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Working with Indigenous and Local Knowledge Systems for the Conservation and Sustainable Use of Biodiversity and Ecosystem Services

An Analysis of Selected Case Studies from WWF Projects Worldwide as a Contribution to IPBES-2

Executive Summary

WWF's projects, fieldwork, reports, and studies are based on experience and evidence from diverse knowledge systems, as indigenous and local knowledge and traditional practices offer valuable contributions to biodiversity conservation and the sustainable use of ecosystems. The WWF case studies assembled in this publication illustrate how indigenous and local knowledge is applied in biodiversity monitoring and management of protected areas all over the world, testifying to the potential of their inclusion in building synergies among diverse knowledge systems.

Based on an examination of the case studies, WWF intends to contribute to the draft work programme to elaborate appropriate "procedures and approaches for working with indigenous and local knowledge systems", which can help guide, encourage, and promote knowledge collaboration and the generation of new knowledge in different settings in order to strengthen IPBES' diverse knowledge foundation.[1]

To inform the IPBES process, an outline of **principles for engagement with indigenous and local knowledge-holders** is suggested, inspired by relevant examples from Asia, Africa and Latin America. Drawn from on-the-ground experience in protected areas, this may help strengthen and support the "Preliminary Principles for Working with Indigenous and Local Knowledge in the IPBES" elaborated in the annex to the IPBES Secretariat Note prepared for IPBES-2.[2]

Furthermore, WWF presents its experiences with **methodologies for participatory biodiversity assessments** that are characterized by a strong sense of ownership by indigenous and local knowledge-holders. In order to build synergies among knowledge systems for the benefit of biodiversity conservation, these tools enable knowledge collaborators to jointly formulate research questions, choose data gathering methods, and work together in interpreting the results in order to draw policy-relevant conclusions for the management of biodiversity and ecosystem services.

In addition to the assessment function, IPBES's work also includes policy support, knowledge generation, and capacity-building. To pave the way for a successful collaboration between diverse knowledge systems, WWF supports the recognition of indigenous peoples' and local community members as "knowledge holders" along with scientists within the implementation process of the IPBES work programme.

[1] IPBES Draft Work Programme, IPBES/2/2, Objective 1, paragraph 9, p. 5
[2] IPBES/2/INF/1/Add.1, 2013, p. 26, 11-13

1. Introduction

1.1. Background

In all regions of the world, indigenous peoples and local communities have developed sophisticated knowledge systems regarding the conservation and sustainable use of ecosystems. As direct users of biodiversity, natural resource-dependent rural communities have long been aware of the unsettling changes occurring in the flora and fauna they rely on for their livelihoods and have consequently developed adaptive management responses.

Meanwhile, protected area managers and conservationists have recognized that by ignoring indigenous peoples and local communities' in-depth ecological memory and detailed, time-tested knowledge, the information base needed for conservation measures is significantly diminished and the ability to make appropriate decisions regarding the protection of biodiversity-rich areas is reduced. Practitioners have also become increasingly aware over the last years that including indigenous and local knowledge in assessing and monitoring the status and trends of a region's biodiversity leads to effective and collaborative problem-solving and fosters motivation among the local population to accept and participate in the enforcement of management regulations.

At the international level, the importance of indigenous and local knowledge for biodiversity conservation has been recognized by the Convention on Biological Diversity (1992), which requires Parties to the CBD to "respect, preserve, and maintain the knowledge, innovations and practices of indigenous and local communities."[3] This role has been reaffirmed by the Aichi Biodiversity Target 18, which calls for the integration of traditional knowledge in the implementation of the Convention and "the full and effective participation of indigenous and local communities, at all relevant levels."[4]

These developments have had repercussions on recent global environmental assessments such as the Millennium Ecosystem Assessment (MA, 2005), the Arctic Climate Impact Assessment (ACIA, 2004), and the 5th report of the Intergovernmental Panel on Climate Change (IPCC, to be released in 2014), which began exploring ways in which to integrate diverse knowledge systems in global assessments that have hitherto been exclusively science-based.

1.2. Indigenous and Local Knowledge Systems in the Context of IPBES

IPBES, the Intergovernmental Platform on Biodiversity and Ecosystem Services,[5] wants to build on these efforts, asserting in its founding documents the willingness to broaden its information base by going beyond formal science and include indigenous and local knowledge in IPBES assessments in order to provide decision-makers with all relevant data available on the status and trends of biodiversity and ecosystem services. The Busan outcome states this as an operating principle for IPBES: "Recognize and respect the contribution of indigenous and local knowledge to the conservation and sustainable use of biodiversity and ecosystems."[6]

By bringing together various knowledge systems, research perspectives, and multiple expertise, IPBES has the potential to become a genuinely diverse knowledge platform, pursuing new approaches in global environmental assessments. A statement by the World Indigenous Network Conference expresses that "IPBES offers a historic opportunity to address the marginalization of traditional knowledge through its recognition, respect and promotion, consistent with the UN Declaration on the Rights of Indigenous Peoples."[7]

IPBES Draft Work Program: IPBES/2/2 (see Annex 3)
Objective 1: Strengthen the Capacity and Knowledge Foundations of the Science-Policy Interface to Implement Key Functions of the Platform
Deliverable 1(c): Procedures and Approaches for Working with Indigenous and Local Knowledge Systems (developed by 2016)

[3] Convention on Biological Diversity (CBD), 1992, Article 8 (j)
[4] http://www.cbd.int/sp/targets/
[5] www.ipbes.net
[6] Busan Outcome, paragraph 7(d). UNEP/IPBES/3/3.
[7] Messages from the WIN Conference in Darwin, Australia, 26-31 May 2013.

In order to discuss how to put these ambitious commitments into practice, first steps have been taken during workshops organized in Guna Yala (2012), Vilm, and Tokyo (2013). The IPBES Draft Work Program, to be decided upon at IPBES-2 in Antalya in December 2013, foresees the establishment of a task group under the lead of the Multidisciplinary Expert Panel (MEP) and the Bureau to elaborate a guide on "Procedures and Approaches for Working with Indigenous and Local Knowledge Systems"[8] by 2016 (see box). An initial guide was developed and will be put before the Plenary at IPBES-2 for informational purposes.[9]

1.3. WWF's Engagement with Diverse Knowledge Systems

WWF's projects, fieldwork, reports, and studies are based on experience and evidence from diverse knowledge systems. One example of a scientific study is WWF's "Living Planet Report"[10], the leading assessment of its kind that documents the health of our planet's ecosystems by using the *Living Planet Index*. It measures our demands on nature with the *Ecological Footprint* Index revealing important drivers for biodiversity loss.[11]

WWF takes into account traditional knowledge when pursuing partnerships with indigenous peoples and local communities in various regions of the world. In 2008, WWF's *Statement of Principles on Indigenous Peoples and Conservation*[12] was reissued in order to affirm WWF's commitment to this policy, which was originally developed in 1996, and to further its consistent application across all WWF program areas. In 2007, WWF published a review on *Strengthening WWF Partnerships with Indigenous Peoples and Local Communities* with recommendations for appropriate measures. In 2008, this was followed by guidelines on *Mainstreaming WWF Principles on Indigenous Peoples and Conservation in Project and Program Management*.[13]

In the field, WWF has developed fruitful partnerships and trusting relationships with various indigenous peoples' organizations and local communities. WWF is committed to involving them in the planning and execution of field programs, respecting their cultural heritage, and promoting their expert biodiversity knowledge.

2. Purpose of the Analysis

The present publication aims to inform the development of IPBES guidelines on working with indigenous and local knowledge systems by showcasing different examples of knowledge collaboration in WWF-supported projects worldwide. WWF seeks to contribute to the discussion by portraying actual on-the-ground experience from processes in which scientists, practitioners, protected area managers, and indigenous and local knowledge-holders have successfully built synergies among diverse knowledge systems for the benefit of biodiversity conservation. Based on an examination of the case studies, WWF wishes to support the elaboration of appropriate procedures and principles for engagement with indigenous and local knowledge-holders, which can help guide, encourage, and promote knowledge collaboration and the generation of new knowledge in different settings in order to strengthen IPBES' diverse knowledge foundation.[14]

3. Indigenous and Local Knowledge Systems

3.1. Characteristics of Indigenous and Local Knowledge

Indigenous and local knowledge systems have co-evolved in conjunction with an enormous diversity of ecological systems. Indigenous and local knowledge is embedded in a context of values and social conventions, ethical principles, religious beliefs, ritual taboos, customs, innovations, and other cultural practices. It is part and parcel of a community's identity and forms the foundation of community livelihoods, connecting people to their land and its natural resources. It is collective rather than individual, although specialized knowledge sometimes resides only in specific groups of men or women, such as in members of designated lineages, respected elders, expert hunters, or

[8] IPBES Draft Work Programme, IPBES/2/2, Objective 1, p. 5, and Modalities, IPBES/2/2/Add.1, Deliverable 1(c), p. 6.
[9] See IPBES/2/INF/1/Add.1, 2013.
[10] WWF International 2012, Living Planet Report.
[11] http://www.footprintnetwork.org
[12] WWF International 2008, Indigenous Peoples and Conservation: WWF Statement of Principles.
[13] Larsen and Springer 2008, Mainstreaming WWF Principles on Indigenous Peoples and Conservation
[14] IPBES Draft Work Programme, IPBES/2/2, Objective 1, paragraph 9, p. 5.

healers, and can only be accessed according to precise cultural regulations. The generation and application of traditional knowledge has the community's well-being at its core.

Indigenous and local knowledge is "lived knowledge".[15] It is often transmitted through stories, teachings, songs, dances and other cultural practices, which can, to a great extent, only be learnt *in situ* on the land. As most knowledge is passed on orally and is not documented or recorded, disruptions in the transmission of knowledge can substantially degrade traditional knowledge systems within one or two generations. As such, the potential to acquire and promote knowledge follows specific rules: "Indigenous and local knowledge is developed, owned, stored, shared, accessed and disseminated in ways that are very different from scientific knowledge."[16]

Indigenous and local knowledge systems are often characterized by an emphasis on:

- Interdependence of ecological, socio-economic, cultural, and spiritual spheres
- Cyclical processes in natural and social domains
- Collective identification with place/land/ancestral territory
- Central role of social relations and reciprocity amongst individuals, as well as in the unity of humans and nature
- Continuity of relations between past, present and future generations, and intergenerational transmission of values, knowledge and responsibilities
- Knowledge is embodied in practice, action, morality, spirituality.

Adapted from Thaman et al. (2013), p.14.

Distinctions stemming from Western scientific thought such as theory and practice, research and technology, or the spiritual and the material are blurred in traditional knowledge systems. As noted by Thaman et al., "indigenous and local knowledge holders do not segregate knowledge from practice as both, in interaction, are sources of innovation, learning and new understanding."[17] Diverse roles and functions such as biological monitoring or research, ecosystem management, resource use and worship may be carried out by the same person displaying a holistic approach towards biodiversity conservation.

As direct users of biodiversity, indigenous peoples and local communities can provide valuable experience and information on the status and trends of biodiversity and ecosystem services. Local knowledge systems can be very sophisticated and fine-grained, providing site-specific observations that may offer critical snapshots of population health, abundance, or composition.[18] Indigenous knowledge, in addition, is often characterised by historical continuity and an ancestral identity deeply connected to a specific region or territory.[19] Indigenous knowledge systems, through their incremental accumulation and transmission over generations, often produce spatial-temporal insights of importance to biodiversity management, such as the ecological roles of slow, intermittent, or rare processes.[20]

Indigenous and local knowledge systems can thus contribute to: "(i) identify indicators to measure the current state of biodiversity, ecosystem services and cultural well-being, (ii) establish thresholds to trigger different levels of management interventions to counter biodiversity decline, (iii) set targets for the rate of recovery, and (iv) fix stopping rules to terminate interventions and divert investments elsewhere."[21]

Combining Science and Local Knowledge

"The current status of wildlife at a site is determined by a combination of historical and ongoing processes .... Local people with a long history in an area will have insights into the spatial extent, intensity, duration, and range of variability of such processes. These details are important for site-specific conservation planning, but are unavailable to protected-area staff and conservation biologists, who are relative newcomers to an area. At the same time, however, local people do not necessarily perceive the positive or negative consequences of their land use or hunting practices for wildlife at the broader spatial scales of concern to biologists. Thus, local people and conservation biologists have much to learn from each other."

R. Steinmetz, WWF conservation biologist at Thung Yai, Thailand, 2006.

[15] Berkes 2012, p. 37.
[16] IPBES/2/INF/1/Add.1, 2013, p. 14.
[17] Thaman et al. 2013, p. 42.
[18] Thaman et al. 2013, p. 12.
[19] Berkes 2012, p. 236.
[20] Steinmetz 2006, p. 1398.
[21] Thaman et al. 2013, p. 12, 16.

3.2. Role of Indigenous and Local Knowledge in IPBES Assessments

Although biodiversity loss is a global phenomenon requiring joint action by the international community, "the sub-global dimensions are often much more significant".[22] It is at the local level where the degradation of ecosystems is experienced most severely – and it is at the regional level where remaining populations of a species can be saved or lost as a direct response to short-term changes in human behavior.[23] These small ecological units are thus fundamental for understanding the trends in biodiversity change, the impact on human well-being, and the effectiveness of management responses.[24]

Regional, and where appropriate sub-regional assessments, are identified as key deliverables in the functions and operating principles of IPBES.[25] Some nomadic or semi-nomadic peoples range over large territories, many indigenous homelands extend across national boundaries or share their cultural and linguistic heritage and collective knowledge with neighboring groups, and can thus provide valuable contributions to IPBES assessments at these levels.[26]
Examining local units of biodiversity conservation, such as protected areas, Indigenous Peoples' and Community Conserved Territories and Areas (ICCAs)[27], or co-managed marine protected areas can provide us with critical insights on the state of endangered species and their habitats, such as the Amur tiger or Western lowland gorillas. Protected areas can also function as "laboratories" for joint research projects, as some of them work directly and *in situ* with respected knowledge holders in appropriate local contexts.[28] Biodiversity assessments or monitoring activities in protected areas are conducted with the specific aim of influencing management decisions and conservation policy. At a small scale, they perform functions IPBES wishes to fulfill at the international level, providing the best available knowledge to decision-makers to ultimately halt biodiversity loss and the degradation of ecosystem services.

3.3. Connecting Indigenous and Local Knowledge with Science

Ecological systems are complex with various interactions across different levels, which are difficult to capture by only one scientific discipline or knowledge tradition. As discussed above, indigenous and local knowledge systems can contribute to biodiversity assessments and management in various important ways. However, indigenous and local knowledge systems are often considered to be confined to their specific ecological context. In order to build synergies with science for global biodiversity assessments, making use of indigenous and local knowledge systems entails resolving issues of scale: "New methods are needed to find innovative ways for legitimate and constructive ways of aggregating, evaluating and synthesizing knowledge to inform scales beyond the local."[29]

Global environmental assessments are thus increasingly confronted with the challenge of how different scales can be integrated, and how different knowledge systems can be connected to complement each other. Drawing from a broad consultation process and in-depth discussions, the Stockholm Resilience Centre has proposed the "Multiple Evidence Base approach" as a conceptual framework for connecting diverse knowledge systems within IPBES.[30] The approach suggests that the provision of multiple sources of evidence allows decision-makers to acquire an enriched understanding of the biodiversity's status and trends. Drawing from its work experience with diverse knowledge systems, WWF considers the Multiple Evidence Base approach a fruitful starting point and valuable framework for knowledge collaboration in different settings.

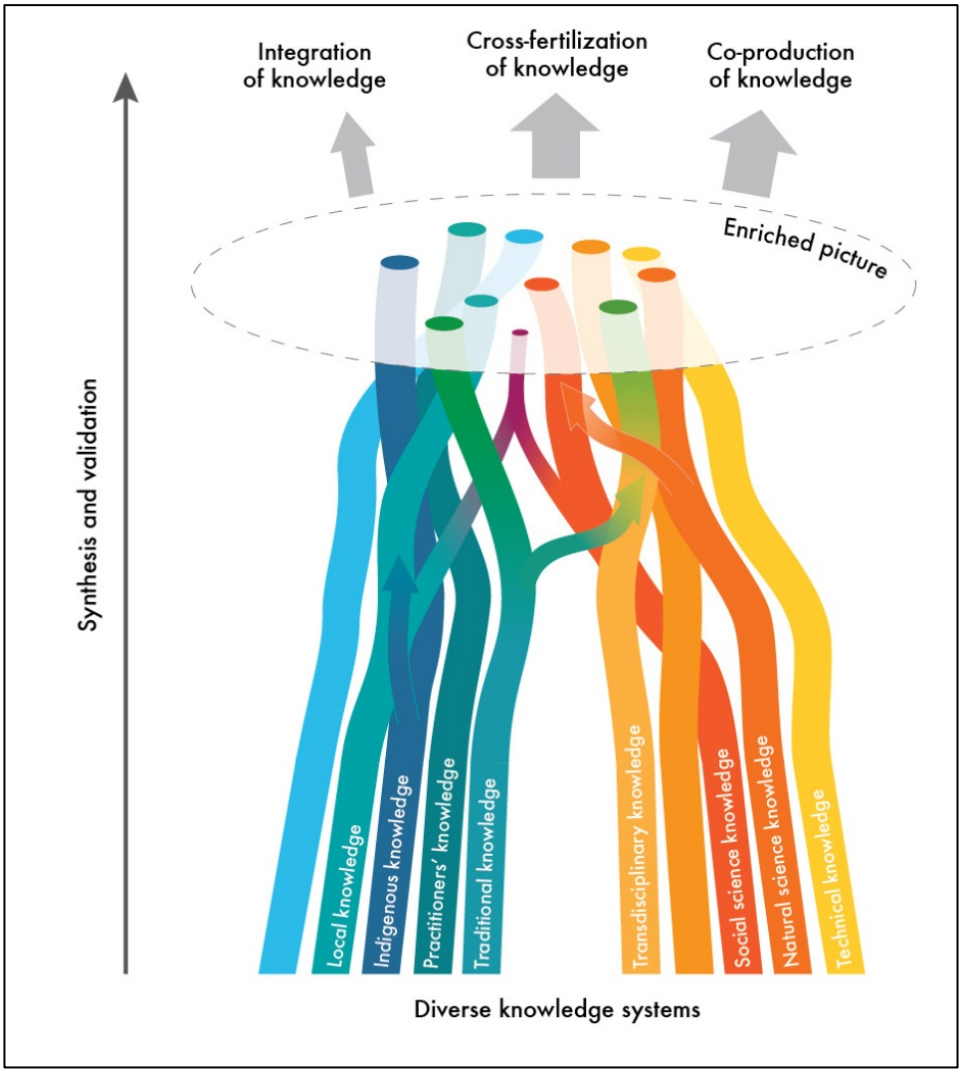
[22] Reid 2006, p. 6.
[23] Steinmetz 2006, p. 1398.
[24] Thaman et al. 2013.
[25] IPBES Draft Work Program, IPBES/2/2, 2013, p. 2.
[26] IPBES/2/INF/1/Add.1, 2013, p. 15-16.
[27] www.iccaconsortium.org
[28] IPBES/2/INF/1/Add.1, 2013, p.13.
[29] Tengö et al. 2013, p. 8, also see Berkes et al. 2006.
[30] Tengö et al. 2013

In a nutshell: Multiple Evidence Base approach

- Indigenous, local, and scientific knowledge systems are different manifestations of equally valid and useful knowledge systems which generate complementary evidence for interpreting conditions, change, trajectories, and causal relationships relevant to the sustainable governance of ecosystems and biodiversity.
- Moving away from translating knowledge into one currency, i.e. "integrating" local and indigenous knowledge into science.
- Different criteria of validation should be applied to data and information originating from different knowledge systems.
- Generates an equal starting point for mutually agreed ways to proceed, including the potential for co-production of knowledge.

From: Tengö et al. (2013), p. 3.

Figure 1: An illustration of a Multiple Evidence Base approach, where diverse knowledge systems contribute to generate an enriched picture of a selected problem or issue of concern. The enriched picture can serve as a legitimate starting point for further analysis and knowledge generation (from Tengö et al. (2013), p. 4.).



4. Selected Case Studies from WWF Projects

4.1. Overview

In order to contribute to IPBES' discussions on working with indigenous and local knowledge systems, WWF has assembled case studies from protected areas it works in around the world. These examples portray various forms of collaboration between natural and social scientists, protected area managers, and indigenous and local knowledge-holders. Reviewing the case studies, we have focused on identifying examples of good practice and distinctive approaches that have positively influenced such collaboration, contributing to the attainment of conservation goals. Drawing from this wide range of experiences and insights gained from projects in different biocultural systems in Asia, Africa and Latin America, we extracted lessons for promoting respectful and constructive cooperation between different knowledge systems. In the following pages, we suggest an outline of principles for engagement with indigenous and local knowledge-holders. In addition, we present two successful methodologies for carrying out participatory biodiversity assessments.

A more detailed description of all examined case studies can be found in the Annex. Annex 1 includes case studies from the Central African Republic, Colombia, Peru, Russia, and Zambia regarding "Principles for Engagement with Indigenous and Local Knowledge-Holders". Annex 2 provides case studies from Namibia, Thailand, and Indonesia embodying different procedures and methodologies for participatory biodiversity assessments. For these case studies, we have asked WWF colleagues on the ground to answer a standard questionnaire regarding their experience in knowledge collaboration.

4.2. Principles for Engagement with Indigenous and Local Knowledge-Holders

The global loss of biodiversity is accompanied by a loss of local and indigenous traditions, languages, and knowledge. Some of the reasons for this cultural crisis are:

- Degradation of ecosystem services and related livelihoods
- Restricted access to natural resources
- Changes in lifestyle
- Advent of formal education systems which disregard traditional ways of knowing
- Disrupted relationships between elders and youth[31]

Increasingly, indigenous and local communities lose confidence and pride in their cultures and knowledge systems as these appear less adequate to confront new challenges. The examined case studies illustrate how protected areas offer multiple opportunities for direct application of traditional ecological knowledge in biodiversity monitoring and management, providing a context in which indigenous and local insights, skills, and expertise not only remain relevant but also become important assets in the shared effort to protect our collective natural heritage. This often empowers communities and triggers important cultural revitalization movements.

IPBES has the potential to provide additional outlets for indigenous and local knowledge systems, recognizing their value, and enabling them to influence decision-making processes at different levels. However, there are also risks involved in this endeavor, as many indigenous peoples and local communities worldwide have not just experienced the exploitation of their territories and natural resources, but also a misappropriation of their knowledge, which in many instances has provoked an "abhorrence and distrust of research."[32] To counter these perils, ethical protocols and principles for engagement need to be developed and widely disseminated.

What follows is a tentative outline of elements, which could serve as a starting point in the elaboration of **principles for engagement with indigenous and local knowledge-holders**. They are based on WWF's on-the-ground experience working with various indigenous peoples and local communities and its efforts to connect diverse knowledge systems. The selected case studies

[31] IPBES/2/INF/1/Add.1, 2013, p. 21.

[32] Smith 2012, p. 111; also see p. 61, 64, 96, 178.

illustrate the importance of these elements in promoting equitable, constructive, and effective knowledge collaboration.

Mutual Respect

Mutual respect is the cornerstone for successful collaboration. Western science has historically enjoyed a much higher status than traditional knowledge systems and is perceived in most professional and political circles as the ultimate repository of truth and the exclusive source of reliable information: "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."[33] Treating traditional local expertise with respect is of outmost importance for scientists or practitioners engaging with indigenous and local knowledge holders, and only then can mistrust and barriers to cooperation be overcome. This also entails acknowledging different motivations for conservation, including spiritual beliefs, different social rules and leadership structures, as well as traditional management institutions. In Bikin, Russia, religious restrictions are the foundation for protecting the Amur tiger, which is considered the "God of the forest" by the indigenous Udege. In the Bangweulu Wetlands of Zambia, it is the spiritual leaders who have traditionally enforced the right of access to fishery resources. At Yaigojé-Apaporis, Colombia, sacred sites and related rituals and practices have provided the basis for the protection of this National Park. Many of the WWF case studies show that recognition of culturally determined motives, practices and institutions for the conservation and sustainable use of natural resources provides the basis for fruitful collaboration.

Acknowledging the contribution of indigenous and local knowledge systems to the protection of an area's biodiversity entails the granting of access rights, tenure security, and rights of participation in the management of protected areas. Government recognition of the rights of the indigenous Khwe and their contributions to park management has proven fundamental for successful biodiversity conservation in Bwabwata in Namibia.

Transparency

As there are differences between indigenous and local knowledge systems and science, the corresponding actors operating in each system often have different priorities and interests. Many WWF case studies mention the need to openly present values, assumptions, and interests in order to discuss the respective agendas in a transparent way. Both the case studies from Russia and Colombia show how indigenous peoples and a conservation organization such as WWF can find common ground by clearly and openly presenting their motivations and objectives. In addition, it is of particular importance to avoid raising false expectations with unrealistic promises. Furthermore, established consultation procedures such as FPIC (Free, Prior and Informed Consent) as described in the UN Declaration on the Rights of Indigenous Peoples[34] need to be respected and embedded in a culturally sensitive approach to knowledge collaboration.

Trust and Long-term Commitment

Trust needs to be built between all actors in a knowledge collaboration in order to enable exchange of information for a common cause. Trust and the successful sharing of knowledge can only be attained in long-term relationships with the local population, as can be seen in the case studies presented in this analysis. Dialogue forums need to be established where diverse underlying assumptions can be discussed and where knowledge collaboration can unfold as a process of mutual learning. As seen in the case study on fisheries in Indonesia, these shared spaces for dialogue and joint reflection can later evolve and become platforms for negotiation, conflict resolution, and decision-making for biodiversity conservation.

Facilitators and "Bridging Agents"

Relationships between indigenous peoples, local communities, and government agencies are not always conflict-free, often due to resource and land use restrictions imposed on the people who live in or adjacent to protected areas. Independent, external NGOs are sometimes well placed to mediate between the different actors, establish common ground, and identify potential shared benefits. Particularly if they have had a long presence in the area, their acquaintance with local knowledge systems and familiarity with the dynamics within communities position them well to function as "bridging agents" between the population and the authorities. Benefitting from a pool of professionals with academic backgrounds in diverse areas of expertise allows them to mediate between local knowledge holders and the scientific community. Many of the selected case studies,

[33] IPBES/2/INF/1/Add.1, 2013, p. 9.

[34] http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf

especially the ones from Thailand, Zambia, Russia, Colombia, and Peru, reveal how facilitation by an organization such as WWF can be key to break the deadlock between different partners and enable fruitful collaboration. These organizations can also arbitrate complex power relations between dominant sectors of society and the very often marginalized rural communities.[35]

Indigenous and Local Languages

Effective communication clearly is one of the most important factors for knowledge collaboration, with indigenous languages carrying important biodiversity information: "Indigenous and local languages are essential vessels for nurturing and transmitting biodiversity knowledge. [...] Dialogue about biodiversity across knowledge systems may succeed (or fail) depending on the ability to recognize and overcome linguistic barriers."[36] Both the case studies from the Central African Republic and Thailand illustrate the need for researchers to learn the local language to be able to communicate successfully with indigenous knowledge holders. Collaboration on biodiversity knowledge not only requires proficiency in the language but also a familiarity with the mode of communication and cultural idiosyncrasy of a particular group of people in order to judge how to assess information conveyed through personal anecdotes, humor, or customary exaggeration. Cultural and language interpreters and intermediaries from local grassroots organizations play an important role in this process.

Identification of Knowledge Holders

To identify legitimate knowledge holders for a specific research question or assessment, it is important to be aware of the social complexities prevalent in the communities from which indigenous and local knowledge originates. In many cases, knowledge is gender-specific with access to it determined by strict cultural rules. On occasion, it might only reside with specialized members of a society. Such is the case with the highly regarded male BaAka hunters of the Central African Republic, whose accurate interpretation of the behavior of Western lowland gorillas and their capacity to operate in close proximity to them was crucial for their successful habituation. Wherever possible, the selection process of knowledge holders should involve local indigenous organizations, which enjoy the trust and recognition of their communities. The positive role played by strong indigenous organizations is apparent in the case studies from Russia, Peru, and Colombia, which show how important it is to invest in the strengthening of these organizations.

Cultural Continuity

The recognition of the valuable role which indigenous and local knowledge systems play in the efforts to protect biodiversity must be accompanied by a commitment to strengthen the cultures that generate them. It is in IPBES's own interest, as a diverse knowledge platform and direct beneficiary of traditional expertise for its assessments, to support the enduring viability of the cultural foundations which sustain this knowledge. Several of the case studies emphasize the need to ensure the continuity of indigenous and local knowledge systems by creating spaces for transmission from generation to generation. Two such examples are the Khwe Academy in Namibia, where elders transmit their tracking skills and ecosystem knowledge in workshops targeting young members of the community, and the Dzanga-Sangha Youth Initiative in the Central African Republic which aims to strengthen indigenous identities and cultures by reinforcing the ties between BaAka elders and youth. New technologies and documentation methods offer novel possibilities for indigenous youth to record and share their cultural heritage in attractive and innovative ways.

Cultural Context

There is a danger in simply extracting fragments of indigenous and local knowledge and using it without taking into account the complexity of its cultural context. "Cherry-picking" isolated and de-contextualized bits of information can end up trivializing and distorting traditional knowledge. Selective and partial use of information as a result of one-sided validation efforts diminishes the potential for fruitful and equitable knowledge cooperation. A greater danger arises when the impoverished version of traditional knowledge returns to the communities. Due to the already vulnerable condition of the cultural foundations of many traditional societies, the inclusion of this knowledge in an international context could easily be perceived by the communities as positive feedback, which might result in the re-absorption of it in its oversimplified form. The deformation of the traditional knowledge systems would be a negative side effect and might accelerate their demise. Many of the case studies show how to make use of traditional knowledge in a comprehensive and respectful way without removing it from its physical and social context.

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[35] Smith 2012, p. 178.

[36] IPBES/2/INF/1/Add.1, 2013, p. 18.

Ownership of Process and Results

The notion of ownership is central to equitable knowledge collaboration. Indigenous and local knowledge-holders need to know that their intellectual property rights are respected. They are the legitimate owners of their knowledge and should be in control of what happens with it from the onset of a project until its end. All research partners should arrive at a joint problem definition, agree on clear research agendas, decide on research questions and data gathering methodologies together, and disseminate results widely, including feedback and return mechanisms of research results to the communities. Specific methodologies for joint biodiversity assessments with strong ownership of the communities, such as the "Event Book System" in Namibia and "Wildlife Workshops" in Thailand, are described in detail in the next chapter.

Sharing of Benefits

Knowledge sharing needs to be accompanied by tangible benefits for the communities. This can be either in monetary terms, such as through payment or employment of selected knowledge holders as shown in the case studies from the Central African Republic, Russia, and Namibia, or alternatively through long-term granting of access rights to natural resources and a stake in the management of the protected area, as in the Colombian case study. At the same time, indigenous peoples and local communities could further benefit from their collaboration with conservation agencies if mechanisms are provided for them to propose specific assessments and raise red flags that call attention to critical situations in their territories in order to obtain support for adaptive management.

4.3. Methodologies for Participatory Biodiversity Assessments

Community-based monitoring and information systems (CBMIS)[37] and "participatory mapping" are two of the better-known tools for participatory biodiversity assessments. While examining tools which have been successfully implemented in WWF-supported protected areas, we found it worthwhile to take a closer look at two other **methodologies for participatory biodiversity assessments** which had a remarkably positive impact on biodiversity conservation. For a full description of these two methodologies, see Annex 2.

The "Event Book System" in Bwabwata National Park, Namibia

The "Event Book System" is a monitoring system, which was designed to assist semi-literate communities to monitor and manage their natural resources. The "Event Book System" is a simple tool made up of charts filled in by local game guards as they record important sightings of wildlife or other events occurring in their assigned area. It differs from conventional monitoring in that the community dictates what needs to be monitored:

- The community decides which species they want to monitor and why
- Experts provide advice on how to gather, process, and report the information for each monitoring subject that the community selects,
- Community members collect the data, analyze it, and subsequently present the results in a simple and clear manner.

By illustrating the status and trends of their targeted resources and activities, the "Event Book System" provides community leaders with critical information for adaptive management. The communities thus have data available in formats that they understand, generated in an assessment process which they fully own. Because the reporting and analysis is based on simply adding up incidents and coloring in blocks, illiterate community members are able to fully participate in the assessment process.

The tool has been adopted with good results by 77 communal conservancies in Namibia, representing about 19.2 % of the country's total land area. It has also been implemented in 15 national parks, with similar systems launched in Zambia, Botswana, Malawi, Mozambique, Zimbabwe, Tanzania, Cambodia, and Mongolia. An advantage of the "Event Book System" is that local biodiversity assessments can be scaled up to form the basis for a national biodiversity monitoring database. In order to respond to additional assessment needs, communities could be subcontracted to undertake these 'external modules' on behalf of national agencies, in addition to their own established monitoring topics – a potential win-win solution for all parties involved.

[37] Tengö et al., 2013, p. 8.

Wildlife Workshops in Thung Yai Naresuan Wildlife Sanctuary, Thailand

"Wildlife Workshops" were designed to assemble local knowledge about the conservation status of mammals in order to identify priority areas for conservation in a participatory manner. The workshops consist of three parts: wildlife status assessment, impact assessment, and conservation planning. The "Wildlife Workshops" rely on village focus groups with experience within a defined spatial area. This arrangement allows participants to cross-check each other and come to general agreement, thus mitigating subjective memory and differences arising from different levels of observation skills. The communities develop criteria to assess status and trends in biodiversity. The evidence that participants relied on to determine population changes, such as encounter frequency with animals and their traces, and the standards used to score impacts on biodiversity are in many ways similar to the criteria biologists use for these assessments.

Through the graphic representation of information gathered in wildlife workshops, local knowledge is displayed in powerful new ways: individual observations aggregate into village-level assessments, which in turn combine to illustrate the overall magnitude of changes across the protected area. At Thung Yai, the workshops resulted in zone-specific depictions of trends in the status of 31 mammal species, covering an area of ca. 800 km^2. They clarified which species were at highest risk of local extinction, where the most threatened populations were, and the likely causes for these developments. Most importantly, they advanced a shared problem definition, thereby unlocking opportunities for collaboration in joint monitoring and patrolling and in the establishment of wildlife recovery zones.

Both experiences from Namibia and Thailand are characterized by a strong sense of ownership by indigenous and local knowledge-holders. In order to build synergies among knowledge systems, these tools enable knowledge collaborators to jointly formulate research questions, choose data gathering methods, and work together in interpreting the results in order to draw relevant conclusions for conservation management. Subsequently, indigenous and local knowledge-holders assume the responsibility for implementing management decisions, leading to increased acceptance by the community and effective enforcement of rules concerning the conservation of biodiversity and sustainable use of ecosystem services.

5. Conclusion

International, national, regional and local decision-making processes concerning the conservation of biodiversity and ecosystem services are often faced with limited empirical data and high levels of uncertainty, while simultaneously being challenged by the need to act quickly. In order to strengthen the knowledge foundation of ecosystem management and provide decision-makers with all available data on the status and trends of biodiversity, multiple sources of evidence from diverse knowledge systems need to be included in ways that respect their integrity.

Indigenous and local knowledge and traditional practices can offer valuable contributions to the conservation of biodiversity and the sustainable use of ecosystems. The WWF case studies assembled in this publication illustrate how indigenous and local knowledge is applied in biodiversity monitoring and management of protected areas all over the world, testifying the potential of their inclusion in building synergies among diverse knowledge systems.

Based on an examination of the case studies, a tentative outline of principles for engagement with indigenous and local knowledge holders is suggested, inspired by relevant examples from Asia, Africa, and Latin America. Drawn from on-the-ground experience in protected areas, this may help strengthen and support the "Preliminary Principles for Working with Indigenous and Local Knowledge in the IPBES" elaborated in the annex to the IPBES Secretariat Note prepared for IPBES-2.[38]

In addition to the assessment function, IPBES' work also includes policy support, knowledge generation, and capacity-building. To pave the way for a successful collaboration between diverse knowledge systems across all four IPBES functions, WWF advocates for the recognition of indigenous peoples' and local community members as "knowledge holders" along with scientists within the IPBES process, as stated in the IPBES Secretariat Note that "conferring special status on relevant knowledge holders [...] would have important implications for IPBES procedures and approaches for building synergies among diverse knowledge systems."[39]

[38] IPBES/2/INF/1/Add.1, 2013, p. 26, 11-13.

[39] IPBES/2/INF/1/Add.1, 2013, p. 12.

As shown in various WWF case studies, collaborative biodiversity assessments with a strong sense of ownership of both process and results by indigenous and local communities provide a basis for successful joint problem resolution and increased participation in the management of natural resources. If implemented according to mutually agreed ethical principles and procedures, IPBES assessments have the potential to provide additional opportunities for knowledge collaboration, reinforcing traditional cultures by showing respect for indigenous and local knowledge holders' expertise and ensuring their relevance and viability as effective partners in the solution of today's challenges. This will clearly have positive effects on the cultural self-esteem and well-being of indigenous and local communities: "To be able to share, to have something worth sharing, gives dignity to the giver."[40] As a diverse knowledge platform, IPBES can offer a unique opportunity to contribute to the dual and interrelated goals of protecting the earth's biological *and* cultural diversity.

6. Table of Selected Case Studies from WWF Projects

Country	***Protected Area***	***Indigenous Group (I) or Local Community (LC)***	***Knowledge Activities***	***Iconic Species***	***Potential for Regional/Sub-regional Assessments***
Central African Republic	Dzanga-Sangha	BaAka (I)	Gorilla Habituation and Youth Initiative	Western lowland gorilla, forest elephant	Yes, within Tri-National de la Sangha (TNS)
Colombia	Yaigojé-Apaporis	Makuna, Tanimuka, Letuama, Cabiyari, Barazano, Jujupmacu, Yauna (I)	Management of Sacred Sites	Jaguar, giant ant-eater, manatee, tapir	Potentially, bordering Brazil
Indonesia	Riung	Ria Latung, Bar, Riung Tiwumeze, Toring, Tuwa, Mbuang, Tadho, Bajo, Bugis (I+LC)	Community Mapping and Assessment of Spawning Aggregation Sites	Coral reef fish such as snapper and grauper	No
Namibia	Bwabwata	Khwe San (I)	Community Monitoring and Khwe Academy	Savanna elephant, roan, sable and tsessebe antelope	Yes, within Kavango-Zambezi (KAZA)
Peru	Güeppí	Secoya, Kichwa, Huitoto (I)	Participatory Zoning of Water Bodies	Pink and grey river dolphins, paiche, arahuana	Yes, within Putumayo
Russia	Bikin	Udege (I)	Traditional Harvesting Activities of Non-Timber Forest Products	Amur tiger	Potentially, bordering China
Thailand	Thung Yai	Karen (I)	Participatory Monitoring	Tiger, bear, gaur, sambar	Potentially, bordering Myanmar
Zambia	Bangweulu Wetlands	Bisa, Unga (LC)	Fishery Management with Spiritual Leaders	Shoebill, black lechwe antelope	No

[40] Smith 2012, p. 110.

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Annex 1: Case Studies illustrating WWF's Engagement with Indigenous and Local Knowledge Holders

Habituating Gorillas in Dzanga-Sangha, Central African Republic

A contribution by Angelique Todd

1. Dzanga-Sangha Protected Areas

Co-managed by the government and WWF, Dzanga-Sangha Protected Areas is located in Southwestern Central African Republic, at the northern edge of the Congo Basin rainforest. It is the largest nearly intact forest block remaining in the country and of exceptional significance for biodiversity conservation. It comprises the Dzanga-Ndoki National Park and the Dzanga-Sangha Dense Forest Special Reserve, with a population of more than 7,000 people in 8 villages within the Reserve. In 2012, Dzanga-Ndoki together with its neighboring national parks in Congo and Cameroon was designated a World Heritage Site, the "Tri-National de la Sangha" (TNS). The majority population living within the Reserve is of Bantu origin with many recent arrivals. The indigenous BaAka hunter-gatherers, who are believed to be the oldest inhabitants of the region, make up about one third of the population. Within the vast contiguous cross-boundary forest of the "Tri-National de la Sangha" World Heritage Site, BaAka from Dzanga-Sangha originate not only locally but also from the Republics of Congo and Cameroon. Traditionally, the BaAka lead a semi-nomadic forest lifestyle, with intermittent stays in the road-side villages, although a more sedentary lifestyle has become dominant since the 1970's. The BaAka have been affected by the designation of the national park, which could be said to limit their traditional hunting grounds. A greater threat to their traditional way of life is the proliferation of arms for the growing bush-meat trade and the consequent over-exploitation of wildlife on which they depend. The BaAka are highly discriminated against by the dominant Bantu population, with generally low levels of formal education and life expectancy resulting from low levels of health and hygiene in the villages.

2. BaAka Knowledge

The BaAka's way of life is intimately linked to nature, with the forest forming the basis of BaAka culture. The BaAka remain capable of existing independently of modern economic society and can survive for long periods in the forest. Their in-depth forest knowledge acquired during these stays in forest camps covers plants, trees, fungi and all animal life. They are also experts in the collection of wild honey from tree tops. Experienced BaAka seem to have an internal compass, easily navigating even unknown parts of the forest through acute observational skills and an inherent ability to build upon an inner multi-dimensional map of the forest. Through this understanding they are able to move swiftly through the forest where others would become entangled in undergrowth. They communicate with other members of the group either non-verbally or through a unique language of sounds such as whistles, claps, and yelps, which are easily discernible and travel over large distances yet blend into the natural soundscape of the forest. Equally from their superior hunting skills, their ability to imitate animal sounds is phenomenal and is also reflected in their music. BaAka music is strongly connected to forest life, and its polyphonic singing internationally renowned and inscribed on UNESCO's List of Intangible Cultural Heritage. As well as identifying the most subtle of traces, their skills are essential for tracking gorillas, especially when new gorilla groups are being searched for or traces have been lost. The BaAka also have detailed knowledge of animal habits, which habitats are favored by gorillas, their diets and their preferred resting places. Their powers of observation and auditory acuteness are also vital with regard to noticing dangerous animals such as snakes or even elephants, which in dense forest can be quite hidden to less experienced eyes. Additional strengths that have proven particularly important for the habituation of gorillas are their courage, tenacity, and endurance in the face of the challenges that they can be confronted with in the forest - all traits which likely originate from their confidence in their expertise and ease in living alongside nature. The power of their determination revolves around their tendency to make decisions as a group as opposed to any clear leadership - although those who show the best hunting or gathering skills within the community are revered to a degree and the best hunters usually also make the best trackers.

3. Western Lowland Gorilla Habituation

Over centuries, the BaAka acquired immense knowledge of tracking gorillas through hunting them before collaborating with gorilla researchers in the early 1980's.The Primate Habituation Program, established in 1997, is a good example of how the BaAka's expert knowledge and superior forest skills have been matched with Western science to improve conservation outcomes. It is one of the few programs in the region to have succeeded in habituating western lowland gorillas and to de-

velop a controlled form of tourism, based on the tracking and viewing of gorillas in small visitor groups. It takes 5-7 years for a gorilla group to be fully habituated, meaning a state where gorillas are accustomed to humans to such a degree that they become a neutral element in the environment. Over its history, the program has so far achieved the successful habituation of three gorilla groups and another two are being habituated. Due to the high density of potentially dangerous animals, researchers could not walk in the forest unaccompanied by BaAka who know how to respond correctly in the face of danger, such as charges by gorillas or elephants, snakes in proximity or poisonous insects. At the same time, they are easily able to locate target species, big or small through reading their tracks, and using their vast knowledge of animal signs such as dung, feeding traces or resting places. BaAka enjoy being in the forest and thus are usually only too willing to spend long periods motivated by the unique challenges of this work. Whilst some strategies such as habituation, using established techniques, took some time to believe, the BaAka are quick to learn by observation and soon begin to contribute to ways in which strategies can be improved, such as how to behave in first proximity to gorillas, how to deal with aggressive periods and behavioral interpretation (which although scientifically should be treated with caution, their insight is frequently along the right lines). Due to the dynamic and adaptive nature of the work, these exchanges have occurred on a regular, even daily basis either in the field or during group discussions when back at camp.As the habituation program has grown over the years, their employment has increased from approximately 10 trackers to currently nearly 50, constituting 30% of the park's employees.For them traditionally there are seemingly no borders, BaAka from Dzanga-Sangha also work as trackers in the neighboring park in Congo.

To enable and encourage the transmission of traditional knowledge between the generations, the Dzanga-Sangha Youth Initiative has been started, assembling indigenous youth and elders from all the villages of the Reserve. By strengthening their cultural self-esteem and commitment, and by opening up a space for elders and youth to meet and exchange, their traditional knowledge systems are explored, documented and widely promoted among the youth. Through several workshops, excursions and field campaigns, the young facilitators acquire the necessary skills, means, and opportunities to actively participate in the protection, interpretation and promotion of their cultural and natural heritage.

4. Contributions to Biodiversity Conservation

As a flagship species, the gorillas serve to protect the habitat and all the other biodiversity it harbors. Since 2001, habituated gorillas have been regularly visited by tourists, who enjoy this experience very much. The gorillas are also the subject of numerous international documentaries and scientific studies that have greatly contributed to our knowledge of this elusive species, raising awareness and support for their conservation. Without the BaAka, successful habituation would not have been possible and the scientific community would remain in the dark about many western gorilla behaviors such as soil scratching behavior (traditionally thought by the BaAka to be scratching for ants but they themselves later observed alongside researchers to be a type of fungus); different ways of eating termites; the role of older male offspring in the groups (during the early years the BaAka always cited the presence of two silverbacks in groups but later alongside researchers, they came to understand that these were not silverbacks but blackbacks who soon emigrated from their natal groups); and nesting patterns (gorillas were thought by early researchers to have flexible grouping patterns but through continuous tracking it was understood that groups split only under exceptional circumstances). The Primate Habituation Program generates significant revenue for conservation as well as tangible benefits for the indigenous BaAka through direct employment. With the exception of the current political instability in Central African Republic, the program is approaching economic sustainability, which is an unprecedented result for a program focusing on lowland (as opposed to mountain) gorillas, and indeed exceptional for any conservation program regionally which are mostly reliant on donors.

5. Factors of Success

Apart from providing BaAka trackers with a stable monetary income, working in the Primate Habituation Program offers additional motivation by allowing them to pass long periods in the forest, doing what they love, at a distance from the frequent anxieties of village life. It reinforces tracking abilities in the younger generation who may otherwise lose or never have incentives to gain forest skills, more and more of them leaving behind the forest in favor of alternative village-based lifestyles. Furthermore, social prestige is given to the trackers, corresponding to the traditionally high status of expert hunters in BaAka society, meriting traditional ecological knowledge. Living in the Primate Habituation camps also has a semblance of BaAka spear hunts, when men go off into the forest for periods spending time away from their families.

6. Challenges faced during the Collaboration

The initial challenge was persuading the BaAka that gorillas could actually be habituated. Perhaps they were not entirely convinced at the beginning, with rewards coming in slowly requiring many years of human-animal interaction, but over time they began to see the astounding results. Nowadays they are confident of their role and lead the habituation process of new groups, ensuring the sustainability of the program. Experienced trackers are able to search for and follow potential

target groups initially without any guide or researcher, and those who can read and write are able to take down baseline data, essentially the only obstacle blocking them from taking on more responsibility (the future implementation of cyber trackers will aid in this). For efficient communication with the BaAka, researchers have to acquire the local language, Sango, or the BaAka language. Since health and hygiene in the villages are poor, staff and family healthcare are of utmost importance for the Primate Habituation Program, as human diseases can be transmitted and prove fatal to the habituated gorillas. A health allowance within the salary is given to the employee's family and a communal health fund through selling of traditional necklaces has been successfully established.

7. Ensuring the Continuity of Indigenous and Local Knowledge Systems
Tracking skills which have originated from hunting practices but are transformed for conservation purposes are an excellent example of how indigenous knowledge systems can be kept alive through continued use. Conservation activities of the protected areas are directly dependent on BaAka knowledge and in return, the park is better protected. Trusted relationships need to be developed with the local population, where employees can act as ambassadors. Traditional knowledge and culture of the BaAka can also be valued through eco-tourism or use of traditional medicine if accompanied by appropriate mechanisms of benefit-sharing. Key is to identify, recognize and value the relevance of traditional knowledge for today's challenges and find suitable outlets for its application.
Photo credits: Chloe Cipolletta, WWF.

Jaguar's Haven in Yaigojé-Apaporis, Colombia

A contribution by Camilo Ortega

1. Yaigojé-Apaporis National Natural Park
Yaigojé-Apaporis National Natural Park (1.056.023 ha) is located in the Apaporis River basin and part of the southern Colombian Amazon rainforest. The area is rich in biodiversity and home to several endangered mammal species such as the giant ant-eater, the squirrel monkey, the white-faced capuchin, the water wolf, the ocelot, the jaguar, the puma, the pink dolphin, the manatee and the tapir. Yaigojé-Apaporis is also the home of the indigenous Makuna, Tanimuka, Letuama, Cabiyari, Barazano, Jujup-macu and Yauna, a population of 1,600 people distributed in 19 settlements. Livelihood activities include hunting, fishing and traditional agriculture, with mandioca (*Manihotesculeta*), pineapple and plantain as the main products. "Yaigojé" means "Jaguar's Haven", a spiritual being that bestows on the indigenous peoples of the region wisdom and the ability to acquire knowledge of their natural environment. The National Park was created in October 2009 as a response to a direct request by the representatives of the indigenous peoples in order to protect their territory against external threats such as gold mining. The special agreement should guarantee their traditional rights, customary management practices and territorial autonomy. The indigenous population was supported in their efforts and determination by the Colombian National Natural Parks Unit and other actors such the Moore Foundation, the GAIA Foundation and WWF.

2. Indigenous Knowledge
The rich cultural traditions of the indigenous peoples living in the area include various rituals and shamanic practices. There are several sacred sites such as hills, rapids, waterfalls, lagoons, or caves which give spiritual meaning to each corner of this territory. According to legend, mankind was created in the Apaporis River, at «Yuisi», a rapid in the middle of a mountain range. This landscape, mix of water and mountains, embodies the equilibrium the jungle depends on. The shamans use the sacred sites for healing and to guarantee, through a series of rituals, the successful management of the environment. The magic coca leave helps the shamans connect their mind with nature. Only the elders can read into the waters and women are not allowed to watch. Indigenous peoples also believe that ancient Anacondas emerged at different points along the Amazon River, creating the tribes called "People from the Yuruparí". Every year in March, communities celebrate "Yuruparí", a ritual where children connect with «Yuisi», marking their passage into adulthood. In these ceremonies, the relationship portrayed between human beings and their natural environment is respectful and caring, based on an understanding of nature formed through observation and analysis over thousands of years of coexistence. This ancestral knowledge and a deep spiritual relationship with nature are the greatest strengths of these communities in managing their territories.

3. Protecting Sacred Sites
The creation of the park is a demonstration of how spiritual and cultural values can be included as part of the criteria to declare a protected area not just for its biological richness, but also for the cultural traditions and practices attached to this diversity. Yaigojé-Apaporis is the only Colombian territory to be declared a National Natural Park at the express request of the indigenous communities living there. Through its status as a National Park, the Yaigojé-Apaporis Indigenous Reserve

(or “resguardo”, a legally-recognized and collectively-owned territory) acquired an additional level of protection, especially regarding its underground resources. The park was created in order to maintain the integrity of various sacred sites of immense importance to the indigenous peoples, not just as isolated landmarks but as an interconnected system with its associated cultural practices and traditions. According to indigenous convention, permanent human activities are forbidden at sacred sites. A community tried to settle at one sacred site in the early 1980s but was not allowed to do so and relocated several kilometers downstream.

The governance structure of the park has two components: 1. The Traditional Authorities (“the elders”), who possess the ancestral knowledge related to the management of the territory and whose position is held for life; 2. The Captains, who are the government representatives in every community (in some cases the Traditional Authority and the Captain can be the same person).

In April 1995, the “Traditional Authorities Association” of the Low Apaporis was founded in order to ensure the cultural, environmental and social integrity of the indigenous communities in the reserve and to establish a communication platform between the population and the state. In February 2000, the “Traditional Indigenous Authorities Association of Yaigojé and Low Apaporis” (ACIYA for its acronym in Spanish), comprising 17 communities, was established in order to “ensure the collective wellbeing of the communities, the unity of the associations for the protection and defense of the territory and the independence of the indigenous peoples who live in the Low Apaporis.”

4. Contribution to Biodiversity Conservation

Drawing on the strong cultural values and indigenous perspectives regarding nature protection in the area, the agreement on what to conserve and why to conserve it was a result of a dialogue which reflects both the indigenous experience and scientific data. The National Natural Parks Unit and the indigenous peoples’ representatives developed a set of rules and protocols for joint planning called the “Special Management Regime” in order to implement and monitor coordinated activities by all actors in the area. The conservation targets were formulated together with indigenous peoples’ representatives and agreed upon through a consultation process. Whereas at other parks, species, ecosystems or ecological processes are the main conservation targets, here all the cultural practices and sacred sites of the indigenous population are declared conservation targets. They include: (1) the protection of the material and intangible values of indigenous peoples related to the conservation, use and management of the territory; (2) the contribution to ecosystem connectivity of the Caquetá and Negro river basins, guaranteeing eco-system integrity of the region, supporting climate regulation and social, cultural and economic wellbeing of the indigenous groups within the protected area; (3) the strengthening of the “sacred sites system” and rituals associated with the territorial management of the indigenous groups.

5. Factors of Success

The main factor enabling good collaboration between all stakeholders involved was the confluence of interests and the joint understanding of the benefits the national park status would bring both for the indigenous peoples and the Colombian Government. In indigenous territories and protected areas, conflict often appears due to land use restrictions for the people who live in the park. However, if as part of a cultural dialogue the interests and views of all parties involved are clearly presented, there is a lot of potential to develop alternative approaches to enable joint management and improved understanding between all stakeholders, leading to the effective conservation of unique environments and majestic places such as Yaigojé-Apaporis. This process was supported by key partners who aided the declaration process by facilitating dialogue between the government and the indigenous peoples. With the creation of Yaigojé-Apaporis National Natural Park, a new era in the relationship of indigenous peoples and the Colombian Government was initiated. Since the initiative to create the park came from the indigenous peoples themselves, this precedent changes the way parks are established in the country.

6. Challenges faced in the Collaboration

The main challenge was the existence of gold mining interests in the area, which generated a great deal of anxiety in the indigenous population. Many were worried about the potential contamination of water and/or soil from improper use of mercury, changing cultural patterns due to the sudden influx of laborers, and unsustainable processes of settlement in their territory. Although the prospect of substantial income could have been a powerful incentive to allow mining activities, in the end their cultural reverence for nature and the deep relationship with their territory led the communities to the decision not allow mining in the area and step up the level of protection by declaring the Indigenous Reserve a National Park.

7. Ensuring the Continuity of Indigenous and Local Knowledge Systems

We need to continue strengthening the commitment among all partners to work together in order to reduce the threat posed by mining activities and improve effectiveness in protecting the ecosystem services provided by this Amazon biome. This process must maintain its joint approach which recognizes the importance of indigenous knowledge and traditions for nature conservation. Respect and understanding for different views of nature are essential among all actors involved. Spaces are needed where elders can pass on their knowledge within their communities. We need to raise awareness among all actors that the fate of this culture is linked to the integrity of their sacred sites.

Photo Credit: National Natural Parks Unit.

Participatory Zoning of Water Bodies in Güeppí, Peru

A contribution by Johana Deza

1. Güeppí Sekime National Park with Airo Pai and Huimeki Communal Reserves

The Güeppí Sekime National Park and the adjacent Airo Pai and Huimeki Communal Reserves are located in Northeastern Peru, spanning over 600,000 ha. These ecosystems are renowned for harboring a wide variety of flora and fauna, such as jaguars, river otters, black caimans, pink and grey river dolphins, manatees, arahuanas, and the paiche, the largest fish of the Amazon basin. Together with the neighboring protected areas in Colombia and Ecuador they comprise a wildlife corridor of over 1.5 million ha, connected by one of the most important tributaries of the Amazon, the Putumayo River. The Communal Reserves contribute towards the protection of the biological integrity of the National Park, but also serve as sources of livelihood for the local population. They benefit a population of over 3,000 indigenous Secoya, Kichwa and Huitoto living in more than 20 settlements. Despite national borders, these groups maintain close family and cultural bonds with their counterparts in Colombia and Ecuador. There are three indigenous organizations in the area: the Secoya Indigenous Organization (OISPE), the Kichwa Indigenous Federation (FIKAPIR), and the Kichwaruna Wankurina Organization (ORKIWAN). The protected areas were created in October 2012, with the indigenous peoples in the Communal Reserves recognized as co-managers alongside the government.

2. Indigenous Knowledge

The livelihood activities of the local population are based on natural resource use such as fishing, farming, hunting and gathering of fibers, leaves and fruits. Some products are traded as a complement to self-consumption. Banana and manioc are the main sources of protein and carbohydrates. The “yoco” (*Paulliniayoco*) is a vine needed to prepare energy drinks used for agricultural activities. The “chambira” *(Astrocaryumchambira*) is a palm used to make hammocks and bags. The Secoya also use it as part of the traditional attire worn during special ceremonies, mostly tied around arms and legs. The “achiote” (*Bixa Orellana*) is a shrub whose seeds the Secoya use to paint their faces and bodies. The “paca” (*Cuniculuspaca*), the white-lipped peccary (*Tayassupecari*) and the collared peccary (*Pecaritajacu*) are important in hunting. Jaguar’s fangs (*Pantheraonca*), related to the powers of shamans, are employed in rituals and traditionally used in necklaces worn by Secoya spiritual leaders. The more fangs a leader has, the more power or prestige he has acquired, although today there are only few spiritual leaders among the Secoya groups in Güeppí. Several sacred sites are located within the protected areas, among them a part of the Wajoya River (Santa María River) which is related to the Secoya creation myth. The myth describes how the Ñañë, the God of Heaven, took the Secoya out of the inner Earth, from the underworld, and put them onto the land where they were taught how to farm and hunt.

3. Participatory Zoning of Water Bodies

The indigenous communities of the Airo Pai and Huimeki Communal Reserves practice sustainable management of the “paiche” (*Arapaima gigas*) and the “arahuana” (*Osteoglossumbicirrhosum*). The paiche is a fish over 2 meters long. Its meat enjoys high worldwide demand due to its flavor and protein content. The young arahuana are highly appreciated by aquarium owners in Asia and Europe. In Güeppí, the paiche and arahuana populations are progressively recovering as a result of joint efforts by the local population and the government’s agency for protected areas (SERNANP). The process of zoning water bodies in Güeppí was led by the indigenous communities, which identified breeding, use and recovery zones for arahuana and paiche. Breeding and recovery zones are under strict protection. The breeding zones for paiche include shallow waters for mating, and specific currents for egg fertilization and the protection of juvenile fish. In another collaborative process, the indigenous communities and SERNANP jointly identified the main threats to the protected areas where pressures from illegal logging and overfishing are high and critical times of the year when these threats are most acute. A surveillance post located at a former access route used by offenders was built within an indigenous community with prior community consent. Management units of fishery resources were established to conduct control and surveillance activities focusing on water bodies. These “community control and surveillance groups” are officially recognized by the Ministry of Production, a nation-wide authority for fisheries, and also coordinate closely with SERNANP. This synergy has contributed towards efficient law enforcement in the area by halting different threats, as well as promoting community participation in control and surveillance activities. Given the great distances between the communities and SERNANP’s headquarters and considering the high fuel prices in the region, the decentralized management structure of the “community control and surveillance groups” has proven to be very effective.

4. Contribution to Biodiversity Conservation and Park Management

The zoning system that defines the boundaries of the National Park and the Airo Pai and Huimeki Communal Reserves was the result of a long-term process involving SERNANP and over 20 indigenous communities and their respective organizations (FIKAPIR, OISPE and ORKIWAN). Together with the population, the government set the limits of the newly protected areas by respecting the communal territories and sacred sites of the indigenous peoples. The sacred sites were categorized as historical and cultural use zones, in which new human settlements or changes to the land use or ecosystems are not allowed. The core objective is to preserve the cultural values of the area.

5. Factors of Success

Key success factors have been the recognition of local knowledge and the relationship of trust built between the indigenous population and SERNANP, as well as the long-term commitment of the local communities to the protection of their environment as the main source of their livelihood. The collaborative nature of the efforts has been decisive in terms of identifying specific areas within the water bodies either as species recovery or breeding zones to ensure the viability of fish populations. The contribution of indigenous groups in designing control and surveillance strategies has also been very valuable. The creation of the protected areas was only possible thanks to the commitment of the local population to the protection of their territory, and their strong position taken during the negotiating process, demanding that already-established agreements should be respected.

6. Challenges faced in the Collaboration

With Güeppí having been designated as a "Reserved Zone" in 1997, the creation of the National Park and the two Communal Reserves was agreed upon in March 2006, after a long consultation process between the indigenous population and the Peruvian government. Unfortunately, in May of the same year, an oil concession fully overlapping with the proposed protected area was granted. Due to a conflict of interests, the process stalled for 15 years. Over the last few years, SERNANP, AIDESEP, CEDIA and WWF supported the indigenous organizations in their endeavors by facilitating dialogue with government institutions. In October 2012, the National Park and the two Communal Reserves were officially created. One of the main challenges for the government has been to regain the trust of the indigenous peoples of the region which blamed it for delaying the National Park designation. Building up mutual confidence between the government and the population was essential to start collaboration in the management of fishery resources and the continuity of these united efforts will be key in achieving further successful conservation outcomes.

7. Ensuring the Continuity of Indigenous and Local Knowledge Systems

- Make sure that schools in indigenous communities offer intercultural bilingual education.
- Strengthen indigenous organizations which have the respect and recognition of their communities.
- Protect sacred sites of indigenous peoples as happened in the zoning process for the Güeppí protected area

Photo credits:
Secoyas celebration, Esteban Morales, AIDESEP, and Ministry of the Environment, Peru.
Credits: Ministry of the Environment.

Protecting Amur Tigers and Indigenous Traditions in Bikin, Russia

A contribution by Markus Radday and Yuri Darman

1. The Bikin "Nut Harvesting Zone"

The forests of the central and upper Bikin River are located in the province of Primorsky in Russia's Far East. The thinly populated area is home to about 800 indigenous Udege (also known as Nanai), mostly living in the main village Krasny Yar. For centuries they have been using the forests and the river in an environmentally-friendly manner. With around 1.3 million hectares, the forests of the Bikin River Basin represent the largest remaining reserve of temperate old-growth forest in Russia. One of the last populations of the endangered Amur tiger is found here. The Bikin forests are also of importance for global climate protection, containing a gigantic carbon stock of hundreds of millions of tons CO_2. However, since the early 1990s, timber companies have repeatedly tried to obtain logging licenses in the Bikin area. Commercial logging of these unique forests would degrade their biological diversity and have devastating consequences to the traditional lifestyle of the Udege.

2. Udege Knowledge

The Udege live on what nature has to offer: they hunt, catch fish and gather at least 30 non-timber forest products. Resource use and culture of the Udege are strongly interrelated with their cosmology, based on animism, shamanism and animal worship. The tiger is regarded as the "God of the forest", and to this day no Udege would dare to kill a tiger. These religious restrictions are the foundation for the protection of the Amur tiger, its prey and habitat. The Udege are organized in an association called the "Tribal Commune Tiger", which was founded in 2003 and is based in Krasny Yar. It is a not-for profit organization and functions both as an interest group of the Udege and as a legal entity executing the economic activities of the community under an elected leader. The gathering of non-timber forest products, which has always been part of the Udege's livelihood activities, has been commercialized in recent years, generating individual and communal income by processing and marketing eight priority forest products such as the seeds of the Korean pine, ferns, mushrooms, berries and herbs or fruits with medicinal properties such as the *Schisandrachinensis* and *Eleutherococcussenticosus*.

3. Traditional Harvesting Activities of Non-Timber Forest Products

In 2008, the Udege and WWF came up with a plan to protect the core area of the Bikin forests by leasing a region covering 461,000 hectares. This was possible due to the fact that this stretch of the Bikin forests is officially earmarked as a "Nut Harvesting Zone", a forest classification dating back to Soviet times. In these specially designated areas, the major resource use is the harvest of forest products, with timber exploitation being limited by law. Such zones can today be leased by private actors through public auctions. It took more than a year of tough persuasion before the Primorsky provincial authorities finally agreed to offer the Bikin "Nut Harvesting Zone" at a public auction in May 2009. The Udege's organization "Tribal Commune Tiger" was granted a lease for 49 years. For the first time in Russia, this project passed the special ethnological expertise which confirmed its relevance to sustain the traditional way of life of an indigenous group. During the first three years, the German KfW Development Bank supported the project with funds provided by the International Climate Initiative of the BMU, the German Ministry for the Environment, paying for the lease of 34.000 € per year as well as operational costs. Since April 2012, "Tribal Commune Tiger" has covered all subsequent lease fees and costs for the protection of the forest through their profits from the commercialization of non-timber forest products. The traditional knowledge and harvesting practices of the indigenous Udege thus provide the basis and financial means for the conservation of this important forest. The sales of carbon credits provide an additional source of income. If prices for carbon credits eventually rebound, a surplus might be generated which would allow for investments in the economic and social infrastructure of Krasny Yar.

4. Contribution to Biodiversity Conservation and Protected Area Management

Strengthening the traditional knowledge and resource practices of the Udege is a crucial element of the project, and it forms the basis for developing any further economic activities. Before the start of the project, only a small number of forest products were commercialized, with most of the harvest being used for subsistence purposes. To achieve higher product value, the project provided initial investments for storage and processing facilities, and helped to establish contacts to a buyer and manufacturer in the city of Khabarovsk. A good harvest of Korean pine nuts in Bikin, such as in 2011, can bring in 100.000€. The "Tribal Commune Tiger" association was also supported in drafting the legal and technical documents required for the auction, including a management and business plan for the lease contract. For the development of the management plan, the necessary structure for a patrolling system was analyzed using satellite images of the area. The needs of the local population for firewood and wood for construction were stipulated in the management plan as the only exceptions to legally log in the area. The contract requires that the lease-holder provides all necessary measures to protect the zone against forest fires, illegal logging and poaching. Consequently, the "Tribal Commune Tiger" association set up ranger and fire-fighter brigades operating along the river, on roads, and via snow-mobiles in winter. Suitable candidates with experience in policing were chosen by the community, with about 80 % of the rangers being indigenous.

5. Factors of Success

WWF has a long working relationship with the Udege in the Bikin area which has built up trust over the years. Both partners have a joint interest in protecting the Bikin forests. Both share an admiration for the Amur tiger: for the Udege, it is a sacred animal, while for environmentalists it is an iconic species and an indicator for the intactness of the ecosystem. As an independent NGO, WWF can act as an ally of indigenous peoples in situations where outsiders are threatening their interests. It can also assist them in dealing with the bureaucratic procedures of governments and their institutions. One WWF staff resides permanently in Krasny Yar and is the contact person for

the local population. It is important to share and discuss ideas among the project partners in a transparent way and not to raise false expectations through unrealistic promises. The success of the Bikin project has been replicated by implementing a regional approach covering four provinces of the Russian Far East. The total size of “Nut Harvesting Zones” now leased amounts to 670,000 ha.

6. Challenges faced during the Collaboration

The overall success of the project was repeatedly jeopardized by attempts by a timber company to carry out a so-called "intermediate logging" model at Bikin. This was possible due to loopholes in the new Russian federal forest code. The Udege defended their user rights through public campaigns. Logging plans were finally stopped as a result of lobbying by WWF at the highest political level. The presence of the Udege in the area proved to provide an additional layer of protection to the forest.

7. Ensuring the Continuity of Indigenous and Local Knowledge Systems

Prior to the KfW-funded project, the European Union provided funds for local initiatives aimed at revitalizing indigenous traditions of the Udege with a focus on children, young people and women. A cultural centre with a natural and cultural history museum and other facilities such as a field camp in the forest were built. Community tutors for traditional knowledge gave courses in sewing, handicrafts, tool making, traditional dancing and singing. Furthermore, a small-scale ecotourism initiative was introduced at Bikin. Active participation of the indigenous community in public decision-making was facilitated. All this has strengthened the indigenous community to speak with one voice and to defend their traditional user rights against outside interests. Valuing indigenous knowledge and keeping it relevant for today's challenges such as the conservation of this area have given the Udege renewed pride and confidence in their heritage.

Photo credits: Nut harvest: Evgeny Lepeshkin, WWF Russia. Patrolling: Frank Moerschel, WWF Germany.

Strengthening Spiritual Leaders for Fishery Management in the Bangweulu Wetlands, Zambia

A contribution by Jonathan Chisaka

1. Bangweulu Wetlands

The Chikuni plains are a RAMSAR site and form part of the Bangweulu Wetlands ecosystem in the Chiefdom of Chiundaponde, in the Muchinga Province of Zambia. The sparsely populated swamps, extensive flood plains, Miombo woodlands and lakes are home to the endemic black lechwe antelope and the rare shoebill. The area lies in the Bangweulu Game Management Area covering 6.000 km^2, which is currently managed under an innovative public-private-community partnership between the Zambia Wildlife Authority, the African Parks Network and six Chiefdoms (Kopa, Kabinga, Chiundaponde, Chitambo, Bwalyamponda and Nsamba). Although the partnership approach in this set-up is experimental, each of the six chiefdoms has a community resource board enjoying a co-managerial mandate under current wildlife legislation. Community partnership parks are among the proposed new categories for protected areas in Zambia, the piloting of which has been funded by UNDP, African Parks and WWF Netherlands. There are approximately 96,000 people living in this area. Bisa speaking people inhabit the eastern side of the Bangweulu plains while Unga speakers are on the western side. Both groups are heavily dependent on fishing for their livelihoods.

2. Local Knowledge

The local communities of the area possess detailed knowledge of their natural environment, especially of the fishing grounds. This includes knowledge of the different types of fish and the seasonal variation in productivity, as well as expertise on the deliberate targeting of certain species congregating during the breeding season. Fishermen move seasonally from one area to the other. For centuries, customary management practices have consisted of traditional rules, beliefs and taboos regarding access, harvesting and use of fish resources. The regulations have always been administered and enforced by the traditional authorities, the chiefs and spiritual leaders locally known as “Ba Chipupila or “Ba Shimapepo”. These spiritual leaders were chosen from clans whose leaders had performed good favors towards the chief. To reward these acts, they were entrusted with rights over parcels of land and the natural resources found in them. It is important to note that the “Ba Chipupila” have management authority delegated from the chief over all natural resources in their areas. For the local population, to disobey the rules set by these spiritual leaders means inviting disasters, famine, loss of fish species or other calamities and, above all, loss of access rights. Adherence to the rules is dependent on the effectiveness and authority of the traditional leaders. Unfortunately, the arrival of fishermen from the outside, increasing commercialization of the fishing trade and introducing unsustainable fishing methods have weakened the traditional management systems, and over the years the powers of the leaders have eroded. The sacred rituals they used to perform to enforce the rules have virtually disappeared, and tradition has been lost in many plac-

es. The disappearance of the traditional rules has led to lawlessness, corruption and greed, resulting in bad harvests and depletion of fish resources. It has also meant that government rules such as fishing bans were not respected. These trends made cooperation between the different actors in the Bangweulu Wetlands very difficult before the start of the project.

3. Fishery Management with Spiritual Leaders

To reverse this trend, the project commissioned an assessment of the state of the fisheries with support from the community using a participatory approach. The assessment was also intended to determine the impact of non-traditional fishing methods on the fish stocks. The research was people-centered in the sense that the process of critical enquiry was informed by local socio-cultural structures such as the spiritual leaders. This promoted the forging of a new partnership between researchers and the communities. Both researchers and local participants were actors in the investigative process, influencing the methodology, interpreting the content, and discussing strategies for action. This collaborative process was empowering. It brought people together around common problems and needs related to fishing. Further participatory tools were adapted to facilitate a visioning process for the communities to express their collective dreams looking at past, present and future scenarios. For the community, this was an opportunity to revisit their traditional knowledge systems. They were encouraged to discuss aspects of their culture related to fishing. Folk lore and myths helped to elicit information on local knowhow and traditional practices, particularly how the knowledge and authority of "Ba Chipupila" contributed to the management of the fishery. A series of meetings were organized in which communities discussed what they wanted their fishing grounds to be like in the future. They also proposed by-laws within the framework of government provisions in the fishery management, and potential enforcement methods. The by-laws were developed around compliance and enforcement, and as an addition to the already existing laws of Zambia. These included access to the fisheries, times and how long fisher folk can remain in the fishing camps, registration of fish traders, who is to be excluded from fishing, and the requirement of fishing permits from the traditional authority. Enforcement of these rules is twofold, as some are enforced at the local level by the traditional authorities, while others are enforced within the laws of Zambia by the Fisheries Department.

4. Contribution to Biodiversity Conservation and Park Management

This process resulted in the formation of a 25-member gender-balanced Fishery Management Committee consisting of members of the Department of Fisheries, fishery scientists, representatives of the chief's council, project staff, representatives of the spiritual leaders, civil society and local fish traders. Currently, the Fishery Management Plan is being developed with input from all stakeholders, to ensure that community priorities and local knowledge are central to the vision and content of the plan. The vision statement to be incorporated in the Management Plan reads as follows: "A well-managed fishery, utilized in a sustainable manner through using lawful and acceptable methods of catching fish, as required by our Bisa traditions. The management plan aims at enhancing and strengthening the traditional rules within the framework of the Zambian Fisheries Act, which allows local management committees to formulate by-laws based on their traditions and knowledge. So far, the main benefits of fishing have been reaped by outsiders. It is hoped that restoring traditional fishery management systems will generate additional income for the local population, whose benefits have so far been limited to the subsistence level.

5. Factors of Success

Fisher folk in the Chikuni plains have sustainably managed their resources for centuries, making use of their traditional knowledge, practices and their customary rules enforced by local leaders and institutions. Today, they are still highly dependent on fish, but are confronted with diverse outside influences and the impeding demise of their own culture. Strengthening the authority of the traditional custodians and their institutions by involving them in monitoring and management is at the core of this initiative. Supporting traditional leadership contributes to improved collaboration with the communities in the area. This partnership includes the Fisheries Department, which thoroughly discussed the Fisheries Act with the communities and assured the communities that their traditional activities were within the stipulated laws of Zambia.

6. Challenges faced during the Collaboration

One of the major challenges faced during this collaboration was that community-based management of fishing resources was a new concept for the organizations involved in the management of the area. Another challenge was that the communities were very suspicious at first to share information about their fishing resources, as some villagers were afraid that this meant giving away their rights to the resources. Enduring trust had to be built between all stakeholders.

7. Ensuring the Continuity of Indigenous and Local Knowledge Systems

Traditions which are passed on orally are much more flexible and susceptible to change than written laws or conventions. Traditions are modified and adapted by successive generations in response to changing circumstances. It is therefore important to recognize and support the custodi-

ans of such traditions and facilitate the sharing of knowledge between the generations. Deliberate efforts must be made to involve traditional leaders at different levels as champions of the process.

8. Suggestions for other projects undertaking a similar approch

In order to mobilize communities for the management of their resources, it is important to understand the power relations which exist in a particular community. It is also important to avoid an interventionist approach. Instead, one should listen to the local people and strive to understand the specific local context. Inherent cultural motivations for conservation should be supplemented with sanctions for non-compliance and incentives for positive change. A right balance of these factors is needed to keep a focus on positive change informed by adequate and legitimate stakeholder interests.

Photo credits: Carl Huchzermeyer.

Annex 2: Case Studies illustrating Methodologies for Participatory Biodiversity Assessments

Community Monitoring and the Khwe Academy in Bwabwata, Namibia

A contribution by Patricia Skyer, Friedrich Alpers, Karine Nuulimba and Greg Stuart-Hill

1. Bwabwata National Park

The Bwabwata National Park in North-eastern Namibia forms part of the "Kavango Zambezi Transfrontier Conservation Area" KAZA (444,000km^2), which was recently established in the border regions of Angola, Namibia, Botswana, Zimbabwe and Zambia. The park is officially managed by the Namibian Ministry of Environment and Tourism and harbors some of the most valuable wildlife species in Namibia, including savanna elephants and the roan, sable and tsessebe antelopes. It includes two core conservation areas and one multiple use area (65% of the total area), where approximately 5,500 people live in eight large and several smaller settlements. The Namibian Ministry of Environment and Tourism has recognized the rights of Bwabwata's residents of Khwe or Hambukushu origin to live and use the natural resources inside the national park, an exceptional situation in the region. The indigenous Khwe or San, traditional hunter-gatherers, are well-known stewards of nature. Their unique and light-footed way of life allowed the environment to flourish. Wildlife and tourism, as well as the sale of high value plants for international pharmaceutical markets such as the organically certified Devils claw (*Harpagophytum-zeyheri*), are central to the economy of the local population. Farming in the park is marginal, with small-scale crop farming practiced for subsistence. The population of the park is represented by the civil-society association Kyaramacan, which can roughly be translated as "Doing things ourselves". Kyaramacan receives benefits from two hunting concessions within the park, with most income being generated through trophy hunting. For the monitoring of the park, Kyaramacan employs 43 local people, of which 27 are game guards and 16 resource monitors.

2. Khwe Knowledge

The folklore and traditional songs of the Khwe center around animal characters – the opportunistic, wily and resourceful jackal (who is usually the hero of the story!), the respected and elegant eland whose meat is able to feed an entire village for weeks, the mighty elephant and the fear-inducing lion. Almost every wild plant has a use; either for food or medicine, and in some cases for use during traditional ceremonies. A recent study found that a large percentage of people's diets remains dependent on food collected in the bush. Most important among these plants is the "mangetti" nut which is pounded into a relish that ensures a steady supply of protein during the lean dry winter months. In traditional Khwe communities, children learn the skills and ecological knowledge from their parents by accompanying them during their wildlife tracking and veldt fruit gathering in the bush. With the onset of formal education, children are separated from the environment in which they learn the knowledge systems of their community. They often attend boarding schools, and even for those whose schools are in their home villages, the content of formal education has little relevance to their immediate environment and needs. The end result is that San children lose the connection to their indigenous knowledge and skills. They often return to their rural settlements with a negative outlook on their own culture and value system, without realizing that their traditional knowledge and skills could be very valuable to maintain their livelihoods in the context of modern integrated park management and the related natural resource-based economy of Bwabwata. The survival knowledge and skills of the Khwe, especially their fa-

mous wildlife tracking skills, are thus under threat of disappearing due to the advent of modern lifestyles.

3. The "Event Book System" and the Khwe Academy

In the past, natural resource monitoring was largely the domain of scientists. An alternative devolved monitoring method, the "Event Book System", was designed in Namibia to assist semi-literate communities to monitor and manage their natural resources. The "Event Book System" is a simple tool made up of charts filled in by game guards as they record important sightings of wildlife or events occurring in their area. It differs from conventional monitoring in that it is the local population which dictates what needs to be monitored: community members decide which species they want to monitor and why; experts provide advice on how to gather, process and report the information for each monitoring topic that the community selects; Kyaramacan employees collect the data, analyze it, and then present the results in a simple and clear manner, illustrating the status and trends of the targeted resources and activities. It assists the community game guards and resource monitors to visually quantify and monitor changes in natural resource trends, thereby providing their leadership and community members with critical information for adaptive management. It is empowering as communities now have data in formats that they understand, in order to make informed decisions about resource use. The community possesses full ownership of the monitoring process and the results. Because the analysis and reporting is based on simply adding up incidents and coloring in blocks, illiterate members are able to fully participate in the process. In a matter of months, the literacy skills of community rangers often improve to the extent that they can complete the data cards unaided. However, extensive use is made of icons on the data cards, reporting charts and job description posters to assist illiterate people. The "Event Book" itself is a personalized A5-ring file maintained by each community ranger in which there are a set of ('yellow') data forms, one form for each monitoring topic. At the end of each month, the daily record of events or data is compiled into a monthly 'reporting chart' (a simple template that shows how many 'events' occurred during each month). Once a year, these monthly ('blue') charts are further summarized into an annual ('red') chart which provides a succinct summary of all the key data for the entire year and compares this with previous years. The yearly audit takes approximately 2 hours to complete and includes archiving all the previous year's data, updating the long-term reporting charts and placing fresh unused cards in the "Event Book" for the new year. The communities take great pride in their annual reports and there is an element of healthy competition between them. Whilst the entire system is paper-based, it also provides digital data to the national program, thus allowing for more sophisticated analysis. Each year data is copied (the original data never leaves the communities!) during the audit and are captured into a national monitoring and evaluation database. This database is being used by the government and the Namibian Association of Conservancy Support Organizations for strategic decision-making such as guiding quota setting, allocation of technical support, compliance monitoring, etc. An advantage of the "Event Book System" is that the management and monitoring efforts from many conservancies are being scaled up to form the basis of a national biodiversity monitoring and management initiative. Whilst primarily designed to meet local information needs, the system provides information for the annual state of conservancies report (NACSO 2013) and the National Report to the United Nations Commission on Sustainable Development (Anon 2012) which has been used by national and on one occasion international decision-makers (CITES). Where society deems other biodiversity values worth monitoring, it is expected that the community could be sub-contracted to undertake these 'external modules' on behalf of national agencies in addition to their own established monitoring system – a win–win solution for all parties involved.

With the aim of enhancing the transmission of indigenous knowledge and skills from Khwe elders to the younger generation, a "Traditional Environmental Knowledge and Outreach Academy" has been established in 2012. Elders train young Khwe who attend school and also those who have dropped out in various aspects of their rich heritage such as tracking, ethno-botany, sustainable natural resource management, traditional leadership and conflict management strategies, history and language. This familiarizes the youth with their traditional knowledge, and increases their self-confidence and self-esteem. The Khwe academy has developed a series of courses on traditional knowledge and wilderness tracking training for various target groups such as KAZA protected area rangers or tourists, and thus generates additional income based on Khwe traditional knowledge and skills. In this way, traditional knowledge undergoes a revitalization process and acquires new relevance and value for the communities.

4. Contribution to Biodiversity Conservation

Through their association Kyaramacan, the Khwe are involved in monthly Board meetings of the National Park, and quarterly Joint Management Committee meetings with the Ministry of Environment and Tourism and private sector operators in the area, a discussion forum for planning, management decision-making and problem solving. They are also participants in the Technical Steering Committee. A planning and report-back workshop is held every semester by all the community-based organizations in the Zambezi region and Bwabwata National Park and attended by government staff, local researchers, partner organizations and donors. At this meeting, the community organizations report back on their work plan outcomes. NGOs and government are also held accountable at this forum. This promotes public accountability, productivity, peer-learning, team building and an open sharing of experiences and challenges.

5. Factors of Success

- Deep knowledge and understanding of the park's resources by the community, their strong commitment to sustainable resource management and the willingness to confront illegal utilization of natural resources
- Government recognition of community rights over natural resources in the park, acknowledgement of their contribution to park management, support of community livelihood options and policies to address human wildlife conflict
- The willingness of both parties to collaborate and good coordination between the community and National Park staff when undertaking joint activities like game counts, leading to trust, respect and friendships developed over years of collaboration on specific park management activities
- A strong working relationship grown out of joint problem solving, such as against poaching
- The realization that the Government and the community have more in common than in difference in terms of their interest to safeguard park resources; a sense of ownership from the side of the communities.

The "Event Book System" has been adopted with good results by 77 communal conservancies and the KA in Namibia, covering 158,247 km^2, which is about 19.2 % of Namibia's total land mass or over 50% of all communal lands in Namibia. It has also been implemented in 15 national parks under the name of "Incident Book System". Similar systems have been initiated in Zambia, Botswana, Malawi, Mozambique, Zimbabwe, Tanzania, Cambodia and Mongolia (under the name of management-oriented monitoring system - MOMS).

6. Challenges faced during the Collaboration

Communication can be a challenge in knowledge collaboration. Government park managers, with basic tertiary qualification, may be accustomed to communicating in writing, while semi-literate community level resource managers mostly communicate orally. Additionally, when government officials are not from the region, they may prefer to communicate in English or Afrikaans, which is not always understood by the local population. NGO staff, especially the ones recruited from the area, has played a critical role as facilitators between government officials and local community leaders or resource managers.

7. Ensuring the Continuity of Indigenous and Local Knowledge Systems

The way Khwe children used to acquire ecological knowledge and skills from their parents by accompanying and observing them in the bush and practically engaging in their traditional activities such as wildlife tracking and veldt fruit gathering was critical in keeping these skills and the associated knowledge alive. It is important to merge and capitalize both on the traditional ecological knowledge of the elders in the community, and the enthusiasm and interest of the youth to learn modern technology such as cyber-tracker or cell-phones by bringing together elders and youth in a training setting where they all feel valued and can contribute to. The granting of continued access, rights, management authority and responsibility over park resources to the community provided a purpose for such knowledge and a context to which it could be applied, thus contributing to its sustenance. Additionally, linking the application of indigenous and local knowledge to a business venture such as tracking or tourism made it possible to generate the much needed cash, thus promoting and expanding the use of such knowledge beyond its traditional holders and ensuring its long-term survival.

Photo credits: Friedrich Alpers.

A more detailed description of the "Event Book System" can be found here:

- Stuart-Hill G., Diggle R., Munali B., Tagg J., Ward D. 2005. *The Event Book System: A community-based natural resource monitoring system from Namibia*. Biodiversity and Conservation 14: pp. 2611–2631.
- Anon, 2012. National Report to the United Nations Commission on Sustainable Development: Namibia. Ministry of Environment and Tourism, Republic of Namibia.
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Wildlife Workshops in ThungYai WHS, Thailand

A contribution by Robert Steinmetz

1. Thung Yai Naresuan Wildlife Sanctuary

Thung Yai Naresuan Wildlife Sanctuary (3622 km^2) lies in western Thailand adjacent to Myanmar. It is part of Thailand's first natural World Heritage Site and forms the core of the largest forested complex in mainland Southeast Asia. The sanctuary is characterized by rugged mountainous terrain and is important for elephant, tiger, bear, gaur, banteng and sambar conservation. Thung Yai is officially managed by the Department of National Parks, Wildlife, and Plant Conser-

vation. The mixed deciduous and evergreen forests have been inhabited by the indigenous Karen for over 200 years. Human population density is low with about 3,800 people living in twelve villages in the sanctuary mainly accessible by foot. National law forbids habitation in wildlife sanctuaries, and the Karen have been threatened with relocation from Thung Yai since its establishment in 1974. Relations between the Karen and Thung Yai authorities have alternated between periods of avoidance and conflict. The Karen practice rotational swidden cultivation, a highly sustainable system that, nonetheless, is commonly vilified as incompatible with nature conservation. The Karen regard Thung Yai as their home and do not separate wildlife conservation from perceived moral and political rights to participate in decision-making. The Karen are accustomed to being accused of causing problems but not being invited to defining or solving them.

2. Karen Knowledge

Most Karen are subsistence farmers, practicing long-fallow rotational rice and vegetable cultivation - "swidden agriculture", complemented by fishing, a major source of protein. The Karen hunt and trap small and medium-sized mammals for food, especially around cultivated areas in response to crop raiding. They also gather plants, medicines, and building materials from the forest. Resource use occurs within traditional village territories which are delineated mostly by streams and ridges but are not recognized officially. Village councils and elders assume overall responsibility for monitoring land use and maintaining resources within their territories. Through their subsistence activities in the region over the last 200 years, the Karen have accumulated a wealth of ecological knowledge. Because it reaches back in time, this knowledge can describe historic trends and reveal the multiple factors causing biodiversity loss. It also provides detailed information about the seasonal changes in distribution and phenology of flora and fauna over the year.

3. Wildlife Workshops and Community Monitoring

The wildlife workshops were organized to (1) combine local knowledge about the conservation status of mammals into an information base and identify priority areas, (2) develop a shared understanding of conservation problems, and (3) build opportunities for collaborative action. Two workshops were conducted, each requiring 2 days. Five villages participated. For each workshop, 5–10 elders and hunters from two to three villages were invited as chief participants. Village headmen also participated, and young people were encouraged to come as observers. Two to three protected area rangers from nearby ranger stations and officers from Thung Yai headquarters attended. Thirty-one mammal species were selected for analysis, covering a wide range of body sizes, life history characteristics, habitat preferences, range requirements, and resilience to hunting and disturbance. The list included species sought exclusively by outside poachers for sale (tigers, gaur), species killed only for local consumption (porcupines, civets), and species killed by subsistence hunters and outside poachers (leaf monkeys, cervids). The workshops consisted of three parts: wildlife status assessment, impact assessment, and conservation planning. We first mapped the zones to which village groups would refer in their analyses; these zones matched traditional village territories. Within each village zone, wildlife status was assessed as a function of magnitude of decline over time. We asked participants to estimate present abundance of each species relative to its abundance 20 years ago (all local participants were over 35 years old). To accomplish this, species names were written on large charts in the local language. Next to each name were three unfilled circles that participants filled in according to the proportion of the population that remained. For example, species that had not declined were represented by three fully filled-in circles; those completely extirpated were represented by three unfilled circles. Participants separated into village focus groups for this exercise, reviewing individual opinions to reach a consensus on percent decline. Conclusions pertained only to each focus group's zone. We averaged percent decline among village zones to illustrate the overall status of each species in Thung Yai. To compare differences among sites and expose common patterns, a group discussion followed the exercise. Each group was asked to describe the evidence they used in their assessment. The most common were frequency of direct observations of animals and frequency of encounters with signs. Next, we asked participants to identify the processes or events (i.e., impacts) that had caused the population changes for each species. They provided six major impacts: commercial poaching, subsistence hunting, civil war in Myanmar, road building, mining, and hydropower development. Village focus groups scored the severity of each impact for each species, from zero (no impact) to five (critical impact). As before, analyses pertained to respective village zones and a 20-year time period. Impact scores were summed first across species, to reveal the most critical impacts overall on wildlife populations, and then across impacts, to derive species-specific scores that showed how severely each species had been affected. An index of hunting intensity was calculated for each species by summing commercial and subsistence hunting scores across village zones. Next, participants were asked to describe the basis for their scores. These were spatial extent (i.e., localized, widespread), intensity (number of animals killed per unit time), technology (i.e., rifle, musket), and motivation (i.e., profit, food). We referred to these criteria during discussions of results to qualitatively compare the mechanisms by which different impacts affected wildlife. Lastly, participants established a species-specific chronology of the appearance and duration of each impact. Workshop partici-

pants were not provided with prior criteria by which to assess mammal population changes or score threats. The workshop process was approached as an experiment, and we wished to see which criteria would naturally emerge without controlling local peoples' inputs. During the final day of each workshop, we described the international conservation status (e.g. distribution, abundance) of selected species and biological characteristics that affect a species' resilience to disturbance and prospect for population recovery. This scientific information was intended to introduce participants to life history characteristics likely to elude their scales and methods of observation, but that are important to consider in planning for species recovery. During group discussions, we referred to this information and specific research on mammals in Thung Yai to complement, challenge, or expand on local people's assessments. For example, by comparing the status of species at local, national, and global levels, Karen villagers became aware for the first time of the precarious status of tigers and elephants within Thailand and the region. The downward population trends they identified attain a new relevance when viewed in this context. Karen villagers and rangers were unaware that some species were rare elsewhere. A sense of positive involvement can follow from such comparisons. Discrepancies between local understandings of behavior of species and scientific information were discussed.

4. Contribution to Biodiversity Conservation

Workshops resulted in a spatially explicit picture of trends in the status of 31 mammal species, covering an area of ca. 800 km². They clarified which species were at highest risk of local extinction, where the most threatened populations were, and causes for these patterns. Most important, they advanced a shared problem definition, thereby unlocking opportunities for collaboration. The graphic combination of spatially explicit trend information from wildlife workshops arranged local knowledge in a powerful new way: individual observations aggregate into village-level assessments that in turn combine to illustrate the overall magnitude of changes across the protected area. This new context expands the awareness of local people and becomes a compelling basis for discussions of what to do about impacts - including theirs - because it is generated from their own observations. Having usually been left out in the decision-making process, when this imbalance shifted during the wildlife workshops, many came forward to participate in an opportunity they believed they deserved all along. At the same time, protected-area staff benefit from an expanded temporal and spatial understanding of the status of wildlife in their area. As a result, local people and sanctuary managers have increased communication, initiated joint monitoring and patrolling, and established wildlife recovery zones.

5. Factors of Success

A willingness from all participants involved to learn from each other in an open process, making one's values explicit and being open to critically discuss them, accepting that communities are dynamic and heterogeneous with different levels of enthusiasm for collaboration, and reframing of management questions by shifting focus from "who to blame" to "what are the issues and how can we collaborate to address them", were important elements which prepared the ground for this successful collaboration. The evidence that participants relied on to determine population changes (encounter frequency with animals and their signs) and criteria used to score impacts (spatial extent, intensity, technology, and motivation) were similar in many ways to what biologists would use for such an assessment. This provided fertile common ground between researches and indigenous knowledge holders. The wildlife workshops relied on village focus groups with experience within a defined spatial area. This arrangement allowed participants to cross-check themselves and come to general agreement, thus mitigating subjectivity arising from different levels of observer skills and memory. In our view, wildlife workshops are likely to be most successful where local people have a long history in the area and a strong stake in the shape of their relationship with protected-area authorities. The involvement, persistence, and 6-year time commitment of a third party (in this case of WWF) were also helpful. Where mistrust and conflict predominate, and communication has broken down, a third party is often necessary to bring stakeholders together.

6. Challenges faced during the Collaboration

Unfortunately, despite many successes on the ground, protected area managers and government officials, in general, remain very dismissive of the possibilities and opportunities of working with local people. Indigenous peoples in particular are commonly regarded as the main enemy of conservation, the same as 20 years ago. On a policy level, convincing authorities of the benefits of indigenous knowledge systems still proves difficult.

7. Ensuring the Continuity of Indigenous and Local Knowledge Systems

Knowledge must be used to stay alive. And indigenous knowledge is not really separable from the cultures and places from which it emerged. Therefore, political rights, social justice, locally-based decision making, are all required too. Without these, the cultures that created knowledge will erode and fade away, along with the knowledge itself. Indigenous people struggling to preserve their identify need confidence to carry on, as the forces against them are so great. Strong and wise local leaders are essential to guide and inspire their communities. Outsiders can help but they need to learn to play a supporting role.

8. Suggestions for other projects undertaking similar approaches
The process of engaging local people in biodiversity assessments and monitoring can unearth previously unrecognized common ground, build a local constituency more aware of its role in the protected area, and promote collaborative action for biodiversity conservation. By showing appreciation of indigenous and local knowledge through inclusion in monitoring efforts, the inherent power dynamics between university-educated and rural people and science and traditional knowledge can be challenged. Conservation action based on the combined knowledge of these stakeholders might more effectively target root causes of mammal declines and be better understood and supported by local people.

Photo credits: Robert Steinmetz, WWF Thailand.
A more detailed account of this knowledge collaboration can be found in:
Steinmetz, R., W. Chutipong, and N. Seuaturien. 2006. *Collaborating to conserve large mammals in Southeast Asia.* Conservation Biology 20: 1391–1401.

Conserving Coral Reefs in Riung, Indonesia

A contribution by Cristina Eghenter and Zakarias Atapada

1. Riung Marine Tourism Park
Indonesia is one of the most biologically and culturally diverse countries in the world. The coral reef in the Flores-Banda Sea displays a unique richness and beauty. Riung Marine Tourism Park is a conservation area of about 9.900 has harboring over 180 species of coral and over 300 species of reef fish, including aquarium species and high economic value species such as snapper and grouper. Riunghasa population of more than 8,000 is distributed in eight hamlets along the coast. Roughly half of its population is indigenous (Ria Latung, Bar, Riung Tiwumeze, Toring, Tuwa, Mbuang, Tadho), with livelihoods based on agriculture and fishing. The other half of the population is comprised of seafaring people originating from Sulawesi (Bugis) and Bajo ethnic groups. The land and sea of Riung are a landscape of multiple, overlapping uses. Exploitation of marine resources is the main subsistence activity, with fish and mollusks representing the most reliable source of protein. Local communities use motor boats to fish pelagic species or do line-fishing around the reef areas; the cultivation of seaweed in small, open bays along the coast is picking up with support from government projects; women and children collect mollusks and sea cucumbers during low tide; there are good spots for diving where tourists are taken; and healthy pockets of mangroves are used for firewood and other gathering activities. The land and coastal areas are classified by the state according to different functions such as exploitation, conservation, strict conservation, and recreation. But these functions do not necessarily correspond with the traditional uses of the local communities. In the past, this has led to ambiguity and sometimes threatened prosecution for encroaching on the part of conservation authorities. The situation requires an iterative process of negotiation and trade-offs among the different agendas and interests. In the fishing sector, the main challenge is the competition with outside fishing groups, whom local people cannot exclude but who often use destructive fishing techniques near the reef area, such as explosives or potassium. The intensification of natural resource exploitation and the threat to food security in coastal areas are urgent problems that call for a reorientation of economic activities and marine resource use towards a development which is grounded on the social capital and traditional knowledge of the local communities, and which is focused on protecting both their cultures and natural assets.

2. Local Knowledge
Resource use in Riung is based on local knowledge. Traditional management regimes include customary regulations which are informed by the understanding of how seasonal changes with the onset of the eastern or western winds and the cycle of the moon affect the presence and abundance of fishing resources. In general, fishing during "*turo*", the new moon, brings a higher catch. There is also an agreed upon system for sharing the catch among the people who are part of the same fishing expedition. In Riung, like in the rest of eastern Indonesia, local people practice "*sasi*", the tradition of closing off an area to exploitation for a period of time to allow for regeneration of the resources such as fish and shellfish. For example, in the hamlet of Lengkosambi, there are two areas for shell, mollusk and fish gathering which are regulated and opened for access for only one night during the months of July and June, when the tide is at its lowest point in a one-year-cycle. Similarly, in the hamlet of Sambinasi, an area regarded as an ancestral site is closed or prohibited ("*pirong*") and opened for exploitation only in October and November every year.

3. Participatory Mapping and Spawning Aggregation Sites Assessments
At Riung, several biodiversity assessment surveys were conducted with the involvement of the local population. The communities did a rapid 'trend' assessment of the proliferation or the decline over the past 20 years of particular resources in the area, especially those valuable to them. Subsequently, after an evaluation workshop, local men and women decided that they also wanted to map their land and how they use it to secure food and energy, both for sustenance and trade. After a "training for trainers" session, local youth trainers, often men and women who have returned to Riung upon completion of a school degree in Java or Bali, were

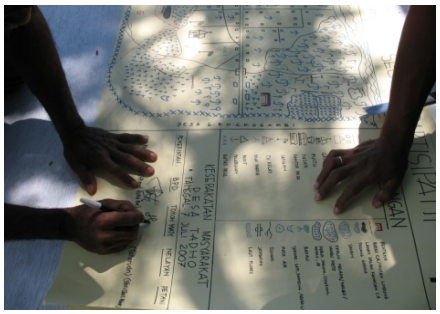
responsible for facilitating meetings in the villages to conduct community mapping of both land and coastal areas. Local people documented their resource use, the boundaries of the area under exploitation, and the relevant local regulations. With regard to marine resources, especially grouper and snapper species were documented as they have the highest market value. A group of locals were trained in diving and scientific methodologies for the assessment of spawning aggregation sites based on size and length of fish under water, aggregation rate of fish, and fish behavior. The identification of spawning sites is important to establish strict measures of protection for the species and ensure a natural spill-over effect in other fishing areas where adult fish can be caught. The team consulted the local fishermen about their knowledge and experience of possible spawning areas and the nine spots indicated by the fishermen were surveyed. After an underwater visual census was conducted, all nine spots showed that aggregation activities were present but four demonstrated a high level of probability to be spawning areas. The assessment was repeated during full and new moon for several months in 2007 to confirm the initial results. The results of the spawning assessment and the community mapping were analyzed in joint collective sessions in each of the six hamlets of Riung and at the sub-district level. A map with recommended no-take use zones and other use zones in the conservation areas for tourism, seaweed cultivation and fishing was presented to the local authorities. The program drew the attention of the Head of the Ngada District who recognized the importance of conserving marine assets for developing local economies, especially fisheries and tourism, for the benefit of the communities in Riung.

4. Contribution to Biodiversity Conservation

The participatory mapping provided the basis for the development of a management plan for the area. As plans for zoning and resource use were developed with the participation of the local communities, incorporating their own recommendations, the level of compliance is now much higher, including respect for the no-take zones. This is also working because the benefits of spill-over are enjoyed by local people in other fishing areas. From 1999-2008 (with short interruptions), WWF supported local people in seizing on their valuable knowledge to become involved in the conservation of their resources and actively engage in economic initiatives.

5. Factors of Success

The main factors which can be identified as key to the successful engagement of local and Indigenous communities in Riung and to their collective commitment to sustainability are the following: (1) A sense of local ownership and control which was generated by the collaborative process. Participatory mapping at village level was an essential prerequisite for documentation and participation in management. (2) The strong sense of ownership was also important in mitigating or avoiding conflict within the community, and between the community and the park/nature reserve authorities, favoring constructive dialogue and negotiations. (3) The combination of local knowledge and scientific methodology for the spawning assessments allowed for direct transfer of expertise and innovation between outside scientists and local experts during the training sessions. While the results of the spawning assessments and local observation of fish behavior showed a high level of correlation, scientific methods and criteria allowed for the consistent organization and effective documentation of data. Diving deep into the waters to observe fish behavior, for example, and replicating the collected data in systematic ways made it possible to communicate the results to other stakeholders outside the community in convincing ways. Having had the opportunity to be a participant in the scientific discourse and to frame their knowledge in another 'language' built the confidence of local people in negotiations with the government and park managers. (4) The creation of local teams of experts in charge of mapping resources was very important as it allowed to document and transfer traditional knowledge from the elders to the youth. With rapid change and new economic opportunities, traditional knowledge is at risk of disappearing as it is considered increasingly 'irrelevant' by the young, especially in the context of new ventures coming into the region such as mining or tourism.



6. Challenges faced during the Collaboration

At a time when global environmental and social changes happen at an unprecedented pace, and poverty and marginalization of natural resource-dependent people remain the key issues to be addressed, our concern is how to protect, sustainably use, and manage natural resources with social equity in order to guarantee future local and global security. The challenge at Riung and other places is to strengthen inclusion of communities and indigenous peoples into economic and conservation planning, and promote integration of their needs, rights, and knowledge at various levels to secure sustainability for the future. It is also important for the results of the mapping and assessments to be monitored over time in connection with plans for economic investment.

7. Ensuring the Continuity of Indigenous and Local Knowledge Systems

Relevance: Traditional or indigenous knowledge is by definition highly contextual knowledge, which is developed and negotiated in specific social, economic, and environmental contexts. It can be meaningfully applied in the management of protected areas and the sustainable use of marine resources. *Revival*: Much of traditional or indigenous knowledge has been transmitted orally and

through example from elders to the youth. The generational 'chain' is now breaking up with the advent of new economic opportunities, formal education, and through the exodus from the original communities. There is a need for specific efforts aimed at capturing the traditional knowledge, revitalizing it (in school-like settings, during festivals and popular celebrations), and furthering its transmission to the younger generations. *Rights*: Traditional or indigenous knowledge is a fundamental element for the continuity of livelihoods and the capacity to adapt to the environment. The rights and responsibilities linked to this knowledge are spelled out and protected by various provisions and international conventions; however, governments are often slow in ratifying and planning specific interventions for protecting traditional knowledge in their countries.

Photo credits: Zakarias Atapada, WWF Indonesia.

Annex 3: IPBES Draft Work Programme, IPBES/2/2, p. 5

Objective 1 – Strengthen the capacity and knowledge foundations of the science-policy interface to implement key functions of the Platform

(c) ***Procedures and approaches for working with indigenous and local knowledge systems*** *(developed by 2016).* 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 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 and the Bureau, an expert group will facilitate a roster and network of experts, a number of global dialogue workshops of indigenous and local knowledge experts, a review of regional case studies to inform the Platform's procedures and approaches for working with indigenous and local knowledge and the delivery of a final set of procedures and approaches for working with indigenous and local knowledge systems. The activities under this deliverable will be backstopped by the capacity-building activities called for in deliverable 1 (b), such as the suggested fellowship-programme. This deliverable will, together with deliverable 1 (d), constitute a coherent approach to working with different knowledge systems across scales. The deliverable responds to requests received. It is envisaged that the deliverable will contribute to achieving Aichi Biodiversity Target 18, on traditional knowledge.

IPBES Draft Work Programme – Modalities, IPBES/2/2/Add. 1, p.6

Deliverable 1 (c) - Procedures and approaches for working with indigenous and local knowledge systems (developed by 2016)

The Plenary has requested the Multidisciplinary Expert Panel to recommend procedures and approaches for working with different knowledge systems for consideration by the Plenary at its second session, drawing on the inputs received from the international expert workshop on the theme "The contribution of indigenous and local knowledge systems to IPBES: building synergies with science", held in Tokyo in June 2013. The outcome of the workshop has informed the development of a preliminary guide on principles and procedures for working with indigenous and local knowledge systems, which will be before the Plenary at its second session for informational purposes. The success of recognizing indigenous and local knowledge in the science-policy interface and building synergies with science has been highly variable around the world, and further work is needed in order to develop a robust set of procedures and approaches for use by the Platform. These efforts will build on and complement those of UNESCO, the Convention on Biological Diversity, the World Intellectual Property Organization, FAO and others. Under the guidance of the Panel and the Bureau, a time-bound and task-specific expert group will be established to further develop the guide, for approval by the Plenary at its fourth session (anticipated in early 2016) so that it can inform the process for developing other ongoing Platform deliverables, in particular the regional/subregional assessments. The expert group, in collaboration with the task force on knowledge and data, will also support the Panel and the Bureau during 2014 in the establishment of a roster and network of experts and knowledge-holders. The roster will be a resource for undertaking Platform activities, including contributions to assessment processes. The development of the procedures and approaches by a wide range of experts will draw on a range of published best practices from each region for working with indigenous and local knowledge systems. This process will be augmented with learning from one or two case studies in each of the five United Nations regions; an e-conference discussion or review of the draft guide, with a broad range of experts and stakeholders (including the World Indigenous Network); and three meetings of the expert group. In 2015, the expert group will evaluate and finalize the guide on the basis of inputs from the review process and e-conferences with a view to its approval by the Plenary at its fourth session and its implementation in the wider assessment process of the Platform.