



منظمة الأغذية
والزراعة للأمم
المتحدة

联合国
粮食及
农业组织

Food and
Agriculture
Organization
of the
United Nations

Organisation des
Nations Unies
pour
l'alimentation
et l'agriculture

Продовольственная и
сельскохозяйственная
организация
Объединенных
Наций

Organización
de las
Naciones Unidas
para la
Alimentación y la
Agricultura

TWENTY-SEVENTH SESSION

Port Denarau, Fiji, 19 – 23 March 2018

Agenda Item 10.2: Overview of Forestry and environment statistics in AP region

Making NWFPs visible: Disentangling definitions and refining methodologies

Contributed by:

Giulia Muir (*FAO Forestry consultant - NWFPs*) & **Simona Sorrenti**, (*Office of Chief Statistician & Forestry*), FAO Rome, HQ

Giulia.Muir@fao.org; Simona.Sorrenti@fao.org





Outline of presentation

1. Brief history and overview
 2. Disentangling definitions
 3. Challenges to data collection & finding methods that work
 4. Concluding remarks
-





What is an NWFP?



- **“Non-wood Forest Products consist of goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests.” (FAO, 1999)**
- **NWFPs cover (1) wild products; (2) managed products; (3) cultivated products.**
- **Includes:** mushrooms, fruits, nuts, herbs, aromatic plants, game, fibres (used in construction, clothing or handcrafts), resins, gums, saps, and products used for medicinal, cosmetic or cultural scopes.



I. Brief history and overview

→ For most of human history forest products other than timber were more valuable for **nourishing, clothing, healing and for providing shelter**

→ species like rubber, quinine, oil palm, and cocoa were brought into **cultivation** around the world, and NWFP species like Brazil nuts and rattan were harvested on an industrial scale.

→ most high value NWFPs became **agricultural crops**. *Source: [Shanley et al. 2016](#).*





NWFPs still matter!

European Wild forest product consumption

Wild mushrooms, truffles, berries, nuts, asparagus, medicinal and aromatic plants

- 91.5% households have consumed WFPs
- 25% households across Europe picked WFPs
- 18.83% household picked wild mushrooms

China Export value (1,000 USD)

Pine nuts	272,206
Mushrooms	56,278
Bamboo shoots	315,050

Canada major food forest products

Maple syrup, wild blueberry, wild ginseng, fiddlehead ferns

Maple products represent a \$354 million dollar industry

Brazil Prod value (1,000 USD)

Açaí	144,269
Cashew nuts	1,473
Brazil nuts	32,250
Erva-mate	118,949
Mangaba (fruto)	473
Palmito	4,324
Pinhão (fruto)	4,273
Pequi	6,360
Umbu (fruto)	3,048

Chilean Export value (1,000 USD)

Forest mushrooms	12,066
Frutos maqui	1,473

Ghana forest-based food

Cola nuts	Bush meat value for annual domestic consumption: US\$ 210 – 350 million
Gum arabic	
Edible leaves	
Edible seeds	
Honey	
Snails	
Mushrooms	
Bush meat	

Overview

- FAO estimates that NWFPs generated **US\$88 billion** in 2011 ([SOFO, 2014](#)).
- **76 million tonnes** of food from the forest were consumed on average in 2011 ([SOFO, 2014](#)).
- **1 billion people** are thought to depend on *wild* foods ([Burlingame, 2000](#)).
- **80 percent** of the population of developing countries rely on traditional medicines, mostly plant drugs, for primary health care.



Table 4 Estimated income from the informal forest sector in 2011 (in billion USD at 2011 prices)

Region	Woodfuel and construction	NWFPs	Total
Africa	14.4	5.3	19.7
Asia and Oceania	9.9	67.4	77.3
Europe	-	8	8
North America	-	3.6	3.6
Latin America and Caribbean	9	3.6	12.6
World	33.3	88	121.3

Source: FAO (2014a), based on various sources.



Contributions of forests & trees for food security and nutrition

- **Dietary diversity.** Recent studies from Asia and Africa (21 countries) suggest a **positive correlation between tree cover** and more diverse and nutritious diets. (Sunderland et al., 2016; Ickowitz et al. 2014).
- **Resilience.** NWFPs can enhance the resilience of forest dependent peoples particularly in times of climatic and economic uncertainty.
- **Income and employment.** Avg. 60 to 80 percent of income of forest-dwellers from natural resources; NWFPs account for an average 40 percent (Ingram et al. 2016)
- **Energy.** Some 2.4 billion rely on woodfuel as main source of energy for cooking (764 million to boil and sterilize water)

Environmental Conservation: page 1 of 13. © Foundation for Environmental Conservation 2016.

doi:10.1017/S0376892916000151

Forest foods and healthy RESEARCH ARTICLE

DOMINIC ROWLAND^{1,2}, AMY TERRY SUNDERLAND^{1,4}

¹Center for International Forestry Research, *Jal African Studies, University of London, London University, 314 Walker Building, University Pa James Cook Dr, Townsville City QLD 4811, Au*
Date submitted: 11 February 2015; Date

Forests, Trees, and Micronutrient-Rich Food Consumption in Indonesia

Amy Ickowitz^{1*}, Dominic Rowland¹, Bronwen Powell^{1,2}, Mohammad Agus Salim¹, Terry Sunderland^{1,3}

¹ Center for International Forestry Research, Jl. CIFOR, Situ Gede, Bogor (Barat) 16115, Indonesia, ² Department of Geography and African Studies, Pennsylvania State University, University Park, Pennsylvania, United States of America, ³ School of Marine and Environmental Sciences, James Cook



ELSEVIER

Contents lists available at ScienceDirect

Global Environmental Change

journal homepage: www.elsevier.com/locate/gloenvcha

SUMMARY

Forested landscape rich food for milli growing evidence of great importan living in close pr

Assessing cost of a r eastern Ba

Céline Termote,

Abstract

Background. *Wild f contributions to nu studied or consider programs.*

Objective. *To stuc in achieving a cost re diet for women and y programming.*

Methods. *An eth food biodiversity was discussions, and five modeling. A market survey assessed available food prices by season. Diets were modeled to minimize cost and maximize nutrient adequacy using the Cost of Diet linear programming tool. Modeling was done without and with wild foods.*

Results. *The modeled diets without wild species were deficient in iron for all age groups during the dry season, deficient in vitamin B₆ and calcium for infants aged 6 to 8 months during the dry season, and deficient in iron and zinc for infants aged 6 to 8 months over the whole year. Adding wild foods, especially Berchemia discolor,*

Dietary quality and tree cover in Africa

Amy Ickowitz*, Bronwen

Center for International Forestry Research,

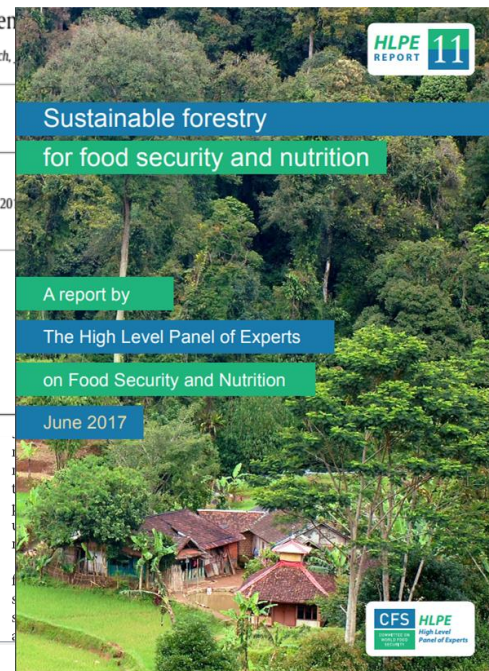
ARTICLE INFO

Article history:

Received 30 January 2013
Received in revised form 24 November 2013
Accepted 2 December 2013

Keywords:

Forests
Nutrition
Food security
Africa
Dietary diversity
Dietary quality





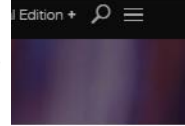
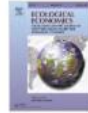
Not just “famine foods”

Comprehensive
REVIEWS
in Food Science and Food Safety



Ecological Economics

Volume 120, December 2015, Pages 303–311



Surveys

From famine foods to delicatessen: Interpreting trends in the use of wild edible plants through cultural ecosystem services

A New Age for *Quercus* spp. Fruits: Review on Nutritional and Phytochemical Composition and Related Biological Activities of Acorns

Ana F. Vinha, João C. M. Barreira, Anabela S.G. Costa, and M. Beatriz P. P. Oliveira

Abstract: The current global food system must adapt to the expected growth of world population (about 9 billion individuals by 2050). This adaptation will probably include an increased consumption of edible wild foods, due to their richness in micronutrients and bioactive compounds, besides providing a cost-effective and sustainable way of improving caloric food security. A striking example of such natural matrices is the *Quercus* genus, which has the additional advantage of being widespread throughout the Northern Hemisphere. In a traditional sense, *Quercus* fruits (acorns) were mainly used in animal feeding, despite their potentially important role on the rural economy. But this preconception is changing. In fact, their nutritional value, high contents in phytochemical compounds, biological activity (such as antioxidant, anticarcinogenic, and cardioprotective properties) and use in the treatment of specific diseases (such as atherosclerosis, diabetes, or Alzheimer's disease) have raised the interest in integrating acorns into the human diet. Accordingly, this comprehensive overview was designed to provide an evidence-based review of the literature, with the objective to achieve useful conclusions regarding the nutritional properties, methodologies of extraction, identification, and characterization of a wide variety of bioactive compounds and scientifically validated bioactivities in *Quercus* species worldwide. The industrial by-products from acorn oil extraction or flour production are also included. Data regarding the analytical techniques, individual compounds, and their bioactivities, are organized in tables. The reported data are

Feelers out for insect fine dining in Bangkok



▲ Waiter, there's a bug in my pasta! ... crab and water beetle ravioli with a turmeric saffron sauce.

Insects have long been a staple in the countryside of Thailand. Now, a top chef is creating a buzz in Bangkok by putting this



For \$300, You Can Drink Gin Made From The Bodies Of Foraged Ants

05/20/2015 11:22 am ET | Updated May 20, 2015



More terms and [some] definitions...

FARMED/CROP (agricultural product)



Non-wood forest products

NWFPs consist of goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests. (FAO, 1999)

Non-timber Forest Products

The term NTFP encompasses all biological materials other than timber which are extracted from forests for human use (DeBeer & McDermott, 1989)

Wild forest products

"wild product" results from the "collection of edible plants and parts thereof, growing naturally in natural areas, forests and agricultural areas" (EU Art. 12, comma 2, Reg. 834/07 "organic law")

Minor forest produce

All non-timber forest produce of plant origin including bamboo, brush wood, stumps, cane, tussar, cocoons, honey, wax, lac, or kendu leaves, medicinal plants, and herbs, roots, tubers and the like. (Government of India)

Secondary or side use of forests

All kinds of use in forests and forest lands not covered by forest, except for timber and minor forest materials, including: animal breeding, beekeeping, farming, processing of wood and wild fruits and berries, medicinal plants; placement of apiaries, collection of wild food resources, medicinal plants, technical raw materials and other; procurement of secondary forest resources (stumps, bark, etc.) Kyrgyzstan Forest Law

Forest byproducts

E.g. berries, mushrooms, herbs, decorative plants as well as hunting, bee-keeping and the grazing of cattle. Categories of forest use: wood production, resin production, secondary forest materials and technological

Current FAO definition and classification used for data collection **is not sufficient to address some of the challenges with statistics**

WII

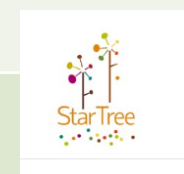
wild meat (bushmeat)/game meat

All meat from animals hunted or trapped for meat that is available for consumption; meat from game that roams in farms (a farm has an enclosed space) is excluded (UNECE, 2017).

EU/FAO study

Country examples of how NWFPs are defined/described in select policies, strategies, programmes on forests

Geographic area	Countries reviewed	Country	Term	Definition	Source
Asia-Pacific	21	Fiji	Non-wood products forest	all forest products except woody materials such as timber, fuel wood, charcoal, woodchips, wood pulp and small wood items such as carvings, including but not exclusively, fibres, leaves, fruits, nuts, roots, resins and latexes, honey, bees wax, all types of fungi, minerals, stones and clay;	Forest Bill , 2016
		Australia	non-wood products/non-wood forest based activities/non-wood forest products	bush foods, traditional Indigenous medicines and essential oils, native cut flowers and, tourism; eco-tourism, land management, park management, bush tucker and bush medicines, bee keeping, and cultural heritage and site management.	National Indigenous Forestry Strategy (2005)
Eastern Europe and Central Asia	25		Non-wood aspects of forests	wildfire management, recreation, and cultural and heritage values	National Forest Policy Statement (1995)
Europe	15*	Nepal	Forest products	<ul style="list-style-type: none"> Timber, firewood, charcoal, catechu, rosin, wood-oil, bark, lac, pipla, pipli (piper longum), or; Tree, leave, fruit, flower, mahwa (bassia longifolia), chiraito (swertia chiretta), Kutki (picorhiza Kurroa) and all kinds of wild herbs, vegetation and different parts or organs thereof, or; Boulder, soil, stone, pebble, sand, or; Bird, wildlife and trophy thereof. 	Forest Act 2049 (1993)
Latin America and the Caribbean	26	New Zealand	Forest produce or forest product	Includes trees and other plants and the produce of trees and other plants, and also includes earth, rock, sand, shingle, and minerals when found in or removed from any forest land or any other land for the time being administered by the Minister	
Africa	10	Bangladesh	Forest produce	Timber as well as a host of other products, including charcoal, wood-oil, resins, wild animals, honey, silk, rocks and minerals, among many others.	

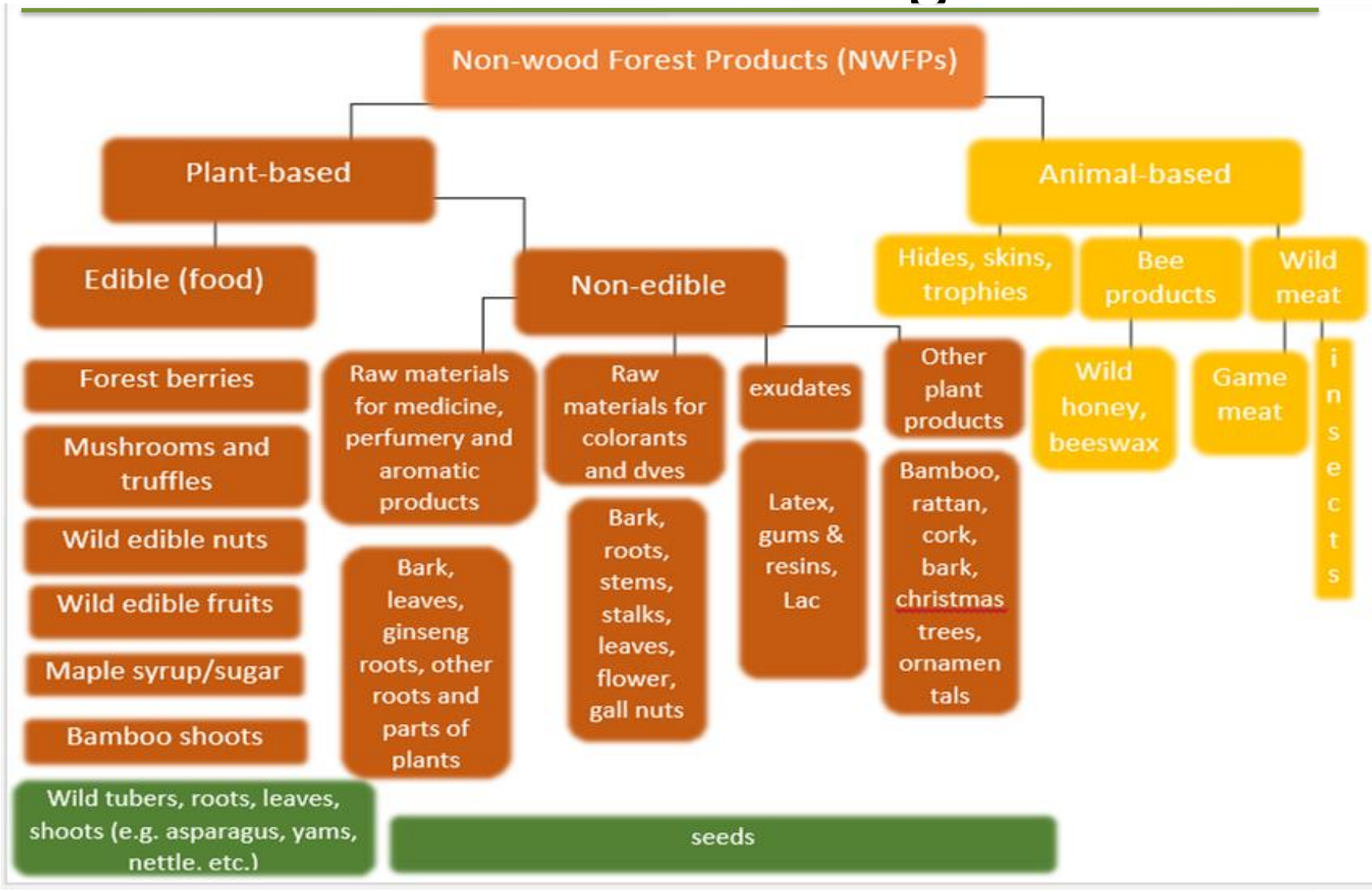




Why is it so difficult to agree on a term & definition? differing opinions on:

1. drawing a line between **wild/domesticated**
 2. inclusion/exclusion of **wood**
 3. products vs **services**
 4. **animal** versus **plant**-based products
 5. what is a **forest**?
 6. in some countries, they have become **legal/fiscal** terms: (Minor Forest products (India); Wild Forest Products (Italy/Europe?))
-

Diversity of NWFPs compounds challenge...



III. Challenges to data collection . . .

- 1) Vast **differences in terminology and definitions** make it difficult to assess trends.
 - 2) **Data is incomplete** as in most cases NWFP use and trade are confined to the **informal sector**.
 - 3) Where and when data is available, it is often **partial and incomparable** across countries and over time;
 - 4) **unclear boundary** between NWFPs and products from agriculture or horticulture.
- ⇒ as a result, NWFPs are **poorly represented in international statistics** → role of NWFPs for food and nutrition security and their economic contribution **underestimated**.
-



... & finding methods that work

[Interpretative] case studies

Analysis of single, bounded unit provides important insights into real-life situations

Individual, household and market surveys

Refining questionnaires to include NWFPs and sources of products

Expert/Delphi surveys

National data on production, consumption and trade

Harmonizing terminology and definitions; improving classifications systems

Regional example: EU Star Tree

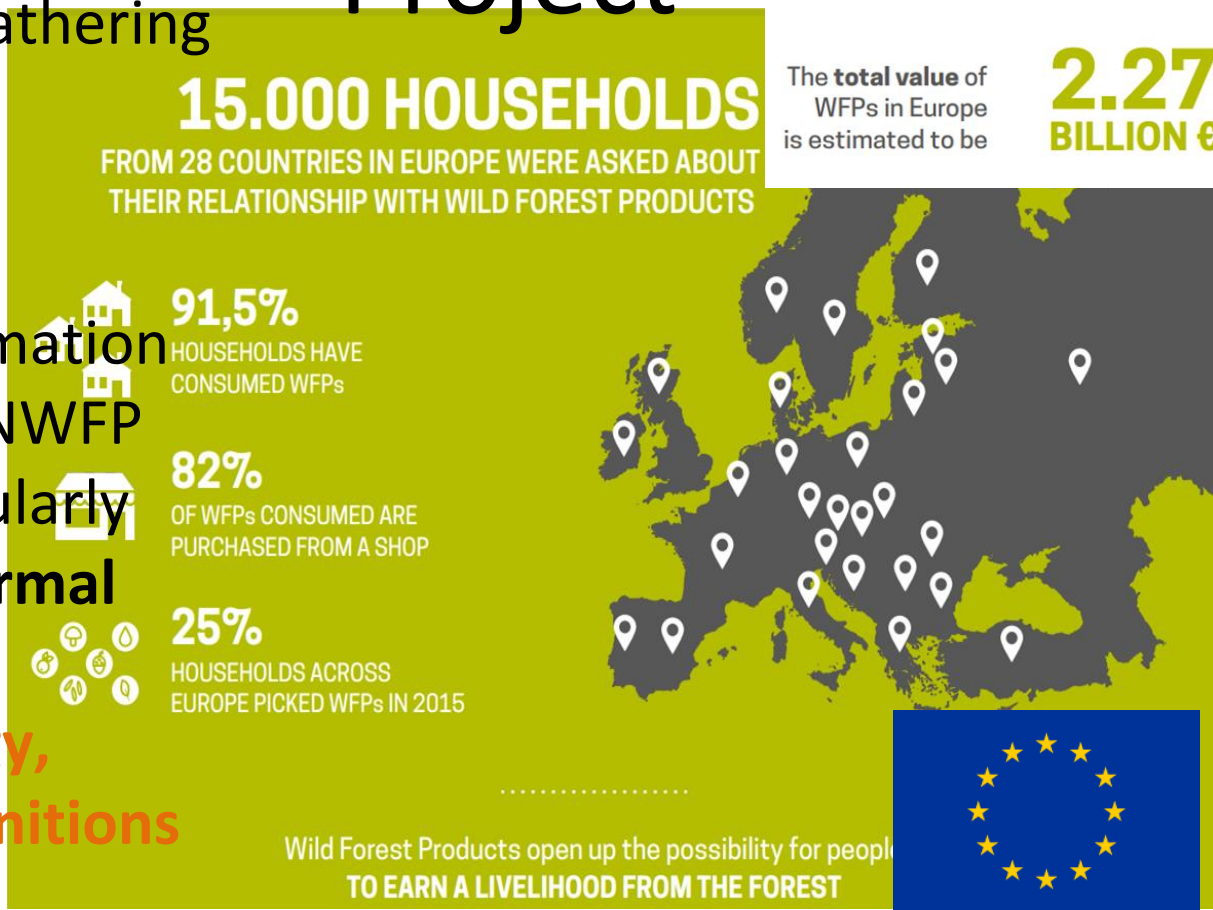
1. **Household surveys** -
consumption and gathering

2. **Delphi method** –
(production)

✓ huge potential for
improving the information
along the different NWFP
supply chain, particularly
with regards to **informal
market**

3. Refining **terminology,
classification and definitions**
(production, trade)

Project



Source: Lovric et al. Star Tree Final Conference.
(<https://star-tree.eu/images/conference/presentations/lovric.pdf>)



Multipurpose trees and non-wood forest products, a challenge and opportunity www.star-tree.eu



UNIVERSITÀ
DEGLI STUDI
DI PADOVA

TESAF





What are we (FAO HQ) doing?

FAO Forestry Department and Office of the Chief Statistician working together to improve NWFPs representation in international statistics through:

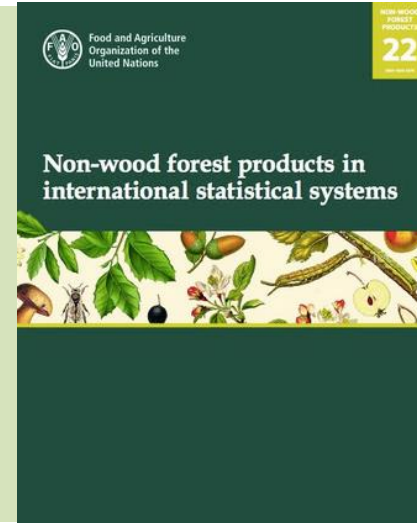
- ❖ Analysis of existing information and development of a global report “Non-wood forest products in international statistical systems”
 - ❖ Joint activities with international partners:
 - Review international classifications with WCO and UNSD
 - Pilot survey on game meat with UNECE
-



NWFPs in international statistical systems

March 2017

- systematic review of NWFPs in international classification systems used for data collection and dissemination with the aim to improve data collection on NWFPs



Mushrooms and
truffles

Edible insects

Edible nuts

Bark

Gums and resins

Maple products

Cork

Wild meat

Skins and trophies

Latexes

Bamboo and rattan

Forest berries

NWFPs in international statistical systems

Major findings

➔ Information is available in national reporting to varying degrees, with countries reporting on products that have value them.

02	MEAT AND EDIBLE OFFAL
0208	Other meat and edible meat offal, fresh, chilled or frozen
02089090	Other
Statistic code: 003	House cricket (<u>kgm</u>)
Statistic code: 004	Grasshopper (<u>kgm</u>)
Statistic code: 005	Bamboo caterpillar (<u>kgm</u>)
Statistic code: 006	Other insect (<u>kgm</u>)

11-digit HS codes – Source Custom Thai

**Thailand
codes for
insects
trading**

Bamboo wood
<u>Paulonia wood</u>
Charcoal
Fuelwood
Shiitake mushrooms
Oyster mushrooms
<u>Bunashimeji mushrooms</u>
<u>Nameko mushrooms</u>
<u>Enokitake mushrooms</u>
<u>Maitake mushrooms</u>
<u>Matsutake mushroom</u>
Chestnuts
Bamboo shoots
Wasabi horseradish
Crude <u>urushi lacquer</u>

**Japan
“minor
forest
products”**

Bamboo shoots
Bamboo shoots
Landscaping material
Nuts and fruits
Wild edible green
Mushrooms
Sap
Resin
Medicinal plants

**Korean
Statistical
Information
Service**

Evidence from reporting:
lack of convergence on
terminology and definition



NWFPs in international statistical systems

Major findings

- ➔ NWFPs are **classified under agricultural categories** without any distinction between wild and farmed produce (especially food items);
 - ➔ Impacts on measurement of forest value, contribution to poverty alleviation and livelihoods, food security
 - ➔ National statistics on NWFPs refer to marketed production and do not include the quantity used for self-consumption or sold/exchanged through informal sector transactions
 - ➔ The amount of harvested production will be much higher than the existing data sources show
-



Review international classifications with WCO and UNSD

HS Classification

FAO proposal to WCO (World Commodity Organization) for amending the HS nomenclature, 11 new codes at detailed level

Central Product Classification

FAO proposal to [UNSD Expert Group on Classification](#) for improving boundaries between agriculture and forestry in CPC (refer to Meeting of the Expert Group on International Statistical Classifications, New York, 6-8 September 2017 (for further details

<https://unstats.un.org/unsd/class/intercop/expertgroup/2017/AC340-33.PDF>)



FAO proposal for HS 2022 version currently under WCO examination

Mushrooms of the genus *Boletus* , Mushrooms of the genus *Cantharellus* , Mushrooms, shiitake (*Lentinus edodes*) (fresh), Mushrooms, matsutake (*Tricholoma matsutake*) , Truffles (*Tuber* spp.), Shiitake, (*Lentinus edodes*) (dried), Pine nuts in shell, Pine nuts shelled, Edible insects (fresh), Edible insects (salted, in brine, dried or smoked), Bark of African cherry (*Prunus africana*). [CITES appendix II]

FAO proposal for improving CPC 2.1 to the UN EG on classifications

Proposal to expand the **0323** and improve the explanatory text of the current:

03 - Forestry and logging products

031 - Wood in the rough

032 - Non-wood forest products

0321 - Natural gums and resins, gums-resins and oleoresins

0322 - Natural cork, raw or simply prepared

0323 - Other wild edible products

0324 - Parts of plants[...] used primarily for dyeing or tanning; vegetable products n.e.c.

0323 defined as:

“edible products that **exist only in the wild**” excluding “edible products that exist in the wild and are also grown (controlled), cf. the corresponding subclass of division 01”.



Explanatory text “edible products that **exist only in the wild** excluding edible products that exist in the wild and are also grown (controlled), cf. the corresponding subclass of division 01 (Products of agriculture, horticulture and market gardening)

1) Harmonize criterion to classify forest products either wood and non-wood, **all products *from the forest* (natural or managed) to be treated as forest products and not as agricultural products :**

Proposal: **replace** the term “wild” with “forest”, covering both planted/managed and natural forest

Reference to Forest definition in SEEA land use classification, based on FAO FRA

Includes: primary, naturally regenerated, planted forest

Excludes: land that is predominantly under agriculture, urban use, and maintenance and restoration of environmental function



Explanatory note: “edible products that **exist only in the wild** excluding edible products that exist in the wild and are also grown (controlled), cf. the corresponding subclass of division 01 (Products of agriculture, horticulture and market gardening)

2) only a very few species nowadays exist in the wild **exclusively** worldwide, while the majority can also be cultivated

identify as NWFPs in **0320 - Other wild edible products** those species that exist “only *or mainly*” in the forest

leave in Division 01 products that are *predominantly* grown in agriculture



Example: add detail under 032 for:

Forest nuts, with detail for:

- Brazil nuts (01377)
- Chestnuts (01373)
- Pine nuts (01379*)
- Areca nuts (01379.01)
- Kola nuts (01379.02)
- Karite nut (01499.01)
- Other forest nuts (01379*)



FAO HQ work on improving statistics about non-wood forest products:

- ❖ Analysis of existing information and development of a global report “Non-wood forest products in international statistical systems”
 - ❖ Joint activities with international partners:
 - Review international classifications with WCO and UNSD

 - Pilot survey on game meat with UNECE
-



Pilot surveys

UNECE/FAO joint enquiry on game meat

Objective: improve knowledge and foster a better understanding of game meat production and trade in the UNECE region.

- Assessed available data sources for UNECE countries and identified problems:
- FAO's Forest Resource Assessment (FRA) program collects information on NWFPs as a minor part questionnaire on global forest resources once every five years. Problem: low data quality and availability for game meat
- FAOSTAT data on game meat are collected through an annual comprehensive questionnaire on agricultural production sent to national statistics bureau of a country. Problem: data on game meat are normally collected and compiled by the forestry or wildlife agency of a country in the region. This mismatch in subject and correspondents may affect the quality of data on game meat in FAOSTAT.
- By making the survey specific and addressed to the right authority, availability and quality of data on game meat production could be improved.

Results coming soon



Concluding remarks:

Be a part of the next steps!

1. **Household surveys/individual consumption surveys and expert surveys**
 - get in touch with us for a sample questionnaire on NWFPs
 2. Improve collaboration with **national statistical agencies**, trade associations, CITES national management authorities to improve harmonization of **terms & definitions for data collection**
 3. Strengthen collaboration with **FAO regional offices** to capture values of local NWFPs
-



Questions? Comments? Suggestions?

Thank you!!!

Please get in touch with us!

Giulia.Muir@fao.org

Simona.Sorrenti@fao.org



FURTHER READING:

- [UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS STATISTICS DIVISION Meeting of the Expert Group on International Statistical Classifications New York, 6-8 September 2017](#)
- [Non-wood forest products in international statistical systems](#) (FAO, 2017)
- [HLPE. 2017. Sustainable forestry for food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.](#)