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The Contribution of Indigenous and Local Knowledge Systems to IPBES: Building Synergies with Science

- **IPBES Expert Meeting Report • 9-11 June 2013 • Tokyo**
- **Towards principles and procedures for working with Indigenous and Local Knowledge systems**

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Printed in 2013 by the United Nations Educational,
Scientific and Cultural Organization
7, place de Fontenoy, 75352 Paris 07 SP, France

Copy-editing of case studies: Christina Reed

Graphic design: UNESCO

Cover design: UNESCO

Illustrations: © Shutterstock

Typeset: UNESCO

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Support for the production of this document was provided by the Ministry of the Environment, Japan and the Local and Indigenous Knowledge Systems programme, UNESCO

SC-2013/WS/23

Table of Contents

PART I

United Nations
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Report of the international expert workshop

The Contribution of Indigenous and Local Knowledge Systems to IPBES: Building Synergies with Science

Final – 14 August 2013

▶ **IPBES Expert Meeting Report • 9-11 June 2013 • Tokyo, Japan**

This report is an information document prepared for the second plenary session of IPBES (IPBES/2/INF/1) and can be downloaded from: http://ipbes.net/plenary/ipbes-2-documents.html

The version of the information document presented here has been enhanced with 19 case studies contributed by participants to the meeting. An electronic version of this document may be found at www.unesco.org/links, along with additional case studies, presentations and documents from the meeting.

The expert meeting was convened by the IPBES Multidisciplinary Expert Panel, and co-organized by UNESCO and UNU, pursuant to decision IPBES/1/2 of the IPBES Plenary. Such decision does not imply Plenary endorsement or approval of the proceedings or any recommendations or conclusions contained therein. Neither the papers presented at the expert meeting nor the report of its proceedings, have been subjected to IPBES review.

Citation:
Thaman, R., Lyver, P., Mpande, R., Perez, E., Cariño, J. and Takeuchi, K. (eds.) 2013. The Contribution of Indigenous and Local Knowledge Systems to IPBES: Building Synergies with Science. IPBES Expert Meeting Report, UNESCO/UNU. Paris, UNESCO. 49 pp.

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Published by:
UNESCO

Table of Contents

1. Introduction

Biodiversity is inextricably intertwined with the well-being of people and of Planet Earth. Across the globe, people are in constant interaction with the biological components of their environment, and through this interaction they nurture sophisticated sets of knowledge and practice, which include both science and indigenous & local knowledge (ILK). In the face of unprecedented declines in biodiversity over past decades, it has become increasingly apparent that synergies must be built among knowledge systems in order to provide policy-makers and science practitioners[1] with the best available knowledge to decide what urgent action must be taken to halt the rapidly accelerating degradation and loss of the biodiversity and ecosystem services that underpin sustainability, as well as resilience in the face of global change.

As a newly established intergovernmental entity, the Intergovernmental Platform on Biodiversity and Ecosystems Services (IPBES) builds upon the ongoing work and achievements of bodies such as the Convention on Biological Diversity (CBD) and the Intergovernmental Panel on Climate Change (IPCC), as well as previous processes such as the International Mechanism of Scientific Expertise on Biodiversity (IMOSEB) and the Millennium Ecosystem Assessment (MA). The key role of indigenous and local knowledge in biodiversity conservation and management has been consistently highlighted within all of the aforementioned processes, including the 1992 CBD article 8 (j) that requires Parties to 'respect, preserve and maintain the knowledge, innovations and practices of indigenous and local communities' and the MA 2004 International Conference on *Bridging Scales and Epistemologies: Linking Local Knowledge and Global Science in Multi-scale Assessments*, amongst many others.

At the first ad hoc intergovernmental and multistakeholder meeting on an Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (Putrajaya, Malaysia, 2008), the first revised concept note that would lead to the creation of IPBES called for an

> *improved dialogue between scientific and other knowledge systems and understandings, perspectives and values regarding biodiversity and ecosystem services to help make policy decisions more effective, efficient and equitable for the sustainable use of biodiversity and ecosystem services*
>
> (UNEP 2008. UNEP/IPBES/1/2. p. 3)

At the third meeting towards the establishment of IPBES in 2010, Members adopted the Busan Outcome that includes the following IPBES principle:

> *Recognize and respect the contribution of indigenous and local knowledge to the conservation and sustainable use of biodiversity and ecosystems*
>
> (UNEP 2010. UNEP/IPBES/3/3. paragraph 7(d))

This operating principle embeds the recognition of and respect for indigenous and local knowledge in all aspects of IPBES including in the scientific and technical functions of the IPBES Multidisciplinary Expert Panel (MEP), as well as in the IPBES work programme.

In preparation for the first session of the IPBES Plenary (IPBES-1), UNESCO as part of the interagency IPBES Interim Secretariat was requested to draft an information document that would consider key issues related to indigenous and local knowledge in IPBES. This document was presented at IPBES-1 as *Consideration of initial elements: Recognizing indigenous and local knowledge and building synergies with science* (IPBES/1/INF/5).

[1] In this context, science practitioners refers to natural resource, protected area and/or environmental managers.

1.1. Relevant IPBES-1 decisions

At IPBES-1, the following decisions were taken in relation to the development of the IPBES work programme. Under the heading *Knowledge Systems,* the Plenary:

> *Requests the secretariat to compile all comments received on the information document on recognizing indigenous and local knowledge and building synergies with science (IPBES/1/INF/5), and to support the Multidisciplinary Expert Panel in convening a multidisciplinary and regionally balanced expert and stakeholder workshop, among other actions, to provide input on this matter in developing the conceptual framework and other aspects of the work of the Platform.*
>
> *Invites members, observers and other stakeholders to submit nominations to the secretariat for participation in the multidisciplinary and regionally balanced expert workshop for consideration by the Multidisciplinary Expert Panel.*
>
> *Requests the Multidisciplinary Expert Panel to recommend possible procedures and approaches for working with different knowledge systems for consideration by the Plenary at its second session, drawing on the inputs received.*
>
> *(IPBES 2013. IPBES/1/12, p. 28.)*

1.2. Selection of participants and organization of the experts meeting

At IPBES-1, the government of Japan announced its support for the organization of an expert and stakeholder workshop on indigenous and local knowledge in IPBES. It was also agreed that UNESCO, further to its lead role in developing the document IPBES/1/INF/5, would co-organize the workshop in partnership with UNU. The international expert and stakeholder workshop on the *Contribution of Indigenous and Local Knowledge Systems to IPBES: Building Synergies with Science* was held from 9-11 June 2013 in Tokyo, Japan. Convened by the MEP, the workshop was co-organized by UNESCO and UNU, with generous support from the Ministry of the Environment, Japan.

Nominations and Selection of Experts

Members, observers and other stakeholders were invited to nominate experts, including indigenous peoples, for participation in the workshop on or before 28 March 2013 (cf. Annex A: Call for Nominations). This deadline was extended to 15 April 2013 by which time 106 nominations were received.

At its first full MEP and Bureau meeting in Bergen, Norway (1-6 June 2013), the MEP reviewed the modalities set in place for the organization of the Tokyo workshop, including the composition of the Organizing Committee, the expert selection process, the list of selected participants, and the proposed agenda. The Organizing Committee of 10 members included four MEP members, two indigenous peoples' experts, a host country scientist, a donor representative from the Ministry of Environment, Japan, and one representative each from UNESCO and UNU as co-organizers of the event (cf. Annex B: Membership of the Organizing Committee). The Organizing Committee reviewed the nomination forms and CVs from the 106 nominees. Following a rigorous selection process, and taking into account relevant expertise, regional balance, gender and the participation of indigenous peoples and local community experts, 21 experts were identified (cf. Annex C: Procedures applied for the Selection of Experts). Along with the 7 expert members of the Organizing Committee, the final participants list for the workshop consisted of 28 experts (cf. Annex D: List of Invited Participants). A full analysis of the composition of the expert group by region, as well as with respect to gender and indigenous participation is provided in Annex E. Immediately prior to the workshop, two indigenous experts were obliged to cancel their participation for health reasons and due to insufficient time to obtain the required visa (from Thailand and China respectively). In order to ensure broad participation in the process, experts who were nominated but not selected will be invited to review the outcomes of the workshop and to contribute their comments and additional inputs.

Workshop objectives

Based on the decisions of the IPBES-1 plenary, the workshop on the *Contribution of Indigenous and Local Knowledge to IPBES* had the following objectives:

1. Examine and identify procedures and approaches for working with indigenous and local knowledge systems in the framework of IPBES.

2. Review and assess possible conceptual frameworks for the work of IPBES that are based on or accommodate indigenous and local knowledge systems and worldviews.

Workshop documents[2]

In support of workshop discussions and debates, participants were provided with a Background Paper that outlined the relevant IPBES Plenary decisions, as well as the workshop objectives and expected outcomes (cf. Annex F). Also provided was the information document IPBES/1/INF/5 on *Consideration of initial elements: Recognizing indigenous and local knowledge and building synergies with science*. The draft revised version of INF/5 incorporating comments and proposed revisions from Members and Stakeholders was also made available to the experts.

In addition to IPBES documents, outcome reports from earlier relevant workshops were also distributed to experts including from the:

1. *Dialogue Workshop on Knowledge for the 21st Century: Indigenous knowledge, Traditional knowledge, Science and connecting diverse knowledge systems* that was organized by the Stockholm Resilience Centre and held in Guna Yala, Panama, 10-13 April 2012;
2. *International Expert Workshop connecting diverse knowledge systems in the context of IPBES* that was organized by the German Federal Agency for Nature Conservation and held in Vilm, 22-25 April 2013; and
3. *Messages from the World Indigenous Network Conference* that was hosted by the Government of Australia and held in Darwin Australia from 26-31 May 2013.

The Stockholm Resilience Centre also provided a discussion paper on *The Multiple Evidence Base as a framework for connecting diverse knowledge systems in the IPBES*.

Carbon farming through Indigenous & scientific knowledge of fire management

Hill, R.

Early dry-season savanna burning activities for Greenhouse Gas (GHG) abatement can support Indigenous fire management practices as part of local Indigenous customary land management regimes (Yibarbuk et al. 2001). The Fish River fire project is the first savanna burning and Indigenous project approved under the Australian government's Carbon Farming Initiative.

Fish River Station, situated along the Daly River in Australia's Northern Territory, was purchased in 2010 by the Indigenous Land Corporation in collaboration with The Nature Conservation Agency, the Australian Government's National Reserve System, and Pew Environment Group, with support from Greening Australia. Indigenous rangers work to abate GHG emissions from savanna fires. By using methods that draw on Indigenous customary patterns and science, the area of land that had been historically burnt each year by wildfires has been reduced from 69 percent to 3 percent. The project will deliver about 13,000 Kyoto-compliant carbon credits a year for sale, helping overcome the barrier posed by the limited resources available to benefit the environment and strengthen Indigenous knowledge and practices (NAILSMA media release 2 November 2012; Nerissa Walton, Indigenous Land Corporation Senior Policy and Environment Advisor, pers. comm. 2013).

Further Reading: Hill, R. et al (2013)

[2] All workshop documents, including background documents and presentations are available at: www.unesco.org/links

1.3. Opening, plenary and working group sessions

The workshop agenda included an opening session, plenary keynotes and a plenary panel on the morning of Day 1, followed by closed parallel working groups sessions on specific themes, interspersed with plenary reports on the afternoon of Day 1 and on Day 2, and a final Plenary debate on Day 3 (cf. Annex G: Agenda).

Opening Session

The meeting was opened by Mr. Kazunori Tanaka, Senior Vice-Minister for the Environment, Government of Japan, who emphasized that 'to achieve the Aichi Targets and to realize a society in harmony with nature, it is important to consider not only the things that can be evaluated by modern science but also things that cannot be evaluated in a single way - such as diverse views of the world and cultural backgrounds'.

The Director-General for the Research and Development Bureau of the Ministry of Education, Culture, Sports, Science and Technology, Mr Kazuo Todani, reiterated the need for transdisciplinarity, to ensure that diverse perspectives are brought together to heighten our understanding of global sustainability issues. Indigenous peoples and local communities, he added, are 'the key stakeholders and key users of knowledge derived from transdisciplinary research with biodiversity elements'.

SATOYAMA Initiative

Nakazawa, N., Saito, O. and Takeuchi, K.

The vision of the SATOYAMA Initiative is to bring societies in harmony with nature, where the maintenance and development of socio-economic activities (including agriculture and forestry) align with natural processes. In order to maintain and rebuild landscapes in which land and natural resources are used and managed in a sustainable manner, the Initiative proposes the following three-fold approach: consolidate wisdom on securing diverse ecosystem services and values; **integrate traditional ecological knowledge and modern science to promote innovations**; and explore new forms of co-management systems or evolving frameworks of "commons" while respecting traditional communal land tenure.

Putting sustainable use and management of natural resources into practice should entail five ecological and socio-economic perspectives:

- Resource use within the carrying capacity and resilience of the environment
- Cyclic use of natural resources
- Recognition of the value and importance of local traditions and culture
- Multi-stakeholder participation and collaboration in sustainable and multi-functional management of natural resources and ecosystem services
- Contributions to sustainable socio-economies including poverty reduction, food security, sustainable livelihood and local community empowerment

In achieving the above aim, the Initiative looks into the relationships between humans and nature in human-influenced natural environments from the social and scientific viewpoints, and collects numerous case studies applicable to various crises and socio-economic changes, in order to share them widely.

Further Reading: Kazuhiko Takeuchi (2010); Satoyama Initiative (Website)

On behalf of IPBES, Professor Zakri Abdul Hamid, founding Chair of IPBES, spoke of the 'sixth great extinction episode' in Earth's history, referring to the ongoing rapid decline of biodiversity and ecosystem services. IPBES, he said, was designed to reduce the gulf between the wealth of scientific knowledge about biodiversity, and the paucity of effective action to reverse damaging trends. Recognizing the necessity, but also the complexity, of the IPBES task to 'identify gaps in knowledge and build capacity for the interface between policy and knowledge – in all its forms', Professor Zakri spoke of the need to develop a process through which scientific and policy communities recognize, consider and build synergies with indigenous and local knowledge in the conservation and sustainable use of biodiversity and ecosystem services. He noted that the outcomes of this workshop would support the MEP in preparing its proposals to the IPBES Plenary that will take place later this year.

Bertie Xavier, an indigenous Toshao leader from Guyana and an Expert Member of the UN Permanent Forum on Indigenous Issues, spoke to the role of traditional knowledge in connecting indigenous peoples with place, identity and culture. He reminded participants of the growing number of international instruments that recognize the rights of indigenous peoples to protect and enjoy their cultural heritage.

Representatives of UNESCO and UNU[3], as co-organizers of the workshop, highlighted the contributions of these two United Nations bodies to IPBES. For United Nations University, these included the hosting of two UNU-ISP workshops on IPBES assessments that contributed significantly to the development of the initial work programme and conceptual framework for IPBES. UNESCO highlighted the contributing role of the Man and the Biosphere Programme with its World Network of Biosphere Reserves, as well as its 10-year programme on Local and Indigenous Knowledge Systems (LINKS) that is leading the current work on indigenous and local knowledge on behalf of the IPBES Secretariat, while also collaborating with IPCC on traditional knowledge for climate change assessment and adaptation.

Plenary Keynotes and Plenary Panel

Fikret Berkes, Distinguished Professor and Canada Research Chair, presented an overview of indigenous and local knowledge in biodiversity conservation and management. He underlined the long history of engagement between indigenous knowledge holders and scientists, and highlighted the importance of indigenous knowledge for resource management, biodiversity conservation, environmental monitoring, and for coping with environmental variability and crises.

Arctic Climate Impact Assessment

Use of Indigenous and Local Knowledge
Berkes, Fikret

One model for incorporating indigenous and local knowledge alongside with western science is the Arctic Climate Impact Assessment (ACIA 2005), which is the authoritative climate change report for northern latitudes. According to the analysis of Miller and Ericson (2006: 306), ACIA is unusual and differs from some of the other international assessments carried out in the 2000s "in that it explicitly bridges epistemologies. Scientists have played key roles; so too have indigenous communities who bring knowledge of Arctic change".

ACIA included indigenous and local knowledge, not only in the two chapters dealing with people, but also in the biophysical chapters. For example, the chapter on arctic and polar ecosystems, in the section dealing with plant responses to climate change, incorporates references detailing observations from indigenous people together with findings from plant scientists. It notes indigenous observations of increases in volume and diversity of grasses and shrubs in parts of the Canadian Arctic, but declines in cloudberries (***Rubus chamaemorus***) and other berries due to "burns" from high early summer temperatures. It then interprets these changes in the light of scientific experiments (Callaghan et al. 2005, p. 271-2).

What made it possible for ACIA to include indigenous and local knowledge at a time when other international assessments did not? The Arctic Council, which includes eight member countries and representatives from indigenous groups, provided strong support for the notion that ACIA include different knowledge systems throughout the chapters. The lessons of ACIA can be successfully applied in operationalizing IPBES by including a broad set of knowledge-holders in various phases of the assessment, and by involving indigenous voices in the IPBES framework.

Joji Cariño, Executive Director of the Forest Peoples' Programme and representative of the International Indigenous Forum on Biodiversity (IIFB) Working Group on Indicators, provided an overview of indigenous peoples' engagement and experiences with biodiversity assessments and sustainable use. An indigenous Ibaloi from the Philippines, Ms. Carino described the modes of participation for indigenous peoples in several different intergovernmental processes, including the Arctic Council and its Working Groups, where indigenous peoples sit as Permanent Observers alongside governments, and the Convention on Biological Diversity (CBD) and its Working Group on Article 8 (j) and related provisions, where indigenous peoples and governments participate in debates as equals.

[3] For UNESCO, Salvatore Arico spoke on behalf of Gretchen Kalonji, Assistant-Director General for the Natural Sciences. For UNU, Osamu Saito spoke on behalf of David Malone, Rector of UNU.

Fiji's Locally Managed Marine Areas Network

A Basis for Promoting and Assessing Marine Conservation Success

Thaman, Randolph

The disappearance of fish and other marine species constitutes one of the most serious biodiversity crises of our generation. It is a crisis, driven namely by overfishing, but also pollution, habitat degradation, ***and the lack of reliable written knowledge*** of how bad it has really become and one we must address now! In the mid-1990s, local fishers and communities who had personally witnessed and been involved in the collapse of their fisheries, partnered with the Fiji national and provincial government agencies (including fisheries), NGOs, private industry, the University of the South Pacific (USP) and international funders, such as the Macarthur, Packard and Total Foundations to establish a Fiji Locally Managed Marine Areas Network (FLMMA). More than 200 villages now have LMMAs and have seen impressive improvements in reef ecosystems and gains in marine biodiversity. The success has been based on participatory management planning and involving communities in all phases, including monitoring.

Particularly exciting has been a taxon-by-taxon assessment of changes in the occurrence and abundance of over 1,000 species that have occurred over the past 50 years within the fishing grounds (***iqoliqoli***) of Vanua Navakavu in the Fiji Islands, based on a comparison of time-depth testimonies of surviving older male and female fishers with results from more recent surveys in an effort to record and correlate observed changes with factors such as intense overfishing, use of fish poisons, increased pollution, a 1953 tsunami and the establishment of the LMMA in 1991. At present, local vernacular names for over 1,000 species have been recorded and the recovery status of almost 900 assessed. Results show that the successful restriction of fish poisons, dynamite fishing, and small-mesh gill netting, combined with the establishment of a successful MPA, seem to be largely responsible for the return of many taxa not seen for decades and the increasing abundance and size of a wide range of fin fishes and invertebrates.

The results show that the combination of the best indigenous and modern scientific and taxonomic knowledge may be the only way of really determining how our efforts at marine conservation are impacting on, and will ultimately affect, marine biodiversity. The cumulative and ongoing results of the surveys highlight the incredible potential of local and indigenous knowledge can play in sustainable fisheries management. These efforts are critical for documenting the un-written histories of the collapses and building ecological, economic and cultural sustainability in the face of global change.

Further Reading: Aalbersberg, W. (2005); Govan, H. (2009); Hubert, A. (2007); Jackson, J.B.C. et al. (2001); Roberts, C. (2007); Thaman, R.R. et al. (2013)

A Plenary Panel of five experts considered the diversity of sources and forms of ILK of relevance to IPBES, from the perspectives of natural scientists, social and human scientists and indigenous peoples. The panelists raised a number of key points. They emphasized that scientific knowledge is not sufficient in and of itself to turn the tide on biodiversity loss. Dialogue and complementarity amongst diverse sets of knowledge bring new insights, choices and solutions. They called attention to the diversity of indigenous and local knowledge of biodiversity – not only the distinctive sets of knowledge from one cultural group to the next, but also among societal groups, between men and women, and between individuals within a community who may possess expertise in specific domains. However, to build synergies among knowledge systems, scientists also need to reflect on the limits of their own concepts and practice. As one expert pointed out, just like fish cannot see the water they swim in, scientists are often unaware of their own assumptions and blind spots. Experts furthermore underlined that the perceptions and understandings of biodiversity/resource managers differed from those of scientists, and must be considered independently.

Synergising biocultural restoration by indigenous knowledge and science partnership

A case study of a customary seabird harvest in New Zealand

Lyver, P.O'B. and Moller, Henrick

Rakiura Māori children learn how to work the birds from an early age. Maintaining the abundance of the birds is not just about maintaining biodiversity and the ecological integrity of the breeding island ecosystems. It is also about nurturing Rakiura cultural identity, kinship and connection to their ancestral places, sustaining their bio-economy. Sustainable birding allows them to continually update and adapt their Traditional Ecological Knowledge, partly by learning from science.
Photo Credit: Corey Bragg

Ecology and mathematical modelling were combined with Indigenous and Local Knowledge (ILK) to better assess the sustainability of customary harvesting of tītī (sooty shearwater, ***Puffinus griseus***) by ***Rakiura Māori*** from 30 offshore island "nature reserves" in southern New Zealand.

The ILK of customary harvesters alerted the community that some external change to oceanic ecosystems and prolonged tītī population declines had occurred. This motivated partnership with science to determine the reasons for the decline and what to do about it. ILK also greatly influenced the subsequent design of the ensuing ecology study, particularly by presenting a myriad of constructs that the scientists treated as hypotheses for test, and offering strident and ongoing peer review of the scientists' conclusions. The ILK of the harvesters that protected tītī breeding habitat and nesting stages from disturbance also forced a whole different community-led ethics approval process requiring very different science methods. A "cultural safety contract" maintained trust and access of the scientists to the birding families, and kept the scientists safe from capture or prevention of disclosure of politically sensitive judgements about harvest sustainability. Several of the cultural and community needs would have been missed entirely by the University scientific ethics procedures had it not been for prolonged communication and relationship building, together with respectful listening to the ILK and lore.

Extensive bird banding and mark-recapture estimation were used to build a predictive demographic model of population and harvest dynamics. The latter was calibrated and checked against Catch per Unit Effort and chick fledging size records in nine family harvest diaries (one reaching back to 1932) to corroborate long-term changes asserted by the ILK. The scientists gained from access to a diachronic data (seven decades) while triangulating to cross-check inferences by their own shorter but spatially well-replicated data. The ILK holders gained from the scientists' discovery of a complex lagged association of harvest and population fluctuations with large-scale climate and oceanic perturbations that periodically knock down bird numbers and chick condition. The methods could be applied on Pacific-wide scales and during the non-harvesting periods to search for the most likely sources of impacts on population and abundance of the tītī, a keystone species in ecosystems.

Science and ILK often agreed with each other about what was happening to the tītī, but sometimes disagreed on why and what needed to be done about the decline. Their methods, spatial scope and information sources were complementary and added much to each other. The partnership mobilised transfer of reparation funds from an oil spill offshore from California (on the migration route of the tītī) to the local Māori community so they could team up with the New Zealand Department of Conservation to eradicate introduced predators from several islands. Our case study is an example where ILK-science partnerships not only deepen and test joint discovery of what to do, but also facilitate cross-scale intervention for restoring biodiversity and ecosystem services: an effective cultural-ecological coupling for thinking globally and acting locally.

Further Reading: Clucas, R. et al (2012); Lyver, P.O'B. et al (1999); McClelland P.J. et al (2011); Moller, H. et al (2009); Newman, J. and Moller, H. (2005)

Panelists made clear that the process of building synergies between knowledge systems goes well beyond the mere integration or assimilation of one knowledge system into another. Procedures and approaches need to be adopted that recognize the inherent value of indigenous and local knowledge systems, that maintain their dynamism within communities and that reinforce their inter-generational transmission.

Parallel and Plenary Working Sessions

The closed working sessions of the workshop began on the afternoon of Day 1 with an initial plenary session to provide experts with background on IPBES (cf. Annex H: Presentation by R. Thaman, MEP Member) and the context of its intersessional work, plus the workshop goals and organization. This was followed by parallel working sessions on specific themes that continued throughout Day 2 with rapporteurs reporting back in Plenary. The final Day was dedicated to plenary discussions with decisions on key messages and recommendations. The participants developed key messages and recommendations for consideration by the MEP on procedures and approaches for working with indigenous and local knowledge systems in the framework of IPBES. One subgroup of experts considered, in a parallel working group, a possible conceptual framework for IPBES that is based on or accommodates indigenous and local knowledge systems and worldviews. The subgroup provided some key messages and recommendations that were adopted by the workshop plenary for consideration by the MEP.

Hereafter Section II of the report presents an overview of the key messages that emerged from the discussions that took place both in working groups and in plenary, based upon the detailed list of workshop messages included in Annex I. Section III of the report presents the Recommendations that workshop experts agreed should be transmitted to the MEP for its consideration.

2. Procedures and approaches for working with different knowledge systems in the framework of IPBES

2.1. Opportunities, challenges and needs with respect to Indigenous and Local Knowledge Systems (ILK) in the framework of IPBES

At the IPBES workshop in Tokyo, experts, including indigenous peoples, examined the issue of procedures and approaches for working with indigenous and local knowledge in the framework of IPBES. During plenary debates, as well as parallel working group discussions focusing on specific aspects, the experts shared experiences, methods and outcomes gained from work in all world regions, in a multitude of ecological, social, cultural and political settings, and across scales from the local to the global.

Vicuña Management in Andean Countries

Use of Indigenous and Local Knowledge
Lichtenstein, Gabriela

Vicuña management by Andean communities provides a wonderful opportunity for the integration of scientific and traditional/local knowledge. Vicuña conservation is considered a success story by CITES. The vicuña recovered from a population of only 10,000 to about 421,500 individuals between 1965–2010 (Lichtenstein 2010a). CITES and the Vicuña Convention, signed by Argentina, Bolivia, Chile, Peru and Ecuador played a key role in halting the population decline. In Article I of the Vicuña Convention (1979), and in the signatory states' subsequent submissions to CITES meetings, Andean people that had been bearing the burden of vicuña conservation were named as the main beneficiaries of vicuña use.

Vicuña management projects follow the logic of community-based conservation. Conserving vicuñas through sustainable use allows for commercial utilization of the fibre obtained from live-shorn animals to generate sufficient economic benefits that outweigh the costs of conservation, and contribute to community development and poverty alleviation. The capture and release system in place in Andean countries evolved from the Inca chaku tradition, whereby large numbers of community members holding colourful flags chase vicuñas into a funnel from where vicuñas are taken to be shorn. Modern chakus incorporate animal welfare considerations, and the use of more modern technology to support the vicuña roundup and monitor vicuña populations.

The participation of indigenous representatives at the Vicuña Convention and a fuller participation of local communities in the design and different levels of implementation of management plans at the national level still remain as a challenge as well as a more equitable distribution of benefits.

Further Reading: Gordon, I. (2009); Lichtenstein, G. (2010)b ; IUCN SSC South American Camelid Specialist Group (Website)

Through this exchange, the experts confirmed that indigenous and local knowledge of the natural environment including its biodiversity, has always been and continues to be a foundation for indigenous and local community livelihoods and cultures. Furthermore, this transdisciplinary domain that crosses boundaries between knowledge systems has been an active area of research and action since at least several decades, and indigenous peoples and scientists have made considerable effort to work together and build synergies between knowledge systems.

Various aspects of this transdisciplinary work have also been addressed through intergovernmental processes. Ratified in 1993, the Convention on Biological Diversity (CBD) outlines several responsibilities of Parties with respect

to: *knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity.* Signatories are expected to 'respect, preserve and maintain' this knowledge, as well as 'promote its wider application (cf. CBD, Article 8(j)).' During the 13 years since its creation in 2000, the *Ad Hoc Open-ended Inter-sessional Working Group to address the implementation of Article 8 (j) and related provisions* has produced several noteworthy outcomes including:

- The Akwé: Kon Voluntary Guidelines for the Conduct of Cultural, Environmental and Social Impact Assessments
- the Tkarihwaié:ri Code of Ethical Conduct to Ensure Respect for the Cultural and Intellectual Heritage of Indigenous and Local Communities

The 8 (j) Working Group has also contributed towards the traditional knowledge dimensions of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity. Other intergovernmental processes of direct relevance to indigenous and local knowledge include the work of the World Intellectual Property Organization (WIPO) on the intellectual property dimensions of traditional knowledge. The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore has been working since 2000 on the development of an international legal instrument for the protection of traditional knowledge, and conducting formal negotiations since 2009. Additional relevant intergovernmental processes include work on the genetic diversity of domestic animals and plants, farmers' rights (Food and Agriculture Organization) and traditional medicine and medicinal plants (World Health Organization). Intergovernmental processes such as these, extending over several years and touching upon specific aspects of indigenous and local knowledge, also need to be taken into consideration when formulating the procedures and approaches to be developed for IPBES.

Conservation of Useful Plants and Traditional Knowledge

Global Program
Salick, Jan

The Global Strategy on Plant Conservation has convened a sub-program to address the current crisis of the loss of tens of thousands of plant species worldwide, useful plants in particular, and the traditional knowledge that supports useful plant diversity. These endangered plants included those used for food and nutrition, medicine, culture, religion, livelihoods, poverty alleviation, food security, and sustainable development. The plants and bio-cultural knowledge play an essential part in plant conservation and the ecosystem services that support all life on Earth.

This sub-panel calls on the international community to address not only the tragic loss of plants but also the loss of essential knowledge about plants and their uses, especially amongst indigenous communities. They specifically address the connection to the GSPC targets for the use and preservation of plants with bio-cultural significance. They contend that it is urgent to address the vital importance of traditional knowledge about plants, their utility, management and conservation.

IPBES should coordinate activities with the GSPC, CBD, FAO, DRIP, the Nagoya Protocol and other international initiatives and agreements that support the role of local, traditional and indigenous knowledge in conservation of biodiversity and ecosystem services.

The importance of incorporating indigenous and local knowledge in assessment processes has been recognized at the national and regional level for many decades. The Millennium Ecosystem Assessment (MA) brought this recognition to the global scale, and recently efforts have been made to operationalize this recognition through the Arctic Climate Impact Assessment. Today the IPCC is also working towards the incorporation of indigenous and local knowledge in their Fifth Assessment Report to be released in 2014 (cf. Nakashima et al. 2012).

The experts also remarked that the challenges of bridging between knowledge systems bear some resemblance to the scientific challenge of interdisciplinarity. Despite concerted efforts in recent decades to build linkages between the natural sciences and the social and human sciences, many aspects remain difficult to resolve including the articulation of quantitative and qualitative approaches, incongruities in terminology, differences in scale, and disagreements over what constitutes scientific method, data and evidence. The fact that the scientific community has yet to come up with 'cookbook' procedures and approaches to create interdisciplinary linkages among the sciences (natural, social and human), helps place in appropriate perspective the even more ambitious IPBES challenge of building linkages between the sciences and other systems of knowledge.

The Multiple Evidence Base Approach

A framework for connecting indigenous, local and scientific knowledge systems
Tengö, M., Malmer, P., Elmqvist, T., Stockholm Resilience Centre; Brondizio, E., Indiana University; Spierenburg, M., VU University Amsterdam

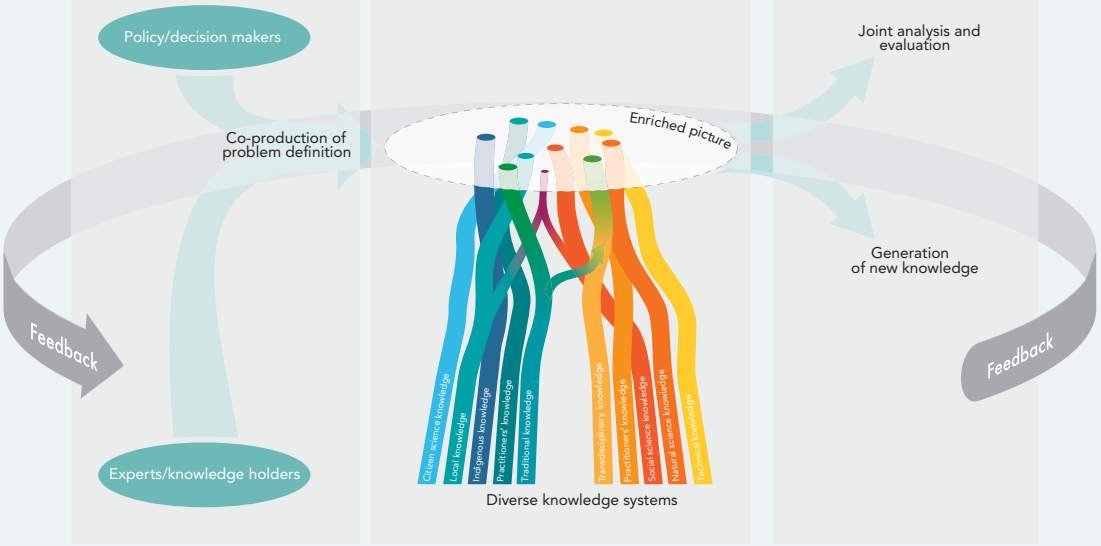

Figure 1. Outlining three phases of a Multiple Evidence Base approach, that emphasizes the need for co-production of problem definitions as well as joint analysis and evaluation of the enriched picture created in the assessment process.

Whereas indigenous, local and scientific knowledge systems are viewed to generate equally valid, complementarily and useful evidence for interpreting conditions, change, trajectories, and in some cases causal relationships relevant to the sustainable governance of ecosystems and biodiversity (Tengö et al. 2013) -- the Multiple Evidence Base (MEB) is an approach that proposes parallels. The approach draws on literature and existing practice emphasizing the complementary nature of various knowledge systems, as well as the need to move away from translating knowledge into one currency, or "integrating" indigenous and local knowledge into science through unidirectional validation processes (Berkes 2007, Nadasdy 1999). It also draws on the outcomes of a dialogue process in collaboration with a network of indigenous peoples and local communities, in particular the International Indigenous Forum for Biodiversity (IIFB) (see www.dialogueseminars.net/panama).

The MEB approach highlights the importance of indigenous and local knowledge systems on their own terms. It also recognizes differences among scientific knowledge, such as social science and natural science disciplines and forms of evidence. To realize the potential of each knowledge system, we argue that different criteria of validation should be applied to data and information originating from different systems. A MEB approach on an issue or assessment topic, such as Arctic sea ice dynamics related to climate change, will create an enriched picture of understanding in an assessment process, as is illustrated in the middle pane in figure 1. We propose the MEB as a 'nested approach' that considers different types of knowledge (from very specific and localized to more general) and different types of overlap between knowledge systems that may appear at different levels (and for different goals). A MEB approach should be tailored in relation to different goals, regions, and kinds of assessment and scales of investigation, but also needs to recognize cross-scale interactions.

Language and linguistic diversity, for example, add additional levels of complexity. This is not merely a matter of communication and interpretation. Indigenous peoples and local communities possess distinctive indigenous nomenclatures and taxonomies with respect to biodiversity, lexicons which may be technically complex, and grammatical forms for talking about observations, evidence and proof. Knowledge about biodiversity that is embedded in indigenous and local languages cannot be captured nor conveyed with any rigor by a simple translation into mainstream languages. The experts emphasized that specific procedures must be defined in order to grasp core indigenous and local terms and concepts with respect to biodiversity and then identify their equivalents in scientific terminology.

Sami Reindeer Herders

The knowledge of snow and ice

Roué, Marie

Sami herders marking reindeer calves in a temporary corral near Staloluokta, Laponian Area World Heritage Site, Sweden. The use of a long pole and noose to capture the calves has been adopted recently in some parts of the Sami territory, replacing the traditional hand-thrown lasso.

In Sapmi (northern Norway, Sweden, Finland and Russia), the reindeer-herding Sami have developed a unique knowledge of their dynamic and changing landscape. During the winter, reindeer survive by digging through the snow to access lichen. Sami knowledge of the winter pastures used by their herds is particularly rich as they must adapt to extremely variable conditions. This knowledge includes an understanding of relationships between multiple elements such as lichen, shrubs and trees in different ecosystems and their interactions with wind, rain, snow and ice. Throughout the winter, reindeer herders constantly monitor the changing snow conditions that determine the difficulty or ease with which their herds can access food. When Sami speak about good "guohton," they refer not only to the presence of abundant lichen but also its accessibility to their herds.

This interdisciplinary Sami knowledge is a science of language (Magga 2006; Eira et al. 2013). It incorporates botany, zoology, ecology of change, physics of liquids, chemistry, meteorology, amongst other disciplines, plus the practical and social skills of nomadism, which coordinates the movements of thousands of reindeers and hundreds of people (Roturier and Roué 2009).

When governments in their attempts to modernize reindeer herding calculate and impose a fixed grazing capacity, they forget to take into account winter conditions and variability. As the Sami have always known, the determining factor for herd survival in the Arctic is not so much the quantity of resources as its accessibility.

Experts also underlined the need to comprehend the social complexities of knowledge. Men and women may possess different and complementary knowledge. Culturally-designated individuals, lineages or clans may possess specialized knowledge and skills in specific domains. And access to knowledge may be governed by culturally-specific rules and procedures.

An additional challenge for IPBES engagement with indigenous and local knowledge, is the need for procedures and approaches to apply across the enormous diversity of ecological systems world-wide, the diversity of cultural systems (e.g. farmers, fishers, pastoralists, hunter-gatherers, some sedentary and others nomadic), and the diversity of co-evolved bio-cultural systems, which are the products of the long-term and intimate interactions between human and bio-physical systems.

Referring to the spatial scale of IPBES assessments, experts pointed out that the spatial extent of some sets of indigenous knowledge coincide with the sub-regional or regional mandate of IPBES. For example, some nomadic or semi-nomadic peoples range over large territories of regional scope. Other groups that share a common cultural and linguistic heritage occupy traditional homelands that traverse the borders of two or more countries, and can therefore contribute relevant knowledge to sub-regional or regional assessments of the status and trends of biodiversity and ecosystem services.

Indigenous Knowledge Integrated with Long Term Ecological Monitoring

Himalayas
Salick, Jan

The sacred Khawa Karpo Peak looms above Feilaisi village in northwest Yunnan.
Photo by: Robert Moseley, Director of Conservation, The Nature Conservancy, Illinois.

Alpine biodiversity is tightly linked to livelihoods and ecosystem services in most mountain areas of the world. Within our Himalayan climate change monitoring studies at the Missouri Botanical Garden, we investigate alpine plants, their uses, biodiversity and land-use management, as well as indigenous peoples' perceptions of, adaptations to, and mitigations of climate change. We study Tibetan cosmology of climate change to understand alternate perspectives and knowledge systems. Why do people care about changing alpine plant distributions with climate change? How will changes affect their lives and livelihoods? How are people adapting to changes? What traditional mitigation strategies are being practiced (perhaps unwittingly) and could be supported? How do people understand the changes they perceive?

In addition to exploring Alpine land and plant uses, we participate with indigenous communities to illuminate the impacts of Alpine climate change on peoples, their livelihoods and the ecosystem services provided by Alpine environments. We advocate conservation of a Himalayan "archipelago of sacred sky islands" or a series of sacred mountains throughout the Himalaya that could help conserve the mountains, indigenous peoples and their belief systems, as well as the alpine species threatened by climate change. Added to ecological monitoring of climate change, cultural data provide a powerful platform from which to analyze the dynamics of coupled natural and human systems in response to global climate change. Additionally, ecological data are given meaning and relevance to local peoples with whom we work.

Further Reading: Anderson, D. et al. (2005); Byg, A. and J. Salick (2009); Byg, A. et al. (2010); Law, W. and J. Salick (2006); Salick, J. (2012); Salick, J. and A. Byg (2007); Salick, J. and R. Moseley (2012); Salick, J. and N. Ross (editors) (2009); Salick, J. and N. Ross (2009); Salick, J. et al. (2004); Salick, J. et al. (2005); Salick, J. et al. (2006); Salick, J. et al. (2007); Salick, J. et al. (2009); Salick, J. et al. (2012)

For more localized groups, IPBES may need to develop specific procedures and approaches to work with contiguous groups whose collective knowledge of biodiversity and ecosystems services, when juxtaposed, may extend across sub-regional or regional assessment areas. Long-distance transboundary migratory species, on the other hand, may raise other methodological considerations. Even though the indigenous and local knowledge of a group may be restricted to a small portion of a species' range, this spatially-limited knowledge may nonetheless prove to be of regional significance for assessments and policy-making when the territory of the group is located at a strategic point along a migratory corridor. In these cases, their site-specific observations and knowledge may provide critical snapshots of population health, abundance, or composition, while creating opportunities for co-management and conservation. It was also stressed that such transboundary knowledge may also be critical for managing the spread of invasive alien species and diseases at subnational, national and international levels. To build synergies with indigenous and local knowledge, these and other aspects must be understood and correctly built into IPBES procedures and approaches.

Cultural-based indicators for measuring ecosystem health

Bridging science and ILK

Moller, Henrick and Lyver, P.O'B.

Science and practitioner-based knowledge systems can sometimes be bridged by selection of indicators and semi-quantitative methods that measure the current state of biodiversity and ecosystem services. Ngāi Tahu, a Māori tribe from southern New Zealand, has developed culturally based indicators that measure the links between their communities and freshwater, lake and marine ecosystems. Often the index is based on ability of all the local community to gather sufficient and safe food in a reasonable time so that they can maintain their kinship links to each other and their place. The rapid-inventory scoring method can be quickly learned from ILK holders and it takes just 15-20 minutes to complete. This allows broad participation in monitoring by the community and associated deepening of commitment to supporting biodiversity and ecosystem services.

The design of the indicators and measurement of a cultural health index primarily reflects values and biocultural conservation priorities. It also builds bridges by being analogous in many ways to an ecological approach. For example, Cultural Health Indices often focus on 'cultural keystone species,' those particularly important plants or animals for maintaining social-ecological links and helping ILK to be transferred to the next generation. Also, the Ngāi Tahu 'Marine Cultural Health Index' also monitors 'Cultural Species Richness' and incorporates many of the same concepts used by ecologists to monitor population recruitment, animal condition, biosecurity and habitat change. Cultural health indices can capture historical knowledge and set goals for restoration. A science-ILK calibration study found that scores of Ngāi Tahu's Stream Cultural Health Index was tightly correlated with full-scale ecological survey results indicating ecosystem health from a scientific perspective.

Collaborative monitoring of the current state of the environment, or of responses in ecosystem health to IPBES interventions, is a good place to start synergizing science and ILK. The cultural health indices also offer added value by monitoring functionally important species, often the most abundant ones, in ecosystems and monitoring trends in these vital indicators long before declines have reached critical species survival thresholds. Cultural Health Indices potentially provide a participatory, low cost, widespread and locally nuanced method that resonates with scientific ways of knowing.

Further Reading: Garibaldi A and N. Turner (2004); Moller H, et al. (2004); Schweikert K, et al. (2012); Townsend CR, et al. (2004)

Discussions at the workshop also made clear that procedures and approaches must also be tailored for IPBES and the specific needs arising from its mandate and four functions. Specific procedures and approaches need to be defined to engage indigenous and local knowledge, and indigenous and local knowledge holders, in IPBES assessments and their sequential phases of scoping, preparation of reports, drafting and reviewing. The other IPBES functions such as capacity-building, knowledge generation or policy formulation raise additional issues and require a different configuration of procedures and approaches. Furthermore, as indigenous and local knowledge is a cross-cutting area of work within IPBES, procedures and approaches must be formulated with respect to the overall engagement of indigenous and local knowledge holders within IPBES.

Dayak Indigenous and Local Knowledge

Indonesia
Soedjito, Herwasono

In the late 1970s, Indonesia and the United States collaborated together as part of the Man And Biosphere Program of UNESCO to integrate forest science with indigenous and local knowledge of the Dayak people in East Kalimantan (Vayda 1985). This multi-disciplinary approach consisted of experts on anthropology, sociology, human ecology, forestry, forest ecology, forest economy, as well as governance and policy. The study, which included radio isotopic analysis, scientifically showed that the indigenous Dayak people conserve genetic varieties of rice (***Oriza sativa***) through their shifting cultivation system (Soedjito 1996). In the tropical rainforest, the Dayak cultivate what is generally low nutrient soil (Soedjito and Pickett 1995) with spatial planning that includes land use for local forest conservation named as ***Tanah Ulen***. The Tanah Ulen provides sustainable forest products for food (fruits, vegetable, carbohydrates), meat (pigs, deer, fishes), as well as sufficient water for the Dayak livelihood (Soedjito 2007, Soedjito et al 2009).

Other studies in Indonesia done to find synergies between science and indigenous local knowledge include those by the WWF, Indonesian Institute of Sciences (LIPI), and other universities within the Kayan Mentarang National Park in East Kalimantan (Jessup and Sellato 1993) in the 1990s; later studies on Baduy in West Jawa; Mentawaian in Siberut Island; Batak in Sumatra; Balinese in Bali; Ngata Toro and Kajang in Sulawesi; and several Moluccas and Papuans east of Indonesia (Soedjito 2006, Soedjito et al 2009). More of this kind of research is needed and should be done in collaboration with institutes and universities around the world, since Indonesia has at least 370 ethnic groups and more than 650 languages. IPBES is best player to assess this.

In summary, the experts at the workshop outlined several examples of procedures and approaches for building synergies between knowledge systems in the context of IPBES and formulated several key messages in this regard. The key messages from these discussions are summarized in Annex I, grouped under the following themes:

1. Rethinking Relationships: Science(s) and Indigenous and Local Knowledge
2. Fundamental Aspects of Indigenous and Local Knowledge
3. Principles for Engagement with Indigenous and Local Knowledge Holders
4. Capacity-building Needs

The experts also proposed recommendations that relate to procedures and approaches for reinforcing ties between knowledge systems, which are included in Section III Recommendations below and organized with respect to IPBES functions.

Finally, it was the consensus of the workshop experts, including indigenous peoples, that considerably more dedicated work would be required in order to achieve in a satisfactory manner the Work Programme milestone of an adequate and comprehensive set of IPBES procedures and approaches for building synergies between knowledge systems (cf. in particular Section III Recommendation 3).

2.2. ILK and the emerging IPBES conceptual framework

Background

At the first plenary meeting of IPBES in Bonn in January 2013, an information document was presented on a potential IPBES draft conceptual framework. The document was the outcome of an informal expert workshop on the development of a conceptual framework for the Platform (27-29 October 2012, Paris), organized by UNESCO on behalf of the IPBES interim secretariat, with generous support from the Ministry of the Environment, Japan.

During IPBES-1, delegates contributed input towards the document, which was also made available for comment through an online review. It was also decided that an expert workshop would be organized during the inter-sessional period to further reflect on a conceptual framework for IPBES, which addresses the objectives, functions and relevant operating principles of the Platform. This workshop, now scheduled to take place in Cape Town, South Africa on 25-26 August 2013, is to draw on a range of sources of information, including inputs received from the Paris workshop. It was also decided that the Tokyo workshop on indigenous and local knowledge would provide additional inputs to

this conceptual framework workshop, including the identification of experts from the Tokyo event who would also participate in Cape Town.

Overview of discussions

The experts at the Tokyo workshop agreed that an IPBES conceptual framework must accommodate indigenous and local knowledge and worldviews in an appropriate and respectful manner. The draft framework that emerged from the Paris workshop was not considered adequate in this respect. The experts acknowledged the need for alternative proposals that provide a broader approach with additional opportunities for including indigenous and local knowledge systems, diverse conceptualizations of relationships between human and non-human beings, and other visions of well-being within ecological systems.

Use of Indigenous and Local Knowledge in Forest Management

Ontario, Canada
Smith, Peggy

Pikangikum First Nation, in collaboration with the Ontario Ministry of Natural Resources (OMNR), developed an approach to forest management in northern Ontario that incorporates the First Nation's "customary stewardship" approach in its Whitefeather Forest Initiative. The community and OMNR undertook a planning process that began in the mid–1990s. Planning has resulted in a Land Use Plan (Keeping the Land, 2006), environmental assessment approval (2009) and a forest management plan (2012). In 2013, Pikangikum was finally granted a provincial Sustainable Forest License to manage the area. Their planning approach was reflected in an appendix to Ontario's Forest Management Planning Manual (2009) that incorporated the Pikangikum approach to forest management planning, including the role of Elders and the use of Indigenous knowledge.

Biodiversity conservation is an important priority for both partners, with Ontario committed to a Biodiversity Strategy (2005). The "Keeping the Land" plan described the biodiversity of the 1.2 million hectares of the boreal Whitefeather Forest as "vast" as the Indigenous knowledge of the area. The customary stewardship approach for planning is guided by a Vision that promotes "internationally acclaimed community-based forest management supporting commercial forestry partnerships led by our First Nation and guided by our Elders, where the forest as an indigenous cultural landscape with its cover, biodiversity, and remoteness, is maintained over time to sustain Pikangikum culture and environment and renew our economy."

Those studying the Initiative have pointed out the need to modify existing practices to accommodate Pikangikum's worldview, including understanding the "range of complex interactions and relationships, which are ecological at one level, but also imbued with intentionality and morality" (O'Flaherty et al. 2009: 20). The Province of Ontario was able to engage in planning, with a view to learning from their Indigenous partners, because the Whitefeather Forest had not been previously subjected to industrial logging and because a new provincial community-based land use policy was developed to facilitate Indigenous involvement in planning in this Far North area.

Further Reading: Berkes, F., et al. (2009); Shearer, J., et al. (2009); Whitefeather Forest Initiative (Website)

With respect to the possibility of recognizing multiple IPBES conceptual frameworks, the experts agreed on the importance of a single unifying conceptual framework for IPBES. The aim is build a conceptual framework that can accommodate multiple worldviews and epistemologies with the ultimate goal of reaching a working understanding among different stakeholders on to how to assess and approach issues of biodiversity and ecosystem services loss.

Participants also agreed that it was important to ensure that basic principles for collaboration with indigenous peoples and local communities should be applied to the dialogue processes leading towards the development of this framework, as well as the conceptual framework itself. This includes the full and effective participation of indigenous peoples and local communities, and the need for an equitable approach that recognizes and respects both indigenous and local knowledge, diverse languages, and science.

Aso grasslands for sustainable agriculture system

Kumamoto Prefecture, Japan
Kim, M.S., Saito, O. and Takeuchi, K.

Aso region of Kumamoto Prefecture is situated in the middle of the Kyushu Island in southern Japan. The Aso region spreads around Mount Aso, the largest active volcano in Japan. Even though the soil and geographic conditions are not suitable for cultivation, local people have for centuries adapted themselves to this challenging environment. They have made improvements to the volcanic soil of the cold uplands and started cultivation – by burning, grazing, and mowing – to create paddies and fields for farming, and grasslands for pastures.

These continuous agricultural activities have resulted in the vast "semi-natural" grasslands, which are used for grazing cows and horses as their primary feed as well as for matting their stables. The composted manure is then used in the fields for paddy and dry field farming. The remarkable feature of Aso region lies in this dynamic system of sustainable agriculture through cyclical grassland use and its management system. Accordingly, the biodiversity and the rural landscapes of Aso have been preserved, and sustainable agriculture has been undertaken.

Currently, 70,000 people live inside and outside the volcano's caldera and most of the grasslands are managed by cooperative units of communities as their "common lands." The unit members or the commonage holders in the communities are able to access the designated mountains and forests in order to obtain the necessary materials for their production and living.

From ancient to modern times, this commonage right requires the consent of all members for selling the land and helps to prevent hasty land development. This commonage system is the core value for village communities to manage regional resources cooperatively.

In the past 10 years, the communities have experienced difficulties in continuing grassland-burning mainly due to the shortage of local participants and the tough work for the elderly. This led to increased difficulty in grassland maintenance, damage to rare flora and fauna, establishment of plant monoculture, and loss of biodiversity.

The Kumamoto prefecture published the local promotion strategy through grassland restoration and its utilization, named "Kabashima initiative" (2012), which includes cooperation with tourism, environment, industry policy etc. for the promotion of the Aso region.

Further Reading: GIAHS study sites - Managing Aso Grasslands for Sustainable Agriculture (Website)

The expert group recalled the rationale provided in document IPBES/1/INF/9 as to the recommendation (Key Message 3) that 'Conceptual frameworks can be used to facilitate the inclusion of indigenous and local knowledge systems, which are essential for understanding the complex interrelationships among biodiversity, ecosystem services and human well-being.' The expert group reiterated that indigenous peoples and local communities, through their worldviews, management and knowledge systems, have their own conceptualizations of the relationships between ecological, social and spiritual spheres. These representations should complement science-based representations and be an integral part of an IPBES conceptual framework in support of the delivery of IPBES functions and the implementation of the Platform's programme of work.

Agrobiodiversity on the Rio Negro

Brazilian Amazon

Carneiro da Cunha, Manuela

A multidisciplinary academic research team (comprising mainly biologists and anthropologists from Brazilian and French institutions) established a formal agreement with regional indigenous organizations and local traditional authorities on the Rio Negro, in Brazil. A joint research program was launched in 2006 on issues of agrobiodiversity, gathering evidence on biological, cultural and political-historical processes that account for an astounding diversity of cultivars of manioc and other domesticated plants.

Such agrobiodiversity is under serious threat by agricultural state policies. To try and counteract those policies, indigenous organizations and their academic allies submitted a report on their findings to the Brazilian government and on November 2011 achieved recognition of the Rio Negro agricultural system as Brazilian cultural patrimony. It is noteworthy that, for the first time, rather than protecting specific cultivars, it was the agricultural system itself that was granted protection.

As an outcome of this research, a new project is being discussed with Embrapa, the major Brazilian scientific organization on agriculture, for a two-way collaboration between *ex situ* and *in situ* conservation of agrobiodiversity by traditional people. This research project is earmarked as a pilot case within the scope of a study for the launching of a long-term program in Brazil for joint projects in science and traditional knowledge.

Crucial for the success of this research were long-term ties between researchers and regional communities that built trust and cooperation; the respectful process of obtaining prior informed consent; and the involvement of indigenous researchers who were able to link agrobiodiversity issues to local demands.

Further Reading: Emperaire, L. and Peroni, N. (2007); Emperaire, L. et al (2008); Emperaire, L. et al (2010); Nogueira, L. et al (2010)

Worldviews or conceptual frameworks of indigenous peoples and local communities often emphasize the following:

- the interdependence of socio-economic and ecological spheres;
- the central role of social relations and reciprocity amongst humans, as well as in the unity of humans and nature,
- the continuity of relations between past, present and future generations, and intergenerational transmission of values, knowledge and responsibilities;
- emphasis on cyclical processes in natural and social domains;
- collective identification with place/land/ancestral territory;
- recognition of the role of communities in managing and maintaining landscape mosaics and biodiversity, including an emphasis on polycultural rather than monocultural agrobiodiversity, that enhance the provisioning of ecosystem services for human wellbeing; and
- recognition that knowledge is also embodied in practice, action, morality, spirituality (as opposed to abstracted and objectified).

All of these points are also reflected in document IPBES/1/INF/9.

In contrast, the current proposed conceptual framework was seen as focusing too much on assessments and a single model that does not recognize the diversity of ways to conceptualize the interactions between social and ecological spheres. Further views collected in the context of the review of the draft conceptual framework document (IPBES/1/INF/9) express the concern that the current proposal has several limitations and bears certain risks with respect to the knowledge systems of indigenous peoples and local communities. Taking into account several examples, case studies and experiences around the world, the expert group agreed that although multiple frameworks could be envisaged, a single conceptual framework should be adhered to and agreed upon for IPBES. The current draft conceptual framework could be used as a starting point for formulating a conceptual representation of interactions between social and ecological spheres that encompasses and reflects the diverse views of indigenous peoples and local communities.

3. Recommendations from the Workshop

3.1. Recommendations on Procedures and Approaches for working with ILK in the framework of IPBES

1. In line with the Operating Principles of the Busan Outcome that form the basis of IPBES, as well as Article 8(j) of the Convention on Biological Diversity and Aichi Target 18, which recognize and respect the contribution of indigenous and local knowledge to the conservation and sustainable use of biodiversity and ecosystems, IPBES should ensure that a meaningful and active engagement is established with indigenous and local knowledge (ILK) holders in all relevant aspects of its work and across all of its functions including by:
   a. recognizing that indigenous peoples and members of local communities have distinct status as knowledge-holders and rights-holders;
   b. putting in place mechanisms and procedures to ensure effective participation in the MEP itself and its activities, including in any working groups, expert bodies and other structures that may be established, in the development of the conceptual framework and work programme, as well as in outreach to indigenous peoples and local communities (IPLCs).

2. Women and men commonly fulfill different, but complementary roles and responsibilities in relation to different components of biodiversity and sustainable use, resulting in different knowledge, needs, concerns, priorities and roles. For this reason, women may possess knowledge, not held by men, which can inform IPBES processes. To fulfill its operational priority to achieve gender equality in all relevant aspects of its work, IPBES should put in place mechanisms that ensure attention to gender specific-knowledge and gender balance in all components of its work.

Fodder for Sheep and Goats

The feeding value of *Najas horrida* (aquatic plant)
Yacoub, Hoda

The Bedouins of Allaqi, living along the shores of Lake Nasser in Egypt's Eastern Desert eat different species of *Najas* (or *Shelbeika* as they are commonly called) as well as feed the aquatic plants to their domestic animals. Their indigenous knowledge, based on long periods of trial-and-error, cover not only the different *Najas* species found in the lake, but also where and when to find the best collection areas; whether to utilize the plants in pure form or mixed with other plants, and how the different types and quantities of the plants used will affect their animals based on the age and condition of the animals as well as their feeding times.

To evaluate how nutritive the species *Najas horrida* is as fodder for sheep and goats, this study relied on Bedouin knowledge as a base for designing its scientific quantitative procedures.

A trusted and well-used method of collecting data and information has been that of formal questionnaire surveys based on carefully constructed random sampling frameworks. Although an efficient and frequently effective way of collecting large amounts of data, there can also be difficulties with this approach. Local and indigenous knowledges, for example, are more behavior-based and holistic than scientific knowledges, and can only be meaningfully interpreted in the social and economic contexts. The idea that local knowledges can be fragmented and de-contextualized is not helpful. As Kalland (2000:326) succinctly puts it: "as local people are more concerned with qualitative data, it follows that it is difficult to incorporate their knowledge into the scientists' models." To achieve qualitative methods compatible with these lines of methodological argument, this study worked with local people over extended periods of time, encouraging an atmosphere of mutual trust in which 'conversations,' rather than interviews, took place.

Although a checklist of topics was developed based on research objectives, this list was seen as provisional in the sense that some topics would in time disappear, and others become added, in the light of the conversations. As far as possible, the agenda was informant-driven. This does not mean that quantitative or 'objective' data was ignored. Rather, it was used, as appropriate, to support arguments, but not to generate the arguments themselves. In Wadi Allaqi (including the area of Sayalla), 16 households were selected, differentiated by clan and by socio-economic status. The research team was divided by gender for the visits; female researchers talked with the Bedouin women while the male researchers talked with the Bedouin men. This division was necessary for cultural reasons. Non-family males are not permitted to enter the women's area in Bedouin settlements, nor are Bedouin women generally permitted to talk with non-family males. Even though women visitors can enter the male spaces in the settlements, it was found that man-to-man conversations were less inhibited. The data was collected through a series of extended discussions/interviews with participants, taking place at monthly intervals (sometimes more frequently) over a period of just over 12 months. Similar questions and topics provided the focus for the discussions, and these were routinely re-visited on subsequent visits, not only for triangulation purposes, but also to determine the ways in which their knowledge may vary due to environmental conditions of the area.

3. To attain the work programme milestone relating to other knowledge systems, and to ensure a consistent and rigorous approach to linking ILK and science within IPBES, IPBES should establish, under the guidance of the MEP, an [interim] working group composed of ILK-holders and scientists[4], amongst others, to:
    a. conduct a scoping of existing experiences, approaches and methodologies on bridging between scientific and indigenous knowledge systems to better understand and assess status and trends with respect to biodiversity and ecosystem services;
    b. further analyze and address gaps in procedures and approaches for working with different knowledge systems in the framework of IPBES;
    c. identify challenges and possible ways forward with respect to evolving work on free, prior and informed consent (FPIC), intellectual property rights, customary governance over indigenous and local knowledge, and access and benefit-sharing;
    d. further develop modalities for building synergies between indigenous & local knowledge and science by fostering the development of innovative approaches, such as knowledge co-production and multiple-evidence base;
    e. develop guidelines for linking indigenous and local knowledge with science at all levels, recognizing the roles and relevance of international policies and protocols, including those related to access and benefits-sharing;
    f. develop guidelines for novel and culturally-appropriate ways to review, validate and disseminate results, which could complement traditional systems of validation and results dissemination while strengthening synergies between ILK and science;
    g. define in precise terms (i) ILK-based indicators that contribute to measuring progress towards IPBES goals as well as the benefits of IPBES for indigenous peoples, and (ii) initiate a monitoring programme to measure and report on those ILK-based indicators in a regular and transparent way.

4. In relation to its assessment function, the MEP should:
    a. pay particular attention, when scoping IPBES assessments, to the impacts of declines in biodiversity and ecosystem services on resource-dependent communities, including indigenous peoples' communities, and to informing these assessments through indigenous and local knowledge, complemented by science;
    b. based upon indigenous and local knowledge, as a complement to science, (i) identify indicators to measure the current state of biodiversity, ecosystem services and cultural wellbeing, (ii) establish thresholds to trigger different levels of management intervention to counter biodiversity declines, (iii) set targets for the rate of recovery, and (iv) fix stopping rules to terminate interventions and divert investments elsewhere;
    c. build a roster on ILK and science that consists of experts, including from indigenous peoples and local communities, who can provide direct inputs to the preparation and review of assessment reports and other IPBES deliverables. This includes their participation in scoping meetings, on writing and review teams[5], and as expert reviewers of draft reports;

[4] In this context 'scientist' may include professionals from all scientific disciplines in the natural, social and human sciences, and also refer to science practitioners, including natural resource and environmental managers.

[5] These may include participation as Coordinating Lead Authors (CLAs), Lead Authors (LAs), Contributing Authors (CAs), Reviewers (Rs) and Review Editors (REs).

d. establish dialogue workshops that are specifically designed to facilitate the direct engagement of relevant ILK holders, with technical support as appropriate, to ensure the appropriate contribution of ILK to the scoping, preparation and review of IPBES assessment reports, technical papers and supporting material;

e. address ILK in assessment reports, technical papers and supporting material across all relevant chapters, and not in a separate section that is isolated from the main body of work.

5. With respect to catalyzing knowledge generation, the MEP should:

   a. recognize the importance of indigenous and local languages, taxonomic systems and methodologies as sources of biodiversity-related knowledge at genetic, species and landscape levels;

   b. recognize that regional assessments of biodiversity and ecosystem services, and landscape-level management modalities, can be informed by indigenous and local knowledge possessed by indigenous peoples whose customary territories extend across national boundaries;

   c. recognize the growing experience and related scientific literature on community-based monitoring of environmental and global change, and local assessments of the status of indigenous languages, knowledge and community well-being;

   d. provide support for pilot projects in areas where IPLCs have already developed productive relationships with scientists and generated policy-relevant knowledge and tools to address biodiversity loss, including through co-management regimes, knowledge co-production and evaluations of barriers to policy adoption.

Community Institutions in Resource Management: Agroforestry by Mobisquads in Goviefe-Agodome

Volta Region, Ghana
Boafo, Y.A., Saito, O. and Takeuchi, K.

In Goviefe-Agodome, Volta Region of Ghana, a local self-development cooperative initiated by the government with support from the Center for International Development and Environment of the World Resources Institute (WRI) and strong and active participation of the people of Goviefe-Agodome successfully turned land that was considered infertile into productive farmland through various agroforestry practices. This was possible through the National Mobilization Programme (NMP)/Mobisquads, community driven and management programmes established in 1984 to marshal human and local resources for revamping areas of the national economy that were badly hit by the natural and anthropogenic disasters of 1982-83. Throughout Ghana, Mobisquads were formed to fight bushfires, replant cocoa and coffee farms, plant trees in degraded forests, reestablish food crop farms and manage natural resources. Mobisquad set up a local system for catalyzing grassroots participation in solving local problems and carrying out self-help community improvement activities.

The Goviefe-Agodome case is one of the most successful and often mentioned example of how village-level and community participation through collaboration with formal/national level institutions can be used to manage and conserve natural resources. This is largely due to the participatory role played by community members' right from the design, implementation and management of the programmes, creating a strong sense of ownership. Also, sustainable indigenous practices for land use and management were applied throughout the programme. The cooperative has emerged as the village's most active community development institution capable of mobilizing labor and resources of both members and nonmembers. The Goviefe-Agodome experience has implications for the government of Ghana and the development assistance community concerned with local-level natural resource management.

Threats and Challenges

Population growth led to the pressurizing of available land in the community meaning that areas could no longer be reserved for agroforestry purposes and conservation. In an area where swidden agriculture is the main economic livelihood, increasing population affected the programme. Second is the withdrawal of external support especially from government agencies and the change in economic policies of the country.

Further Reading: Dorm-Adzobu et al (1991)

6. With respect to policy support tools and methodologies, the MEP should:

   a. promote the synergies between indigenous and local knowledge and science through making available periodic reviews and assessments of relevant tools and methodologies.

b. review how the IPBES programme of work can be decentralized to the most appropriate scales, and encourage the establishment of regional and sub-regional centres of excellence in indigenous and local knowledge;

c. ensure that IPBES materials include policy-relevant syntheses that provide tools and approaches for the continued transmission of indigenous and local knowledge, as well as support for customary sustainable use. These considerations should extend to agencies and bodies that may not be directly linked to biodiversity and ecosystem services (e.g. education, health and cultural heritage);

d. review existing mechanisms for soliciting requests/inputs/suggestions with an aim to reinforcing requests/inputs/suggestions from IPLCs with respect to their customary territories, lands and resources.

7. With respect to capacity-building, the MEP should:

a. promote reciprocal capacity-building through two-way learning where capacities of scientists are built by ILK holders, and in return, ILK holders are exposed to scientific concepts and methods, so as to reinforce opportunities for building ILK-science synergies;

b. grant fellowships to ILK holders to engage in IPBES processes and develop the skills required to bridge between knowledge systems. Support should also be provided for fellows to mentor other ILK holders through peer-to-peer exchanges and visits;

c. promote intercultural education that supports the transmission of indigenous and local knowledge and practice, alongside mainstream education, so as to develop skills in both scientific and indigenous knowledge systems.

d. integrally involve ILK-holders, community leaders, local scientists and students in IPBES activities so as to enhance capacity building, ownership and relevance of IPBES assessments.

Collaborative two-way knowledge and management of gubinge

Australia
Hill, R.

The integration of Indigenous and scientific knowledge systems and cultural values has been identified as a key factor underpinning successful Indigenous land management in Australia (Hill et al. 2013). Such engagements help address the barrier posed by the limited respect, recognition and practical support afforded Indigenous knowledge and world views.

Better understanding of the human, knowledge and well-being dimensions of Indigenous peoples' relationships with and use of bush food (tucker) offers a critical ingredient to guide such two-way knowledge engagement (Walsh and Douglas 2011). For example, an initiative led by the Kimberley Training Institute (http://www.kti.wa.edu.au/about/corporateoverview/Pages/Projects.aspx) has engaged local Indigenous students to cultivate gubinge (***Terminalia ferdinandiana***), a tree of cultural significance and nutritional value to many Aboriginal groups in northern Australia with commercial value as a natural source of vitamin C. The initiative combined Indigenous knowledge of the tree with scientifically-based agricultural techniques based on enrichment planting. Partners include the Rural Industries Research and Development Corporation, CSIRO, University of WA, Charles Darwin University and the Aboriginal Carbon Fund.

8. IPBES should use a wide variety of media, languages, forums, communication processes to maximize participation and learning from and by indigenous and local knowledge holders.

Hani Rice Terraces

Yunnan Province, China

Yiu, E., Saito, O., Takeuchi, K.

Located along the southern slopes of the Ailao Mountains in the Honghe Hani and Yi Autonomous Prefecture, southeast of Yunnan Province in China, the Hani Rice Terraces cover about 70,000 ha of agricultural landscapes, a mosaic of forests, villages, rice terraces, and water systems. The region is home to several ethnic minorities dominated by the Hani and the Yi. The Hani peoples' worldview, which is based on respect for nature and keen insights into the relationships between humans and nature, has created a rich ILK (specifically ecological knowledge) and an amazing cultural landscape based on rice terrace cultivation that dates back 1,000 years.

The Hani have systematized an agronomic work cycle based on worship of the owners of the natural resources and a profound understanding of environmental conditions such as landforms, soil conditions, vegetation types, and hydrology. For example, rice fields must be located on a sun-facing, mid-slope position where it is easy to obtain irrigation water and where the environmental conditions are suitable for rice. The Hani have also established a year-round cultivation system based on a careful consideration of the monsoons and the wide temperature variations throughout the year. They divide the year into 4 month periods based on a lunar calendar – namely the cool, warm, and rainy seasons. Hani farmers developed soil conservation techniques that can safely sustain cultivation at low, medium, and high altitudes. They have also accumulated rich knowledge about management of the local hydrologic cycle, from which they were able to build a complex and efficient irrigation system that overcame the limitations of a vulnerable steep-slope mountain environment. The planting of diverse rice landraces in small and narrow paddy fields by each Hani household within the heterogeneous landscape of green corridors of grass levees, provides a large range of habitats for organisms – including both beneficial and pest species, which not only lowers the risk of propagation of a single or dominant pest, but also conserves rich biodiversity.

Further Reading: Hongyan Gu, et al. (2012); Yuanmei Jiao, et al. (2012)

3.2. Recommendations on an IPBES Conceptual Framework

1. Discussions on the IPBES conceptual framework should be opened to experts on indigenous and local knowledge, including from indigenous and local knowledge networks, to allow them to contribute to the debate and broaden consultations as a basis for building synergies between ILK and science.

2. The conceptual framework should be further developed so as to reflect the multiple representations of relations between social and ecological spheres both in terms of science-based conceptual frameworks as well as diverse indigenous and local worldviews.

3. IPBES should critically evaluate the appropriateness of the Ecosystem Services framework and its current priority setting tools for equitable allocation of resources to restore indigenous and local community well-being.

4. The MEP should ensure participation by biodiversity and environmental managers in all IPBES conceptual thinking, priority setting and subsequent interventions. This will ensure that their practice-based knowledge of how to best protect and enhance biodiversity and ecosystem services is combined with the knowledge and expertise of scientists and indigenous and local knowledge holders.

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Annex A: Call for Nominations

United Nations
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Nomination of Experts and Stakeholders

International Expert and Stakeholder Workshop on
The Contribution of Indigenous and Local Knowledge Systems to IPBES:
Building Synergies with Science

Convened by the Multidisciplinary Expert Panel of the Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES) – Hosted by the Ministry of the Environment Japan – Co-organized by UNESCO and UNU – 9-11 June 2013, Tokyo, JAPAN

At the first Plenary of IPBES, Members requested the Multidisciplinary Expert Panel (MEP) to convene a multidisciplinary and regionally-balanced expert and stakeholder workshop to provide input on the contribution of indigenous and local knowledge systems to the Platform. As a contribution to the IPBES intersessional process, the Ministry of the Environment of Japan has generously offered to host this workshop, which will be co-organized by UNESCO and UNU in close collaboration with the MEP. Members, observers and other stakeholders are invited to nominate experts and stakeholders with relevant expertise and experience for participation in the workshop.

Workshop Objectives:

1. Examine and identify procedures and approaches for working with indigenous and local knowledge systems in the framework of IPBES.
2. Review and assess possible conceptual frameworks for the work of IPBES that are based on or accommodate indigenous and local knowledge systems and worldviews.

Nominees for participation in the Workshop should fulfill one or more of the following criteria:

1. Indigenous peoples and local community members with in-depth knowledge of biodiversity, or persons with significant experience working with indigenous and local knowledge holders.
2. Persons with direct experience with procedures and approaches for working with indigenous and local knowledge of biodiversity, and for building synergies between indigenous and scientific knowledge.
3. Persons that have been directly involved in assessments at local, national, regional or global levels that interface indigenous and local knowledge with scientific knowledge.

Nominations of indigenous peoples with expertise in the domain and women experts are encouraged.

For each nominee, please submit:

- a curriculum vitae for the nominee
- a completed nomination form (on page 2)

Contributions from selected nominees will be circulated at the workshop, and some may be presented orally in plenary or parallel sessions.
Note: the working language for the workshop will be English.

Closing date for submission of nominations:
28 March 2013

Annex B: Membership of the Organizing Committee

Joji CARINO, Executive Director, Forest Peoples Programme
Phil LYVER, IPBES MEP member, Western Europe and Other States
Roger MPANDE, IPBES MEP member, African States
Edgar PEREZ, IPBES MEP member, Latin American and Caribbean States
Kazuhiko TAKEUCHI, University of Tokyo, Japan
Randy THAMAN, IPBES MEP member, Asia-Pacific States
Bertie XAVIER, Member, United Nations Permanent Forum on Indigenous Issues (UNPFII)

For the organizing secretariat
Fumiko NAKAO, Ministry of the Environment, Japan
Osamu SAITO, United Nations University (UNU)
Douglas NAKASHIMA, United Nations Educational, Scientific and Cultural Organization (UNESCO)

Annex C: Procedures applied for the Selection of Experts

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International Expert and Stakeholder Workshop on The Contribution of Indigenous and Local Knowledge Systems to IPBES: Building Synergies with Science

9-11 June 2013
Venue: United Nations University,
Institute for Sustainability and Peace (UNU-ISP) Tokyo

Procedures applied for the Selection of Experts

The Organizing Committee made every effort to ensure that the selection process for the IPBES workshop in Tokyo is rigorous, fair and transparent.

The ten-member Organizing Committee includes (see list in Annex B):

- four MEP members endorsed by the MEP that were selected for their expertise in relation to indigenous and local knowledge;
- two indigenous persons (including a Member of the UN Permanent Forum on Indigenous Issues);
- one host country expert (Japan);
- one donor representative (Ministry of Environment of Japan);
- one representative each from UNU and UNESCO as co-organizers of the event.

Selection Method

Prior to reviewing the nomination files, the Organizing Committee (OC) agreed upon the selection procedure. The OC members reviewed independently the 107 nominations received for the IPBES Tokyo workshop. Each nominee was rated as either 'selected', 'perhaps for selection' or 'not selected' on the basis of their relevant expertise for the workshop as reflected in their completed nomination form and CV. Where a potential conflict of interest existed between an OC member and a nominee, that member withdrew from any deliberations relating to that nominee and abstained from any ranking of that nominee.

In line with the classification of the event as an international expert workshop, appropriate expertise was the primary criterion for selection.

By compiling the results of this 3-level rating by OC members, the collective ranking was established for all nominees for the Tokyo workshop. This ranking was used to sequentially select participants for the event, starting with nominees who the largest number of OC members designated as 'selected'. This step-wise selection was then adjusted, as required by the IPBES Plenary, for regional balance and multidisciplinary expertise. Equally important, given the workshop theme, was the inclusion of indigenous knowledge holders, along with scientists, as well as the consideration of gender.

Selected experts were sequentially invited, while maintaining an appropriate balance amongst regions, expertise, indigenous peoples and women, until the available budget envelope was exhausted. Experts from developed countries, once selected, were asked whether they might have access to funding for their travel costs. The great majority of experts from Western European and Other States were able to cover their airfares from other sources, which then freed up funds for additional developing country participants.

Calendar

The intersessional calendar for IPBES is very tight. Following the First IPBES Plenary (21-26 January 2013), Members, Observers and Stakeholders were invited to submit nominations for the Tokyo Workshop on or before 28 March 2013. In order to provide additional time for nominations, this deadline was extended to 15 April 2013. With the IPBES Secretariat, all nomination forms and CVs were compiled into a single spreadsheet and accompanying database, while double-checking to ensure all were recorded, and completing where possible partial dossiers.

On 28 April, the complete nomination file was sent to the Organizing Committee for their review and evaluation. By 2 May, a ranked listing of nominees was established by the Organizing Committee and advance notification of the top-selected nominees began. This step-wise process of notification, following the ranked listed and balancing expertise, region, indigenous participation and gender, continued as contacted nominees informed us that they were either no longer available or had funding to cover some of their expenses. As a result, additional nominees could then be invited, and they were notified in their turn. This rolling and sequential series of notifications continued until 25 May when the budgetary envelope for mission costs was exhausted, and the final participants invited.

Composition of the Final Participants List

The final list of 28 experts (including 21 selected experts and 7 experts that are members of the Organizing Committee) appears in Annex D. It includes a wide range of expertise in relation to indigenous and local knowledge, including both natural and social scientists, as well as 9 indigenous peoples (several of whom are also trained scientists). Nominators can be commended for the relatively large number of indigenous nominees (38). The proportion of indigenous exerts at the workshop (33%) is lower than the proportion of indigenous nominees (36%), in part because some indigenous nominees could not be chosen because they did not have a sufficient command of English, the only working language of the workshop. Although the gender ratio of 11 women experts to 17 men (39%) falls short of parity, it improves on the overall gender ratio amongst the nominees (33%).

The 28 experts came from 23 countries. In the few cases where two experts are from the same country, one was an indigenous person or a MEP member. The regional breakdown of 28 experts follows:

- African States - 7
- Asia-Pacific States - 7
- Eastern European States - 1
- Latin American and the Caribbean States - 6
- Western European and Other States (WEOS) – 7

The low number of experts from Eastern Europe reflects the low number of nominations received (1 expert selected out of 4 nominations).

A Table with an analysis of the composition of the 106 nominees and that of the 28 experts appear in Annex E.

A large number of nominees had a high level of expertise with respect to the workshop theme. Accordingly, not all nominees with experience and expertise relating to indigenous and local knowledge could be retained for the workshop. Through the selection process described above, the OC attempted to select in a rigorous, fair and transparent manner the most appropriate group of experts for the Tokyo workshop. Unfortunately, due to budgetary restrictions, only a small portion of the large number of nominated experts could be invited to participate. Competition was particularly stiff for the WEOS group due to the large number of nominations from this region.

Nominees who were not selected for participation in Tokyo were invited to continue to stay engaged in this stream of IPBES work and to review and comment on the outputs of the Tokyo event.

The question arose whether non-selected nominees could participate in the Tokyo workshop as self-funded Observers. Consistent with other IPBES events, Observers participation was not accepted in order not to upset regional and other balances achieved through the expert selection process.

Annex D: List of Invited Participants

United Nations
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International Expert and Stakeholder Workshop on The Contribution of Indigenous and Local Knowledge Systems to IPBES: Building Synergies with Science

9-11 June 2013
Venue: United Nations University,
Institute for Sustainability and Peace (UNU-ISP) Tokyo

List of Invited Participants

1. **Zemede Asfaw**
   Associate Professor, Department of Plant Biology and Biodiversity Management
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2. **Vital Bambanze (Batwa, Burundi)**
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9. **Gabriela Lichtenstein**
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25. Bertie Moses Xavier *(Toshao, Guyana)*
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IPBES Bureau and meeting organizers

29. Zakri Abdul Hamid (IPBES Bureau Chair)
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Annex E: Analysis of Profiles of Participants

Overview of Nominations								
	Total Received	106						
			Male		Female		IP/LC	
Region	Africa	19	17	89%	2	11%	8	42%
	Asia-Pacific	34	27	79%	7	18%	11	32%
	Eastern Europe	4	2	33%	2	50%	2	50%
	Latin America and Caribbean	16	7	44%	9	56%	6	38%
	Western Europe and Others	33	18	55%	15	45%	11	33%
	Total	106	71	67%	35	33%	38	36%
Nomination by	Member/Observer	30						
	Stakeholder	65						
	MEP	11						

Overview of Experts Selected by the Organizing Committee			**% nominations accepted**
	Total Nominations Retained	21	20%
	Experts on Organizing Committee	7	
	Total Workshop Experts	28	
			% against nominations received
Region	Africa	7	37%
	Asia-Pacific	7	21%
	Eastern Europe	1	25%
	Latin America and Caribbean	6	38%
	Western Europe and Others	7	21%
Nomination by	Member/Observer	3	10%
	MEP	6	55%
	Stakeholder	11	17%
Gender	Female	11	39% of selected experts (31.4% of female nominations were selected)
	Male	17	61% of selected experts (23.9% of male nominations were selected)
IP/LC	IPs	9	32% of selected experts (23.7% of IP/LC nominations were selected)

Annex F: Background Paper

United Nations
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International Expert and Stakeholder Workshop on The Contribution of Indigenous and Local Knowledge Systems to IPBES: Building Synergies with Science

Convened by the Multidisciplinary Expert Panel of the Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES)
Hosted by the Ministry of the Environment Japan
Co-organized by UNESCO and UNU
Date: 9-11 June 2013
Venue: United Nations University,
Institute for Sustainability and Peace (UNU-ISP) Tokyo

Background Paper

1. Context

The 'Intergovernmental Platform on Biodiversity and Ecosystem Services' (IPBES) was established as the leading intergovernmental body for assessing the state of the planet's biodiversity, its ecosystems and the essential services they provide to society. IPBES provides a mechanism recognized by both the scientific and policy communities to synthesize, review, assess and critically evaluate relevant information and knowledge generated worldwide by governments, academia, scientific organizations, non-governmental organizations and indigenous communities. IPBES is unique in that it will aim to strengthen capacity for the effective use of science in decision-making at all levels.

At the third meeting towards the establishment of IPBES in 2010, Members adopted the Busan Outcome whereby they agreed inter alia that an IPBES should be established; collaborate with existing initiatives on biodiversity and ecosystem services; and be scientifically independent. One of the principles in the Busan Outcome was that IPBES would

> *Recognize and respect the contribution of indigenous and local knowledge to the conservation and sustainable use of biodiversity and ecosystems*
>
> (Busan Outcome, paragraph 7(d). UNEP/IPBES/3/3)

In fulfillment of this principle, the first Plenary of IPBES (IPBES-1) requested the Multidisciplinary Expert Panel (MEP) to convene a multidisciplinary and regionally-balanced expert and stakeholder workshop to provide input on the contribution of indigenous and local knowledge systems to the Platform. As a contribution to the IPBES intersessional process, the Ministry of the Environment of Japan has generously offered to host this workshop, which is to be co-organized by UNESCO and UNU in close collaboration with the MEP. Members, observers and other stakeholders were invited to nominate experts and stakeholders with relevant expertise and experience for participation in the workshop.

2. IPBES-1 decisions relevant to the organization of this meeting

At IPBES-1, the following decisions were taken in relation to the development of the IPBES work programme. Under the header Knowledge Systems, the Plenary:

> *Requests the secretariat to compile all comments received on the information document on recognizing indigenous and local knowledge and building synergies with science (IPBES/1/INF/5), and to support the Multidisciplinary Expert Panel in convening a multidisciplinary and regionally balanced expert and stakeholder workshop, among other actions, to provide input on this matter in developing the conceptual framework and other aspects of the work of the Platform.*
>
> *Invites members, observers and other stakeholders to submit nominations to the secretariat for participation in the multidisciplinary and regionally balanced expert workshop for consideration by the Multidisciplinary Expert Panel.*
>
> *Requests the Multidisciplinary Expert Panel to recommend possible procedures and approaches for working with different knowledge systems for consideration by the Plenary at its second session, drawing on the inputs received.*
>
> (Decision IPBES/1/2 Next steps for the development of the initial IPBES work programme, paragraphs 9-11. IPBES/1/12).

3. Objectives and Expected Results of the Expert Meeting

3.1. Objectives

a) Examine and identify procedures and approaches for working with indigenous and local knowledge systems in the framework of IPBES.

b) Review and assess possible conceptual frameworks for the work of IPBES that are based on or accommodate indigenous and local knowledge systems and worldviews.

3.2. Expected outcomes

A report of the meeting that will provide

- For consideration by the MEP, key messages and recommendations for procedures and approaches for working with indigenous and local knowledge systems in the framework of IPBES
- For consideration by the MEP, key messages and recommendations for conceptual frameworks that based on or accommodate indigenous and local knowledge systems and worldviews

3.3. Provisional Agenda

It is attached separately as Annex (G)

4. Working document

The IPBES Note by the Secretariat on *Consideration of initial elements: recognizing indigenous and local knowledge and building synergies with science* (IPBES/1/INF/5) (http://www.ipbes.net/images/documents/IPBES_1_INF_5_En.pdf) forms the main working document for the meeting. It is attached separately as Annex (_).

From 26 February – 15 April 2013, governments and other stakeholders were invited to review INF/5. These comments can be viewed at: http://www.ipbes.net/intersessional-process/comments-received.html

5. Organization and Participation

An Organizing Committee was formed to assist the IPBES Multidisciplinary Expert Panel with the logistical and organizational details of the meeting. Annex (B) details the list of Organizing Committee members.

The list of participants is attached separately as Annex (D).

6. Resource materials

A. Other IPBES documents relevant to discussions on indigenous and local knowledge

- IPBES Note by the Secretariat *Critical review of the assessment landscape for biodiversity and ecosystem services* (IPBES/1/INF/8)
  In particular Section V. Experience with integrating input from diverse knowledge systems (p. 10-13) (http://www.ipbes.net/images/IPBES_1_INF_8_En.pdf)

- IPBES Note by the Secretariat O*utcome of an informal expert workshop on main issues relating to the development of a conceptual framework for the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (IPBES/1/INF/9)
  In particular Key Message 3 that 'conceptual frameworks can be used to facilitate the inclusion of indigenous and local knowledge systems' (p. 13) (http://www.ipbes.net/images/ipbes_1_inf_9_en1.pdf)

- IPBES Note by the Secretariat *Draft procedures for the preparation, review, acceptance, adoption, approval and publication of assessment reports and other Platform deliverables* (IPBES/1/INF/3) (http://www.ipbes.net/images/IPBES_1_INF_3_En.pdf)

B. General IPBES decisions from IPBES-1

- IPBES 2013 intersessional timetable (www.ipbes.net/intersessional-process)

- IPBES Policies and procedures (http://www.ipbes.net/policies-and-procedures)

- IPBES-1 Decisions (http://www.ipbes.net/resources/2013-05-14-13-36-16/ipbes-1) with reference to

  – Rules of procedure for the Plenary of the Platform (IPBES/1/1), Next steps for the development of the initial IPBES work programme (IPBES/1/2)

  – Procedure for receiving and prioritizing requests put to the Platform (IPBES/1/3)

  – IPBES administrative and institutional arrangements (IPBES/1/4)

  – Status of contribution and initial budget for the Platform for 2013 (IPBES/1/5)

Annex G: Workshop Agenda

United Nations
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International Expert and Stakeholder Workshop on The Contribution of Indigenous & Local Knowledge Systems to IPBES: Building Synergies with Science

9-11 June 2013
Venue: United Nations University,
Institute for Sustainability and Peace (UNU-ISP) Tokyo

Draft Workshop Agenda

Saturday, June 08, 2013

Arrival of international participants

Check-in of international participants at Shibuya Tokyu Inn 1-24-10, Shibuya, Shibuya-ku, Tokyo, 150-0002 Tel (81) 3-3498-0109 Fax (81) 3-3498-0189

Sunday, June 09, 2013

8:30 to 8:50 AM	Registration
9:00 to 10:00 AM	**Opening Ceremony** Welcoming remarks from Dr. David M. Malone, UNU Rector Mr. Kazunori Tanaka, Senior Vice-Minister for the Environment, Government of Japan Mr. Kazuo Todani, Director-General, Research and Development Bureau, Ministry of Education, Culture, Sports, Science and Technology, Government of Japan Professor Zakri Abdul Hamid, Chair, IPBES (Intergovernmental Platform for Biodiversity and Ecosystem Services) Bertie Xavier, Member of the UN Permanent Forum on Indigenous Issues (PFII) Dr. Gretchen Kalonji, Assistant Director-General for the Natural Sciences, UNESCO (TBC)
10:00 to 10:30 AM	Break

10:30 AM to 12:30	**Contributions of Indigenous & Local Knowledge Systems to IPBES: Building Synergies with Science** Chair: Professor Takeuchi, UNU **Indigenous & Local Knowledge (ILK) in Biodiversity Conservation & Management: Points of origin and histories of interaction** *Fikret BERKES, Canada (University of Manitoba)* [15'] **Indigenous Peoples' engagement and experiences in Global Processes for biodiversity assessment and sustainable use** *Joji Carino, Philippines (Ibaloi)* [15'] Panel Discussion: **The diversity of sources and forms of ILK of relevance to IPBES** *Zemede Asafaw, Ethiopia (Addis Ababa University)* [5'] *Manuela Carneiro Cunha, Brazil (University of Chicago)* [5'] *Prasert Trakansuphakon, Thailand (Karen)* [5'] *Henrick Moller, New Zealand (University of Otago)* [5'] ▶ What are the places, livelihoods, practices, social systems, and worldviews associated with indigenous & local knowledge of relevance to IPBES? ▶ Who are the holders of relevant knowledge? ▶ What is the added-value of bringing ILK and Science together? Discussion
12:30 to 1:30 PM	Lunch
1:30 to 3:00 PM	**Session 1: Workshop Context and Purpose** Chair: Professor Zakri, IPBES An Overview of IPBES– *(Randy Thaman, IPBES MEP)* An IPBES Conceptual Framework: Outcomes of the international expert workshop – *Salvatore Arico, UNESCO* Indigenous & Local Knowledge in the framework of IPBES, with reference to the Secretariat Note on *"Consideration of initial elements: recognizing indigenous & local knowledge and building synergies with science" (IPBES/1/INF/5)* – *Douglas Nakashima*, UNESCO Workshop goals and process *(UNESCO and UNU)* Organization of the Workshop *(Meeting Co-Chairs)*
3:00 to 3:15 PM	Break
3:15 to 5:30 PM	**Session 2: Working Group Sessions - Scoping Experiences, Methodologies and Emerging Opportunities for Bridging across Knowledge Systems** Chair: Workshop Co-Chairs (3) ▶ What approaches, methods and techniques are used to bring together indigenous & local knowledge of biodiversity with scientific knowledge? ▶ What are the methodological challenges of bridging between ILK and science, natural and social sciences, quantitative and qualitative approaches? ▶ What factors contribute to the success or failure to build synergies? ▶ How can these lessons be successfully applied in operationalizing IPBES?
18:00	Reception at 2nd floor Reception Hall

Monday, June 10, 2013

9:00 am to 9:30 am	**Reports from Working Groups - Session 2** (10' each)
9:30 am to 12:00 pm	**Session 3: Parallel Working Groups** **a) Conceptual Frameworks/Worldviews of Indigenous Peoples & Local Communities: (in) compatibilities with the IPBES Conceptual Framework?** Chair: Edgar Selvin Perez, MEP Member ▶ Can an IPBES conceptual framework accommodate indigenous & local knowledge and worldviews? ▶ Can multiple frameworks be envisaged? ▶ If not, what are the challenges for indigenous knowledge holders who engage with IPBES? **b) Principles and Protocols of relevance to Indigenous & Local Knowledge** Chair: Phil Lyver, MEP member ▶ What types of principles, protocols and guidelines exist to facilitate the engagement between indigenous & local knowledge holders and science (from global to community scale; compulsory regulations or voluntary arrangements, FPIC, etc.) ▶ What experiences with these protocols can be shared? **c) Engaging Indigenous Knowledge-holders in IPBES and its Functions** Chair: Randy Thaman, MEP member ▶ What factors promote or limit ILK-holder engagement in IPBES? ▶ What measures might be taken to expand opportunities for an active and equitable dialogue?
12:00 pm to 1:30 pm	Lunch
1:30 pm to 5:30 pm *(Break from 3:00 to 3:15)*	**Session 4: Working Group Sessions – Identifying Gaps and Needs with respect to Procedures and Approaches for working with Indigenous & Local Knowledge in the Framework of IPBES** ▶ What major gaps in our understanding and implementation capacity must be addressed in order to identify Procedures and Approaches to bring ILK into IPBES

Tuesday, June 11, 2013

9:00 am to 10:30 am	**Reports from Working Groups - Sessions 3 and 4**
10:30 am to 11:00 am	Break
11:00 am to 12:30 pm	**Session 5: Plenary discussion - Key Messages and Recommendations to the MEP on bringing Indigenous & Local knowledge into the work of IPBES, and on the IPBES conceptual framework**
12:30 pm to 1:30 pm	Lunch
1:30 pm to 5:30 pm *(Break from 3:00 to 3:15)*	**Session 6: Plenary Discussion continued - Key Messages and Recommendations to the MEP on bringing Indigenous & Local knowledge into the work of IPBES, and on the IPBES conceptual framework** **Finalization of outcomes** **Final wrap-up and next steps**

Wednesday, June 12, 2013

International participants check-out from Shibuya Tokyu Inn
Departure of international participants

Annex H: Messages from Opening Ceremony

Available at: www.unesco.org/links

Annex I: Key Messages on Procedures and Approaches for working with ILK in the Framework of IPBES

Discussions of procedures and approaches for working with ILK took place during the opening day plenary and in parallel working groups. The key messages from those discussions are summarized below and grouped under the themes:

1. Rethinking Relationships: Science(s) and Indigenous and Local Knowledge
2. Fundamental Aspects of Indigenous and Local Knowledge
3. Principles for Engagement with Indigenous and Local Knowledge Holders
4. Capacity-building needs

Rethinking relationships: Science(s) and Indigenous and Local Knowledge

Disconnection and lack of synergy between natural and social sciences/humanities

The absence of synthesis and synergy amongst scientific disciplines, in particular the unresolved challenge of bridging between the natural sciences and the social and human sciences, is symptomatic of the larger challenge of building synergies between knowledge systems. 'Putting all of science into one box' remains problematic due to the compartmentalization of disciplines in the natural sciences, social sciences and humanities. Indigenous peoples and local communities, on the other hand, adhere to a more holistic perspective in which environment, economy, society, and spirituality recognized as being closely interrelated. There is a critical need for an approach that is interdisciplinary (bridging scientific disciplines, especially between the natural and social sciences) and transdisciplinary (bridging knowledge systems). This is particularly important both within the MEP, in terms of stakeholder engagement and in the down-scaling of IPBES deliverables from the global, regional and sub-regional to the national and local.

Limitations of sciences that are reductionist and quantitative

Conventional scientific approaches and methodologies are largely inadequate for addressing the vast cultural and natural diversity which must be considered when addressing threats to biodiversity and ecosystem services. These limitations have been further exacerbated by an over-emphasis on "hard" sciences and on quantitative rather than qualitative research. The term 'science' is often used in too narrow a sense, excluding the social and human sciences.

Limitations of scientific validation processes

There are innumerable examples in the scientific literature of indigenous and local knowledge and practices that are initially unintelligible to scientific interpretations and attempts at validation. For example, scientists have carried out independent research for decades on the role of fire in tropical savannah environments before finally concluding that traditional firestick management was the modality best-adapted to managing the biodiversity values of these landscapes. This initially-maligned traditional practice is now the cornerstone of national park management policy in Australia. As indigenous and local knowledge is rooted in empirical and philosophical traditions that are temporally-deep and thematically-broad, their outcomes and systems of explanation may confound validation efforts using the reductionist and quantitative approaches of science. In some cases, as in the example of firestick management, science may shift from an initial position of skepticism to one of agreement, after a long period in which scientists

adjust their methods and analyses in the light of indigenous and local understandings. In other cases, scientific efforts to validate may require considerably more investment, or may not succeed at all (e.g. diagnosing/treating disease and medical problems, predicting weather such as rain/drought, explaining hunting/fishing success or failure, etc.). Either way, the limitations of scientific validation processes are as much an issue as the exactitude of indigenous and local knowledge. In short, scientific validation as a prerequisite to acknowledging indigenous and local knowledge is not considered to be an appropriate way forward for IPBES. Other modalities such as co-production of knowledge or use of a multiple evidence base should be further explored.

Complementarity and synergy building rather than integration of knowledge systems

Integration infers an inequality between knowledge systems, as one set of knowledge is 'integrated' or absorbed into the other. This is usually understood as an integration of indigenous and local knowledge into science, in accordance with scientific principles, criteria and validation processes. Integration is not considered to be an acceptable approach for IPBES, as it presupposes a hierarchy amongst knowledge systems (with science being dominant), which may limit insights from other knowledge systems, as well as the creative potential from synergies between knowledge systems. Recognition of the complementary nature of knowledge systems, as well as the potential for building synergies, was considered the appropriate approach for IPBES.

Not only science but knowledge

Throughout IPBES documents and processes, the more encompassing term 'knowledge' should be systematically applied, replacing the more limited term of 'science' (which, as indicated above, is often used in the context of IPBES in the even more narrow sense of 'science' as the natural sciences).

Fundamental Aspects of Indigenous and Local Knowledge

One size does not fit all - Need for a diversity of approaches that understand, respect and are adapted to local values, norms, customs, taboos

Building synergies between knowledge systems requires an in-depth understanding of the incredible diversity of political, social, cultural, religious and environmental contexts, including the specificity of correct social interaction with respect to gender, age or status. For IPBES, establishing procedures and approaches that accommodate this enormous variability is a *sine qua non* for bringing science together with indigenous and local knowledge of relevance to assessments.

Not only knowledge but practice

When considering indigenous and local knowledge relating to biodiversity and ecosystem services, it is essential to also consider the practices and know-how that are part and parcel of knowledge. Knowledge should not be viewed as abstract and disconnected from the ways in which peoples act upon their environments and utilize its resources. Indigenous and local knowledge holders do not segregate knowledge from practice as both, in interaction, are sources of innovation, learning and new understandings. In the scientific arena, science is considered to be distinct from technology, and theory is separated from practice. If IPBES is to achieve its ultimate objective of contributing to halting biodiversity decline, then these additional compartmentalization must also be overcome, including the divide between scientists and practitioners on-the-ground, such as renewable resource managers, protected area managers or extension agents.

Importance of languages

Indigenous and local languages are essential vessels for nurturing and transmitting biodiversity knowledge (e.g. through vernacular naming conventions (nomenclature) and classification systems (taxonomies)). Dialogue on biodiversity and sharing across knowledge systems will pass (or fail) first and foremost by successful exchange across

linguistic barriers, which means rigorous translation not only of words (with their correct semantic fields) but also of concepts. In the same way that scientists are trained to master and uphold the precision and rigour of 'scientific language', indigenous and local knowledge experts master and uphold the rigour and precision of terminology in their indigenous languages, including with respect to biodiversity. IPBES must therefore pay attention to the central importance of indigenous and local languages, as vessels and vehicles for indigenous and local knowledge of biodiversity and ecosystem services.

Recognition of the specific roles and critical knowledge of women

It is essential for IPBES to take into account in its procedures and approaches the critical importance of the complementary and differential knowledge of women with respect to biodiversity. Also to be reflected is that fact that in many societies, women's knowledge can only be accessed by certain persons. In many Polynesian, Melanesian and Australian Aboriginal societies, for example, taboos are common that restrict men from talking to women, including brothers talking to sisters. Muslim societies also have important gender-related proscriptions. IPBES must incorporate these gender aspects in its work, and also improve the gender balance in its own bodies.

Importance of spirituality

The separation of the spiritual from the material is at the origins of scientific thought. This defining feature may hinder the engagement of science with indigenous and local knowledge systems, where such a separation of the spiritual from the material does not exist. As biodiversity knowledge in indigenous and local communities is framed at least in part by the spiritual, and by non-material relationships between human and non-human beings, IPBES must also develop procedures and approaches that can respectfully accommodate both scientific and indigenous worldviews.

Principles for Engagement with Indigenous and Local Knowledge

Problem-oriented approach/Multi-causal approach

There is a need to start with a problem-oriented approach to identifying priorities that inform biodiversity research and conservation. This approach should connect to objectives and problems as identified by local communities themselves and/or local governments because:

- biodiversity and ecosystem services mean different things to different people/groups,
- conservation means different things to different people,
- local areas and biodiversity inheritances and livelihoods are complex,
- most problems are complex and multi-causal, and
- most knowledge is linked to solving practical problems.

Sciences and ILK should be linked from project conception to outputs

Research and assessments should be conducted together in the field, as equals, so as to ensure co-production of knowledge. Indigenous peoples and local communities should participate in assessing the process of knowledge production. Building ownership of outputs is also critical, through the return of relevant findings in appropriate formats to ILK holders and co-authorship to recognize ownership and the central role of ILK holders in the generation of relevant assessments, scenarios and relevant policy for conservation and co-management of biodiversity and ecosystem services,

Building mutual trust and respect

Successful engagement with indigenous peoples and local communities requires mutual trust and respect. This means investing the time needed to build relationships with local communities and to establish mutual understanding of each other's requirements. The communities need to feel that they have control and ownership when a project is initiated and as it evolves.

Recognition and involvement of resource owners/users and knowledge holders

To achieve research or conservation objectives, it is important to insure that the original resource holders and knowledge holders are included and involved from the very beginning. To this end, engagement *in situ* is preferred so as to work directly with recognized experts in appropriate local contexts, rather than removing them from the places where their knowledge is situated and has meaning, or relying on intermediaries.

Involvement of appropriate local intermediaries and leadership

Outsiders need to invest time to understand which leaders or knowledge holders are trusted and influential. Local intermediaries or leaders who are engaged with the work may facilitate building local confidence. In other cases, local authorities may yield the opposite result and impede progress. Making well-informed choices about local collaborators is an essential requirement for IPBES.

Ethical approaches to working with indigenous peoples and local communities

In the framework of IPBES, all scientists need to be made aware of the ethical requirements for working with indigenous and local knowledge in indigenous and local communities, and must tailor their methodologies accordingly. Examples of relevant ethical guidelines include:

- The Tkarihwaié:ri Code of Ethical Conduct to Ensure Respect for the Cultural and Intellectual Heritage of Indigenous and Local Communities Relevant to the Conservation and Sustainable Use of Biological Diversity.
- Cultural safety guidelines and agreements between scientists and ILK holders that guide their behaviour, responsibilities and accountability relating to knowledge acquisition, ownership, release, implementation, sharing, and community capacity building.

Free, prior and informed consent (FPIC)

FPIC, as described in the UN Declaration on the Rights of Indigenous Peoples, was considered to be a pre-condition for success when bridging between indigenous and local knowledge and the sciences. Furthermore, indigenous intellectual property rights relating to knowledge of interest to IPBES must be recognized and assured.

Clear and mutually-agreed-upon agendas

There is a need to make clear what the agendas are, who is to benefit and how, how long it will take, how local people are to be compensated, how long you agree to work together, how results will be distributed, who can publish and under what conditions, who will be the authors/owners, how to deal with the media, etc.

Sharing the benefits of research

Scientists ask local communities to share their knowledge but in turn do not necessarily share research findings and outputs. The participation of indigenous and local people should be recognized by scientists, and there is a need to share the benefits of research, and to return outputs to the communities.

Need for compensation/provide return value

It is important to confer value on consultations/research with indigenous and local knowledge holders, and to make clear the responsibilities and associated benefits. Benefits may be in non-monetary, however most communities, even in remote locations, are tied into the money economy.

Capacity-building needs

Importance of education and awareness-raising

The need for education and awareness-raising in this emerging area of work was repeatedly emphasized. Capacity-building is required on both sides, and in both directions, with scientists receiving training on indigenous and local knowledge, and indigenous peoples being trained on science. Furthermore awareness-raising is required with all key stakeholders, including decision-makers, management practitioners, protected area managers, the private sector, the general public etc.

Training scientists about indigenous and local knowledge

Contemporary science education is not self-reflexive, and continues to educate young scientists to accept science as a unique and superior knowledge form, while marginalizing historical and philosophical research that sets such claims into a broader perspective. Science education does little to prepare scientists to acknowledge and respect other systems of knowledge. IPBES goals would be served by efforts to expose scientists to a more inter-cultural understanding of human-environment relations and the diversity of related knowledge systems.

Indigenous and local knowledge in education curricula

Formal education curricula, for indigenous and non-indigenous students alike, should include teachings about and based upon indigenous and local knowledge. Indigenous-based content relating to biodiversity should be taught alongside or as part of science education, but without science serving as a filter or gate-keeper for knowledge from other cultures. Particular importance should be placed on the involvement of ILK holders as teachers and curriculum developers in order to build two-way synergies between ILK and science in the formal education system.

Building awareness about IPBES amongst indigenous peoples

More time should be given to indigenous peoples and local communities to be informed about IPBES and to inform the IPBES process through systems for delivering ILK. IPBES could provide a centralized place for communities to bring their concerns to the attention of scientists.

Building capacities of local/indigenous scientists

Indigenous peoples who have been raised in their own cultures and knowledge systems and who then become scientists, may help bridge across knowledge systems. They may also better engage local communities because there is more trust in their 'own' scientists. The provision of a fellowship programme is a goal of Objective 1 in the draft IPBES Work Programme (to "*Enhance the foundation of the knowledge policy interface for biodiversity and ecosystem services*"). This fellowship programme could be opened to recipients from indigenous peoples and local communities with an emphasis on training in both the sciences and ILK systems.

Loss of ethnobiodiversity may be a more serious crisis that the loss of biodiversity

Indigenous and local knowledge is lost as older generations pass away, livelihoods and lifestyles change, schools teach only mainstream languages and scientific knowledge, environments are transformed, access to traditional territories and resources is barred, etc. For IPBES, this loss of ethnobiodiversity may be one of the most serious constraints to the actual conservation and sustainable use of biodiversity and ecosystem services. Erosion of indigenous knowledge reduces opportunities to benefit from understandings rooted in long histories of interaction with the natural environment, and diminishes insights from building synergies with science.

Part II

United Nations
Educational, Scientific and
Cultural Organization

Science and Policy
for People and Nature

Initial elements of an IPBES approach: Towards principles and procedures for working with Indigenous and Local Knowledge (ILK) systems

Prepared by IPBES MEP and Bureau Working Group on ILK systems in conjunction with UNESCO

5 October 2013

This text is an information document for the second plenary session of IPBES (IPBES/2/INF/1/Add.1) and can be downloaded from: http://ipbes.net/plenary/ipbes-2-documents.html.

Table of Contents

1. Background and Goal

At the first Plenary of IPBES (IPBES-1) that took place in January 2013 in Bonn, the following decisions were taken in relation to the development of the IPBES work programme with respect to 'Knowledge Systems':

> *Requests the secretariat to compile all comments received on the information document on recognizing indigenous and local knowledge and building synergies with science (IPBES/1/INF/5), and to support the Multidisciplinary Expert Panel in convening a multidisciplinary and regionally balanced expert and stakeholder workshop, among other actions, to provide input on this matter in developing the conceptual framework and other aspects of the work of the Platform.*
>
> *Invites members, observers and other stakeholders to submit nominations to the secretariat for participation in the multidisciplinary and regionally balanced expert workshop for consideration by the Multidisciplinary Expert Panel.*
>
> *Requests the Multidisciplinary Expert Panel to recommend possible procedures and approaches for working with different knowledge systems for consideration by the Plenary at its second session, drawing on the inputs received.*
>
> Decision IPBES/1/2, paragraphs 9-11

Responding to this decision, UNESCO on behalf of the IPBES secretariat compiled comments received on the information document (INF/5) on recognizing indigenous and local knowledge (ILK) and building synergies with science, and integrated these comments into a revised version with bracketed text.

Furthermore the international expert workshop on 'The Contribution of Indigenous and Local Knowledge Systems to IPBES: Building Synergies with Science' was convened by the IPBES MEP and co-organized by UNESCO and UNU (Tokyo, 9-11 June 2013). Experts at the workshop formulated a series of Recommendations and Key Messages contained in the draft workshop report.

From the workshop report, the following recommendation is of particular relevance for the present document. It proposes the meaningful inclusion of ILK and ILK holders in all aspects of IPBES work, as well as the inclusion of ILK not only in carrying out the IPBES assessment function, but also in fulfilling the three additional functions of policy support, knowledge generation and capacity-building.

> *In line with the Operating Principles of the Busan Outcome that form the basis of IPBES, as well as Article 8(j) of the Convention on Biological Diversity and Aichi Target 18, which recognize and respect the contribution of indigenous and local knowledge to the conservation and sustainable use of biodiversity and ecosystems, IPBES should ensure that a meaningful and active engagement is established with indigenous and local knowledge (ILK) holders in all relevant aspects of its work and across all of its functions including by:*
>
> *(a) recognizing that indigenous peoples and members of local communities have distinct status as knowledge-holders and rights-holders;*
>
> *(b) putting in place mechanisms and procedures to ensure effective participation in the MEP itself and its activities, including in any working groups, expert bodies and other structures that may be established, in the development of the conceptual framework and work programme, as well as in outreach to indigenous peoples and local communities (IPLCs).*
>
> *Recommendation 1 from the international expert meeting on 'The Contribution of Indigenous and Local Knowledge to IPBES' (Tokyo, 9-11 June 2013)*

Furthermore, experts from the Tokyo workshop recommended that IPBES organize a step-wise process under the auspices of an [interim] working group. This working group would ensure that IPBES adopts a state-of-the art set of procedures and

approaches by conducting the necessary scoping of experience, analyzing gaps, identifying continuing challenges and emerging solutions, and developing innovative modalities for working with ILK across all four IPBES functions.

> *To attain the work programme milestone relating to other knowledge systems, and to ensure a consistent and rigorous approach to linking ILK and science within IPBES, IPBES should establish, under the guidance of the MEP, an [interim] working group composed of ILK-holders and scientists[6], amongst others, to:*
>
> *a. conduct a scoping of existing experiences, approaches and methodologies on bridging between scientific and indigenous knowledge systems to better understand and assess status and trends with respect to biodiversity and ecosystem services;*
>
> *b. further analyze and address gaps in procedures and approaches for working with different knowledge systems in the framework of IPBES;*
>
> *c. identify challenges and possible ways forward with respect to evolving work on free, prior and informed consent (FPIC), intellectual property rights, customary governance over indigenous and local knowledge, and access and benefit-sharing;*
>
> *d. further develop modalities for building synergies between indigenous & local knowledge and science by fostering the development of innovative approaches, such as knowledge co-production and multiple-evidence base;*
>
> *e. develop guidelines for linking indigenous and local knowledge with science at all levels, recognizing the roles and relevance of international policies and protocols, including those related to access and benefits-sharing;*
>
> *f. develop guidelines for novel and culturally-appropriate ways to review, validate and disseminate results, which could complement traditional systems of validation and results dissemination while strengthening synergies between ILK and science;*
>
> *g. define in precise terms (i) ILK-based indicators that contribute to measuring progress towards IPBES goals as well as the benefits of IPBES for indigenous peoples, and (ii) initiate a monitoring programme to measure and report on those ILK-based indicators in a regular and transparent way.*
>
> *Recommendation 3 from the international expert meeting on 'The Contribution of Indigenous and Local Knowledge to IPBES' (Tokyo, 9-11 June 2013)*

Recommendations from the workshop were reviewed by the IPBES Bureau and MEP at its meeting in Cape Town, South Africa (27-30 August 2013) and are to be considered by the IPBES Plenary at its second meeting in Antalya, Turkey (9-13 December 2013). The current draft work programme that is being prepared for consideration by the second IPBES Plenary proposes under Deliverable 1(c) that a time-bound and task-specific expert group will be established to further develop a guide on '***procedures and approaches for working with indigenous and local knowledge systems***' for approval at IPBES-4 (anticipated in early 2016) so that it can inform the process for developing other ongoing IPBES deliverables, in particular the regional/sub-regional assessments. The proposed actions will contribute towards fulfilling the recommendations from the Tokyo workshop. Further support will therefore likely be required in order for IPBES to adhere to its Operating Principles and meet its work programme objective of 'effectively integrating (including)' indigenous and local knowledge as an important function of the platform.

While awaiting the forthcoming deliberations and decisions of the MEP and Plenary on the Tokyo workshop recommendations and on the larger framework for IPBES action with respect to indigenous and local knowledge systems, this document attempts to advance reflection in one limited area of IPBES work. Based on the deliberations and outputs from the Tokyo workshop, it proposes initial elements for a preliminary guide that may serve during the first round of IPBES thematic, sub-global and global assessments. This preliminary guide may also serve as a first step towards the guide on procedures and approaches for working with indigenous and local knowledge systems that would address all four IPBES functions.

[6] In this context 'scientist' may include professionals from all scientific disciplines in the natural, social and human sciences, and also refer to science practitioners, including natural resource and environmental managers.

2. Introduction and Basic Concepts

In the face of the global biodiversity crisis and its emerging challenges and unknowns, it is essential that decision-makers and practitioners base policies and actions on the best available knowledge. The bio-physical and social sciences contribute significantly to our collective understanding of earth systems, social systems and their interactions. However, there has been a growing awareness that scientific knowledge alone is inadequate for addressing the erosion and degradation of biodiversity and ecosystem services. In particular, the knowledge of indigenous peoples and local communities – often referred to as local, indigenous or traditional knowledge – is increasingly recognized as a source of vital importance.

This chapter provides a brief introduction to basic definitions and concepts in the field of indigenous and local knowledge (ILK) as it relates to the sustainable use of biodiversity, its conservation and related decision-making. Reference is made to numerous studies that document how indigenous knowledge has provided the basis for more informed and effective decision-making with respect to biodiversity.

2.1. Who are 'indigenous peoples'?

Indigenous peoples live in all regions of the world and own, occupy or depend on resources from approximately 22% of the global land area, which in turn harbors 80% of the world's biological diversity (UNDP, 2011: 54). They are estimated to number some 370 million people, and represent the greater part of the world's cultural diversity (UNPFII, n.d.), including the major share of the world's almost 7000 languages (Harrison, 2007). At the nexus of the world's cultural and biological diversity, indigenous knowledge, practices and worldviews contribute importantly to the conservation and sustainable use of genetic, species and landscape diversity.

In view of the global distribution of indigenous peoples, the diversity of their environments and cultures, their varied histories of contact and interaction with other societies, and the broad spectrum of political contexts in which they live, it is impossible to formulate a definition of 'indigenous peoples' with universal application. Operational definitions converge around a set of core criteria that generally include:

- maintenance of social and cultural traits distinct from those of mainstream or dominant society (which may include distinct languages, production systems, social organization, political and legal systems, spirituality and worldviews, among other aspects);
- ties to ancestral territories and to the natural resources of these places;
- self-identification and recognition by others as being part of a distinct cultural group (Cobo, 1986);
- In many instances, reference is also made to a historical or continuing experience of subjugation, dispossession and marginalization.

Whereas application of the term 'indigenous peoples' has been relatively straight forward in regions and countries with a clear history of colonial occupation such as North, Central and South America, Australia, New Zealand and the Pacific Islands, use of the term has proven to be more complex in other regions such as Africa and Asia. The African Court of Peoples and Human Rights has recently made an important effort to clarify the concept in the African region, proposing criteria similar to those listed above but adapted to the continent's context and history, and proposing an open-ended listing of African indigenous peoples.

Terms used to designate indigenous peoples vary considerably with place, social context and historical moment. Native, aboriginal or tribal peoples, hill tribes, traditional owners, scheduled tribes, sea gypsies, Indians, bushmen, First Nations or ethnic minorities are only a few of the many terms that may be applied to and by indigenous peoples. Other names are more clearly derogatory such as savages, primitives or 'indigenes' (as opposed to the more neutral

French term 'autochtones'). Some members of indigenous groups may hide their identity due to the negative connotations of the 'indigenous label' in some countries and contexts (Montenegro and Stephens, 2006). Many groups that self-identify as indigenous peoples are not recognized as such by the countries in which their homelands exist. Many indigenous homelands extend across national borders, and in some cases a single people may find themselves divided among several countries (UNPFII, n.d.).

2.2. What is indigenous and local knowledge?

The terms 'indigenous and local knowledge' make reference to knowledge and know-how accumulated across generations, which guide human societies in their innumerable interactions with their surrounding environment. Berkes defines such traditional ecological knowledge as: 'a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment' (2012: 7).

These knowledge systems are transmitted and renewed by each succeeding generation, and ensure the well-being of people around the globe by providing food security from hunting, fishing, gathering, pastoralism or small-scale agriculture, as well as healthcare, clothing, shelter and strategies for coping with environmental fluctuations and external forces of change (Warren, Slikerveer and Brokensha 1995; Sillitoe, Bicker and Pottier, 2002; Nakashima and Roué, 2002; Sillitoe, 2007).

An abundance of labels for this knowledge co-exist in the literature. Common terms include but are not limited to indigenous knowledge, traditional knowledge, traditional ecological knowledge (TEK), local knowledge, farmers' knowledge, folk knowledge and indigenous science. Although each term may have somewhat different connotations and reference groups, they often share sufficient meaning to be utilized interchangeably in many contexts (Berkes, 2012; Nakashima and Roué, 2002). While many of examples put forward relate to knowledge developed and maintained by indigenous peoples, it should be kept in mind that valuable local knowledge of relevance for biodiversity assessment is also held in non-indigenous, rural societies (Grabherr, 2009; Lawrence, 2009). To capture both of these major sets of knowledge, the term indigenous and local knowledge (ILK) is the principle term used throughout this document.

In this document, the term 'knowledge' is used in its broadest sense. In Occidental cultures, knowledge (in particular, scientific knowledge) is often distinguished from practice (e.g. science vs. technology) and the rational is opposed to the spiritual (e.g. science vs. religion). In indigenous worldviews, however, these elements are combined in a holistic understanding of interaction with the surrounding environment. Indigenous knowledge thus encompasses not only empirical understandings and deductive thought, but also community know-how, practices and technology; social organization and institutions; and spirituality, rituals, rites and worldviews. For the purposes of this document, indigenous and local knowledge marries the rational with the symbolic, and interlinks the theoretical, empirical, and practical (Nakashima and Roué, 2002).

2.3. What is the relevance of indigenous and local knowledge to IPBES?

People in all world regions have developed, nurtured and passed on extensive and sophisticated knowledge about the bio-physical environment that has allowed them to survive and prosper in virtually all of the world's ecological systems. With the growing pre-eminence of science, this local, traditional and indigenous knowledge has tended to be stereotyped as archaic, anecdotal, irrational and riddled with superstition.

Interdisciplinary research during the last several decades, however, has countered these misrepresentations. The contributions of indigenous and local knowledge systems towards a better understanding of biodiversity and its sustainable use and management, has been recorded in the scientific and gray literature in many domains: biodiversity conservation and wildlife management (Freeman and Carbyn, 1988; Inglis, 1993; Berkes, 2012), customary marine

resource management (Johannes, 1978; 2002; Hickey, 2006; Haggan, Neis and Baird, 2007), rural development and agroforestry (Falanruw, 1989; Scoones and Thompson, 1994; Sillitoe, Bicker and Pottier, 2002), traditional medicine and health (Ford et al., 2010; Pourchez, 2011), impact assessment (Sadler and Boothroyd, 1994; Usher, 2000); and natural disaster preparedness and response (Shaw, Uly and Baumwall, 2008).

This extensive documentation illustrates many of the benefits that IPBES could derive from reinforcing synergies between indigenous and local knowledge systems and science. This includes benefits to science and scientists such as:

- more holistic knowledge that inter-relates information across multiple bio-physical, social and human science disciplines;
- historical timeline data that may in some cases extend back over several generations;
- localized and fine-grained observations at inaccessible spatial and temporal scales;
- information from regions and ecological systems as yet poorly known to science or where scientific research has been patchy in time and/or space;
- information and understandings as yet unknown to science or that challenge current scientific thinking and representations;
- observations on the generation, maintenance and use of biodiversity by one of its major user groups.

It also generates benefits for indigenous and local knowledge holders including:

- opportunities to exchange and share knowledge and understandings about their biodiversity (plants, animals, landscapes, etc.) that brings recognition and respect for their societies and cultures;
- opportunities to secure sustainable use (including customary sustainable use) of their biodiversity (plants, animals, landscapes, etc.) that brings recognition and respect for their societies, cultures and knowledge systems;
- opportunities to correct misunderstandings or misinterpretations about local biodiversity based on poor or inadequate science;
- re-affirmation of their identities, as well as their intimate knowledge of and the strength of their ties to homelands and territories;
- engagement with government processes of knowledge generation, assessment and decision-making that have direct impacts on their lives and livelihoods.

Finally strong synergies between indigenous and local knowledge systems and science may provide benefits to decision-makers, including:

- enhanced communication and exchange with major knowledge holders on biodiversity and ecosystems services including both scientists and indigenous and local knowledge holders;
- improved decision-making based upon a more complete, up-to-date, relevant and consensual knowledge base;
- more successful implementation of conservation and management decisions due to the direct involvement of indigenous peoples and local communities who both know and use biodiversity and ecosystem services.

3. Elements for an Initial IPBES Approach: Principles and Procedures for Building Synergies Between ILK and Science

3.1. Engaging with ILK holders and communities: basic requirements

The IPBES work programme includes the goal of 'understanding … how to effectively integrate local and traditional knowledge' as an important function of the platform (UNEP/IPBES.MI/2/9, para. 20). If IPBES is able to build synergies between indigenous and local knowledge systems and science as a basis for more holistic subregional, regional and/or global assessments, it will indeed have made a significant and unique contribution towards better understanding, conserving and managing biodiversity and ecosystems services, while significantly reinforcing the science-policy interface. Included in the Annex are basic steps that could be followed in synergizing ILK with science as a basis for the implementation of the IPBES programme of work.

Before this goal can be satisfactorily attained, however, certain obstacles need to be overcome. They are not insignificant and may include amongst others:

- the mistrust of ILK holders who have suffered from the misappropriation of indigenous and local knowledge, including through biopiracy of medical, pharmaceutical, agricultural and other knowledge without respect, consultation, consent nor benefit sharing;
- the ethnocentrism of scientists and decision-makers who are educated to consider science as superior to other forms of knowledge, and who thus consider that indigenous and local knowledge lacks empiricism, logic and rigour;
- the bias of decision-making institutions and processes that have traditionally upheld the status quo of mainstream society and perpetuated the marginalization of indigenous peoples and local communities without recognizing the importance of their specific knowledge systems, values, priorities, and needs.

This being said, projects across the globe have successfully demonstrated that diverse knowledge systems, whether indigenous, local or scientific, can join forces. During the last several decades, there have been numerous efforts, with varying degrees of success, to recognize and respect indigenous and local knowledge, while building synergies with science. Emblematic cases include the indigenous Inupiat whalers of the North Slope of Alaska (USA) who completely revised population size estimates for the Bowhead Whale in the 1970s based upon their unique knowledge that whales migrate not only along shore leads but also far offshore and, even more surprisingly for whale biologists at the time, that the whales migrate under the ice. Similarly, the Australian national park policy recognises that biodiversity values are best conserved through traditional Aboriginal firestick management. Based upon similar research outcomes, wildlife resource management policy in northern Canada formally requires the incorporation of traditional knowledge alongside science.

While ground-breaking work of this nature has been documented from many places in the world, these achievements have generally been restricted to local and sub-national scales. Efforts to extend to sub-regional, regional and global levels have so far been largely unsuccessful. Bridging knowledge systems was an explicit goal of the Millennium

Ecosystem Assessment, but it has remained largely unfulfilled. Today the sub-regional Arctic Biodiversity Assessment is making advances in this challenging area of work, creating opportunities for global platforms such as IPBES to bring indigenous and local knowledge into regional and global decision-making and action for conserving biodiversity and ecosystems services.

Beyond mere recognition and respect for indigenous and local knowledge, IPBES' stated objectives are to build strong synergies between indigenous and local knowledge and science, and to engage with indigenous and local knowledge holders, as core priorities of the IPBES programme of work. Engagement with ILK should be conducted in accordance with the preliminary principles outlined in Annex 2. Several decades of interaction with ILK holders have made clear that some of the necessary pre-conditions for the success of such engagements include:

Recognizing indigenous peoples as knowledge holders

To appropriately frame its overall action with respect to ILK, IPBES may wish to clearly recognize indigenous peoples and local community members, along with scientists, as knowledge holders of central relevance to the goals of IPBES. Recognizing ILK holders as a group distinct from other "stakeholders" would be in line with the IPBES Operating Principles of the Busan Outcome, as well as Article 8(j) of the Convention on Biological Diversity and Aichi Target 18, all of which recognize and respect the contribution of indigenous and local knowledge to the conservation and sustainable use of biodiversity and ecosystems. Conferring special status on relevant knowledge holders, whether they be indigenous peoples, local community members or scientists, would have important implications for IPBES procedures and approaches for building synergies among diverse knowledge systems.

Establishing mutual trust and respect

Successful engagement among indigenous peoples and local communities, scientists and decision-makers requires mutual trust and respect. This means dedicating the time and energy required to overcome misunderstandings, misconceptions and apprehensions which in some cases may be deeply-rooted, so as to come to a point of mutual acceptance and understanding of each other's observations, interpretations, values, worldviews and priorities. The success of knowledge sharing and collaborative action depends on the degree to which mutual respect and trust can be established, nurtured and maintained as part of a long-term relationship.

Involving ILK in all assessment phases: from conception through to outputs

Efforts to achieve interdisciplinarity regularly fail due to belated efforts to bring on board other disciplines (typically social science disciplines), which some would claim are merely an 'add-on' or 'after-thought'. The weakness of ILK in the MA process may be attributed at least in part to this major shortcoming. If ILK-science collaboration is to succeed in IPBES, it is important that all relevant knowledge holders are involved early (from conception stage), equitably (ensuring equal access to information and decision-making), and consistently (throughout the entire process to assessment outputs). Communities need to know that they have an acceptable degree of control and ownership when an action, such as an IPBES assessment, is initiated and as it evolves. Assessments should be conducted together in the field, as equals, so as to ensure co-production of consensual and policy-relevant conclusions. Indigenous peoples and local communities should participate in assessing the process of knowledge production. Building ownership of outputs is also critical, through the return of relevant findings in appropriate formats to ILK holders and co-authorship to recognize ownership and the central role of ILK holders in the generation of relevant assessments, scenarios and relevant policy for conservation and co-management of biodiversity and ecosystem services.

Recognition of resource owners/users and knowledge holders

To achieve research or conservation objectives, it is important to ensure that the original resource holders and knowledge holders are included and involved from the very beginning. To this end, engagement ***in situ*** is preferred so as to work directly with recognized experts in appropriate local contexts, rather than removed from the places where their knowledge is situated and has meaning, and instead of relying on intermediaries.

Involvement of appropriate local intermediaries and leadership

Outsiders need to invest time to understand which leaders or knowledge holders are trusted and influential. Local intermediaries or leaders who are engaged with the work may facilitate building local confidence. Making well-informed choices about local collaborators and the most appropriate avenues through which to engage with them is an essential requirement for IPBES.

Ethical approaches

In the framework of IPBES, all scientists need to be made aware of the ethical requirements for working with indigenous and local knowledge holders in indigenous and local communities, and must tailor their methodologies and protocols accordingly. Examples of relevant ethical guidelines include:

- The Tkarihwaié:ri Code of Ethical Conduct to Ensure Respect for the Cultural and Intellectual Heritage of Indigenous and Local Communities Relevant to the Conservation and Sustainable Use of Biological Diversity;
- Cultural safety guidelines and agreements between scientists and ILK holders that guide their behaviour, responsibilities and accountability relating to knowledge acquisition, ownership, release, implementation, sharing, and community capacity building.

Free, prior and informed consent (FPIC)

FPIC, as described in the UN Declaration on the Rights of Indigenous Peoples, is increasingly considered the universal standard for equitable engagement with indigenous peoples and local communities. Synergies between indigenous and local knowledge holders and scientists cannot be developed without partnership, and partnership cannot be established without mutual consent, and a clear understanding of the objectives, reasons for and possible benefits of IPBES engagement with ILK systems. Furthermore, indigenous intellectual property rights relating to knowledge of interest to IPBES need to be recognized and assured.

Benefit-sharing

Scientists ask local communities to share their knowledge but in turn do not necessarily share research findings and outputs. The participation of indigenous and local people should be recognized by scientists, and there is a need to share the benefits of research, and to return outputs to the communities. There is, as suggested above, great scope for including local ILK experts as co-authors of IPBES outputs, which achieves the dual goal of ensuring both recognition and ownership of the outputs, as well as providing a basis for their involvement in policy-making to address biodiversity issue

3.2. Working with ILK in IPBES assessments

Having outlined some basic requirements for a successful engagement with ILK holders (Section 3.1), this section proposes initial methods and techniques for bringing relevant ILK into IPBES assessments. While ILK complements science and provides valuable additional data and understandings to improve biodiversity decision-making, it is evident from the previous sections that indigenous and local knowledge is developed, owned, stored, shared, accessed and disseminated in ways that are very different from scientific knowledge. For this reason, procedures identified to incorporate ILK in IPBES assessment processes cannot be expected to be identical to those designed for incorporation of scientific knowledge. If IPBES and its MEP are to attain the stated work programme goal of 'integrating' indigenous and local knowledge into the functions of the platform then alternative modalities, which differ from many of those for science and which are adapted to the unique nature of ILK, need to be developed, adopted and resourced.

3.2.1. Identifying relevant ILK for IPBES assessments

When initiating an IPBES assessment, one of the first challenges will be to determine, in view of the assessment objective, whether ILK holders may be concerned and whether ILK may be relevant. This may be self-evident in cases where assessments concern biodiversity use, processes, genetic resources, species, landscapes or ecosystems services of central importance to the livelihoods, territories and cultures of indigenous peoples and local communities.

For example, the proposed IPBES thematic assessment of 'pollination and its impact on food security' (IPBES Draft Work Programme 2014-18) would no doubt benefit from the knowledge possessed by the numerous indigenous groups who are specialized in wild honey collection and who may therefore offer time-depth observations and knowledge about wild species of honey-collecting bees and other insects, including their distribution, plant-animal interactions and population status (including eventual declines). Indigenous peoples and local communities also have important knowledge about the large number of flowering plants that are essential for their food security and which depend on the health of pollinator populations.

The proposed IPBES 'thematic assessment on degradation and restoration of land and freshwater systems and/or biodiversity and agriculture' provides another example, which relates directly to the livelihoods and social vulnerability of local communities. Local peoples are often best-placed to know how and why their socio-ecological vulnerability increases. Restoring local arrangements that maintain critical resources like water, soil production, refuge and other services can help guarantee the long-term sustainability of local livelihoods and production systems.

In other cases, even though ILK may be of relevance to biodiversity assessment and scenario development, it may be overlooked due to the absence of documentation in the scientific or gray literature, or the ignorance of assigned Authors and Reviewers. In such cases, targeted scoping is essential to ensure that relevant ILK and ILK holders are identified and drawn into the assessment and review processes.

Primary Sources: Identification by ILK holders and ILK researchers

Indigenous and local knowledge holders serve as primary sources of knowledge that may be of direct relevance to IPBES assessments. The challenge for IPBES is to identify the key indigenous peoples and local communities that possess relevant knowledge. A series of nested consultations with indigenous peoples and local communities and researchers with expertise in the domain can be conducted from the global level down to regional, sub-regional and local levels. For indigenous peoples, numerous interlinked networks exist starting at the highest level with the UN Permanent Forum on Indigenous Issues (UNPFII). From the global, regional, national and down to local levels, these networks can serve as an initial medium to relay IPBES scoping efforts and assist in the identification of primary sources of relevant ILK. Similar professional networks exist amongst researchers and academics specialized in indigenous and local knowledge or related themes, linking global, regional and national expertise.

Identifying groups or individuals with specialized knowledge

Once indigenous peoples or local communities identify themselves or are identified as possessing pertinent knowledge, and express their interest in being involved in an IPBES assessment, it is important to identify within the group those sub-groups or individuals that possess knowledge of particular relevance. While much knowledge is shared and familiar to all, acknowledged experts or specialists exist within most indigenous and local communities. These may be specific older men or women, highly skilled and respected hunters, fisherfolk or gatherers, agriculturalists, crafts persons or traditional health specialists with unique knowledge of medicinal plants. These culturally-designated individuals, groups, lineages or clans may possess specialized knowledge and skills tied to a certain land or sea territory, or specific ecosystem. Understanding the social complexities of knowledge distribution, acquisition, sharing and access within indigenous peoples and local communities, and how these differ from but can be synergized with modern science, may be essential for the success of IPBES' engagement with ILK and ILK holders.

Gender-specific knowledge and IPBES assessments

Women and men commonly fulfill different, but complementary roles and responsibilities in relation to different components of biodiversity and biodiversity use systems, resulting in different knowledge, needs, concerns and priorities. In many island and coastal countries, for example, women generally have greater knowledge of medicinal plants, nearshore small finfish and marine invertebrates, and handicraft plants and animals, whereas men commonly have greater knowledge of timber and woodcarving resources, larger fish and offshore marine resources. Much of this knowledge, regardless of the gender of the holders, may serve as important indicators of the health of biodiversity and ecosystem services in a given area. For these reasons, IPBES assessments may pay special attention to the gender-based nature of ILK knowledge and consider the differential content and relevance of men and women's knowledge for specific assessments.

To identify such gender specific knowledge may require specific procedures and methods. In some societies, for example, women's knowledge is only accessible to specific individuals. In many Polynesian, Melanesian and Australian Aboriginal societies, taboos commonly restrict men from talking to women, including in some societies brothers talking to sisters. IPBES may need to identify targeted procedures in order to benefit from gender-specific knowledge, while respecting the gender-specific protocols of indigenous peoples or local communities.

Geographic considerations when identifying relevant ILK holders

With respect to geographic scale, some sets of indigenous knowledge may coincide with the sub-regional or regional focus of an IPBES assessment. For example, some nomadic or semi-nomadic peoples, including specific families or individuals, may range over large territories of regional scope and collect observations and knowledge that cuts across one or more national boundaries. Other peoples may be less mobile, but because their homelands traverse the borders of two or more countries, their shared cultural and linguistic heritage and collective knowledge may also contribute importantly to a sub-regional or regional assessment.

For more localized but contiguous groups, the biodiversity knowledge of indigenous peoples and local communities may be juxtaposed to provide relevant knowledge extending across IPBES assessment sub-regions or regions. On the other hand, if an IPBES assessment concerns long-distance transboundary migratory species, then even spatially-limited knowledge may prove to be invaluable where the territory of a group is located at a strategic point along a migratory corridor. This has been demonstrated to be the case for the Rakiura Māori of New Zealand who harvest the chicks of the sooty shearwater, ***Puffinus griseus***, at their nesting grounds. In these cases, their site-specific observations and knowledge may provide critical snapshots of population health, abundance, composition or vulnerability, while creating opportunities for co-management and conservation. Such transboundary knowledge may also be critical for monitoring and managing the spread of invasive alien species and diseases at subnational, national and international levels. Understanding and correctly scoping these spatial dimensions of ILK may be of critical importance to assessment processes.

Relevant indigenous practices and techniques for IPBES assessments

Whereas scientists separate science from technology and technique, and differentiate theory from practice, indigenous and local knowledge holders recognize that knowledge is linked to practice and problem-solving, and through practice (seeing and doing), knowledge is transmitted and problems are resolved (including resource overexploitation). When bridging between different knowledge systems, IPBES may need to consider the relevant knowledge expressed not only through abstractions and words, but also through practice and techniques. For example, the practice of Aboriginal firestick management (i.e. when, what and how to burn) harbours within it a profound understanding of the workings of a fire-adapted ecological system and in this manner, it is through practice that biodiversity is created, maintained and managed across entire landscapes. This knowledge expressed through practice may not be immediately available to IPBES assessments in the form of an abstract and reductionist analysis, but may require 'translation' between knowledge systems.

Bridging knowledge systems requires bridging worldviews

The separation of the spiritual from the material can be traced to the very origins of science. This defining feature of scientific philosophy is just as important today, but it may hinder science's efforts to engage with knowledge systems where the spiritual and the material are often interlinked and inter dependent. These fundamental differences in cosmology and worldview need not impede a productive collaboration in the framework of IPBES. Areas of constructive dialogue and exchange can be fostered alongside matters over which one agrees to disagree. Benefiting from previous experiences of productive partnerships between ILK holders and scientists, IPBES may wish to build the capacities of its collaborators in order to foster productive knowledge-sharing arrangements based on mutual respect for each other's philosophies, cosmologies and worldviews.

Secondary sources: ILK documented in the scientific and gray literature

In the scoping phase of IPBES assessments, reviews of the scientific and gray literature may reveal the existence of documented ILK that is of relevance to IPBES assessments. ILK relating to biodiversity and ecosystems services may have been documented in the framework of indigenous land claim processes, environmental and social impact assessments, studies of wildlife populations and distributions, protected area establishment, tourism initiatives, or any number of other undertakings. ILK may also have been collected by indigenous peoples and local communities as part of efforts to record and preserve their knowledge, language and culture, or as academic efforts to understand indigenous societies and cultures and their biodiversity inheritances. In some cases, documentation is available due to the efforts of early explorers or religious groups.

Given the global scope of IPBES and the range of potential biodiversity-related assessment themes, the volume and scope of documented ILK is often quite limited. Furthermore, the recorded data may not correspond with the specific needs of the IPBES assessment as the earlier documentation undoubtedly addressed different goals. Nevertheless, scoping previously recorded ILK, particularly from biodiversity-dependent communities, is essential in those cases where they are of relevance to a given assessment. Indigenous groups and local communities, as well as scientists experienced with ILK-related research, can facilitate the identification of documented sources, some of which may be of limited distribution and difficult to access.

3.2.2. Enhancing current IPBES procedures for assessments

Following the IPCC model, the procedures for incorporating scientific knowledge into IPBES assessments is envisaged as a series of scoping processes and Authors' meetings involving scientific experts who have been designated as Report co-chairs, Coordinating Lead Authors (CLAs), Lead Authors (LAs), Contributing Authors (CAs), Reviewers (Rs) and Review Editors (REs). These meetings would produce a series of draft reports based upon the current scientific knowledge available from the published scientific and gray literature that would go through a series of reviews towards elaboration of a final version of the assessment report.

These IPBES assessment procedures as currently formulated identify some entry points for indigenous and local knowledge and ILK holders. In the *"Draft procedures for the preparation, review, acceptance, adoption, approval and publication of assessment reports and other Platform deliverables",* it is foreseen that ILK holders and/or their representatives could be directly involved in such processes. They may be proposed and selected to participate in the scoping processes, or may be appointed as Authors, LAs, CAs, CLAs, Rs, REs or even co-chairs. Furthermore, some ILK has been partially documented in the scientific and gray literature. Where ILK of relevance to an assessment is included in these secondary source materials, then they may provide a venue for injecting ILK into assessment processes as they are currently conceived. They could also help with the identification of knowledge holders who could be appropriately involved in the scoping and review processes of IPBES outputs.

Despite these potential entry points, opportunities to enhance the work of IPBES by bringing on board indigenous and local knowledge will remain limited if efforts are not made to adapt assessment procedures to the specific needs of ILK. Limiting factors may include, amongst many others:

- Linguistic barriers and conceptual incompatibilities, including differences between indigenous and local (vernacular) taxonomies and scientific taxonomies;

- Valuing of oral communication over written documentation;
- Reluctance of ILK holders to speak outside their own experience, and therefore refusal to speak for or represent others;
- Incompatibility of holistic ILK views compared to more reductionist scientific views;
- Incompatibility of time-depth generational knowledge with short-term scientific 'baseline studies';
- Socio-cultural barriers, including constraints imposed by inappropriate modes of interaction, inappropriate fora, restrictions related to gender or social status, inability of younger ILK holders to speak in front of elders, different interpretations of what constitutes evidence, proof, validation etc.;
- Inadequacy of secondary sources of ILK, as published works record only a minute proportion of existing ILK, may only rarely align with IPBES objectives as they were designed to achieve other goals, and may not capture current observations and understandings of ILK holders.

Requests submitted to the Platform: referencing relevant ILK

With respect to the '*Procedure for Receiving and Prioritizing Requests Put to the Platform*', future Requests to the Platform, in addition to encouraging inputs and suggestions from indigenous peoples and local communities, may be formally required to include information on the existence of relevant ILK, its accessibility and possible modalities for its inclusion, and the potential benefits of such requests for ILK holders. To be consistent with the diverse knowledge systems approach, future procedures could request IPBES National Focal Points to develop a national process which includes ILK in the formulation of Requests, including assessments.

A roster of experienced experts in ILK, including indigenous experts and institutions

IPBES will work with UNESCO, FAO, CBD and other agencies to assemble a roster of experts and organizations dealing with the interface of ILK and science, including from indigenous peoples and local communities. These individuals can be proposed to participate in scoping and assessment processes or be considered for positions of Authors, LAs, CAs, CLAs, Rs, REs or co-chairs. They may also provide direct inputs to scenario development or the review of assessment reports and other IPBES deliverables. *The case study work identified as Objective 2(d) in the draft Work Programme can be used to identify this expertise.* The roster would include an identification of thematic expertise and will be available for Fast Track Assessment development as well as regional and sub-regional assessments. Criteria should be developed to aid in the selection of ILK expertise.

Overcoming linguistic and conceptual differences: ethnoscientific methods

Indigenous and local languages are essential vessels for nurturing and transmitting biodiversity knowledge. In the same way that scientists are trained to master and uphold the precision and rigour of 'scientific language', indigenous and local knowledge experts master and uphold the rigour and precision of terminology in their indigenous languages, including with respect to biodiversity.

Before scientists and indigenous and local knowledge holders can dialogue and exchange together in a mutually intelligible and intelligent manner, they need to be aware of the differences in their naming conventions (nomenclature) for elements of the bio-physical environment, as well as classification systems (taxonomies). Dialogues about biodiversity across knowledge systems may succeed (or fail) depending on the ability to recognize and overcome linguistic barriers. This requires rigorous translation not only of words (with their correct semantic fields) but also of concepts.

Ethnoscientific methodologies have been refined to elucidate naming conventions and classification systems in different knowledge systems, including how to determine in a rigorous manner correspondence with scientific nomenclatures and taxonomies. This first essential procedure can help ensure that scientists and indigenous and local knowledge holders dialogue in a mutually intelligible manner and are not just talking past each other.

Facilitating access to IPBES processes though Dialogue Workshops

The rigidity, formality and institutional requirements of current IPBES processes for scoping, preparing and reviewing assessment reports, technical papers and supporting materials are not conducive to bringing on board ILK. The same limitations apply to procedures across the four functions of IPBES. There is a need to develop special measures in order to allow ILK holders to engage in mainstream IPBES processes and contribute their knowledge and insights. To overcome linguistic, conceptual and socio-cultural barriers, IPBES may consider organizing Dialogue Workshops that are specifically designed to bridge between ILK holders and core IPBES procedures. These workshops, which may involve expert and technical facilitators, would provide a more accessible and productive engagement of ILK holders with scientists and policy-makers, as well as to text preparation and review processes.

Mobilizing broad-scale ILK inputs to IPBES through community-based work sessions

For a broader engagement with ILK holders and expanded application of ILK, IPBES may wish to consider organizing community-based workshops or work sessions that facilitate optimal inputs of relevant ILK from ILK holders. Unlike conventional IPBES workshops and meetings, these work sessions can be adapted to the specific needs of ILK holders by tailoring group size, adjusting composition by gender and/or age, responding to language requirements, fine-tuning the timing and location of the work, and using different techniques for ILK recording. These adaptations are to be decided upon with direct community involvement. Community members and/or experienced professionals may apply tried and tested methodologies such as: cultural, land use or ecological mapping; resource use or harvesting studies; semi-directive interviews on key assessment themes; and/or life histories for time-depth data across generations.

These efforts would contribute importantly towards acknowledging and recording the extensive and rich knowledge about biodiversity and ecosystems services that ILK holders have accumulated during their lifetimes. Passed down through the generations, reaffirmed and revised through their own observations and experiences, and enriched through exchange and sharing with others, these individual knowledge sets are the ILK equivalents to the scientific and gray literature. Through well-designed and implemented community-based work sessions, relevant information from these valuable knowledge sets can be mobilized for all stages of IPBES assessment, as well as other IPBES functions.

3.3. Catalysing ILK generation within the IPBES process

With respect to catalyzing knowledge generation, the MEP should:

a. recognize the importance of indigenous and local languages, taxonomic systems and methodologies as sources of biodiversity-related knowledge at genetic, species and landscape levels;

b. recognize that regional assessments of biodiversity and ecosystem services, and landscape-level management modalities, can be informed by indigenous and local knowledge possessed by indigenous peoples whose customary territories extend across national boundaries;

c. recognize the growing experience and related scientific literature on community-based monitoring of environmental and global change, and local assessments of the status of indigenous languages, knowledge and community well-being;

d. provide support for case study projects in areas where IPLCs have already developed productive relationships with scientists and generated policy-relevant knowledge and tools to address biodiversity loss, including through co-management regimes, knowledge co-production and evaluations of barriers to policy adoption.

3.4. Capacity building within the IPBES process

To build capacity and ensure that IPBES outputs reach the policy interface, the first requirement is to involve ILK holders, including formally trained scientist from ILK systems, in all phases of scoping, assessment and resultant policy formulation and capacity building.

Community-based work sessions to bring relevant ILK into IPBES

IPBES may wish to consider organizing community-based workshops or work sessions that are specially designed to facilitate optimal inputs to assessment processes of relevant ILK from ILK holders. Unlike conventional IPBES workshops and meetings, these work sessions can be adapted to the specific needs of ILK holders by tailoring group size, adjusting composition by gender and/or age, responding to language requirements, fine-tuning the timing and location of the work, and using different techniques for ILK recording, all decided upon with direct community involvement. Recording efforts by community members and/or experienced professionals may apply tried and tested methodologies such as: cultural, land use or ecological mapping; resource use or harvesting studies; semi-directive interviews on key assessment themes; and/or life histories for time-depth data across generations.

These efforts would contribute importantly towards acknowledging and recording the extensive and rich knowledge about biodiversity and ecosystems services that ILK holders have accumulated during their lifetimes. Passed down through the generations, reaffirmed and revised through their own observations and experiences, and enriched through exchange and sharing with others, these individual knowledge sets are the ILK equivalents to the scientific and gray literature. Through well-designed and implemented community-based work sessions, relevant information from these valuable knowledge sets can be mobilized for inclusion in IPBES assessment processes of scoping, drafting and review.

Importance of education and awareness-raising

There is a great need for education and awareness-raising in this emerging area of work. Capacity-building is required for both ILK-holder and scientists, and in both directions, with scientists receiving training about indigenous and local knowledge, and indigenous peoples being trained about science. The aim is not to convert scientists into indigenous knowledge holders nor ILK holders into scientists, but rather to establish enough common ground to promote mutual understanding and facilitate an informed dialogue. Furthermore awareness-raising is required with all key stakeholders, including decision-makers, management practitioners, protected area managers, the private sector, and the general public.

Training scientists about indigenous and local knowledge

Contemporary science education is not self-reflexive, and continues to educate young scientists to accept science as a unique and superior knowledge form, while marginalizing historical and philosophical research that sets such claims into a broader perspective. Science education does little to prepare scientists to acknowledge and respect other systems of knowledge. IPBES goals would be served by efforts to expose scientists to a more inter-cultural understanding of human-environment relations and the diversity of related knowledge systems.

Indigenous and local knowledge in education curricula

Formal education curricula, for indigenous and non-indigenous students alike, should include teachings about and based upon indigenous and local knowledge. Indigenous-based content relating to biodiversity should be taught alongside or as part of science education, but without science serving as a filter or gate-keeper for knowledge from other cultures. Particular importance should be placed on the involvement of ILK holders as teachers and curriculum developers in order to build two-way synergies between ILK and science in the formal education system.

Building awareness about IPBES amongst indigenous peoples

More effort should be dedicated to inform indigenous peoples and local communities about IPBES and its processes for involving ILK. IPBES could represent a forum where communities can bring their concerns about potential threats to biodiversity and ecosystems services to the attention of scientists and policy-makers.

Building capacities of local/indigenous scientists

Indigenous peoples who have been raised in their own cultures and knowledge systems and who then become scientists may help bridge across knowledge systems. They may also better engage local communities because there is more trust in their 'own' scientists. The provision of a fellowship programme is a goal of Objective 1 in the draft IPBES Work Programme (to "*Enhance the foundation of the knowledge policy interface for biodiversity and ecosystem services*"). This fellowship programme could be opened to recipients from indigenous peoples and local communities with an emphasis on training in both the sciences and ILK systems.

Loss of ethnobiodiversity may be a more serious crisis that the loss of biodiversity

Indigenous and local knowledge is lost as older generations pass away, livelihoods and lifestyles change, schools teach only mainstream languages and scientific knowledge, environments are transformed, access to traditional territories and resources is barred, etc. For IPBES, this loss of ethnobiodiversity may be one of the most serious constraints to the actual conservation and sustainable use of biodiversity and ecosystem services. Erosion of indigenous knowledge reduces opportunities to benefit from understandings rooted in long histories of interaction with the natural environment, and diminishes insights from building synergies with science.

3.5. Policy relevance and support for ILK holders

The transdisciplinary domain that crosses boundaries between knowledge systems has been an active area of research and policy action for at least several decades, and indigenous peoples and scientists have made considerable effort to work together and build synergies between knowledge systems.

Various aspects of this transdisciplinary work have been addressed through intergovernmental policies and processes. Ratified in 1993, the ***Convention on Biological Diversity*** (CBD) outlines several responsibilities of Parties with respect to: knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity. Signatories are expected to 'respect, preserve and maintain' this knowledge, as well as 'promote its wider application' (cf. CBD, Article 8(j)). During the 13 years since its creation in 2000, the Ad Hoc Open-ended Inter-sessional Working Group to address the implementation of Article 8 (j) and related provisions has produced several noteworthy outcomes including the:

- Akwé: Kon Voluntary Guidelines for the Conduct of Cultural, Environmental and Social Impact Assessments
- Tkarihwaié:ri Code of Ethical Conduct to Ensure Respect for the Cultural and Intellectual Heritage of Indigenous and Local Communities

The 8 (j) Working Group has also contributed towards the traditional knowledge dimensions of the *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity*. Other intergovernmental processes of direct relevance to indigenous and local knowledge include the work of the World Intellectual Property Organization (WIPO) on the intellectual property dimensions of traditional knowledge. Since 2000, the *WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore* has been working on the development of an international legal instrument for the protection of traditional knowledge, and conducting formal negotiations since 2009.

Additional relevant intergovernmental policies and processes include work on the genetic diversity of domestic animals and plants, farmers' rights (Food and Agriculture Organization) or traditional medicine and medicinal plants (World Health Organization). Intergovernmental processes such as these, extending over several years and touching

upon specific aspects of indigenous and local knowledge, also need to be taken into consideration when formulating the procedures and approaches to be developed for IPBES.

The importance of recognising indigenous and local knowledge in intergovernmental policy has also occurred at the national and regional level for many decades. The Millennium Ecosystem Assessment (MA) brought this recognition to the global scale, and recently efforts have been made to operationalize this recognition through the Arctic Climate Ecosystem Assessment. Today the IPCC is also working towards the incorporation of indigenous and local knowledge in their Fifth Assessment Report to be released in 2014 (cf. Nakashima et al. 2012).

Policy support for ILK systems at national and regional levels has received less attention in the field of biodiversity and ecosystems services. It is proposed that IPBES could play a facilitation role in facilitating specific policies at the regional and sub-regional, as well as, international scales. These policies may include, but not limited to, the following:

- Identification and acquisition of ILK (creating, capturing and storage);
- Communicating and dissemination of the knowledge (using various platforms, videos, tapes, and storytelling);
- Validation of the knowledge through various platforms;
- Development of policy-relevant tools.

Engagement with other UN policy processes

It is not infrequent that national or federal laws conflict with the local or territorial rules of informal institutions of indigenous peoples and local communities. These conflicts may stem from fundamental differences in social organization and cultural values between governmental and community institutions. It is proposed that IPBES outcomes and capacity building will assist institutions (governmental and community, formal and informal) to identify mutual interests and find common ground. In some cases, the governance arrangements of indigenous and local knowledge holders cross national boundaries and can play an important role in ecosystem governance, conservation and sustainable use of biodiversity (e.g. Mayan, Quechuan, Inuit, Sami). Regional or National Focal Points therefore could be developed to facilitate a national process for including indigenous and local community perspectives in the IPBES assessments and the science-policy interface. Any project or assessment could be considered as an 'intervention' and may create tensions in the local political environment. IPBES and governments therefore need a long term strategy to engage IPLC's and develop confidence, trust, credibility and respect. An important concept to capture in any new policy is the concept of 'reciprocity' with IPLC's.

Working with ILK systems in the science-policy interface

Indigenous peoples and local communities and their social institutions offer a strategic foundation for implementing a "bottom up strategy" which would enhance the IPBES science-policy interface.

With respect to policy support tools and methodologies, the MEP should:

a. Promote the synergies between indigenous and local knowledge and science through making available periodic reviews and assessments of relevant tools and methodologies.
b. Review how the IPBES programme of work can be decentralized to the most appropriate scales, and encourage the establishment of regional and sub-regional centres of excellence in indigenous and local knowledge;
c. Ensure that IPBES materials include policy-relevant syntheses that provide tools and approaches for the continued transmission of indigenous and local knowledge, as well as support for customary sustainable use. These considerations should extend to agencies and bodies that may not be directly linked to biodiversity and ecosystem services (e.g. education, health and cultural heritage);
d. Review existing mechanisms for soliciting requests/inputs/suggestions with an aim to reinforcing requests/inputs/suggestions from IPLCs with respect to their customary territories, lands and resources.

4. Integrating ILK Across all IPBES Functions

Dialogue workshops among ILK holders, scientists and decision-makers

To facilitate the direct engagement of relevant ILK holders in the mainstream processes of scoping, preparation and review of IPBES assessment reports, technical papers and supporting materials, IPBES may consider organizing dialogue workshops that are specifically designed to facilitate inputs from ILK holders. These workshops would provide the necessary conditions for a meaningful and productive dialogue among ILK holders, scientists and policy-makers, and may involve expert and technical facilitators as required. They may serve as the necessary bridge to bring information and insights from indigenous peoples and local communities directly into core IPBES processes.

Annex 1: Preliminary steps for synergizing indigenous and local knowledge (ILK) systems with science

The following are the basic procedures that could be followed to achieve the objective of building synergies between ILK and sciences as a basis for achieving the outputs or products in the context of specific projects of the IPBES work programme. These are based on the following premises:

1) ILK holders, because of their long relationships with their natural and cultural biodiversity and ecosystem services, have extensive and in-depth, often collective, knowledge of these systems at spatial and temporal scales that differ and complement those of scientists;

2) That ILK and ILK holders should, where appropriate, be involved in all stages in scoping, assessments, review, developing policy and capacity building activities of a specific project of the WP of IPBES.

Basic steps for synergizing ILK and science in the context of a given IPBES project under the work programme are as follows:

1. Identify relevant ILK required to achieve the objectives of a specific project, including through building synergies with science.

2. Carry out preliminary mapping to identify relevant ILK holders, specific communities or sources of relevant ILK, including groups of ILK experts, practitioners, and trained scientists from ILK communities that should be involved in the project.

3. Develop robust relationships and trust with these communities, experts and scientists and follow appropriate and mutually agreed upon protocols to access this information and ensure shared benefits.

4. Gather and interpret, through mutually agreed upon collaborative research protocols involving ILK holders and community members, the information that is pertinent for specific project deliverables.

5. Where needed, bring together ILK and scientific knowledge to achieve the integrated assessments, policy outputs and capacity building objectives of the project (this can be done in most phases of the process).

6. Review the outputs, ensuring that appropriate and mutually agreed upon methodologies are employed that recognize the distinctive features of ILK and ILK holders (e.g. oral, communal or local language traditions), which may require additional new review mechanisms (e.g. through ILK engagement groups or other means).

Annex 2: Preliminary principles for working with ILK in the IPBES process

Beyond recognition and respect for indigenous and local knowledge, IPBES' stated objectives are to build strong synergies between indigenous and local knowledge and science, and to engage with indigenous and local knowledge holders, as core priorities of the IPBES programme of work. Several decades of interaction with ILK holders have made clear some of the necessary pre-conditions for the success of such engagements. The function of principles should be to draw attention to activities that raise issues or potentially threaten cultural health and/or community well-being, and point the way towards internationally acceptable solutions. Such activities may include pursuits that impinge upon human communities, their land and resources, their livelihoods, ways-of-life, spirituality, intellectual property, governance or stewardship, amongst other matters. When proposed activities raise cultural and social issues or threats, precautionary measures should be taken.

1. Recognizing different knowledge holders

To appropriately frame its overall action with respect to ILK, IPBES should clearly recognize indigenous peoples and local community members, along with scientists, as knowledge holders of central relevance to the goals of IPBES. ILK should be recognized as a group distinct from other "stakeholders" defined by the Stakeholder Engagement Strategy.

2. Establishing mutual trust and respect

Successful engagement among indigenous peoples and local communities requires mutual trust and respect so as to come to a point of acceptance and understanding of each other's observations, interpretations, values, worldviews and priorities.

3. Recognizing and respecting intellectual property (IP)

Successful engagement of indigenous peoples and local communities knowledge requires Free, Prior and Informed Consent (FPIC), as described in the UN Declaration on the Rights of Indigenous Peoples and other ongoing initiatives and processes. Synergies between indigenous and local knowledge holders and scientists must be based on mutual consent, and a clear understanding of the objectives, reasons for and possible benefits of IPBES engagement with ILK systems. Furthermore, indigenous intellectual property rights relating to knowledge of interest to IPBES need to be recognized and assured.

4. Involving ILK in all assessment phases

It is important that all relevant knowledge holders are involved early (from conception stage), equitably (ensuring equal access to information and decision-making), and consistently (throughout the entire process to assessment outputs).

5. Benefit-sharing

The requirement to share knowledge and return benefits from the IPBES assessment process to ILK-holders and communities must be recognised. Indigenous and local knowledge holders must be identified and clearly acknowledged as co-authors, which achieves the dual goal of insuring both recognition and ownership of the outputs, as well as providing a basis for their involvement in policy-making to address biodiversity issues.

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Support for the production of this document was provided by
the Ministry of the Environment, Japan and the Local and Indigenous Knowledge Systems programme, UNESCO

United Nations
Educational, Scientific and
Cultural Organization

Ministry of the Environment
Government of Japan