

The current classifications exhibit several problems. First, game meat is scattered across several categories of meat products in the current international CPC and HS classification systems. Second, some subclasses/subheadings include meat from domestic animal species and wild animal species without differentiation. For example, wild boar and domestic pig meats are classified under the same subclass/subheading without further breakdown. This makes it extremely difficult to estimate the production and trade volume of certain common game meat products. Moreover, even when wild animal species are listed separately, they are not sufficiently detailed to separate wild animal meat hunted in the forest from the meat of farm-reared animals. The same type of wild meat may be exclusively collected in the wild, farm-reared or both in a country. Consequently, even when species of wild animals are listed within categories, it is still impossible to distinguish between agriculture and forestry products.

Proposed definition and classification

In order to precisely identify whether the meat of wild animals is a forest product, it is recommended that the CPC explanatory notes of the two classes of "Meat of mammals" and "Other meat and edible offal" be clarified by including the following descriptions:

- The meat of animals hunted/trapped in the wild (ISIC 0170[25]).
- The meat produced through animals reared and bred (ISIC 014[26]).

This will allow further expansions of wild game meat if the evidence from statistical data indicates a need.

For greater clarity, the most relevant hunted species should also be listed at each subclass level. With regard to the subclass of pig meat, the following should be mentioned:

- Wild boar (*Sus scrofa*).
- Warthogs (*Phacochoerus aethiopicus*), river hogs or pig deer (*Potamochoerus porcus*), and the black forest pig; babiroussa (*Babyrousa babyrussa*).
- Peccary (wild swine) (*Dicotyles tajacu*).

These species are already cited in the Combined Nomenclature 2014 and in some national HS subheadings. The identification of major hunted species belonging to other subclasses requires further investigation.

[25] The International Standard Industrial Classification of All Economic Activities (ISIC) Rev.4 defines class 0170 as "Hunting, trapping and related service activities" and includes: hunting and trapping on a commercial basis;- taking of animals (dead or alive) for food, fur, skin or use in research, zoos or as pets.

[26] The ISIC Rev.4 defines group 014 as "Animal production". This group includes the rearing (farming) and breeding of all animals except aquatic animals.

Existing data sources

Production

Data on meat production are usually provided by agricultural production statistics and refer to the activity of slaughterhouses. Information on the quantity and number of animals by different species, as well as on animal farming activities, is also available.

As previously mentioned, updated forest product statistics on game meat are hard to find. However, many studies carried out from other perspectives, for example conservation of wildlife, provide information about species that are hunted for food.

For example, big and small game meat, such as duikers, bushbuck, antelope, giant rats, porcupines, squirrels, pangolins and wild swine, are commonly traded in African countries (FAO, 2001). Estimates on the quantity of large and medium-sized Neotropical primates, such as woolly (*Lagothrix* ssp.), spider (*Ateles* ssp.), howler (*Alouatta* ssp.) and capuchin (*Cebus* ssp.) monkeys, which are consumed as food in the Brazilian Amazon, are provided, along with conservation issues (Care for the Wild International, 2007) and reptile species from Central and South America traded worldwide (Fitzgerald *et al*., 2004; Traffic, 2009).

In addition, data could be indirectly estimated by hunting statistics, especially if hunting was regulated and subject to permissions; authorities responsible for wildlife monitoring could represent an additional data source. At the European level, national statistics offices and hunters' associations provide statistical datasets on animals hunted. Schulp, Thuiller and Verburg (2014) synthesized hunting statistics from 17 EU countries and identified 97 species. The five main game species hunted in all countries include *Cervus elaphus* (red deer), *Capreolus capreolus* (roe deer), *Lepus europaeus* (hare), *Phasianus colchicus* (pheasant) and *Sus scrofa* (wild boar).

Further information could also be collected by food security agencies or by wildlife conservation institutions. For example, the Food Standards Agency of New Zealand and Australia provides data on wild game meat of kangaroos, wallabies, mutton birds and wild boars.

Overall, there is a need for quantitative analysis to obtain structured statistical data on markets and trades.

International Trade

At present, useful information about markets and data on wild game meat can be obtained by international trade data, because some countries have adapted the HS classification system to respond to their needs in terms of categorizing wild meat. For example, China added further codes for the meat of bovine and swine (Table 68); Japan introduced codes for wild boar; other countries expanded the residual class of "Other meat" by listing species (Table 71). The statistical database of international trade provided by Eurostat relies on the Combined Nomenclature 2014 classification, which provides a category for game meat (see Table 72). All these codes are able to classify the meat of non-domestic animals, irrespective of their origin, whether hunted in the wild or farmed.

China. The official customs tariff schedule products are classified with eight-digit codes, and the Customs Administration uses a system with two additional digits for the use of internal taxation and customs documentation requirements. For each subheading of bovine and swine meat, the custom tariff provides codes for meat of wild animals and for processed meat it lists some species of wild swine (see Table 68 and Table 69).

Table 68. China HS codes and description of swine meat, freash, chilled or frozen

HS code		Description	HS code		Description
02.01		Meat of bovine animals, fresh or chilled	02.02		Meat of bovine animals, frozen
0201.1000		-Carcasses and half-carcasses	0202.1000		-Carcasses and half-carcasses
	10	**--Of wild bovine animal**		10	**--Of wild bovine animal**
	90	--Other		90	--Other
0201.2000		- Other cuts with bone in	0202.2000		- Other cuts with bone in
	10	**--Of wild bovine animal**		10	**--Of wild bovine animal**
	90	--Other		90	--Other
0201.3000		- Boneless	0202.3000		- Boneless
	10	**--Of wild bovine animal**		10	**--Of wild bovine animal**
	90	--Other		90	--Other

Source: Customs Tariff and Tax Schedule of the People's Republic of China 2012 Edition

Table 69. China HS codes and description of processed meat

HS code		Description
02.10		Meat and edible meat offal, salted, in brine, dried or smoked; edible flours and meals of meat or meat offal.
		- Meat of swine
		--Hams, shoulder and cuts thereof, with bone in
0210.1110		---Hams, shoulder with bone in
	10	**-----Of pig-deer (*Babyrousa*), pigmy pig (*Porcula*)**
	90	-----Other
0210.1190		---Other
	10	**-----Of pig-deer (*Babyrousa*), pigmy pig (*Porcula*)**
	90	-----Other
0210.1200		--Bellies (streaky) and cuts thereof
	10	**-----Of pig-deer (*Babyrousa*), pigmy pig (*Porcula*)**
	90	-----Other
0210.1900		--Other
	10	**-----Of pig-deer (*Babyrousa*), pigmy pig (*Porcula*)**
	90	-----Other

Source: Customs Tariff and Tax Schedule of the People's Republic of China 2012 Edition

Table 70. Japan national HS codes for Wild boar meat

HS code		Description	HS code		Description
02.03		Meat of swine, fresh, chilled or frozen	02.06		Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled or frozen
		Fresh or chilled :	0206.30		Of swine, fresh or chilled
0203.11		Carcasses and half-carcasses		010	**1 Of wild boars**
	010	**1 Of wild boars**			2 Other
		2 Other	0206.41		Livers
0203.12		Hams, shoulders and cuts thereof, with bone in		010	**1 Of wild boars**
	010	**1 Of wild boars**			2 Other
		2 Other			
0203.19		Other			
	010	**1 Of wild boars**			
		2 Other			

Source: Japan's Tariff Schedule, 2014.

Table 71. National extended HS codes for 020890 in USA, Australia, South Africa and Thailand

Country	HS code	Description
USA	02089020	Meat and edible offal of deer, fresh, chilled or frozen
USA	02089030	Quail, whole, eviscerated, fresh chilled or frozen
Australia	02089011	Fresh, Chilled Or Frozen Meat And Edible Meat Offal Of Kangaroo
South Africa	02089010	Meat of ostriches
Thailand	02089010001	Deer
Thailand	02089010002	Rice birds

Sources: Revision 1, Official Harmonized Tariff Schedule of the United States 2014; Australian Harmonized Export Commodity Classification (AHECC); South Africa – Schedule 1 - Customs and Excise Tariff 2014; Customs Department of Thailand.

European countries. The Combined Nomenclature 2014, used for EU countries, classifies at eight-digit level the meat of wild swine, wild rabbits or hares, and game meat[27]. This last category is an expansion of HS 020890, the residual class of "other meat", and includes the meat and edible meat offal of game other than rabbits and hares, as defined through the following explanation:

> 1. Furred game: fallow deer, roe-deer, chamois or izard (*Rupicapra rupicapra*), moose or elk, goat-antelope, antelope, gazelles, bears and kangaroos.
>
> 2. Feathered game: wild pigeons, wild geese, wild ducks, partridges, pheasants, woodcocks, snipes, grouse, ortolans and ostriches.

[27] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2014:312:FULL&from=EN

The meat and edible meat offal of animals that are generally the object of hunting and shooting (pheasants, fallow deer, ostriches, etc.) remain classified as meat and edible meat offal of game, even when such animals have been raised in captivity.

Table 72. EU-28 import and export value (1 000 USD) of commodity 020809030 (meat of game, other than rabbits and hares), 2015

	Import value	Export value
EU-28 Extra trade	109 089	48 167
EU-28 Intra trade	265 944	264 750

Source: Eurostat

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8.12 Edible insects

Description

Insects belong to the category of multipurpose non-wood forest products, as they are used in many products such as natural medicines, honey, cosmetics, silk, candles, and human and animal food. Because of their increasing role in food security, this factsheet is focused on edible insects for human consumption.

Insects are commonly eaten worldwide, especially in Asia and the Pacific, Africa and Latin America, with more than 1 900 species reportedly used as food (FAO, 2013). FAO data state that species such as beetles, caterpillars, bees, wasps and ants are regularly consumed, as well as locusts, crickets, cicadas, leaf and plant hoppers, scale insects, true bugs, termites, dragonflies and flies, to a lesser extent.

Existing classification

Central Product Classification (CPC Ver 2.1)

In the CPC, insects used in edible products are not explicitly classified. They fit the subclass 21170 of "Other meat" and are specified in the group of live animals as follows:

Section	**0**	**Agriculture, forestry and fishery products**
Division	02	Live animals and animal products (excluding meat)
Group	021	Live animals
Class	0219	Other live animals
Subclass	**02199**	**Other live animals, n.e.c.** It includes: - amphibians, such as: --- frogs --- toads --- salamanders - spiders **-insects, such as:** --- butterflies --- beetles --- moths --- silk-worms --- larvae - scorpions - worms - leeches

Harmonized Commodity Description and Coding System (HS 2017)

The HS includes edible insects at subheading level (six digits) in the residual category of "Other meat".

Chapter	2	Meat and edible meat offal
Heading	02.08	Other meat and edible meat offal, fresh, chilled or frozen
Subheading:	0208.10	- Of rabbits or hares
	0208.30	- Of primates
	0208.40	- Of whales, dolphins and porpoises (mammals of the order Cetacea); of manatees and dugongs (mammals of the order Sirenia); of seals, sea lions and walruses (mammals of the suborder Pinnipedia)
	0208.50	- Of reptiles (including snakes and turtles)
	0208.60	- Of camels and other camelids (Camelidae)
	0208.90	**- Other**

The explanatory note states that heading 02.08 "covers meat and meat offal of the animal classified in heading 01.06, provided that they are suitable for human consumption". Heading 01.06 includes insect at subheading level and therefore, the HS subclass 0208.90 is the one that classifies the meat of edible insects.

Heading	01.06	Other lives animals
Subheading:	-	Mammals
		…….
	-	Reptiles
		…….
	-	Birds
		…….
	-	- Insects
	0106.41	**-- Bees**
	0106.49	**-- Other**

Assessment

The HS does not exhibit problems when classifying edible insects; the explanatory note specifies that bees and other insects are included under subheading 0208.90. The CPC, instead, requires a more detailed description in the explanatory note.

Proposed definition and classification

In order to give edible insects a better place in the CPC, the explanatory note of "Other meat" should be refined to include reference to a subclass that covers live insects (it specifies: butterflies, beetles, moths, silk-worms, larvae, scorpions, worms and leeches), and should mention the inclusion of insects, whether farmed or caught in the wild.

Existing data sources

Production

Edible insects, commercially harvested or farmed, are not yet the subject of regular statistical surveys. International and national classification systems do not provide explicit codes for these products, and official statistics do not include data on forestry and agricultural production. At present, the nutritional aspects of insects are provided, and some data on consumption exist (Huis *et al*., 2013).

International trade

Regarding international trade, although some "unstructured" information is available, only the Customs Department of Thailand provides codes for edible insects. Thailand expanded the class of "Other meat" (HS 020890) so that edible insects have four detailed codes (Table 73):

Table 73. Edible insects HS codes (Thailand)

02089010003	House cricket
02089010004	Grasshopper
02089010005	Bamboo caterpillar
02089010090	Other insect

Source: Custom Department of Thailand

Trade statistics clarify the importance of these products for the country. In fact, imports of edible insects amount to 1.7 million USD accounting for 91% of imports recorded for HS 020890 in 2015. Supplying market for imports of bamboo caterpillar, grasshopper and other insects is China.

Table 74. Thailand imports value of HS 020890, 2015

Item code	Item name	Value (1 000 USD)	Share (%)	Cumulative share (%)
02089090006	**Other Insect**	1 665	86.7	86.7
02089090005	**Bamboo Caterpillar**	46	2.4	89.1
02089090004	**Grasshopper**	34	1.8	90.9
02089090001	Deer	120	6.2	97.1
02089090090	Other	55	2.9	100.0

Source: Global Trade Atlas

Table 75. Thailand exports value of HS 020890, 2015

Item code	Item name	Value (1 000 USD)	Share (%)	Cumulative Share (%)
02089090006	**Other Insect**	78	44.4	44.4
02089090003	**House Cricket**	5	2.8	47.2
02089090090	Other	93	52.8	100.0

Source: Global Trade Atlas

Export values of HS 020890 show that 47% is attributable to edible insects (Table 75). Major export market is the United States of America which accounts for 100% of "house cricket" exports and for 95% of "Other insects" exports (Table 76 and Table 77).

Table 76. Thailand exports statistics commodity 02089090003 (House cricket), 2015

Destination	Value (USD)	Share (%)
World	4 957	100
United States	4 957	100

Source: Global Trade Atlas

Table 77. Thailand exports statistics commodity 02089090006 (Other insect), 2015

Destination	Value (USD)	Share (%)
World	77 763	100.0
United States	74 059	95.3
Germany	2 359	3.0
Japan	1 270	1.6
Switzerland	75	0.1

Source: Global Trade Atlas

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This report compares the international statistics on non-wood forest products (NWFPs) by reviewing the three main international statistical classifications: the Harmonized System (HS), the Central Product Classification (CPC) and the International Standard Industrial Classification (ISIC). It discusses specific issues in linking major NWFPs across the three reference systems, as well as how countries deal with these issues. It proposes ways for improving the international classification systems and presents some of their main NWFPs. Each product group is fully described in the annexes, which provide information on where it is situated in the existing international classifications, as well as production and international trade data sources. The intention of this paper is not to reinvent a statistical system of NWFPs, but rather to provide information on NWFPs in the existing national/international statistical systems so that users can compile national/regional/international statistics on NWFPs according to their assessment needs.

I6731EN/1/03.17

ISBN 978-92-5-109602-4 ISSN 1020-3370

9 789251 096024

I6731EN/1/03.17