Indigenous valuation of biodiversity and ecosystem services compared to other ways of valuation in the context of IPBES

August 11th-14th, 2014 in Mandaluyong City, The Philippines,

Organized by the German Federal Agency for Nature Conservation (BfN)

in cooperation with the Institute for Biodiversity Network e.V. (ibn) and Indigenous Peoples' International Centre for Policy Research and Education (TEBTEBBA, Philippines)

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Cover picture: Flower of a *Proteacea* (C. Paulsch)

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Contents

1 Introduction

The aim of the workshop was to give the opportunity to discuss how indigenous peoples and local communities value biodiversity and ecosystem services in their diverse knowledge systems and how this can be respected in the context of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES).

In its multi-stakeholder meeting in Panama 2012 and the first plenary in 2013 IPBES has decided that different forms of knowledge, including indigenous and local knowledge should be recognized and respected in the work of IPBES, e.g. in assessments.

An information document to IPBES 1 prepared by UNESCO had proposed "organizing international expert workshop(s) that bring together relevant natural and social scientists with indigenous and local knowledge holders to initiate the process of elaborating the procedures for recognizing indigenous and local knowledge and for building synergies with science within the framework of IPBES" (IPBES/1/INF/5, Section F c).

In this sense, the current workshop wanted to give the opportunity to experts from science, indigenous organizations and other stakeholder groups to discuss proposals for coming IPBES meetings on how IPBES procedures can be shaped in order to allow the recognition and respect of knowledge coming from different knowledge systems, including the values that indigenous peoples and local communities give to biodiversity and ecosystem services.

In the second plenary (IPBES 2, December 2013) IPBES agreed to form a task force and an expert group to develop ' Procedures, approaches and participatory processes for working with indigenous and local knowledge systems' and to develop 'Policy support tools and methodologies regarding the diverse conzeptualisation of values and nature's benefits to people including ecosystem services'. The results of the current workshop are made freely accessible and are forwarded to the respective task force and expert group. Furthermore, members of these IPBES bodies, including the Multidisciplinary Expert Panel (MEP) participated in the workshop.

The workshop was hosted by the German Federal Agency for Nature Conservation and organized by the Institute for Biodiversity Network e.V. in collaboration with the Philippine indigenous organization Tebtebba.

The participants had been invited in their personal capacity as experts and did not represent any organizations or governments. Their contributions are their personal opinions as experts and do not necessarily reflect the views of their institutions or the Federal Agency for Nature Conservation.

The workshop was held at Mandaluyong City, Philippines, from August 11.-14. 2014.

This report puts together the results of the discussions and group work performed during the workshop and adds the abstracts of the introductory presentations. The participants agreed to formulate the results in a concise format: conclusions and main ideas were put as statements or theses, each of which is supported by an explanation or rationale and then the consequences / actions for the IPBES process are outlined.

2 Background

After founding in April 2012 the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) is still in the process of being developed and procedures are not yet fully established. Nevertheless, there is common understanding that indigenous and local knowledge forms an important part of IPBES and that there are different concepts of valuing how nature contributes to human wellbeing.

In its second plenary meeting (December 2013 in Antalya, Turkey) IPBES took a major step forward in adopting two essential building blocks for its work: a conceptual framework and a work programme for the period 2014-2018. In the conceptual framework (figure 1) it becomes obvious that IPBES is well aware of the different concepts of viewing the world, as a scientific perspective and a perspective from other knowledge systems are treated in parallel: in the category 'Nature' (box at bottom) the scientific view is called 'biodiversity and ecosystems', whereas the other view is expressed by the term 'Mother Earth systems of life'. In the category 'nature's benefits to people' (box middle left) science uses the term 'ecosystem goods and services', some of which might be expressed in monetary terms, whereas the other concepts would rather use the term 'nature's gifts'. And, finally, in the category 'good quality of life' (box in upper part of figure 1) science might talk of 'human wellbeing' (including aspects such as access to shelter, availability of food and clean water, health, education, etc.), while in other world views the expressions 'living in harmony with nature' or 'living-well in balance and harmony with Mother Earth' might be more appropriate. This conceptual framework illustrates that IPBES sees different forms of knowledge and concepts as a crosscutting issue throughout all functions of IPBES, but the question how to deal with such concepts is still not answered.

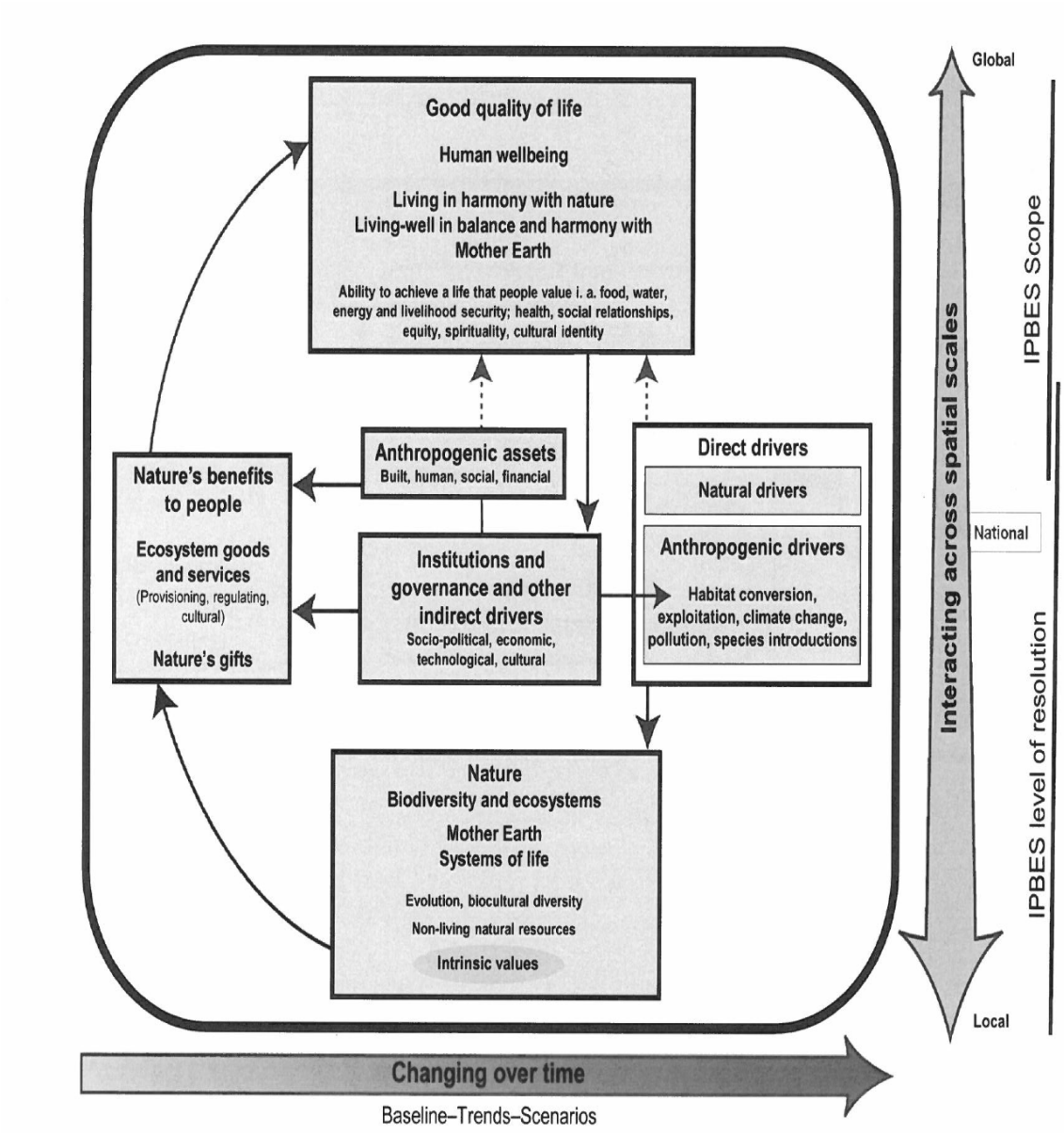

Figure 1: IPBES conceptual framework (http://ipbes.net/plenary/ipbes-2.html, meeting report)

In the work programme 2014-2018 two foreseen deliverables explicitly deal with indigenous and local knowledge or diverse conzeptualisation, respectively:

a) deliverable 3d wants to develop 'Policy support tools and methodologies regarding the diverse conzeptualisation of values and nature's benefits to people including ecosystem services based on an assessment and a guide'. An international expert group for this task was established in 2014. The work programme explains:
The assessment of tools and methodologies regarding multiple values of biodiversity to human societies is important for guiding the use of such methodologies in all work under the Platform. Different valuation methodologies will be

evaluated according to different visions, approaches and knowledge systems and their policy relevance based on the diverse conceptualization of values of biodiversity and nature's benefits to people including provisioning, regulating and cultural services. Policy support tools guide decision-making by taking into account the multiple values of nature and its benefits, including biodiversity and ecosystem services, and identifying synergies and trade-offs between various possible development pathways, including new tool development for intrinsic, existence and bequest values. This deliverable will result in a guide. As directed by the Plenary, this deliverable will promote and catalyse the further development of tools and methodologies on these issues (IPBES/2/17).

b) Deliverable 1c is meant to develop ' Procedures, approaches and participatory processes for working with indigenous and local knowledge systems' and the work programme further elaborates as follows:

The importance of indigenous and local knowledge to the conservation and sustainable use of ecosystems has been acknowledged in the Platform's Operating Principles, as well as in Article 8 (j) of the Convention on Biological Diversity and Aichi Biodiversity Target 18. The Platform will promote a meaningful and active engagement with indigenous and local knowledge holders in all relevant aspects of its work. Under the lead of the Multidisciplinary Expert Panel in consultation with the Bureau, a task force for the period for the work programme 2014–2018 will facilitate a roster and network of experts to support the Platform's work, a number of global dialogue workshops of indigenous and local knowledge experts, a review of regional case studies to inform the Platform's procedures for and approaches to working with indigenous and local knowledge, and the delivery of a preliminary and final set of procedures and approaches for working with indigenous and local knowledge systems. The task force will also establish a participatory mechanism for indigenous and local knowledge systems to be established under the Platform, oriented to facilitate the linkages between indigenous and local communities and scientists and to strengthen the quality of indigenous peoples' participation in the development of the deliverables of the Platform (IPBES/2/17).

The respective task force was established in 2014. In its first meeting after election of the Multidisciplinary Expert Panel (MEP) decided that the following MEP members will play a particular key role in the IPBES process going forward on knowledge systems: Randy Thaman (Asia Pacific), Phil Lyver (WEOG), Rodger Mpande (Africa) and Edgar Perez (GRULAC).

Randy Thaman from the MEP, as well as several members of the task force to 1c (Wilfredo Alangui) or the expert group to 3d (Heidi Wittmer, Madhu Verma) will take part in the workshop, securing the direct link to ongoing processes within IPBES itself.

The current workshop is not the first international meeting to discuss the issue of integrating different knowledge systems into the work of IPBES. For example, the Stockholm Resilience Centre (SRC) together with the International Indigenous Forum on Biodiversity (IIFB) has organized a dialogue process including two meetings, one in Jokkmokk in June 2011 and one in April 2012 in

Panama (Guna Yala). The German Federal Agency for Nature Conservation (BfN) through the Institute for Biodiversity Network (ibn) held a workshop on 'Connecting diverse knowledge systems in the context of IPBES' on Vilm Island (Germany) in April 2013. The current workshop is part of the same series as this Vilm workshop. The results of the Vilm workshop went into the official IPBES expert workshop (by UNESCO at the UNU in Tokyo in June 2013) 'The Contribution of indigenous and local knowledge systems to IPBES: building synergies with science'.

Some of the theses elaborated at the Vilm workshop already deal with conzeptualisation, e.g. the participants formulated (http://biodiv.de/fileadmin/user_upload/PDF/Projekte/BfN_Skript_341.pdf):

Inclusiveness of IPBES

Thesis:

The work programme of IPBES across all its functions, would benefit from collaborative work informed by multiple expertise and diverse knowledge systems.

Explanation / Rationale:

The complexity of social-ecological systems requires collaboration among multiple expertise and diverse knowledge systems to co-produce complementary and holistic understanding of the interrelationships between communities / peoples, biodiversity and ecosystem services.

Consequences / Actions for IPBES:

All elements of the IPBES work programme need to show how multi-disciplinary expertise and diverse knowledge systems are addressed, including indigenous and local knowledge, in accordance with guidelines approved by the MEP.

Another outcome was formulated as: Knowledge in cultural context

Thesis:
Traditional knowledge should not be extracted by cherry-picking de-contextualized fragments of information, but it should always be understood as part of a complex values-based and constantly evolving knowledge system.

Explanation / Rationale:
If knowledge is vetted through a too narrow filter so that only a particular form of information is validated, then there is a risk of de-framing or de-contextualizing the way knowledge is generated at the community level. In order to accommodate to the requirements of the scientific community for “validation”, traditional knowledge might become skewed and ossified.

Consequences / Actions for IPBES:
Avoid acquiring the information from only a small number of selected individuals, but encourage broad community involvement in the assessment process as well as in the means of sharing the knowledge. Make the most of the exchanges with local communities by supporting local cultural initiatives and the inter-generational transmission of knowledge. Keep the IPs and LCs informed on the way the knowledge they have provided moves through the process, sharing with them the final assessments and their eventual impact on policy.

A third thesis explained: Methods for co-production of knowledge

Thesis:
Successful co-production of knowledge requires methodologies and methods appropriate to contextualizing local and national outcomes arising from diverse worldviews.

Explanation / Rationale:
Relying exclusively on scientific methods and methodologies will limit understanding of environmental issues from a broader perspective. Applying existing and accepted indigenous methodologies can be synergistic with scientific methodologies as well as address multiple aspects of research and knowledge synthesis.

Consequences / Actions for IPBES:
IPBES should promote intercultural methods throughout its work including through the use of diverse methodologies, development of guidelines and sharing good practices.

Furthermore, the participants noted: Complementary evidence

Thesis:
Diverse knowledge systems can generate complementary evidence for sustainable management of biodiversity and ecosystem services.

Explanation / Rationale:
Complementary knowledge can create an enriched understanding of the topic, and provide triangulation of different sources of understanding. Further, using multiple sources can contribute to assessments that are reliable across groups of stakeholders and rights holders, and improved implementation of knowledge.

Consequences / Actions for IPBES:
When IPBES is generating assessments it should ask for multiple evidence derived from diverse knowledge systems, including indigenous, local, and traditional knowledge systems. Assessment reports can have different chapters for knowledge generated by diverse knowledge systems which have to be reviewed by different reviewers according to their insight into the respective knowledge system, using a multiple evidence base approach. The procedures for developing a review process should be established in an inclusive and participatory process.

The Tokyo workshop (http://ipbes.net/plenary/ipbes-2.html, Inf.doc 1) *inter alia* recommended to IPBES to:

- further analyze and address gaps in procedures and approaches for working with different knowledge systems in the framework of IPBES,
- recognize the importance of indigenous and local languages, taxonomic systems and methodologies as source of biodiversity-related knowledge at genetic, species and landscape levels,
- 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,
- address ILK in assessment reports, technical papers and supporting material across all relevant chapters, and not in a seperate section that is isolated from the main body of work.

3 Results

3.1 Conclusions

3.1.1 Link between biodiversity, ecosystem services and human practices

Thesis:
A large part of biodiversity depends on human practices. Knowledge of indigenous and local communities is essential to conserving, maintaining and enhancing biodiversity and ecosystem services in many parts of the world.

Explanation / Rationale:
Indigenous peoples and local communities (IPLCs) have contributed to the heritage, current, and future (bequest) values of biodiversity and ecosystem services through the use of their knowledge systems. Elements of biodiversity and ecosystem services have been maintained for both economic and cultural purposes.
ILK-systems and biodiversity and ecosystem services are thus integrally linked. This implies that the value of single species can go far beyond areas of origin or face value.

Consequences / Actions for IPBES:
The reciprocal relationship between humans and nature and the co-production of biodiversity and ecosystem services, while mentioned, needs significant elaboration in the IPBES conceptual framework. The framework should incorporate more explicitly the positive contributions these relationships provide.
Assessments have to take into account the heritage, current, and bequest values through appropriate methodologies and assure that understanding of these relationships is addressed and understood.

3.1.2 Stewardship or guardianship as a core value of indigenous peoples.

Thesis:
Stewardship implies a permanent reciprocal relationship between indigenous peoples and their territories and resources, which embodies continuing obligations to protect and sustainably use ILK and associated biodiversity and ecosystem services (ILKBES). ILKBES is integrally linked to the land, ancestors and culture and thus place-based.

Explanation / Rationale:
Stewardship implies that exchange of knowledge about biodiversity and ecosystem services includes safeguards to respect these obligations and associ-

ated rights of indigenous peoples for their appropriate use. This means ILK cannot be used inappropriately (or to violate rights).

ILKBES is characterized by human rights and economic, cultural, spiritual, and other values that will be identified in the assessment process. It affects human dignity, identity and other values that contribute to human wellbeing (e.g. health).

The respect and promotion of collective economic, social and cultural rights of indigenous peoples depend on and provide biodiversity and ecosystem services.

Consequences / Actions for IPBES:

Assessment processes should ensure the implementation of safeguards and FPIC in collecting and providing new knowledge to the IPBES process. Published literature should be included following best practices and ethical standards. There are methods to capture ILK and IPLC issues without directly disclosing essential traditional knowledge.

3.1.3 Protection of values and rights

Thesis:

Indigenous peoples and Local communities' populations are often small and their values are not reflected in aggregate values. Therefore their values and rights require special protection.

Explanation / Rationale:

A considerable amount of the remaining biodiversity is in territories managed by IPLCs and they have historically taken care of it, while deriving sustainable livelihoods. The right to enjoy and derive use and value from BES should be recognized and respected.

Consequences / Actions for IPBES:

IPBES should take all relevant values into account. In ranking and prioritizing different issues, the equitable inclusion of these cultural values should be ensured. Proposed trade-offs and other interventions cannot occur in violation of cultural and spiritual values, human rights, treaties, agreements, and other constructive arrangements between indigenous peoples, local communities and States.

3.1.4 Link between IPLCs and territories

Thesis:

Indigenous Peoples and Local communities often manage and depend on increasingly constricted territories, which depend upon and influence surrounding landscapes.

Explanation / Rationale:

This works both ways, as territories:

a) Provide important benefits like water, local climate regulation, CO2 storage, spillover species, recreation and health, among others, to surrounding landscapes.

b) Depend on genetic inflow and water provision, etc. from surrounding landscapes and are increasingly affected by long-range external impacts.

Consequences / Actions for IPBES:

Assessments should include understanding of these interrelationships and the impacts of other external activities affecting the territories. Policy implications should take into account an understanding how to reduce impacts, increase awareness of benefits and foster their provisioning.

3.1.5 Importance of local scale for the work of IPBES

Thesis:

Although IPBES as an intergovernmental body has defined its focus at global and sub-regional scales, the success of the process will be contingent on the legitimate and appropriate synthesis of local studies, particularly those that are based on Indigenous and Local Knowledge Systems (ILKS).

Explanation / Rationale:

Biodiversity and ecosystem services are essentially locally manifested. There is a wealth of existing case studies, most of which are done at the local scale, that should be incorporated in the global and sub-regional assessments. ILK holders have the best historical knowledge of the changing status of ecosystems over time.

Consequences / Actions for IPBES:

1. IPBES needs to organize sub-regional dialogues to ensure more involvement of local knowledge holders and experts, and make assessments more relevant, particularly in terms of policy formulation.

2. Resources in terms of financial and technical support should be made available to consolidate existing knowledge.

3. To maximize the applicability of IPBES deliverables for local and global scales, IPBES should develop methodologies for the aggregation of data from local and community-based case studies, and the formulation of relevant and appropriate policy recommendations.

Action Commitment:

Strengthen community based monitoring and information systems to contribute to the work of IPBES.

3.1.6 Strengthening IPBES participatory mechanisms

Thesis:

An inclusive stakeholder engagement strategy and participatory mechanisms are fundamental to the IPBES work processes.

Explanation / Rationale:

Given the importance of capturing the full range of knowledge diversity it is to be ensured that the different stakeholders and perspectives are continuously integrated in IPBES processes. There are existing networks of different expertise that are willing to contribute to the work of IPBES.

Consequences / Actions for IPBES:

To ensure full and effective participation of ILK holders, IPBES can work with existing networks, inter alia through,

1. Engagement with the International Indigenous Forum on Biodiversity and Ecosystem Services (IIFBES) as an established forum for indigenous peoples and local communities;
2. Inclusion of IIFBES members in the roster of experts;
3. Adoption of best practices for IPLC participation from other UN bodies like CBD, UNFPII, FAO Committee on Food Security;
4. Establishment, strengthening and recognition of centers of excellence on ILK to help in outreach, information flow, capacity building;
5. IPBES processes that are opened to submissions of relevant research and materials from different knowledge systems including grey literature and have developed means to address them in assessment processes.

3.1.7 The critical role of IPBES in capacity building

Thesis:

Capacity building is needed for IPLCs, the scientific community, governments and policy makers for mutual understanding. IPBES can make distinctive contributions in building linkages across diverse knowledge systems.

Explanation / Rationale:

Stakeholders can only effectively participate if there is adequate and appropriate understanding of IPBES objectives, principles, procedures, and deliverables, and if they are aware of the opportunities for engagement.

Consequences / Actions for IPBES:

1. Support capacity building initiatives for ILK practitioners and holders (including, for example, on documentation, policy formulation, and monitoring).
2. Ensure that understanding of IPLC issues is included in capacity building activities for scientists and relevant government units participating in IPBES work.
3. Place priority on producing IPBES outputs that are packaged and disseminated in forms appropriate to diverse knowledge holders and local communities.
4. IPBES national focal points to work with ILK centers of excellence, academic institutions, relevant government units, and other relevant bodies and networks, to enhance capacity building programs.
5. Promote interaction among Indigenous Peoples and Local communities, stakeholders, and government entities at all relevant levels.

3.2 Additional Recommendations

Working steps/procedures for synergizing indigenous and local knowledge (ILK) systems with science (Adapted from 'Initial elements for an approach towards procedures and approaches for working with indigenous and local knowledge systems proposed for use by the IPBES (IPBES/2/INF/1/Add.1).

Includes:

Seven Premises or assumptions about ILK.

"Elaborated" steps or procedures that could be followed and adapted to achieve the objective of building synergies between ILK and science as a basis for achieving the outputs or products in the context of specific assessments, knowledge generation, development of policy support tools and capacity building.

Seven Premises or Assumptions about ILK

INDIGENOUS AND LOCAL KNOWLEDGE (ILK): The term indigenous and local knowledge includes both indigenous and other non-indigenous knowledge systems that have been developed and used by resource users throughout the world, including a diverse range of farming, fishing, hunting, herding, urban and other communities of varying economic, social and environmental interests. Both indigenous and local knowledge systems are dynamic and constantly interacting with each other and other forms of knowledge.

NATURE AND RELEVANCE OF ILK TO IPBES: ILK holders, because of their long relationships with their natural and cultural biodiversity and ecosystem services, have extensive, mostly collective, often oral and unwritten, in-depth

and time-depth, knowledge of these systems at spatial and temporal scales that differ from and complement those of scientists.

RURAL AND URBAN ILK: ILK holders include both rural and urban ILK holders because a large and increasing proportion of all ILK holders live in urban areas. Urban ILK holders often continue to depend on the maintenance of urban or peri-urban BES or maintaining links with their rural origins.

INTEGRAL INVOLVEMENT OF ILK HOLDERS: ILK holders should, on an equal basis, be involved in all stages in scoping, assessments, review, policy development, disseminating results and capacity building activities wherever issues touch upon their rights, territories and resources. Collaboration on ILK should include safeguards and be built on best practices and on Free, Prior and Informed Consent (FPIC) on any new knowledge collected.

ILK RESEARCH NOT NEW: Synergizing ILK with science is not new and is, in many areas, an established practice that can inform and enrich the work of IPBES. That ILK holders and practitioners welcome the recognition by IPBES is of the central importance for building synergies between ILK and science in IPBES. These working steps provide a “living” adaptive set of procedures to build such synergies.

IMPORTANCE OF LOCAL STUDIES: Because biodiversity and ecosystem services are best manifested at the local level and because most in-depth BES studies are conducted at the local ecosystem level, global and regional assessments and policy development will need to build on the synthesis of local case studies and assessments and their application to local policy formulation.

OPENESS TO ONGOING SUBMISSIONS: Because of the nature of ILK, IPBES processes should be open to ongoing and novel submissions (e.g. the products of global and sub-regional dialogues) of relevant research and materials from different knowledge systems, including grey literature and inputs from the ILK Task Forces, the Roster of Experts and Networks and develop means to address them in IPBES assessments and other deliverables.

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

STEP 1 – Problem Identification and Design

When initiating IPBES activities bring together diverse visions, approaches and knowledge systems, including ILK holders, in problem identification, scoping, assessment and activity design and analysis of projected outcomes, policy outputs and capacity building objectives of the project (to be done continuously during the phases of the process and can include co-production and self-identification). This will require specific allocation of time for the involvement of

ILK holders and the development of mutual understanding between ILK holders and the scientific community within existing IPBES processes.

STEP 2 – Identification of Relevant Knowledge and Knowledge Holders

Carry out preliminary mapping, with participation of ILK holders, to identify relevant knowledge, knowledge holders, specific communities or sources of relevant ILK (including existing grey and scientific knowledge), groups of ILK experts, practitioners, and trained scientists, particularly those from ILK communities that should be involved in the assessment/activity, including direct submission of relevant materials.

STEP 3 – Development of Relationships and Trust as a Basis for exchange, information compilation and analysis

Develop robust relationships and trust across the diverse group of knowledge holders and follow appropriate protocols for mutual exchange, compilation and analysis of information to ensure reciprocity, transparency, shared benefits and understanding of potential risks. IPBES should follow best practices and ethical standards for the use of published material and ensure FPIC for access to undisclosed knowledge.

STEP 4 – Review of outputs using appropriate methodologies

Review the outputs, ensuring that appropriate and mutually agreed upon validation methodologies are employed that recognize the distinctive features of different knowledge systems, for example through using a Multiple Evidence Based approach, where each knowledge system is validated through its own terms.

STEP 5 – Appropriate packaging, authorship and dissemination of results/outputs

Ensure that the results/outputs are packaged, “authored” and disseminated in appropriate forms with respect to the diversity of knowledge holders who have been involved in given activities. Where possible promote dissemination in other forms such as oral, or local language, or art forms.

STEP 6 – Evaluation, Adaptation and modification of processes, protocols and results/outputs

Ensure that the processes, protocols, outputs and other aspects of the assessment/activity are evaluated to revise and strengthen the “procedures’ for synergizing indigenous and local knowledge (ILK) systems with science (Objective 1(c)). It is essential that mechanisms be put in place, which may require innovative processes and capacity building.

4 Abstracts of presentations

4.1 Indigenous valuation of biodiversity and ecosystem service; Axel Paulsch

Institute for Biodiversity Network (ibn)

Axel Paulsch presented the contents of the background paper he had prepared for the workshop (see chapter 2).

4.2 The Co-generation of Ecosystem Services by Nature and Indigenous Peoples: The Value of Adaptive Biocultural Relationships and the Role of Traditional Knowledge; Preston Hardison

Tulalip Tribes

Mr. Hardison made the presentation **"The Co-generation of Ecosystem Services by Nature and Indigenous Peoples: The Value of Adaptive Biocultural Relationships and the Role of Traditional Knowledge"**.

This presentation covered three themes related to the interaction between science and traditional knowledge in a policy context:

1. The consideration of the wider frameworks or contexts in which traditional knowledge is embedded (the “ecology of traditional knowledge”);
2. A brief mention of some of the methodologies used to value or incorporate traditional knowledge in the science/policy interface; and
3. Cultural, ethical and legal considerations related to the encounter between different knowledge systems, and some suggested guidelines for the use of traditional knowledge in IPBES.

It was noted that the IPBES Conceptual Framework is a good beginning, in that is recognizes Mother Earth, systems of life, biocultural diversity, and the engagement of diverse knowledge systems. Mr. Hardison referred to an Indigenous Forum on Biodiversity and Ecosystem Services (IFBES) statement at IPBES 2, in which it was emphasized that ecosystem services are not simply the products of pristine ecosystems, but often co-generated through interactions between humans and nature. Cultural ecosystem services in particular are not only the intangible values people place on natural ecosystem processes, but actively created through human modification of ecosystems, fire regimes, hydrological regimes, landscapes and biophysical processes to generate preferred outcomes. Adaptation to global environmental and climate

change will require that communities find opportunities for deriving ecosystems services in cultural ecosystems (e.g. matrix landscapes, anthromes, agroecosystems, agroforests, production landscapes, field margin ecosystems, home gardens, backyard ecosystems, cultural seascapes, and cultural landscapes).

Traditional knowledge has a long history of use that has enabled indigenous peoples to successfully cope with environmental variability and contingencies. They possess time-tested knowledge on fire, water, natural resources, biodiversity, ecosystem services, disaster risk management, natural products, natural hazards, and other dimensions of surviving and thriving in the world. It has continuing value for the conservation and sustainable use of biodiversity and ecosystem services. With the unprecedented rate of change in the environment, environmental cues, patterns, dynamics and contingencies are changing or becoming less reliable, and traditional knowledge may be insufficient by itself for coping with the change. This is one of the drivers for the engagement between scientists and traditional knowledge holders, and a number of methodologies have been developed for this process.

One of the principle methods has been termed knowledge co-production. In this process, scientists and indigenous communities collaborate and exchange knowledge. The combined knowledge outcomes can produce new knowledge and innovations that can promote better coping and utilization by indigenous communities and provide solutions that can be used by other communities. Although a potentially powerful approach, there are issues related to power asymmetries and unequal footing. The ideal in knowledge co-production is to produce knowledge with mutual respect for different knowledge systems and to implement solution in the local context. The past practice has often been to mine traditional knowledge, where it is acquired by scientists, evaluated and validated externally out of context, with decisions about its use in policy and management made by scientists. The knowledge co-production process reforms these practices to some extent, but many asymmetries remain and it is still dominated by the exchange-and-validate approach. Knowledge co-production can also underestimate the range of cultural, ethical and legal issues that need to be navigated to provide sufficient safeguards for knowledge exchanges. The literature on co-production rarely discusses these issues and the potential risks associated with sharing traditional knowledge.

The Multiple Evidence Base approach is an emerging method. It is similar to knowledge co-production, but differs in the degree to which traditional knowledge is exchanged. The approach acknowledges that traditional knowledge, rather than being externally validated, can be validated within its own context. Traditional knowledge may be exchanged, but indigenous communities can also develop indicators, proxies and surrogate values to interact with scientists. This allows the integrity of each knowledge system to be maintained.

It follows several rules of engagement:

1. equality among participants;
2. listening with empathy;
3. making assumptions explicit. Is provides a discussion context in which conflicts in evidence are resolved through consensus decision making, and uses a "braiding" metaphor rather than "incorporation" of one knowledge system into another.

Other methods used include: community-based management information systems (CBMIS), cost-effectiveness analysis, extended cost-benefit analysis, multi-criteria analysis, multi-stakeholder analysis, participatory 3D mapping, rights-based analysis, risk-benefit analysis / risk-opportunity analysis, scenario planning, and social discourse analysis. Each has strengths and weaknesses. One principle dimension is the degree to which the different methods are participatory and take into account the cultural values and sensitivities of indigenous communities. Indigenous peoples have emphasized the relational dimension of their knowledge systems, and the need to take into account direct, indirect and contextual values (relationships, substrates, processes, flows, linkages, etc.). They have expressed concern about the potential undermining effects of valuation that occurs without their direct participation.

The presentation then turned to a consideration of the need for guidelines for managing the traditional knowledge-science-policy interface. Some provisional guidelines were discussed. A fundamental principle is to understand differences in worldviews and beliefs about the nature of knowledge. Indigenous peoples come from traditions that often emphasize such values as respect, reciprocity, continuing stewardship obligations to knowledge, respect for customary law and the appropriate use of knowledge, the need to have a good heart and good mind for receiving knowledge and the need to maintain right relationships. Knowledge is often thought to have a spiritual origin and has limits to its proper use. When it is shared, the recipient is expected to assume these stewardship obligations, and pass them on to others. Some knowledge is considered to be secret, sacred, or closely held by one or a few member of their communities. Scientists are embedded in another set of expectations and worldviews, and commonly shaped by the open knowledge society, a material ad secular view of knowledge as information, intellectual property rights, the public domain, the common heritage of humankind.

Scientists may often approach indigenous communities to solve a particular problem by gaining access to traditional knowledge. Traditional knowledge holders are nested in a much wider context beyond solving a narrow problem, in which they pay attention to their customs and traditional values. Their communities may be under significant pressures from environmental change, climate change, territorial incursions, lack of secure tenure, lack of recognition of fundamental rights, cultural resource degradation and loss, invasive species, species range shifts, political and social marginalization, human rights violations, and a number of other threats. In the context of their cultural values and the pressure they are face with, knowledge exchanges are not without risk and involve complex considerations.

Guidelines should consider "internal" and "external" considerations. Internal considerations involve cultural values (e.g. reciprocity, equilibrium); procedures (e.g. protocols for contacting communities, methods for obtaining free, prior and informed consent or FPIC), and community-defined forms of benefit sharing. External considerations need to take into account issues related to the status, benefits and threat to traditional knowledge beyond community boundaries. These should address issues such as who owns and controls exchanged knowledge, who owns and controls any products, rules for sharing knowledge with third parties, controls over publications, and checkpoints to control changes in use, explicit benefits to communities, acknowledgement, and other issues.

The legal issues related to the sharing of traditional knowledge should be carefully considered. Once shared, traditional knowledge in many countries becomes regulated by intellectual property rights (IPRs). Most IPR systems treat traditional knowledge as being so old or not fulfilling the conditions for protection (e.g. written vs. oral form, no identifiable author) that it is considered to be part of the public domain. Once knowledge is categorized as being in the public domain, it generally loses any form of protection, is open to exploitation, and has no obligations for benefit sharing.

Traditional knowledge is often related to beings in the living world that have deep spiritual significance and are core to cultural heritage, identity, livelihoods, integrity and dignity. Misappropriation and misuse of knowledge can lead to the misuse (e.g. overharvesting, local extirpation) of the resources to which it is linked.

Free, prior and informed consent (FPIC) is a significant procedural safeguard to ensure that indigenous communities have control over the process of knowledge exchange. FPIC recognizes that indigenous peoples have the right to say no. If they do agree to consider allowing access, FPIC ensures that the process of provides a balanced and fair basis to decision making. Free implies a lack of coercion, but also requires that the framework for decision making is decided by the traditional knowledge holders. Prior implies that consent is obtained before accessing traditional knowledge (or using traditional knowledge in the case of already disclosed traditional knowledge). Informed requires that both benefits/opportunities and risks are considered. This is a significant condition, as many published studies suffer from the "optimism bias", only considering the benefits of knowledge exchange without considering issues such as misappropriation and misuse. Consent requires that indigenous peoples themselves identify their own processes for making an authoritative decision about access. Consent can also only be made on mutually agreed terms, which allows communities to specify the safeguards and conditions they want to impose on knowledge exchanges.

The need to develop guidelines in the IPBES process is a priority. Traditional knowledge exchanges are currently occurring in a vacuum. There are some regulations emerging from the CBD and Nagoya Protocol provisions on access and benefit sharing. Many of the emerging laws are focused on genetic resources, and not the comprehensive range of issues related to biodiversity and ecosystem services. There are few legal frameworks that treat traditional

knowledge comprehensively, taking into account cultural, human rights, intangible cultural heritage rights, intellectual property rights and other aspects. Increasing funding is being made available for traditional knowledge research without appropriate safeguards being put into place. The process of utilizing traditional knowledge in global assessments should ensure that the information has been acquired through community-led processes and based on the fundamental principle of doing no harm. Getting the process right is essential to building trust and that traditional knowledge is being used in a way that provides benefits to and does not harm indigenous peoples.

4.3 Fonua mo e Moana – Island and Ocean Biodiversity and Ethnobiodiversity as the Foundation for Cultural and Ecological Sustainability - Pacific Island Perspectives and Opportunities for Building Synergies between Indigenous and Modern Science; Randolph Thaman

Professor of Pacific Islands Biogeography, The University of the South Pacific

The small island developing states (SIDS) of the tropical Pacific Ocean, despite arguably among the most peaceful (Pacific) and least poverty-stricken areas on Earth, are clearly on the frontline against climate change, sea-level rise, death of coral reefs, overfishing, deforestation, loss of agricultural diversity, invasive alien species, pollution, increasing population and urbanization. The presentation stresses the fundamental importance of the conservation and sustainable use of the biodiversity and ecosystem services and associated “ethno-biodiversity” as a basis for food, health, energy and livelihood security in Pacific SIDS in the face of these unprecedented changes .Emphasis is placed on the central importance of conserving and revitalizing indigenous and local knowledge (ILK) of island (fonua) and ocean (moana) biodiversity and building synergies between ILK and the most up-to-date modern scientific knowledge of biodiversity, global change and adaptation to such change. This is one of the main operating principles of the recently established Intergovernmental Platform on Biodiversity and Ecosystem Services(IPBES). Examples are provided of the nature, critical importance and threatened status of island and ocean biodiversity from both the larger Melanesian countries, such as Papua New Guinea, Solomon Islands, Vanuatu and Fiji in the west, and from the smaller oceanic volcanic and raised limestone islands and atolls of Polynesia and Micronesia in the central Pacific.

Particular stress is placed on the need for biodiversity conservation on both the larger biodiversity-rich “biodiversity hotspot” islands AND on the smaller “biodiversity “cool spot” islands, such as atolls and raised limestone islands which have among the most limited and highly threatened terrestrial biodiversity inheritances on Earth and the fewest options for modern market-oriented urban development. It is stressed that islands are like “arks”, each with their own limited biodiversity inheritances. Prominent among these uniquely

adapted inheritances are biodiversity and ethno-biodiversity. Ethno-biodiversity is defined as the knowledge, uses, beliefs, resource-use systems and conservation practices, taxonomies and language that a given society, including modern scientific scientists (both “hard” and “social”) have for biodiversity, in this case for island biodiversity. ILK is particularly important in Pacific SIDS where the agricultural, wildland, freshwater and marine resource owners and users are almost exclusively indigenous Pacific Island peoples who have lived in, and adapted their biodiversity-use strategies to, their islands and ocean for millennia. This is also an area where very rapid urbanization has put stress on traditional systems and required the synergistic adaptation of traditional and modern systems to rapidly expanding urban areas and new and intensifying threats due to global change.

The diversity of island “biodiversity” becomes more astounding when the ethno-biodiversity dimension is added, and an attempt is made to catalogue all the uses of all species, subspecies, forms, varieties, cultivars, races, breeds, provenances, of wild and domesticated terrestrial and aquatic plants and animals from each class, or biota type in each ecosystem. The magnitude of biodiversity, even for a small island community, becomes clear, but is almost inconceivable to orthodox economists, planners, agriculturalists, foresters and to even international biodiversity scientists and conservation “experts” who extol the virtues of biodiversity conservation. An attempt to do this for trees in Pacific Island agroforestry systems showed they serve at least twelve distinct ecological functions, have over 70 cultural uses, and provide between 10 to as high as 80% of the real income and production of most rural Pacific peoples. The diversity and value of marine resources to Pacific Islands peoples is, similarly, astonishing, with most traditional coastal fishing communities having names for and using or selling at least a 1000 species of seaweeds, finfishes, molluscs, crustaceans, echinoderms, corals and other marine invertebrates or organisms.

As suggested above the richness of ethno-biodiversity is almost incomprehensible to the ordinary urban planner or scientist who has lost touch with the natural world and subsistence living systems. The term “biodiversity” for people who depend on it and know it, particularly rural Pacific peoples with only limited opportunities for generating cash incomes, takes on immense meaning. Yet the wider economic, cultural and ecological value of biodiversity, particularly biodiversity in its widest sense, is rarely acknowledged in development plans, project documents, or aid proposals, even though the products and benefits provided by it would be extremely expensive or impossible to replace with imported substitutes.

It is stressed that alongside the well-known and well-publicized biodiversity crisis, there is a parallel “ethno-biodiversity crisis” a result of which these traditional ethno-biodiversity inheritances are being rapidly eroded due to increasing monoculture, monetization, urbanization, modern education, lifestyle changes, the E revolution and because they are often neglected in main-

stream biodiversity conservation initiatives. This is despite the fact that most culturally useful and highly threatened biodiversity is normally found within the fabric of active garden areas, near shore marine areas and near settlements.It is NOT normally found in virgin inland or montane forests or distant isolated “pristine” reefs, where most local people rarely venture. It is argued that a failure to conserve and sustainably use biodiversity and ethno-biodiversity in Pacific SIDS, and a failure to build synergies between Pacific ILK and modern scientific knowledge, will ultimately result in the abject poverty, food and energy insecurity and nutritional and health deterioration, something that we associate with the world’s most destitute societies, a trend already reaching serious proportions in many areas of both the developing and developed world in the face of unprecedented global change.

4.4 Climate change and Biodiversity monitoring: Experiences from an Indigenous Pastoral community in Southern Kenya; Stanley Kimaren Riamit

Indigenous Livelihoods Enhancement Partners (ILEPA)

As resources are becoming scarcer, partly as a consequence of Climate change amongst other factors, the monitoring of environments and natural resources becomes increasingly important. The Bali Action plan (BAP) highlighted the importance of “measurable, reportable and verifiable” (MRVs) greenhouse gas mitigation actions and commitments for a Post-2012 climate framework. MRVs are therefore one of the key areas of negotiations under the UNFCCC. MRV systems have been recognized to be a key element for an effective REDD+ mechanism, as well as an essential component of any post Kyoto agreement. The overall aim of the MRV process (on mitigation actions) under the UNFCCC is to develop strong nationally-owned and coordinated forest monitoring systems with competent technical and institutional capacity.

Hence, in order to participate in the REDD+ Programme, state Parties have to provide evidence of forest conservation and carbon sequestration. Therefore, one of the key elements for REDD+ implementation is the development of transparent, comparable, coherent, complete and accurate measurement, reporting and verification (MRV) national systems with respect to Carbon stocks. The IPCC Good Practice Guidelines (GPG) provide a broadly discussed and recognized framework for international requirements for an MRV system, whose ultimate outcome is to support countries to develop their national forest GHG-inventory in order to report on REDD+ activities to the UNFCCC Secretariat.

The current MRVs tools and standards in the public domain mostly focus on climate change dynamics at the global and national level and least on local communities. They over rely on state Parties under the UNFCCC as the organ of both negotiation and eventual implementation of mitigation and adaptation activities. In situations for instance where the state is seen as less supportive (which is often the case) to the course of indigenous peoples, climate change

intervention mechanisms such as REDD+ may worsen the human and economic rights violation against indigenous peoples, local communities and women.

Secondly, most of the existing MRVs tools and/or standards put emphasis on the monitoring of carbon stocks and financial flows to REDD+ interventions and less on non-carbon issues (e.g. social, economic and environmental safeguards). This trend might be informed by the overriding goal of climate change mitigation through emission reductions, under the UNFCCC.

Thirdly, the development of these tools, standards and the adopted methodologies (measurements/monitoring, reviewing and reporting) is guided by 'expert' meetings. The experts and technical agencies are often informed by scientific research with little recognition and input of both indigenous peoples and their indigenous knowledge.

In recognition of the shortcomings of the current MRV tools and standards, there is growing interest in both expanding the scope of monitoring beyond carbon stock and financial flows, and to include social and environmental related safeguards and exploring the value of community based monitoring information systems, including indigenous knowledge systems and practices.

To begin with, the REDD+ Decision of the Cancun Agreement taken at the UNFCCC Conference of Parties in 2010 requests developing country Parties to develop a robust and transparent national forest monitoring system for the monitoring and reporting of REDD+ activities including subnational monitoring and reporting. The Cancun Agreements recognizes 5 key principles of interest to indigenous peoples that form the basis for the safeguard information system, namely: the integration of a human rights approach with specific reference to the United Nations Declaration on Rights of Indigenous Peoples (UNDRIP); effective participation of Indigenous Peoples; recognition and respect for traditional and indigenous knowledge; security of land tenure and multiple functions of forests and other ecosystems.

Further the Warsaw decision of 2013 reaffirmed the Cancun provisions on the need to develop robust national forest monitoring systems including subnational monitoring of anthropogenic forest-related greenhouse gas emissions by sources and removals by sinks as a basis for estimating forest carbon stocks.

Additionally, a number of research initiatives (especially Danielsen's et al. 2009 and 2013) have been undertaken to draw lessons and experiences on community based monitoring information systems but often most of these initial studies have tended to focus on comparative analysis of costs, efficiency, pace of decision-making, accuracy and precision of the data collected as compared to externally-expert driven monitoring. The studies also looked at the potential for community uptake of new technologies related to estimation of carbon stocks in forests.

On all this counts, the Danielsen's et al. 2009 and 2013, studies conclude very positively on the value of community based monitoring, asserting that decision-making for example is faster and costs relatively lower in the long run when monitoring is undertaken by community monitors. The third benefit identified of community monitoring is the value of existing knowledge that indigenous peoples and communities have.

It is evident from the foregoing that community based monitoring studies have also tended to look at the monitoring from a carbon stock monitoring perspective and less from the local community perspective, and, hence benefitting little from the rich indigenous knowledge systems and practices related to biodiversity monitoring.

In order to draw some lessons from community based monitoring information systems, Indigenous Livelihoods Enhancement Partners (ILEPA) conducted a case study research in Enkutoto group ranch, southern Kenya, amongst an indigenous pastoral Maasai community. Data was gathered through a series of semi-structured questionnaires, participant observations and focus group discussions.

Afterwards, compiled findings were presented to the community to elicit further comments and validation of findings. The results show that there are a variety of different forms of monitoring taking place, that this monitoring is done by a wide variety of community members and that there are various institutions involved in this.

The local indigenous peoples' livelihood system is still deeply embedded in the natural ecosystem including their cultural heritage, spiritual belief systems and economic production activities. Community Based monitoring Information System (CBMIS) regulated through customary law, norms and taboos, is still vibrant, elaborate and robust despite the numerous external pressures exerted on it.

The results of our recent studies show that there are a variety of different aspects of the ecosystem and biodiversity monitored by indigenous people. These range from rainfall seasonality, trends in abundance or scarcity of flora and fauna, trends and incidences of diseases, to land use changes and water quantity. The monitoring is conducted by virtually all components of the community, depending on what their main livelihood focus is.

Different aspects of biodiversity and environment are monitored by different groups in the community. For example, amongst the pastoral Maasai, the Ilaleenok (Assessors/monitors), monitor the trends and abundance in pasture, saltlicks, water and disease incidence to inform livestock mobility. The Ilapuayak/Ilomon (Travelers): since most travelling at the local level is by foot, significant observation happens and is reported through Ilomon (news) in the subsequent stop of the traveler. Also, trends and abundance in herbal medicine and wild honey is monitored by the medicine men and hunter-gatherers respectively. And, the council of elders/Elders, as embodiments of community's collective memory, puts the collected data into historical perspectives to capture the overall emerging trends in climate variability and changes in the ecosystem.

This complex network of informants builds up a monitoring information system, which is then transferred to a variety of institutions, including the local Council of Elders, Group Ranch officials , locally established Forest monitoring Committee, or Community Forest Association (CFAs), local area Chief, Kenya Wildlife Service (KWS) and Kenya Forest Service (KFS).

This information is then disseminated though a variety of different channels: there is 'ilomon' which is oral sharing of the news; another means is the official

traditional meeting known as ‘ilkiushin’. Other more formal forms come in the form of reports, either written or verbal, which often go to government agencies or department such as the KWS or KFS.

This long-term memory of forest aspects can contribute valuable insights for restoration (qualitative): what species might work best in the long term, and which natural vegetation existed on degraded lands. Monitoring should therefore involve direct participation of indigenous peoples at all level.

The establishment of the SIS on the basis of community-based monitoring information system is an indispensable pre-requisite for a cost-effective and participatory implementation of REDD+, which contributes to building trust, strengthen forest governance, secure indigenous peoples rights and tap into the indigenous knowledge.

4.5 Rotational Farming, Biodiversity, Food Sovereignty and Climate Change of Karen (Pgaz K’ Nyau) community in Northern Thailand; Prasert Trakansuphakon

Pgaz K’ Nyau Association for Sustainable Development (PASD)

The production systems of Karen People and many other indigenous communities of South and South East Asia have traditionally been shifting or rotational cultivation and they are still strongly embedded in their collective rights to their ancestral lands and territories and depend on their traditional knowledge systems which have been meticulously accumulated through centuries of interaction with nature. The philosophy of management of land and forests (territories) of Karen people comes from their elders’ wisdom: Live with the water care, for the river, live with the land, care for the forest. It is a production system that physically and culturally integrates forest and agriculture. It provides people with food security and maintains the fertility of the soil through various sustainable cultivation practices that are based on the abundant biodiversity of their landscapes and the self-regulating mechanisms of ecosystem services. It incorporates the continuous adaptation required by the ecosystem. The fields are continuously rotated. For example, rice and other food crops are planted for just one year. However, lands are kept fallow for 6-7 years to allow the regeneration of the soil and land and to bring a balance between land, water and forests. After 6-7 years, the fallow land begins another cycle of farming and thus providing a continuing system of agriculture. The cycle also aids the regeneration of fauna, flora and consequent biodiversity and the conservation of both animals and plants

Indigenous communities have therefore been able to make use of more than 200 plant species due to the 6 to 10 years of fallow (Anan et al, 2004, http://www.ikap-mmsea.org/documents/RFconceptpaper.pdf (accessed on 10/12/2011)) The season in which these plants can be harvested differs, so there is always something available right from the beginning of the year to the end. Rotational farming is a secure source of food, to all family members and

at all times. It also gives the communities access to sufficient safe and nutritious food to meet their dietary needs for an active and healthy life (Resource Manual on Transmission and use of IK on rotational farming by the Karen in Hin Lad Village, IKAP publication, 2009)

Rotational-farming is based on traditional collective land rights. All families have to select and slash their fields collectively. These land rights are very flexible: some families could give or share some parts of their land with other families in some years, if it was collectively considered necessary. The rights could easily flow between families, especially when they are cousins, because nobody thought of these as their personal rights, but rather the collective rights of the village. The philosophy behind the collective rights of rotational farming is to create space for poor family members to have equal access to the land for using, e.g. orphans or widows, who are powerless in the community rights.

Some of the finding of research on climate change and rotational farming are accessible, for example from 2010, in the Hin Lad Nai Community study on "Forestry Agriculture and Community Forest and its Roles in Enhancing Food Security and Reducing Green House Gases" (Hin lad nai villagers by the support from Northern Development Foundation (NDF) and Oxfam GB Thailand have done this research). The community would like to raise their voice that mountainous people are not the cause of climate change. Instead, their farming system and ways of living are beneficial and have the potential to reduce Green House Gases (GHG) emissions. Another finding of the research mentioned is that rotational farming can work as a mitigation strategy, through the reduction of greenhouse gases emission and the carbon storage in higher fertile soil and community forest. The rotational farming system therefore has the capacity to also contribute to carbon sequestration.

However, for many communities the land rights have been changing increasingly to personal rights and villagers were forbidden to practise rotational farming and mono cropping, because cash crops became the preferred policy choice. Many rotational-farming lands have therefore been converted to permanent fields and some to paddy fields. However, in remote areas, many villages still practise rotational farming just as they have for generations. Despite these restrictions, indigenous communities still strongly believe that the government should respect the collective rights of all indigenous communities. With the adoption by the UN General Assembly in 2007 of the UN Declaration on the Rights of Indigenous Peoples, the Thai Government and others have started to renegotiate with some indigenous communities on some of their traditional practices. For example, in a Thai Government Cabinet resolution of August 3rd, 2010 entitled "Recovering the livelihood of Karen" there is a mentioning of the need to enhance and support the practice of rotational farming as a sustainable system.

As Governments and development agencies are beginning to see the wisdom of listening to indigenous communities around the world, it is very crucial that efforts are made to enhance the collective negotiating capacities of these communities especially for defending their customary and collective land rights

including biodiversity of seeds and plants both in rotational farming fields and natural forest.

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