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FUTURE WORK OF THE IPCC

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(Submitted by the Secretariat in support of the process of the Task Group on the Future Work of the IPCC)

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WMO UNEP

Joint Submission of
UNU, UNESCO & the Secretariat of the CBD

The following joint submission is made by UN agencies with specialized expertise on traditional knowledge of the environment and takes into account those submissions already received as part of the review process of the IPCCC. It draws upon decades of experience dedicated to expanding contributions to the global knowledge base on issues such as climate change and biodiversity through the appropriate inclusion of indigenous, local and traditional knowledge[1] within science and environmental policy.

That the IPCC now recognizes the importance of indigenous/traditional knowledge is a commendable milestone. Compared to previous IPCC assessments, the AR5 contained a marked increase in the number and quality of references to traditional knowledge (TK), Indigenous Peoples and associated concepts. As the IPCC Assessment is generally recognized as the most authoritative scientific assessment on climate change science and policy this is an important recognition of TK by mainstream science and politics.

Nevertheless, a closer examination of these references reveal important gaps and illustrate that despite the considerable progress since AR4 much more needs to be done. Some of these gaps are highlighted in the UNU's analysis of 5AR provided in the Annex to this submission.

A. What should be the future products of the IPCC?

1. To assist the IPCC in understanding the multiple contributions of traditional/indigenous knowledge to climate change assessment, the IPCC should consider **the production of a Special Report on Traditional/Indigenous Knowledge Systems** within its next work cycle. The production of such a Special Report presents the opportunity to focus an assessment on the growing body of literature, both scientific and grey, on various traditional/indigenous knowledge and climate change topics, including reviewing key concepts and understandings on indigenous knowledge. It could also provide the IPCC with recommendations in relation to the building in of traditional/indigenous knowledge in future assessments as well as policy-relevant recommendations to national adaptation decision-makers on various tools, methods and approaches to bring in traditional/indigenous knowledge into their national mitigation and adaptation strategies. This

[1] The terms indigenous, local and traditional knowledge are used interchangeably within the context of this document.

would have the added benefit of providing a suitable method to deliver updates and address some of the gaps identified by UNU's preliminary analysis of the Working Group's II and III contributions on 5AR on TK.

2. The **AR6 should have chapter(s) on traditional knowledge in its assessment of adaptation and mitigation**. In the case that a Special Report on Traditional/Indigenous Knowledge Systems is approved and funded, outputs from the report can feed into respective chapters of AR6.

3. A number of topics for possible future Special Reports (SRs) were raised in the submissions received. Many proposals such as food security, agriculture, REDD, biodiversity, loss and damage and transitions benefit from inputs from traditional/indigenous knowledge. For any such **relevant SR every effort be made to include traditional/indigenous knowledge holders and experts and that such SRs have a dedicated chapter on traditional/indigenous knowledge**.

4. **The development of special guidelines for accessing indigenous or traditional knowledge in AR6** to take into account that much of the most valuable information about traditional knowledge does not appear in peer reviewed literature.

5. Should the IPCC establish a group to analyze, assess and evaluate the impact of data gaps in the assessment reports then this needs to include an assessment about the gaps of traditional/indigenous knowledge in 5AR.

B. What would be the appropriate structure and modus operandi for the production of these IPCC products?

1. The **Bureau includes either as a member or *ex officio* an Indigenous Person with appropriate expertise**.

2. The IPCC could **consider flexible mechanisms to promote the inclusion of local and indigenous knowledge holders**. Examples of mechanisms, including those that have been used within other intergovernmental assessments and mechanisms include:
   a. Ensuring and monitoring that teams are transdisciplinary (thus including indigenous experts) from the scoping to review process;
   b. Encouraging government nominations of indigenous experts; and
   c. Ensuring balance of regions, disciplines and knowledge holders in the composition of Author teams and inviting the use of resource persons to achieve balance.

3. **Continued collaboration** with organizations working on indigenous issues and with scientific assessment processes that respect and recognize indigenous knowledge including IPBES and regional assessment processes in the Arctic (for example the Arctic Climate Impact Assessment and Adaptation Actions for a Changing Arctic (AACA)).

4. Support to the suggestion to **merge the three WGs into two thematic groups**: Group I - climate change and its impacts and Group II – mitigation, adaptation and vulnerability as in the view of most Indigenous Peoples mitigation and adaptation are so related that considering them in isolation is an artificial distinction that limits approaches and thinking to climate change.

5. The **establishment of an IPCC network of relevant experts and Indigenous Peoples to support and participate in the IPCC processes** – including the review process – would facilitate access to TK and support research and scholarship on this issue.

C. Ways to ensure enhancement of the participation and contribution of developing countries in the future work of the IPCC

1. **Considering how to build synergies with indigenous knowledge is an important issue in the developing country context** as many countries contain significant populations of communities and indigenous peoples who are highly dependent on natural resource-based livelihoods and as such, vulnerable to the impacts of climate change. Their knowledge bases for local level assessment and decision-making form an important contribution to climate change adaptation – a contribution that is often misunderstood and ill-framed in relation to science – and often reflective of the status of Indigenous Peoples as the most marginalized and disadvantaged in many developing countries. Thus while there is broad recognition of indigenous knowledge within these countries, there is a need to develop methodologies for its appropriate inclusion in climate policy and decision-making. Finally while not detracting from the notion that decisions should be based on 'best available knowledge,' the appropriate inclusion of indigenous knowledge systems is in any case more cost-effective in many contexts where expensive, state-of-the-art infrastructure and resources are not available.

2. On the other hand, over the last decades, specific sub-regions including the Arctic and Pacific have made significant gains in understanding how to incorporate indigenous knowledge systems in assessment and adaptation action. **Cross-regional sharing and exchange from these countries can provide a capacity-building opportunity for developing countries** where traditional/indigenous knowledge is an immense resource but where there are gaps in considering its inclusion in decision-making. Therefore an IPCC workshop on indigenous knowledge enhances participation of developing countries on a long-term basis through cross-regional exchanges.

3. In considering the **organization of an IPCC workshop on the Contributions of Traditional/Indigenous Knowledge Systems**, the Panel could consider the following processes including:

a. The establishment of a Scientific Steering Committee and inclusion of indigenous experts in the committee
b. A selection process that is inclusive and transparent as a way to ensure the relevant range of scientific, technical and socio-economic views is represented
c. Supporting the full and effective participation of indigenous knowledge holders *inter alia* recognition of indigenous peoples' representation across 7 socio-cultural regions[2]
d. Scheduling of a SR and workshop is held early enough in the 6AR cycle so as to be properly included in all the relevant products of this cycle.

[2] The seven (7) geo-cultural regions established by the UNPFII are: Africa; Asia; Eastern, Central Europe and the Caucasus; Europe and Arctic; Latin America including the Caribbean and Central America; North America; and the Pacific.

Annex

A Preliminary Analysis of TK and related issues in the 5AR by UNU

1. Introduction

Since 2007, UNU has worked closely with the IPCC to address an important gap regarding the extent to which publications concerning the impacts on and perspectives of indigenous peoples would be included in the AR5. This gap is particularly salient because AR4 identified Indigenous Peoples have been as a highly vulnerable subgroup but their accumulated knowledge can help us identify how the climate is changing, characterize impacts and provide valuable lessons for adaptation

There was a marked increase in the number and quality of references to traditional knowledge (TK), Indigenous Peoples and associated concepts in the AR5 to previous assessments by the IPCC. TK, Indigenous People and related Indigenous content is captured and examined in 30 out of 60 chapters of the reports of WGII and WGIII. Importantly TK is recognized as an important source of knowledge. As the IPCC Assessment is generally recognized as the most authoritative scientific assessment on climate change science and policy this is an important recognition of TK in mainstream science and politics.

Nevertheless, a closer examination of these references reveal important gaps and illustrate that despite the considerable progress since AR4 much more needs to be done. Some of these gaps are highlighted in the following analysis of 5AR.

Based on the submissions already received as part of the review process of the IPCCC, the experience of UNU's work with the IPCC to promote TK in AR5, as well as similar experiences with the Millennium Ecosystem Assessment and the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES), a number of key interventions that would promote TK further in AR6 are provided.

2. TK and Climate Change

Indigenous Peoples and TK have an important role to play in responding to climate change. Indigenous Peoples form approximately 5% of the world's population, manage 11% of the world's forest lands and customarily own, occupy or use 22% of the world's land surface. It has been estimated that Indigenous lands and other protected areas created to safeguard land rights, indigenous livelihoods, biodiversity and other values contain more than 312 billion tons of carbon.

Despite having contributed the least to global warming by traditionally leading 'low carbon' ways of life, Indigenous Peoples are disproportionately vulnerable to climate change because: They usually live in ecosystems particularly prone to the effects of climate change (polar regions, small islands, high altitudes, humid tropics, coastal regions, deserts); they are heavily dependent on lands and

resources for basic needs and livelihoods (food, medicine, shelter, fuel, etc.) and they are amongst the poorest and most marginalized people globally. Compounding these vulnerabilities, programs being implemented by non-indigenous people to mitigate and adapt to climate change also have the potential to adversely affect Indigenous Peoples' livelihoods' as well as undermine their customary rights to lands and natural resources if not properly designed and implemented.

Indigenous People are, however, not simply victims of climate change but have an important contribution to make to address climate change. Due to their close relationship with the environment, Indigenous Peoples are uniquely positioned to adapt to climate change. Indigenous Peoples are also repositories of learning and knowledge on successfully coping with local-level climate change and effectively responding to major environmental changes such as natural disasters. Indigenous Peoples play a fundamental role in the conservation of biological diversity, protection of forests and other natural resources, and their traditional knowledge on climate change can also substantively enrich scientific knowledge and adaptation activities of others.

3. The IPCC and TK

In previous assessments, TK and Indigenous perspectives have been given relatively little prominence and have mostly been relegated to the regional chapters – mainly the Polar region. In the AR4, however, indigenous knowledge was cited "an invaluable basis for developing adaptation and natural resource management strategies in response to environmental and other forms of change." This was reaffirmed at the 32nd Session of the IPCC in 2010: "indigenous or traditional knowledge may prove useful for understanding the potential of certain adaptation strategies that are cost-effective, participatory and sustainable" (IPCC-XXXII/Doc 7).

But observations and assessments by indigenous peoples, marginalized populations and developing country scientists have remained relatively inaccessible to the IPCC process mostly due to the epistemological framing of the IPCC reports (Ford et al. 2011), a lack of scholarship on the topic and language and socio-cultural barriers. Various studies have highlighted geographical and disciplinary biases in past IPCC assessments (IAC 2010, Ford et al. 2011, Pielke, 2010a, Bjurstrom and Polk 2011a; Bjurström and Polk 2011b; Hulme and Mahony 2010; Ravindranath 2010; Vasileiadou et al. 2013) and have urged the IPCC to expand its scope and range by diversifying authorship, types of knowledge, accessing important information in grey literature and improving accountability

The IPCC itself recognized its limitations and the needed to make a special effort to include indigenous and marginalized knowledge systems (Ebi 2012). At its 32nd session, the IPCC recommended broadening the participation of regional experts, the inclusion of grey literature, literature in other languages, and the organization of workshops - particularly in developing regions - to collect and assess relevant in situ observations and scientific data on topics relevant to AR5

(IPCC-XXXII/Doc 7). And Ebi (2012) noted the importance of quality, relevant research and expert review for the IPCC.

Taking advantage of this growing awareness within the IPCC, since 2007, UNU with the support of many partners and funders worked closely with the IPCC to strengthen the assessment of the links between traditional knowledge, indigenous peoples and climate change and so promote awareness for TK in this important forum.

Highlights of this work include: a preliminary desktop study of this issue in December 2010 (*Advance Guard: Climate Change Impacts, Adaptation, Mitigation and Indigenous Peoples - A Compendium of Case Studies*). Two international expert workshops held in collaboration with the IPCC on *Vulnerability, Adaptation and Traditional Knowledge* in Mexico, July 2011; and *Climate Change Mitigation with Local Communities and Indigenous Peoples* in Cairns, March 2012), with additional input from two meetings of the members of the international advisory team and Co-Chairs from IPPC's Working Group II (adaptation) and Working Group III (mitigation). A technical report that covered topics related to adaptation was published in June 2012 in collaboration with UNESCO (*Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation*) and a special issue of the journal *Climatic Change* focusing on TK and mitigation was published in January 2014. In addition, a series of video documentaries and interviews addressing the intersection between traditional knowledge and climate science was produced, primarily targeted at indigenous peoples and local communities and the general public. But behind the scenes the work also included, working closely with authors to identify relevant references in literature, co-editing peer-reviewed publications on traditional knowledge and climate change, identifying and supporting indigenous experts to participate in the review process and reviewing the first and second order drafts of the AR5 on climate change adaptation, vulnerability and mitigation and participating in various meetings of the IPCC, especially the final plenary meetings to adopt the reports of WGII and WGIII.

UNU and UNESCO's Technical Report on "Weathering Uncertainty" based on the IPCC-UNU Workshop in Mexico was cited 15 times in WGII and WGIII's Reports (e.g. WGII Chapter 2 (Pages 8,20); Chapter 5 (Page 34); Chapter 7 (Page 33), Chapter 9 (Page 25); Chapter 12 (Pages 9,10); Chapter 15 (Pages 14,21); Chapter 26 (Pages 37), Chapter 28 (3 times on Page 18) and WGIII Chapter 3 Page 69 and 110)).

UNU's Advanced Guard was cited 5 times in WGII Report in Chapter 21 (Page 30), Chapter 22 (Page 35), Chapter 28 (Pages 16, 18, 32).

Other publications by UNU Staff were cited 8 times including Green and Raygordetsky (2010) and Warner et all (2012). UNU's suggestions on bibliographical references were included throughout the text and numerous authors from the Mexico workshop were widely cited in the WGII report including Ford, Falanruw, Dekdeken, Pearce, Maynard, Redsteer and Salick.

Most importantly UNU has supported the work of the IPCC by developing a network of Indigenous Peoples and authors with indigenous expertise that participated in the IPCC AR5 process. Another critical contribution that UNU has made is though identifying key case studies. These case studies have been even more critical due to the absence of global, or metadata on TK and Indigenous Peoples and climate change.

At the same time UNU has also been working closely with Indigenous People and supporting their direct engagement in the IPCC processes as well as related climate change policy forum such as the UNFCCC. For example, UNU-IAS, the Secretariat of the UN Permanent Forum on Indigenous Issues and NAILSMA, convened the International Expert Group Meeting on Indigenous Peoples and Climate Change, in Darwin, Australia in April 2008. Based on this meeting the Seventh Session of the Permanent Forum (UNPFII) held from 21 April to 2 May 2008 adopted the recommendation that the UNU-IAS undertake climate change assessments as follows:-

"20. The Permanent Forum recommends that the United Nations University – Institute of Advanced Studies, university research centres and relevant united nations agencies conduct further studies on the impacts of climate change and climate change responses on indigenous peoples who are living in highly fragile ecosystems, such as low-lying coastal areas and small island States; semi-arid and arid lands and dry and sub-humid lands (grasslands); tropical and subtropical forests; and high mountain areas."

UNU also supported other Indigenous People initiatives such as the Indigenous Peoples Global Summit on Climate Change, in Alaska in April 2009, the Indigenous Peoples Climate Change Assessment and case studies in Brazil and Lapland.

4. Adaptation: References to TK in the contribution of WG II to AR5

The report of Working Group II for AR5 references traditional knowledge and indigenous peoples in 24 of their 30 chapters. 15 out of 20 thematic specific subjects addressed in the report of WGII include reference to TK. 9 out of 10 regional assessments also refer to TK.

That is a marked increase from the report of Working Group II for AR4 where only 3 (out of 12) of the thematic chapters and 5 (out of 8 regional chapters) mentioned TK or Indigenous People or where overall only 8 out of 20 chapters (or 40%) of the chapters mentioned TK or Indigenous People. Furthermore, many of the chapters in the report of WGII for AR4 merely mentioned TK and Indigenous People but did not include a detailed assessment. The number of bibliographical references that contain significant work on TK or Indigenous Peoples in AR4 is approximately 80% less than in AR5. Finally, in AR4 only 5 case studies/boxes on Indigenous People/TK were included in the entire text (all under the cross-cut of Indigenous Knowledge for Adaptation to Climate Change).

A highlight of the importance that WG II placed on TK is the four references in the Summary for Policy Makers to the role of TK, Indigenous People and community based management, in particular, that "Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples' holistic view of community and environment, are a major resource for adapting to climate change, but these have not been used consistently in existing adaptation efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation".

The Technical Summary of the WGII report also contains 13 references to TK and 19 references to Indigenous People. For example, it concludes "Indigenous, local, and traditional forms of knowledge are a major resource for adapting to climate change (robust evidence, high agreement). Natural resource dependent communities, including indigenous peoples, have a long history of adapting to highly variable and changing social and ecological conditions. But the salience of indigenous, local, and traditional knowledge will be challenged by climate change impacts. Such forms of knowledge are often neglected in policy and research, and their mutual recognition and integration with scientific knowledge will increase the effectiveness of adaptation. [Sections 9.4, 12.3, 15.2, 22.4, 24.4, 24.6, 25.8, Table 15-1] ".

The full WGII Report contains many important references to TK and Indigenous People. A full list of them is provided in the Annex to this document. Some important examples include:-

- Science and Traditional Knowledge not mutually exclusive. Important to integrate traditional knowledge with scientific knowledge (Chapter 2, Page 8 and Chapter 14, Page 9). In some cases these different knowledges are already being combined to co-produce new knowledge and create new discourse on adaptation planning (Chapter 2, Page 20). There is robust evidence that mutual integration and co-production of local and traditional knowledge increase adaptive capacity and reduce vulnerability (Chapter 12, Page 10);
- Local knowledge often highlights vulnerabilities and impacts that may not be well known (Chapter 15, Page 6).
- Indigenous knowledge has developed to cope with climate hazards contributing to food security in many parts of the world (Chapter 7, Page 33). Indigenous knowledge is an important resource in climate risk management and is important for food security in many parts of the world (Chapter 7, Page 36). Traditional agriculture preserves soil carbon sinks, supports onsite biodiversity and uses less fossil fuel than high-input agriculture (Chapter 4, Page 61);
- Climate Change may endanger harvests of marine species with spiritual and aesthetic importance to indigenous cultures, raising ethical concerns about cultural preservation (Chapter 6, Page 41);
- Impacts on the health and well-being of Arctic residents from climate change are significant and projected to increase - especially for many indigenous peoples (Chapter 28, Page 3). The Arctic, where indigenous peoples, are projected to be exposed to the disruption and possible

destruction of their hunting and food sharing culture are highlighted as at "compounded risk" (Chapter 19, Page 20);
- Indigenous and local adaptation strategies have been documented for Southeast Asia and could be used as a basis for future climate change adaptation (Chapter 24, Page 18);
- Improved management of savanna fires to reduce the extent of high intensity late season fires could substantially reduce emissions as well as having significant benefits for biodiversity and indigenous employment (Chapter 25, Page 95);
- It is also important to consider the role of Indigenous groups in Central and South America; there is a growing acknowledgement that recognizing the land ownership authority of indigenous groups can help central governments to better manage many of the natural areas remaining in the region (Chapter 27, Page 12).

Nevertheless despite the increase in recognition of TK and Indigenous People there remain important gaps in the repot of WG III. An important gap in the report of WGII is that the references are generally confined to cautious observations of existing challenges that Indigenous Peoples and TK face and provide little in the way of solutions to these challenges. So that even though it is significant that WGII recognizes that TK is a major resource for adapting to climate change and that it has not been used consistently in existing adaptation efforts, WGII does not adequately highlight examples where TK is being used effectively or what could be done to rectify this problem.

Another issue is that Indigenous Peoples and experts in TK are not adequately represented in the authors or reviewers of WGII. Also the mechanisms for accessing this type of information are *ad hoc* and limited. As noted by Ford et al. (2011) this lack of expertise represents a barrier to including more references to TK and Indigenous People, because if authors do not have the requisite expertise then they take a conservative approach to the issue and are reluctant to include even peer reviewed literature that they are not familiar with or is not in their area of expertise (also see Jonas et al., 2001).

5. Mitigation: References to TK in the contribution of WG III to AR5

The report of Working Group III for AR5 contains 17 references to TK and 22 references to Indigenous People, in 5 out of a total of 16 chapters, namely:-

- Chapter 2: Integrated Risk and Uncertainty Assessment of Climate Change Response Policies;
- Chapter 3: Social, Economic and Ethical Concepts and Methods;
- Chapter 4: Sustainable Development and Equity;
- Chapter 9: Buildings; and
- Chapter 11: Agriculture, Forestry and Other Land Use (AFOLU).

As with the report of WGII, this represents a significant advance on the report of WGIII for AR4, which had no references to TK or Indigenous People. A full list of them is provided in the Annex to this document. Some important examples include:-

- Indigenous knowledge can supplement scientific knowledge in geographic areas with a paucity of data (Green and Raygorodetsky, 2010) and can guide knowledge generation that reduces uncertainty in areas that matter for human responses (Assessment, 2004) (Chapter 2, Page 20);
- Chapter 3 has a specific sub-section relating to indigenous peoples, under the 'social and cultural issues' sub-heading. In particular, it recognizes that the normal methods for balancing interests, such as economic valuation, are not suitable for developing climate change policies, because "social concerns and objectives, such as the preservation of traditional values, cannot always be easily quantified or monetized" and some values differ so radically from each other that they cannot be determinately weighed together. For example, it may be impossible to weigh the value of preserving a traditional culture against the material income of the people whose culture it is, or to weigh the value of biodiversity against human wellbeing (Chapter 3, Page 18).
- The ancestral lands of indigenous peoples contain 80% of the earth's remaining healthy ecosystems and global biodiversity priority areas, including the largest tropical forests (Sobrevila, 2008) (Chapter 3, Page 68);
- Indigenous People are often marginalized in decision making and unable to participate adequately in local, national, regional, and international climate-change mechanisms (Chapter 3, Page 68);
- Importantly, AFOLU mitigation measures may have impacts on land tenure and land-use rights for several social groups including indigenous peoples, local communities and other social groups, dependent on natural assets (Chapter 11, Page 55); and
- The Western Arnhem Land Fire Abatement Project (WALFA), a fire management project in Australia initiated in 2006 that produces a tradable carbon offset through the application of improved fire management using traditional management practices of indigenous land owners (Whitehead et al., 2008; Bradstock et al., 2012) (Chapter 11, Page 70).

Nevertheless despite the increase in recognition of TK and Indigenous People as with the report of WG II there remain important gaps in the report of WG III. A critical one is that despite the great importance WG III placed on AFOLU as a mitigation option and the importance of TK and Indigenous People to many of the issues explored in this report of WG III, the SPM does not include any link between TK, Indigenous People and AFOLU.

The SPM also observes that "When implemented sustainably, activities to reduce emissions from deforestation and forest degradation (REDD+ is an example designed to be sustainable) are cost effective policy options for mitigating climate change, with potential economic, social and other environmental and adaptation co-benefits (e.g., conservation of biodiversity and water resources, and reducing soil erosion) (limited evidence, medium agreement). [Sections 11.3.2 and 11.10]". Indeed, REDD is mentioned in 10 different chapters 158 times and once in the SPM. Despite the critical role Indigenous Peoples play in

all REDD programmes, this role fails to be mentioned in the report of WGIII. Tellingly, the relationship between biodiversity and REDD gets much more attention than TK or Indigenous People. Compared to the report of WGII, the lack of references to Indigenous Peoples and TK is worrying gap in the report of the WG III.

Moreover, the few references to TK or Indigenous Peoples in the Report are heavily qualified and provide little guidance about the importance of TK or Indigenous People issues. For example, the following observations is typical (emphasis added):-

> AFOLU mitigation measures **may** have impacts on land tenure and land‐use rights for several social groups including indigenous peoples, local communities and other social groups, dependant on natural assets. Co‐benefits from AFOLU mitigation measures can be clarification of land tenure and harmonization of rights, while adverse side‐effects can be lack of recognition of customary rights, loss of tenure or possession rights, and even displacement of social groups. Whether an impact on land tenure and use rights is positive or negative depends upon two factors: (a) the institutions regulating land tenure and land‐use rights (e.g., laws, policies), and (b) the level of enforcement by such institutions. **More research is needed** on specific tenure forms (e.g., individual property, state ownership or community rights), and on the specific effects from tenure and rights options, on enabling AFOLU mitigation measures and co‐benefits in different regions under specific circumstances.

This caution means that the IPCC has missed an opportunity to promote or support Indigenous Peoples important role in mitigating climate change.

The reasons for this caution are many and varied. Ford's concerns about the lack of expertise in the authors of the WGII of the IPCC (Ford 2011) are more pronounced from an ad hoc analysis of the authors of WGIII. This lack of expertise surely represents a barrier to including a more robust assessment of TK and Indigenous People and climate mitigation. A reason given by many of the authors of WGIII was the lack of metadata or global or even regional data trends that can be used to measure the contribution that TK and Indigenous People make to mitigate climate change. Although the data that does exist, such as the contribution that traditional fire management might make or the amount of forests under the management of Indigenous Peoples, which was brought to the attention of the authors in the review process, still did not make it into the Report. Interestingly the lack of such data for REDD didn't prevent 158 references. The lack of expertise in the authors no doubt results in a conservative approach to the issue and a reluctance to include even peer-reviewed literature that they aren't familiar with or is not in their area of expertise (Ford 2012 and Jonas et al., 2001), which poses further barriers to including this material.

6. Special Reports of the AR5

There were two special reports prepared by the IPCC as part of the AR5 cycle, the Special Report on Renewable Energy Sources and Climate Change Mitigation (SRREN) and the Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX). Both Special Reports were requested by governments and are referenced in the reports of the Working Groups and SYR.

SREX contains extensive references to TK, Local knowledge and Indigenous People and has several sections devoted to traditional or local knowledge and Indigenous Peoples. For example, TK (or related terms such as indigenous or local knowledge) is referenced 70 times and Indigenous Peoples 20 times.

SREX observes that traditional knowledge is increasingly valued as important information to include when preparing for disasters. That place based memory of vulnerable areas, know-how for responding to recurrent extreme events and detection of abnormal environmental conditions manifest the power of local knowledge. Community participation in disaster management is essential to tap this information as it can offer alternative perspectives and approaches to problem-solving. Indigenous people as well as long-term residents often conserved their resources in situ, providing important information about changing environmental conditions as well as actively adapting to the changes. Integration of local knowledge with external scientific, global, and technical knowledge is an important dimension of climate change adaptation and disaster management. Experiences in environmental management and integrated assessment suggest mechanisms for such knowledge transfers from the bottom up and from the top down. For example, communities set up trusted intermediaries to transfer and communicate external knowledge such as technology-based early warning systems and innovative and sustainable farming techniques that incorporate the local knowledge system - (P311).

The extensive nature of these references along with their more assertive observations and conclusions and promotion of solutions provided by TK and Indigenous Peoples contrasts with the reports of the Working Groups and demonstrates what is possible within the current IPCC environment. Because of this, perhaps a SR on indigenous peoples and related issues during the AR6 cycle might be an appropriate format for addressing the topic. As noted by Ford et al. (2011), a SR would "confer the creditability, rigor and profile of an assessment report and provide timely reporting and vital information to the scientific and policy communities."

7. The Synthesis Report

The SYR is the most important political outcome of the IPCC and as such the more that TK is referenced in the SYR the more political momentum TK will derive from the IPCC. At the moment the SYR is being drafted and confidential. The SYR is, however, confined to information contained in the reports of the WGs. As result the gaps with the WGII and WGIII reports will be in the SYR.

8. TK and AR6

The IPCC at its 37th Session (Batumi, Georgia, 14-18 October 2013) decided to set up a Task Group on the future work of the IPCC. At this meeting it was also suggested to involve experts working with traditional and indigenous knowledge – see summary from secretariat at http://ipcc.ch/apps/future/docs/future_summary_37_fin.pdf.

In the submissions so far on the future work there is only one reference to TK and Indigenous Peoples. A few countries supported a TP, or other IPCC report, using the outputs of the three AR5 reports to address the topic of food security, agriculture and climate before the UNFCCC COP 21 in Paris in 2015, which could be important for promoting the recognition of TK and Indigenous Peoples.

Many countries pointed out that there is a growing need for information that can support local decisions. One country pointed out that there is a great opportunity for the IPCC to further the production of localized integrated decision support information and one idea to make this happen was that the IPCC could work to create an easy to use and open access data facility, that includes all that is used in making IPCC ARs, creating and allowing users to develop and apply data selection and integration tools, describing methodologies and best-practices for doing assessments, including in relation to risk, and training and accrediting persons and institutions performing climate assessments. Finally consulting with UN and other organizations on how to make available necessary information not from the IPCC.

In the submission received so far there is a lot of thought given to diversifying authors and inputs. Unfortunately though the proposals focus mainly on developing countries and non-English speaking sources. Only Saudi Arabia suggested, "Indigenous information and literature other than English shall be given higher priorities when citing specific examples".

In the submissions on new topics that need attention there is a significant emphasis on the issue of "loss and damage" and on "transitions", biodiversity is mentioned 7 times as an important priority for further study, "local" 15 times and REDD twice. TK or Indigenous People are not mentioned.

9. Recommendations

Whilst there is a growing recognition of TK and Indigenous Peoples in the IPCC, as the IPCC recognizes repeatedly in AR5, more needs to be done to highlight this role, in particular, to move beyond the recognition of its value to the recommendation of specific ways that TK and Indigenous People can be recognized, supported and more effectively incorporated into main stream science.

Based on the experience of UNU work with the IPCC to promote TK in AR 5, as well as similar experiences with the Millennium Ecosystem Assessment and the Intergovernmental science-policy Platform on Biodiversity and Ecosystem

Services (IPBES), key interventions that would promote TK further in AR6 include:-

- A dedicated chapter in AR6 on TK and Indigenous Peoples;
- An IPCC Special Report (SR) and/or Technical Paper to focus on Indigenous peoples and related issues;
- Ensuring that relevant SRs that might be undertaken such as food security, agriculture, REDD, biodiversity, loss and damage and transitions, properly considers TK and engages Indigenous Peoples;
- Early identification and recruitment of authors with Indigenous expertise for the IPCC AR6 process – specifically for roles as Coordinating Lead Authors (CLA's), Lead Authors (LAs) and review editors (Res);
- Development of a database of TK to promote access to TK issues and scholarship (including literature in languages other than English) and assist with the development of information tools that can assist local decision making;
- Establishment of an IPCC network of experts and Indigenous Peoples to support and participate in the IPCC processes – including the review process;
- Workshops to contribute to capacity building and knowledge sharing in developing countries, including exchanges between scientists and indigenous peoples; and
- Develop special guidelines for accessing TK in AR6.

Annex

WG II References

- Linking indigenous and conventional climate observations can add value to develop consensus forecasts (Chapter 14, Page 17);
- Indigenous Peoples often possess detailed knowledge of climate change that is derived from observations of environmental conditions over many generations (Chapter 18, Page 26);
- Recognition that Indigenous Knowledge is enriching climate change research (Chapter 1, Page 12) and becoming increasingly relevant for climate services (Chapter 2, Page 20);
- Recognition of local and indigenous knowledge is fundamental to building trust within decision-making processes (Chapter 2, Page 3);
- Science and Traditional Knowledge not mutually exclusive. Important to integrate traditional knowledge with scientific knowledge (Chapter 2, Page 8 and Chapter 14, Page 9). In some cases these different knowledges are already being combined to co-produce new knowledge and create new discourse on adaptation planning (Chapter 2, Page 20). There is robust evidence that mutual integration and co-production of local and traditional knowledge increase adaptive capacity and reduce vulnerability (Chapter 12, Page 10);
- There is concern that indigenous and traditional knowledge is itself under threat (Chapter 12, Page 11);
- Indigenous peoples particularly vulnerable under a changing climate (Chapter 2, Page 12). Vulnerability is often high among indigenous peoples (Chapter 13, Page 7). Local knowledge often highlights vulnerabilities and impacts that may not be well known (Chapter 15, Page 6). Indigenous communities are particularly at risk due to compounding stressors such as lack of government support, urban infrastructure, and insecure land tenure (Chapter 13, Page 11);
- Indigenous knowledge has developed to cope with climate hazards contributing to food security in many parts of the world (Chapter 7, Page 33). Indigenous knowledge is an important resource in climate risk management and is important for food security in many parts of the world (Chapter 7, Page 36). Traditional agriculture preserves soil carbon sinks, supports onsite biodiversity and uses less fossil fuel than high-input agriculture (Chapter 4, Page 61). Traditional knowledge may contribute to the establishment of diverse and resilient agricultural systems (Chapter 4, Page 65). Projected changes beyond historical conditions could reduce the reliance on IK affecting the adaptive capacity of a number of peoples globally (Chapter 7, Page 33) but also some policies and regulation may be limiting the contribution that indigenous knowledge can make to effective climate adaptation (Chapter 7, Page 36);
- Climate Change may endanger harvests of marine species with spiritual and aesthetic importance to indigenous cultures, raising ethical concerns about cultural preservation (Chapter 6, Page 41);
- Steps to energy self-sufficiency can reinforce rural autonomy in isolated rural communities including indigenous groups (Chapter 9, Page 15);

- Market integration is seen as reducing the capacity of indigenous or smallholder systems from dealing with climate risk in Bolivia, Mexico, Mozambique and in the Sahel (Chapter 9, Page 20);
- Some authors emphasize the need for local response and indigenous knowledge to reduce vulnerability (Chapter 9, Page 21), other state that local knowledge is too local and in some case information from further away is important (Chapter 9, Page 21);
- Adaptation can also build upon local and indigenous knowledge for responding to weather events and a changing climate (Chapter 9, Page 25);
- Indigenous peoples who depend heavily on local resources, and live in parts of the world where climates are changing quickly, are generally at greater risk of economic losses and poor health (Chapter 11, Page 9);
- Impacts on the health and well-being of Arctic residents from climate change are significant and projected to increase - especially for many indigenous peoples (Chapter 28, Page 3). The Arctic, where indigenous peoples, are projected to be exposed to the disruption and possible destruction of their hunting and food sharing culture are highlighted as at "compounded risk" (Chapter 19, Page 20);
- In Africa, traditional and autonomous adaptation strategies have been construed by social-ecological change and drivers such as population growth, land privatization…and erosion of traditional knowledge (Chapter 22, Page 43);
- Indigenous and local adaptation strategies have been documented for Southeast Asia and could be used as a basis for future climate change adaptation (Chapter 24, Page 18);
- Indigenous Peoples in both Australia and New Zealand have higher than average exposure to climate change due to a heavy reliance on climate-sensitive primary industries and strong connections to the natural environment and face particular constraints to adaptation (Chapter 25, Page 4);
- Improved management of savanna fires to reduce the extent of high intensity late season fires could substantially reduce emissions as well as having significant benefits for biodiversity and indigenous employment (25, Page 95);
- Among the most vulnerable in North America are indigenous peoples due to their complex relationships with their ancestral lands and higher reliance on subsistence economies (Chapter 26, Page 5); and
- It is also important to consider the role of Indigenous groups in Central and South America; there is a growing acknowledgement that recognizing the land ownership authority of indigenous groups can help central governments to better manage many of the natural areas remaining in the region (Chapter 27, Page 12).

WG III References

- Chapter 3 has a specific sub-section relating to indigenous peoples, under the 'social and cultural issues' sub-heading;

- Indigenous knowledge can supplement scientific knowledge in geographic areas with a paucity of data (Green and Raygorodetsky, 2010) and can guide knowledge generation that reduces uncertainty in areas that matter for human responses (Assessment, 2004) (Chapter 2, Page 20);
- Section 9.3.10 suggests that indigenous building practices in many parts of the world provide important lessons for affordable low-energy housing design and that developed countries can learn from traditional building practices, transmitted over generations, the social-scale equivalent of 'intuitive' processing and learning at the individual level (Chapter 2, Page 21);
- Changes in the timing and extent of freezing and melting (and associated effects on sea ice, flora, and fauna) have been experienced since the 1990s in the American and Canadian Arctic and especially indigenous communities (Laidler,2006), leading to increased concern with climate change because traditional prediction mechanisms no longer can explain these phenomena (Turner and Clifton, 2009) (Chapter 2, Page 19);
- Because social concerns and objectives, such as the preservation of traditional values, cannot always be easily quantified or monetized, economic costs and benefits are not the only input into decision making about climate change. (Chapter 3 Page 10)
- Any decision about climate change is likely to promote some values and damage others. These may be values of very different sorts. In decision making, different values must therefore be put together or balanced against each other. Some pairs of values differ so radically from each other that they cannot be determinately weighed together. For example, it may be impossible to weigh the value of preserving a traditional culture against the material income of the people whose culture it is, or to weigh the value of biodiversity against human wellbeing (Chapter 3 Page 18)
- Evidence suggests that it may already be damaging the culture of Arctic indigenous peoples (Ford et al., 2006, 2008; Crate, 2008; Hassol, 2004; see also WGII Chapter 12) (Chapter 3, Page 20);
- The extraordinary scope and scale of climate change raises particular difficulties for economic methods (Stern, forthcoming). First, many of the common methods of valuation in economics are best designed for marginal changes, whereas some of the impacts of climate change and efforts at mitigation are not marginal (Howarth and Norgaard, 1992). Second, the very long time scale of climate change makes the discount rate crucial at the same time as it makes it highly controversial (see Section 3.6.2). Third, the scope of the problem means it encompasses the world's extremes of wealth and poverty, so questions of distribution become especially important and especially difficult. Fourth, measuring non‐market values—such as the existence of species, natural environments, or traditional ways of life of local societies—is fraught with difficulty. (Chapter 3 Page 25)
- Some have argued that the bio-cultural heritage of indigenous peoples is a resource that should be valued and preserved as it constitutes an irreplaceable bundle of teachings on the practices of mitigation and

sustainability (Sheridan and Longboat, 2006; Russell-Smith et al., 2009; Kronik and Verner, 2010) (Chapter 3, Page 68);

- The ancestral lands of indigenous peoples contain 80% of the earth's remaining healthy ecosystems and global biodiversity priority areas, including the largest tropical forests (Sobrevila, 2008) (Chapter 3, Page 68);
- Indigenous People are often marginalized in decision making and unable to participate adequately in local, national, regional, and international climate-change mechanisms (Chapter 3, Page 68);
- Yet, it is increasingly being recognized that indigenous peoples can impart valuable insights into ways of managing mitigation and adaptation (Nakashima et al., 2012), including forest governance and conserving ecosystems (Nepstad et al., 2006; Hayes and Murtinho, 2008; Persha et al., 2011) (Chapter 3, Page 69);
- It is important to distinguish between formally acquired knowledge on climate change—often based on scientific developments—and traditional knowledge on climate related issues (Smith and Sharp, 2012), as well as to recognize that the relative validity of both types of knowledge to different audiences, and the meaning and relevance of personal engagement, will be influenced by individual perceptions, preferences, values, and beliefs. (Chapter 4 p 24);
- In the agricultural sector, for example, scholars have for many years highlighted the potential of fostering both mitigation and adaptation by supporting traditional and biodiverse agro-ecological systems around the world (Campbell, 2011; Altieri and Nicholls, 2013, and see Section 11.5) Chapter 4, Page 47);
- AFOLU mitigation measures may have impacts on land tenure and land-use rights for several social groups including indigenous peoples, local communities and other social groups, dependent on natural assets (Chapter 11, Page 55); and
- The Western Arnhem Land Fire Abatement Project (WALFA), a fire management project in Australia initiated in 2006 that produces a tradable carbon offset through the application of improved fire management using traditional management practices of indigenous land owners (Whitehead et al., 2008; Bradstock et al., 2012) (Chapter 11, Page 70).