Nutrition Indicators for Biodiversity

1. Food Composition

2. Food Consumption

Report on the progress of data availability 2011

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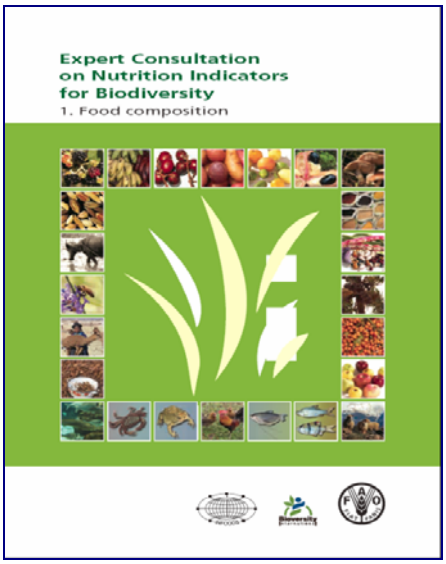

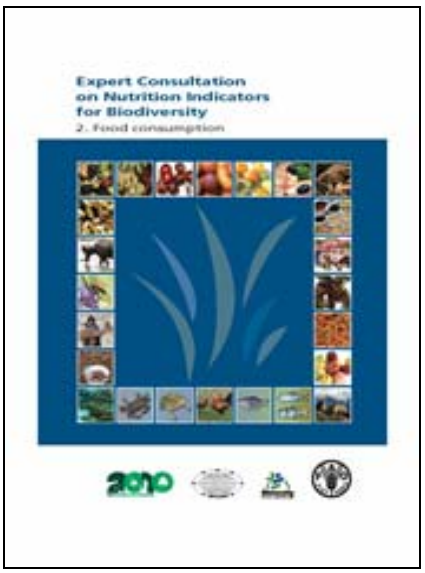

INFOODS

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Table of contents

Background

FAO in collaboration with Bioversity International and other partners is leading the Cross-Cutting Initiative on Biodiversity for Food and Nutrition which has been established to measure, investigate and promote biodiversity and nutrition (FAO, 2008; FAO, 2010).

Biodiversity and nutrition play their parts at three levels- ecosystems, the species they contain and the genetic diversity within species. Two Indicators have been developed at these levels, addressing nutrient **composition** and **consumption** of underutilized, wild foods and foods below subspecies level. The Nutrition Indicator for Biodiversity - 1. Food Composition was launched in 2008 (FAO, 2008) and reporting was done on a yearly basis. The Nutrition Indicator for Biodiversity - 2. Food Consumption was developed in 2009 (FAO, 2010) and reporting should be done every 2nd year. Detailed information on both indicators, as well as previous reportings are available on the FAO/INFOODS website (www.fao.org/infoods/biodiversity/index_en.stm) and on the website of the Biodiversity Indicators Partnership (BIP) (www.bipindicators.net).

This report presents the progress of data availability of the two Nutrition Indicators- 1. Food Composition and 2. Food Consumption for 2011.

Nutrition Indicator on Biodiversity - 1. Food Composition

Definition of the Indicator 1:
The Indicator is a count of the number of foods with sufficiently detailed description on taxonomic rank below species with at least one value for a nutrient or bioactive component (FAO, 2008).
Exceptions exist for wild and underutilized foods for which information on the species level is satisfactory. For the term `underutilized foods` a reference list of underutilized species (together with the indication of country/region) contributing to the indicator was developed and is available at the INFOODS webpage (INFOODS, 2011a). More detailed information on the Indicator is given in the Expert consultation of the Biodiversity Indicator for Biodiversity - 1 Food Composition (FAO, 2008). Revised criteria for the inclusion or exclusion of foods counting for the indicator are available on the INFOODS webpage (INFOODS, 2011b).
The indicator is reported on a yearly basis. Previous reports are presented on the BIP website (www.bipindicators.net) and in a scientific article (Stadlmayr et al., 2011).

Methods:
For the reporting in 2011, data were mainly obtained through peer-reviewed articles by using the search engines Scopus and Science direct. Specific searches were conducted for:

- Fish, worldwide,
- Indigenous African fruits
- Underutilized starchy roots and tubers with focus in Africa
- Green leafy vegetables, worldwide
- Insects

The search terms included food composition, composition, biodiversity, variety, cultivar, breed, wild food and underutilized species in different combinations. Reference lists of relevant papers were cross-checked and any suitable additional articles were included.
Additionally to searches in the scientific literature, a call for data was conducted through the INFOODS (International Network of Food Data Systems) mailing list.

Results and Discussion:
Since the development of the Nutrition Indicator for Biodiversity on Food Composition more than 12800 foods have been counted (2008-2011). Most of the foods were found for Asia (4082), followed by America (2757), Africa (2427), Europe (2046), Oceania (1064), Global Databases (304) and the category Unknown (135), which reflects the number of foods reported without indication of a country (see Figure 1).

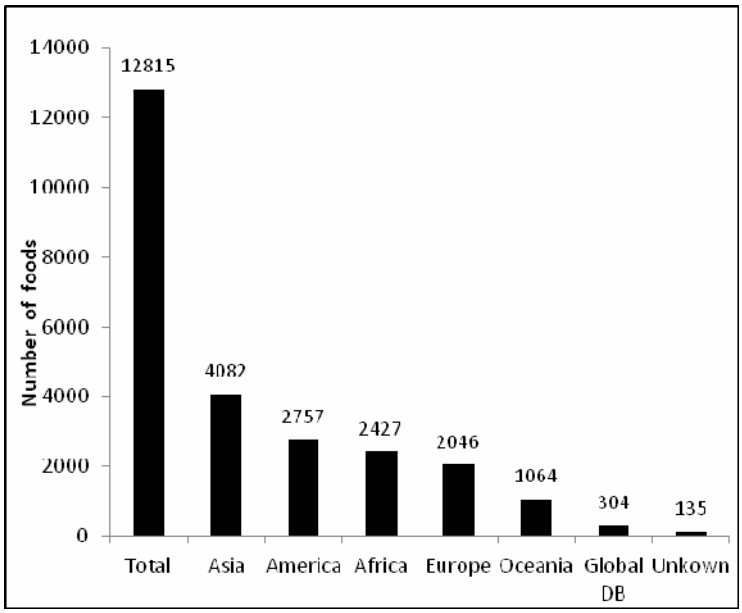

Figure 1: Number of foods per continent reported for the Biodiversity Indicator on Food Composition (2008-2011).

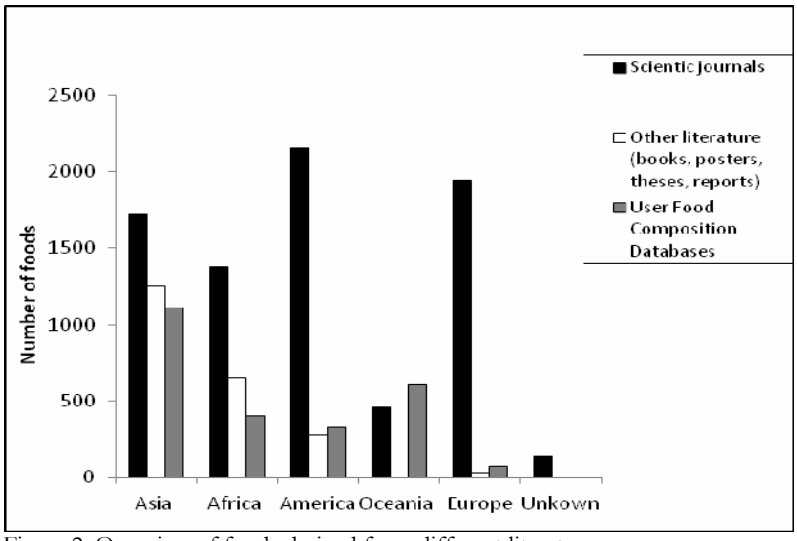

Figure 2: Overview of foods derived from different literature sources.
Data are presented per continent (2008-2011).

Figure 2 gives an overview of the different literature sources where data were obtained from. From 2008 to 2011, the majority of the data were obtained through scientific journals (7783) for all continents apart from Oceania where most of the data were derived from User Databases. Slightly more data were found in User Databases (2826) than in other literature (e.g. books, posters, theses) (2206). An explanation for the differences among continents and among

literature sources can be attributed to data availability (data generation and publication) and the intensity of data search. Since the development of the Indicator, data were most intensely looked for in scientific search engines.

The yearly increase in data availability since 2008, for all continents is shown in Figure 3.
4704 foods were found in 2008, **5590** in 2009, **850** in 2010 and **1671** in 2011. The figure clearly shows that the total amount of foods counting for the Biodiveristy Indicator is steadily increasing. Yearly differences exist regarding the amount of data as well as the distribution of data per continent. This can be attributed to the specific searches conducted in the different years and to the time dedicated to look for data. The most extensive search for data was conducted in 2009 (6 months) which is reflected in the high amount of data found in this year. In other years targeted searches in different countries were carried out. e.g. Africa in 2008, which explains the high data contribution for this continent in the reporting of 2008.

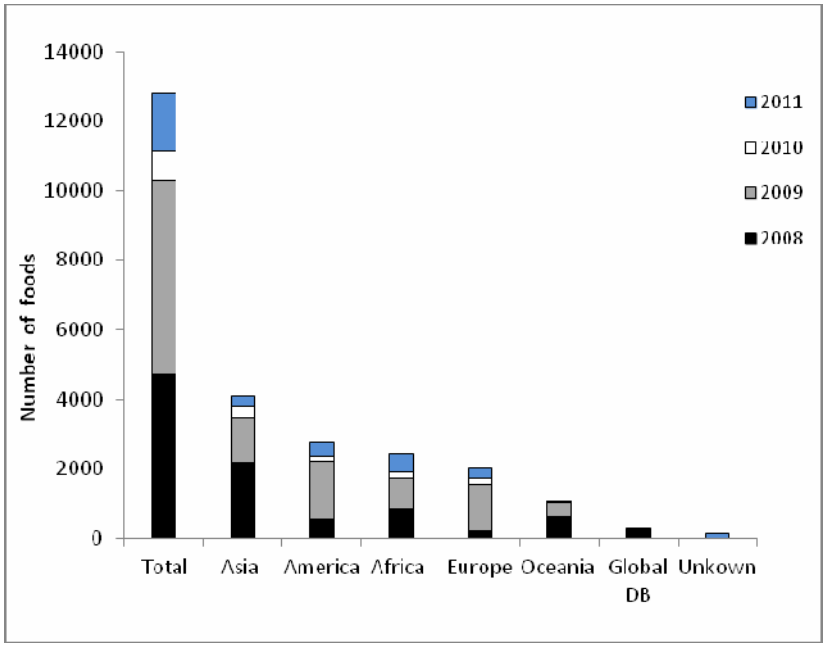

Figure 3: Increase from 2008 to 2011 for all continents

In 2011 altogether 1671 foods were found. Most of the data were obtained for Africa (536), followed by America (407), Europe (314), Asia (255), Unkown countries (124) and Oceania (24). The high amount of foods for Africa can be explained by the targeted literature search conducted for Africa for indigenous fruits as well as for starchy roots and tubers in 2011. Oceania has the least increase with only 24 new foods, which may result from the fact that no specific search was carried out.

Due to the mode of searching, the majority for the data found in 2011 derive from scientific articles. Only 263 foods out of the total 1671 foods count for the category ´Other literature´, including books, posters, theses and reports.

Figure 4 shows the distribution of foods per food group from data found in 2011. 62% of the data found in 2011 are for Fish, followed by Fruits (11%) Vegetables (10%), Starchy roots and tubers (9%), Insects (9%) and Cereals (< 1%). Out of these data 90% were counting for wild and underutilized foods and 10% for varieties or cultivars.

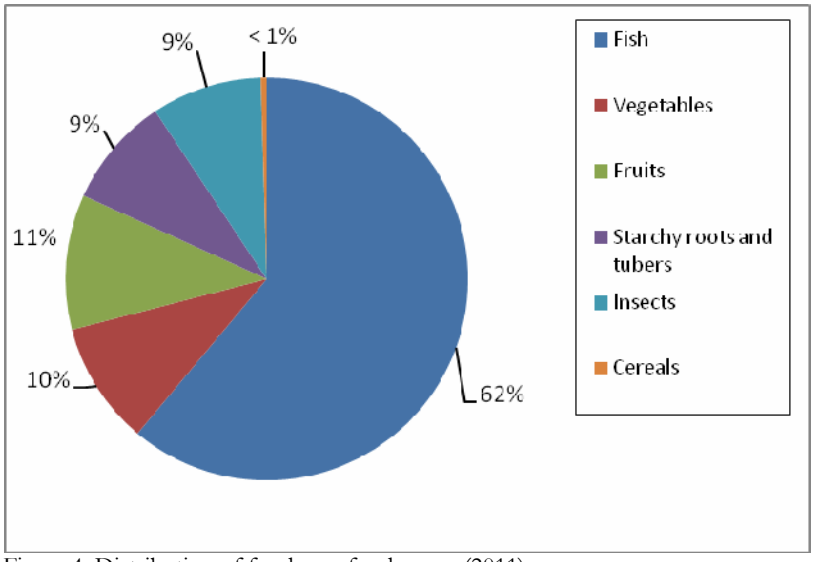

Figure 4: Distribution of foods per food group (2011)

The majority of the foods were analysed for 2-9 or 10-30 components, which were often within one component group (e.g. fatty acids, phytochemicals) rather than covering a broad spectrum of components. This trend was already observed in the reporting of 2009 (Stadlmayr et al., 2011).

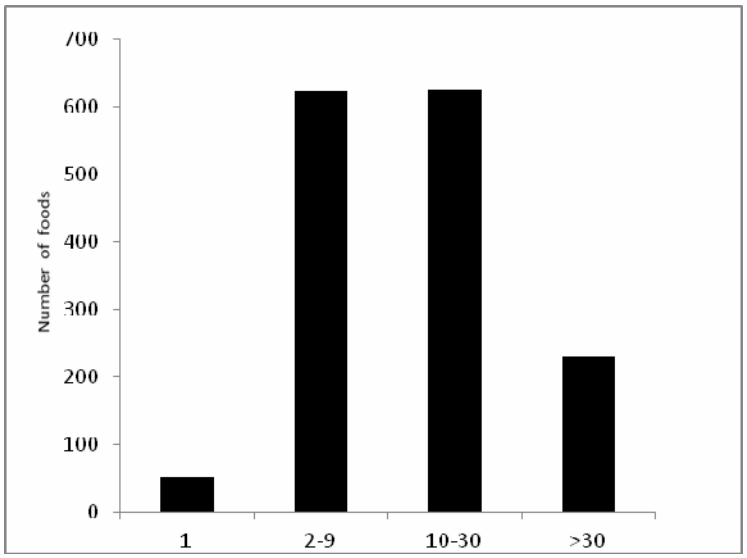

Figure 5: Number of components analysed for 1, 2-9, 10-30 and > 30 components (2011)

The compositional data found for the Nutrition Indicator on Biodiversity are being compiled in the FAO/INFOODS Food Composition Database on Biodiversity, which is freely available and downloadable on the INFOODS webpage (INFOODS, 2011). The current version of the DB contains more than 2400 food entries covering various food groups. The DB will be yearly updated. The 2nd version is expected to be published in March 2012.

Nutritional Indicator on Biodiversity- Food Consumption II

Definition for the indicator 2:
Indicator 2 is a count of the number of foods with sufficiently detailed description on taxonomic rank below species reported in a survey (FAO, 2010).

A secondary survey indicator was developed and is a count of the number of food consumption surveys and similar surveys taking biodiversity into consideration on their design and/or reporting, with at least one reported food meeting the criteria for Indicator 2. It should be reported in relation to the total number of surveys examined.

More details on the criteria of the Indicator 2 can be found in the Expert Consultation on Nutrition Indicators for Biodiversity - 2. Food Consumption (FAO, 2010).

Methods:
The Nutrition Indicator for Biodiversity on Food Consumption is reported every second year.
For the reporting in 2010 and 2011 data were obtained through peer-reviewed articles and trough books.
A specific search was conducted on wild meat/bush meat in 2010, while in 2011 a more general data investigation on the consumption of wild, underutilized foods, varieties, cultivars and breeds was carried out in the scientific literature.

Results and Discussion:
The number of foods counting for the Nutrition Indicator for Biodiversity on Food Consumption (2009-2011) is shown in Figure 5. Since the development of the Indicator in 2009 more than 4900 foods were counted. Most of the foods were found in Oceania (1720) followed by Asia (1041), Africa (954), America (750) and Europe (481).

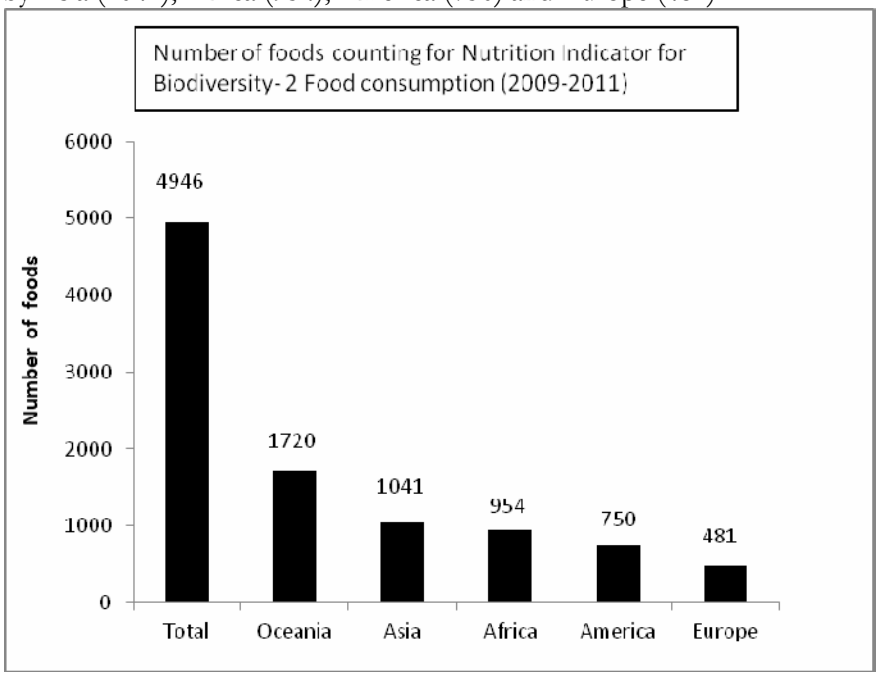

Figure 5. Number of foods counting for Nutrition Indicator for Biodiversity on Food Composition (2009-2011)

Figure 6 shows the increase in data availability from 2009 to 2011. Out of the 1827 foods found in 2010 and 2011, most the foods derive from Oceania (800), followed by Europe (481), Africa (368), Asia (92) and America (86).

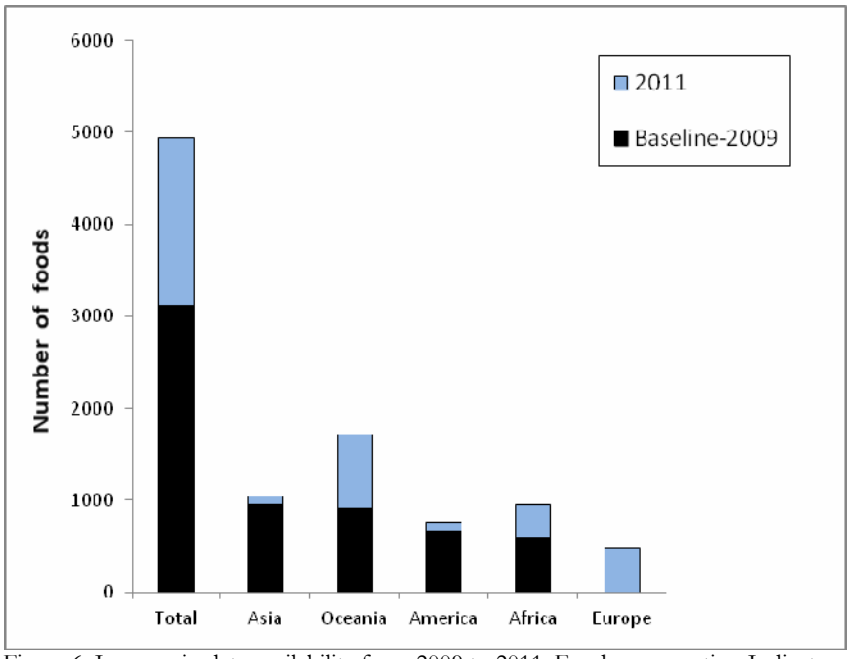

Figure 6. Increase in data availability from 2009 to 2011. Food consumption Indicator

For the targeted data search in 2010 on wild meat/bush meat, most of the instruments used to capture consumption data were market surveys and observations (19) which provided mainly data on prices and weight of species of wild meat/bush meat. Only 2 reports actually captured consumption data through adequate instruments. Data collection was mainly conducted in Ghana, Botswana, Nigeria, Liberia, Cameroon, Central African Republic, Rhodesia, Zambia, Myanmar, Peru, Mexico. Most data found were from 1970-1990, little information existed up to date.

Data found in 2011 represented mainly wild, edible plants investigated through interviews and surveys on traditional knowledge of wild, underutilized edible plants. Relevant data were found in Australia, Spain, Portugal, Bosnia-Herzegovina, Bangladesh, India, Nepal, Ethiopia, Uganda, Argentina and Venezuela .

No data on the secondary indicator were evaluated since 2009.

Conclusion

The progress of data availability in 2011 for the Nutrition Indicators for Biodiversity supports the increasingly recognized importance of biodiversity for nutrition. Both indicators are necessary to improve the evidence base and the impact of biodiversity for nutrition and for nutrition and food security.

The total amount of data counting for the Nutrition Indicator for Biodiversity on Food composition is yearly increasing, in particular through data found in the scientific literature. A wider spectrum of foods and components need to be analysed in order to mainstream biodiversity into nutrition activities and it is hoped that data on traditional cultivars, varieties, wild and underutilized foods will become more available also in User databases.

Regarding the Nutrition Indicator for Biodiversity on Food consumption, data exist but it is hoped that in future reportings more data are being found and that more instruments actually capture the food consumption of traditional varieties, cultivars wild and underutilized foods. As carried out for the indicator on Food composition, a more targeted search should be conducted for the indicator on Food consumption for future reportings.

Acknowledgement:

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