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SUBSIDIARY BODY ON SCIENTIFIC, TECHNICAL AND TECHNOLOGICAL ADVICE
Eleventh meeting
Montreal, 28 November-2 December 2005
Item 6.6 of the provisional agenda*

REPORT OF THE INTERNATIONAL CONSULTATION ON INDICATORS FOR BIODIVERSITY USED IN FOOD AND MEDICINE

I. INTRODUCTION

A. Background

1. At its seventh meeting, the Conference of the Parties to the Convention on Biological Diversity, in its decision VII/30 agreed on a limited number of indicators to be tested or developed for use to assess progress at the global level towards the 2010 biodiversity target, 1/ and to communicate effectively trends in biodiversity related to the three objectives of the Convention. These headline indicators are listed in annex I to decision VII/30. Parties considered for immediate testing indicators for which data are available from existing sources while other indicators require further development.

2. As requested in paragraph 6 of decision VII/30, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) considered at its tenth meeting the report of the ad hoc technical expert group on indicators for assessing progress towards the 2010 biodiversity target 2/ and reviewed the indicators listed in annex I of decision VII/30. In its conclusions (paragraphs 3 to 5 of recommendation X/5), the Subsidiary Body on Scientific, Technical and Technological Advice:

(a) Confirmed the suitability of those indicators considered by the Conference of the Parties as ready for immediate testing and use; and

(b) Considered the following additional indicators ready for immediate testing, while recognizing that data availability and/or indicator methodology may require improvement prior to 2010:

(i) Change in status of threatened species;

(ii) Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socio-economic importance;

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* UNEP/CBD/SBSTTA/11/1.

1/ In decision VI/26 (para. 11), Parties commit themselves to a more effective and coherent implementation of the three objectives of the Convention, to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth.

2/ UNEP/CBD/SBSTTA/10/9 and UNEP/CBD/SBSTTA/10/INF/7.

/…

(iii) Area of forest, agricultural and aquaculture ecosystems under sustainable management;

(iv) Trends in invasive alien species; and

(v) Connectivity/fragmentation of ecosystems.

(c) Recommended that, given the broad nature of the indicators mentioned in paragraph 2(b) above, various sources of data could be used, including *inter alia,* but not limited to, the application of the Red List Index approach and data on both *in situ* and *ex situ* conservation, and that the indicators identified by the Conference of the Parties and SBSTTA at its tenth meeting as requiring further work be developed urgently;.

3. Annex I to SBSTTA recommendation X/5, containing the summary of indicator status and work that needs to be carried out, the following headline indicators directly relevant to indicators for biodiversity used in food and medicine:

(a) Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socio-economic importance (for immediate testing and use), and for more development;

(b) Health and well-being of communities who depend directly on local ecosystem goods and services; and

(c) Biodiversity for food and medicine.

4. The Executive Secretary, in collaboration with COHAB 2005-the First International Conference on the Importance of Biodiversity to Human Health - and the World Conservation Monitoring Centre of the united nations Environment Programme (UNEP-WCMC) convened this consultation to further the work on indicators of biodiversity used in food and medicine started by the AHTEG on indicators, taking into account SBSTTA recommendation X/5. The consultation took place at the Radisson SAS Hotel in Galway City, Ireland, on 26 August 2005.

B. Attendance

5. The meeting was attended by 26 experts participating in their personal capacity.

6. A list of participants is attached as annex II.

II. OPENING OF THE MEETING

7. The meeting was opened at 9 a.m. on Friday 26 August 2005 by Ms. Flora Katz from Fogarty International Centre, National Institutes of Health, Maryland, United States of America, who was selected as the Chair of the consultation. After a brief welcome address, she described the objectives of the meeting, and introduced its agenda (see annex I below) and the speakers for short presentations. She noted that, although the framework adopted by the Conference of the Parties to the Convention on Biological Diversity was for the 2010 target, there was a need to consider development of indicators that could also be used beyond 2010.

8. Mr. Kalemani Jo Mulongoy, Principal Officer for Scientific, Technical and technological Matters in the Secretariat of the Convention on Biological Diversity, welcomed the participants on behalf of the Executive Secretary of the Convention on Biological Diversity. He described the framework of goals, targets and indicators adopted by the Conference of the Parties in its decision VII/30 to enhance the evaluation of achievements and progress in the implementation of the Strategic Plan and the 2010 biodiversity target and to communicate effectively trends in biodiversity. He also described the work of the Ad Hoc Technical Expert Group (AHTEG) on Indicators for Assessing Progress towards the 2010 Biodiversity Target that had met in Montreal from 19 to 22 October 2004, including its observations regarding indicators of biodiversity for food and health. In particular, he noted that the headline indicators

already adopted by the Conference of the Parties could be applied to biodiversity used for food and medicine where specific data were available. He introduced two notes by the Executive Secretary prepared for the tenth meeting of SBSTTA on indicators for assessing progress towards, and communicating, the 2010 target at the global level (UNEP/CBD/SBSTTA/10/9) and on indicators for assessing progress towards the 2010 target: trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socio-economic importance (UNEP/CBD/SBSTTA/10/INF/14).

9. Mr. Philip Bubb of the World Conservation Monitoring Centre of the United Nations Environment Programme (UNEP-WCMC) described the mandate given to UNEP-WCMC by the Conference of the Parties, which entailed the collection and synthesis of data on a number of indicators, and contribution to the development of indicators in the framework of the Convention on Biological Diversity and the preparation of the second edition of the Global Biodiversity Outlook, which would contain an assessment of the status and trends of, and threats to, biodiversity. He noted the importance of indicators in research, policy-making and development, in monitoring and learning processes, and for awareness raising and education. Indicators could best be presented in the form of statistics, graphs or maps. Mr. Bubb made a proposal on the organization of work, and he referred to document entitled "Biodiversity: Its Importance to Human Health" edited by Eric Chivian (2002). He also described the following as the intended outcomes of the consultation:

(a) Identification of existing and potential indicators of biodiversity for use in relation to food and medicine which can be promoted within the framework of the Convention on Biological Diversity, including measuring and reporting on progress towards the biodiversity 2010 target, as for actions towards achieving the Millenium Development Goals (MDGs);

(b) Recommendations to the eleventh meeting of the Subsidiary Body on Scientific, Technical and Technological Advice in November 2005 for the development of these indicators;

(c) A preliminary identification of the needs, opportunities and "champions" for the development of these indicators.

10. Mr. Emile Frison, Director General of the International Plant Genetic Resources Institute (IPGRI), recalled that agricultural biodiversity contributed to human health both through food production and the provision of medicines. He stressed the importance of linking work on indicators with the Millennium Development Goals (MDGs) and of taking account of work on indicators of sustainable utilization of agricultural biodiversity. He noted some aspects of the use of plant species for food and medicine that needed to be reflected in developing appropriate indicators. These included, *inter alia*, the facts that: (i) some production systems, such as home gardens, contained very rich concentrations of diverse species and varieties used for food and medicine; (ii) both within and between crop diversity made important nutritional and medical contributions; (iii) the status of many plants important in diets, e.g. the leafy vegetables in Africa, was not reflected in statistics; (iv) the uses of some components of biodiversity were complex and could vary in time (multiple uses does not necessarily correlate with biodiversity) and be different from area to another; and (v) thus scale was an important factor. While there are indicators of biodiversity at the species level, it might be necessary to start with the available data for higher levels e.g. for cereals, pulses etc. for which more statistics were available. Finally Mr. Frison recalled the required characteristics of suitable indicators (reliability, cost effectiveness, aggregation, possibility of monitoring over time etc.).

11. Mrs. Sue Mainka of IUCN – The World Conservation Union reviewed some of the recent discussions within IUCN on biodiversity indicators for health and food. She started by describing the IUCN perspective on indicators for the 2010 target and MDGs. She then showed that MDGs and biodiversity indicators could be bridged through ecosystem services indicators such as employment in biodiversity-based industry or amount of food from fish. In this perspective, she noted some gaps and invited the meeting to consider the following indicators: (i) bushmeat consumption indicator; and (ii) number of medicinal species added to CITES lists/Appendices. Building on the IUCN Red List, she described the potential usefulness of a Red List Index for medicinal plants and for food species to support

ecosystem service indicators. While not yet available, these indices could be targeted for further development. During the discussions, trade was noted as an important driver of biodiversity for food and medicine and therefore should be taken into account.

12. The host of the meeting, Mr. Conor E. Kretsch, Director of COHAB 3/ 2005, welcomed the participants. In his review of the outcomes of COHAB 2005, that had taken place over the previous three days, he identified the major themes and issues pertaining to food production, nutrition, medical research and human health that warrant the development of indicators of biodiversity. He also drew attention to the potential value of linking health indicators identified by national/local authorities (such as occurrence of infectious or non-infectious disease) with biodiversity indicators for food and medicine, in order to identify and track possible cause and effect situations. That could help, for example, to identify and define areas where biodiversity loss was contributing to nutritional deficiencies, or where loss of ethnomedicinal resources was impacting on the health of local communities. He noted that from a health-sector perspective, use of biodiversity indicators could have value as an early warning system for potential public health problems, and could provide a means of engaging more closely with the health and development aid communities in specific countries or regions.

III. ORGANIZATION OF WORK

13. Following the presentations and questions from participants, participants were invited to split into small working groups, as suggested in the agenda. The following three themes were agreed for consideration and, accordingly, the working groups were established:

(a) Medicines from natural sources and value of biodiversity to medical research and human health;

(b) Ecosystem disturbance and infectious diseases; and

(c) Biodiversity, nutrition and human health.

14. Bearing in mind the intended outputs of the meeting listed above, each working group was requested to consider:

(a) Which indicators already exist or could easily be adapted, for international reporting and for use at the national and local scales;

(b) Who is producing and using these indicators;

(c) What the availability and suitability of data for these indicators are;

(d) What other indicators are needed or recommended;

(e) Who could be the “champions” for these indicators (i.e. the organizations that would lead and coordinate the work required for their development).

15. Before closing, participants reconvened in plenary to discuss the findings of each working group. It was recognized that due to limited time the consultation could not provide a list of existing and potential indicators of biodiversity for use in relation to food and medicine/health. Participants could only provide some key elements that could be taken into consideration in future work on the development of indicators for biodiversity in relation to food and health.

3/ Conference on Health and Biodiversity held in Galway City, Ireland, from 23 to 25 August 2005.

IV. RESULTS OF THE DISCUSSIONS

16. Areas identified by the respective working groups for consideration in the development of indicators for biodiversity in the context of food production and consumption, and health are contained in annex III below.

V. CLOSURE OF THE MEETING

17. Mr. Mulongoy explained that the report of the meeting would be submitted as an information document for the eleventh meeting of SBSTTA from 28 November to 3 December 2005 in Montreal and as a basis for follow-up at the eighth meeting of the Conference of the Parties.

18. The Chair thanked the participants for their contribution during the discussions, the Director of COHAB 2005 for hosting the meeting and Ms. Fidelma Murray for the logistical and technical support before and during the meeting. One of the participants reiterated gratitude to the hosts (Mr. Conor E. Kretsch and Ms. Fidelma Murray) and thanked the Chair.

19. The Chair declared the meeting closed at 1 p.m. on 26 August 2005.

Annex I

PROVISIONAL AGENDA

CBD INTERNATIONAL WORKSHOP ON BIODIVERSITY INDICATORS FOR FOOD AND MEDICINE

Galway, Ireland, 26 August 2005-09-06

Time	Activity	Comments
09:00	Welcome, introductions and explanations of the intended outcomes and the agenda	Flora Katz
09:15	Presentation and questions – the CBD and indicators for the "2010 Target"	Jo Mulongoy
09:25	Presentations & Questions – UNEP – WCMC and the development of biodiversity indicators	Philip Bubb
09:35	Presentation & Questions – IPGRI and agricultural biodiversity indicators	Emile Frison
09:45	Presentation & Questions – IUCN work on biodiversity indicators for health and food	Sue Mainka
09:55	Presentation & Questions – COHAB major themes & issues	Conor Kretsch
10:05	Formation of 4 Work Groups to address guiding questions and sxtart	Philip Bubb

Annex II

LIST OF PARTICIPANTS

Name	Organization	Country	e-mail contacts
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Annex III

KEY POINTS FOR CONSIDERATION IN THE DEVELOPMENT OF INDICATORS FOR BIODIVERSITY IN RELATION TO FOOD AND HEALTH

1. Regarding medicines from natural sources, and value of plants, animals and microbes to medical research and human health:

Areas for indicators	**Possible champions and possible sources of data**
1. Trade in biodiversity-based medicines (status of trade, volume and trends)	UNEP/WCMC
2. List of biodiversity-based medicines (e.g. drugs, phytomedicines and botanicals) from domesticated versus wild-harvest sources	
3. Conservation status and number of species of animals, plants and microorganisms (collected from nature) currently used in medical research and/or industry (for testing, basic research, or as disease models)	Research organizations and industry
4. Number of Access and Benefit-Sharing agreements (e.g. per region) for biodiscovery and medical research projects	CBD Secretariat and countries (in their national reports)
5. Number of *in situ* conservation programmes relating to medical products supported by the industry	Industry

2. Regarding ecosystem disturbance and infectious diseases:

Areas for indicators	**Possible indicators**	**Possible champions**
1. Infectious diseases. It was recommended to focus on emerging infectious diseases (e.g. West Nile Virus) and re-emerging infectious diseases (e.g., malaria, cholera, dengue fever), because better data exists or is being collected for these high profile diseases, and changes in their status is often associated with some form of perturbation which may include ecosystem disturbance. (It is advisable to indicate the causes or consequences of the perturbation. Some diseases also represent risks to domestic and wild animals.	• Number and types of diseases • Number of affected people • Number of outbreaks	WHO
2. Ecosystem disturbance. Encroachment, in the broad sense, is the main cause of ecosystem disturbance	• Agricultural frontier expansion (area per unit of time) • Dams and their construction (number, area affected) • Mining(number, area affected) • Pipelines (length) • Bushmeat (quantity, species) • Road construction (new roads and improvement) (length) • Pollution and other forms of contamination (quantity)	
Risk	Number of people possibly exposed	

Environmental impact assessment (EIA) needs to consider health impacts increasingly and in association with ecosystem disturbance (number). Reference can be made to the process of the Convention on Biological Diversity for the integration of biodiversity considerations into EIA legislation and/or process and Strategic environmental assessment (SEA) (decision VI/7 A of the Conference of the Parties to the Convention). The working group also recognized that the main factor limiting the identification of indicators is the availability of reliable global data.

3. Regarding biodiversity, nutrition and nutritional diseases:

A note on indicators for assessing progress towards the 2010 target: Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socio-economic importance (UNEP/CBD/AHTEG-2010-Ind/1/INF/10) was used as a background to the discussions.

3.1 Indicators relevant in terms of use of biodiversity:

Indicators 1 (**Number and share of main crops**), 2 (**Total number and listings of all species used for food and agriculture, including crop wild relatives**), 6 (**Share of major varieties in total production for individual crops**) and 12 (**Security of traditional knowledge**) in annex II (List of indicators under consideration) of the above-mentioned document were found suitable for indicators relevant in terms of use of biodiversity. Their description is reproduced in the table below.

Indicator	Relevance / Usefulness	Data availability / feasibility	Level of application/ Aggregation	Notes/Outstanding matters
1. Number and share of main crops	Provides an overall indicator of between-species diversity	Reasonably good data available everywhere at national level, at least for major crops (e.g.: FAO 4 /statistics on production and food balance). Would be possible to calculate a Shannon-Weaver or Simpson index, if desired.	Applicable to site (household & community), country and global levels. Available data is by country. For site level could use simple "2x2 square analysis". For aggregation of country data to global level could provide both: Average # and share of crops by country Total # and global share.	Whether and how to combine inter-crop and intra-crop diversity. This indicator was proposed by Wetterich, (Fig 8) at OECD workshop.
2. Total number and listings of all species used for food and agriculture, including crop wild relatives	A simple indicator of total species diversity. Provides a checklist for assessing endangered or neglected species.	Much data available, but not all collated.	Applicable to site (household & community), country and global levels.	

4/ It should be noted that
(a) FAO Statistics cover what is available for major crops and animals
(b) Non-market and minor crops are not recorded. Thus
(i) Make a list based on literature search, and
(ii) Survey at regular intervals
(c) FAO Statistics should be disaggregated to show genetic diversity
(d) IPGRI could contribute to the development of indicators for minor species

Indicator	Relevance / Usefulness	Data availability / feasibility	Level of application/ Aggregation	Notes/Outstanding matters
6. Share of major varieties in total production for individual crops: either / or: (a) # varieties accounting for [50]% total [acreage][production] (b) % total [acreage][production] of top [5][10] varieties Also, • List names of varieties • % to MVs	*Evenness of diversity in use* *Also relates to vulnerability* To identify potential vulnerability, important to "calibrate" names against other measures of genetic diversity, where possible	Good or reasonable data for most OECD countries and high potential areas in some other countries. (NB. data needed for Shannon-Weaver or other indices would not be available in most countries)	Applicable to site/community, country and global levels. At global level can provide both: average share (weighted and unweighted by country crop areas) and aggregate number.	This indicator is used in the OECD indicator set.
12. Security of traditional knowledge: • Demographics: Age-profile of community; Out-migration • presence or absence of specialist, nodal farmers etc • persistence of local language • availability of local recipes, food processing, festivals etc • legal/institutional frameworks to protect traditional knowledge	Provides information on knowledge that underpins the generation and maintenance of diversity on farm.	Data available only in specific cases	Applicable to site, or production system.	

3.2 Other indicators:

(a) In relation to food safety: genetically modified organisms (GMOs) or living modified organisms (LMOs); toxins; and anti nutritional factors;

(b) With regard to uses beyond food: the following can be considered in the selection of indicators: who is consuming; what is being used; how much; what for (e.g. as medicine), and how;

(c) Regarding accessibility: indicators can be based on access to seeds, to food reserves, to markets; home surveys;

(d) The following can also be considered possibly as indirect indicators of food production and health: soil fertility, biofertilizers, and invasive alien species.
