Local and indigenous knowledge at the science–policy interface

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Towards global recognition

In recent years, local and indigenous knowledge has emerged as a new and increasingly influential contribution to the global science–policy interface. Of particular note is the recognition provided by the Intergovernmental Panel on Climate Change (IPCC) in its *Fifth Assessment Report* (2014). In analysing characteristics of adaptation pathways in the Summary for Policy-makers on *Climate Change 2014: Synthesis Report*, the IPCC concludes:

> *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.*

This acknowledgement of the importance of local and indigenous knowledge is echoed by IPCC's 'sister' global assessment body. The Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES) established in 2012 has retained indigenous and local knowledge as an 'operating principle' that translates into the following scientific and technical function of the IPBES Multidisciplinary Expert Panel: *explore ways and means of bringing different knowledge systems, including indigenous knowledge systems, to the science–policy interface.*

Other prestigious scientific bodies with global mandates in science and policy are bringing local and indigenous knowledge to the fore. The Scientific Advisory Board to the Secretary-General of the United Nations decided at its Third Session in May 2015 *'to prepare a policy brief for the attention of the Secretary-General recognizing the important role of indigenous and local knowledge for sustainable development and providing recommendations for enhancing the synergies between ILK and science'*.

Understanding local and indigenous knowledge systems

Before going any further, it may be useful to clarify what is meant by 'local and indigenous knowledge systems.' The term makes reference to knowledge and know-how that have been accumulated across generations, which guide human societies in their innumerable interactions with their environment; they contribute to the well-being of people around the globe by ensuring food security from hunting, fishing, gathering, pastoralism or small-scale agriculture, as well as by providing health care, clothing, shelter and strategies for coping with environmental fluctuations and change (Nakashima and Roué, 2002). These knowledge systems are dynamic, and are transmitted and renewed by each succeeding generation.

Several terms co-exist in the published literature. They include indigenous knowledge, traditional ecological knowledge, local knowledge, farmers' knowledge and indigenous science. Although each term may have somewhat different connotations, they share sufficient meaning to be used interchangeably.

Berkes (2012) defines traditional ecological knowledge as 'a cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.'

Recognition as 'knowing again'

Local and indigenous knowledge is not something new. Indeed, it is as old as humanity itself. What is new, however, is its growing recognition by scientists and policy-makers around the world, on all scales and in a rapidly growing number of domains.

Recognition is the key word, not in the sense of 'discovering' what was previously unknown but rather as revealed by the word's etymology: 're' (again) + 'cognoscere' (know), meaning 'to know again, recall or recover the knowledge of …. something formerly known or felt.'[1] Indeed, today's efforts to 'know again' indigenous knowledge acknowledge the divide put in place by positivist science centuries ago.

This separation, and even opposition, of science, on the one hand, and local and indigenous knowledge, on the other, was not a malevolent act. It might best be understood as a historical necessity without which science could not have emerged as a distinct body of understanding with defined methods and an identifiable group of thinkers and practitioners. Just as Western philosophy has ignored continuities and emphasized discontinuities when constructing 'nature' in opposition to 'culture', so, too, has positivist science chosen to ignore innumerable traits shared with other knowledge systems in order to set itself apart, first as different then as 'unique' and ultimately as 'superior.'

Still today, young scientists are trained to value the scientific traits of being empirical, rational and objective, which suggest by opposition that other knowledge systems suffer from

1. See: www.etymonline.com/index.php?term=recognize

subjectivity, the anecdotal and irrationality. Of course, no one can deny the impressive track record of positivist science in advancing understandings of our biophysical environment with an astounding suite of technical advances that have transformed and continue to transform, for better and for worse, the world in which we live. The division and opposition of science to other knowledge systems, and among disciplines within science itself, are no doubt important keys to the global success of positivist science.

However, compartmentalization, reductionism and specialization also have their limitations and blind spots. Have the advantages of opposing nature and culture, or science and other knowledge systems, been increasingly outweighed in recent decades by their disadvantages? Might the growing understanding and appreciation of these shortcomings be contributing to the emergence of local and indigenous knowledge in the global arena?

Local and indigenous knowledge emerging in global arena

The emergence of local and indigenous knowledge at the global science–policy interface suggests that a long period of separation between science and local and indigenous knowledge systems is coming to an end. This said, separation may not be the right term. In actual fact, the interconnections of science with other knowledge systems may never have been severed, only obscured. Science grew from local observations and understanding of how nature works. In the early days of colonial science, for example, ethnobotany and ethnozoology relied on the knowledge and know-how of local people to identify 'useful' plants and animals. Local and indigenous systems of nomenclature and classification, adopted wholesale, were often disguised as 'scientific' taxonomies. European understanding of Asian botany, for example, *'ironically, depended upon a set of diagnostic and classificatory practices, which though represented as Western science, had been derived from earlier codifications of indigenous knowledge'* (Ellen and Harris, 2000, p.182).

Not until the mid-20th century do we observe a shift in the attitude of Western scientists towards local and indigenous knowledge. This was triggered by Harold Conklin's iconoclastic work in the Philippines on *The Relations of Hanunoo Culture to the Plant World* (1954). Conklin revealed the extensive botanical knowledge of the Hanunoo which covers *'hundreds of characteristics which differentiate plant types and often indicate significant features of medicinal or nutritional value.'* In another realm and another region, Bob Johannes worked with Pacific Island fishers to record their intimate knowledge of *'the months and periods as well as the precise locations of spawning aggregations of some 55 species of fish that followed the moon as a cue for spawning'* (Berkes, 2012). This indigenous knowledge more than doubled the number of fish species known to science that exhibit lunar spawning periodicity (Johannes, 1981). In northern North America, land use mapping for indigenous land claims paved the way for advocating a role for indigenous knowledge in wildlife management and environmental impact assessment (Nakashima, 1990).

Efforts to better understand the vast stores of knowledge possessed by indigenous peoples and local communities expanded in the years to come, with a particular focus on biological diversity. The now well-known article 8(j) of the Convention on Biological Diversity (1992) contributed to building international awareness by requiring Parties to '*respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity.*'

But local and indigenous knowledge was also gaining recognition in other domains. Orlove *et al.* (2002) unveiled that Andean farmers, through their observations of the Pleiades constellation, could predict the advent of an El Niño year with an accuracy equivalent to that of contemporary meteorological science:

> *The apparent size and brightness of the Pleiades varies with the amount of thin, high cloud at the top of the troposphere, which in turn reflects the severity of El Niño conditions over the Pacific. Because rainfall in this region is generally sparse in El Niño years, this simple method (developed by Andean farmers) provides a valuable forecast, one that is as good or better than any long-term prediction based on computer modelling of the ocean and atmosphere.*

Recognition of the veracity of local and indigenous knowledge has also emerged in another domain: that of natural disaster preparedness and response. One of the most striking examples relates to the Indian Ocean tsunami that tragically took over 200 000 lives in December 2004. In the midst of this immense disaster, accounts began to emerge of how local and indigenous knowledge had saved lives. UNESCO had its own direct source of understanding, as a project had been running for many years with the Moken peoples of the Surin Islands in Thailand. The 2004 tsunami completely destroyed their small seaside village, but no lives were lost. After the tsunami, the Moken explained that the entire village, adults and children, had known that the unusual withdrawal of the ocean from the island shore was a sign that they should abandon the village and move rapidly to high ground. None of the Moken present on the Surin Islands had themselves witnessed *laboon*, their term for tsunami but, from the knowledge passed down through generations, they knew the signs and how to respond (Rungmanee and Cruz, 2005).

Biodiversity, climate and natural disasters are but a few of the many domains in which the competence of local and indigenous knowledge has been demonstrated. Others could

be mentioned, such as knowledge of the genetic diversity of animal breeds and plant varieties, including pollination and pollinators (Lyver *et al*., 2014; Roué *et al*., 2015), knowledge of ocean currents, swells, winds and stars that is at the heart of traditional open ocean navigation (Gladwin, 1970) and, of course, traditional medicine, including women's in-depth knowledge of childbirth and reproductive health (Pourchez, 2011). That human populations around the world have developed expertise in a multitude of domains related to their everyday lives seems self-evident, yet this fount of knowledge has been obscured by the rise of scientific knowledge, as if science needed to marginalize others ways of knowing in order to ensure its own global growth in recognition and influence.

Where to from here?

The emergence of local and indigenous knowledge at the global level brings with it many challenges. One relates to maintaining the vitality and dynamism of local and indigenous knowledge and practices in the local communities from which they originate. These other knowledge systems are confronted with a multitude of threats, including mainstream education systems that ignore the vital importance of a childhood education anchored in indigenous languages, knowledge and worldviews. Recognizing the risks of an education centred only on positivist ontologies, UNESCO's programme on Local and Indigenous Knowledge Systems is developing education resources rooted in local languages and knowledge with the Mayangna of Nicaragua, the people of Marovo Lagoon in the Solomon Islands and for Pacific youth.[2]

Of a different nature is the challenge of meeting expectations raised by the recognition, in multiple domains, of the importance of local and indigenous knowledge. How, for example, might local knowledge and knowledge-holders contribute to assessments of biodiversity and ecosystems services, or to understanding the impact of climate change and opportunities for adaptation? Moving beyond recognition to address the 'how' has become a major focus in science–policy fora. Having reinforced recognition of the importance of local and indigenous knowledge for climate change adaptation in the IPCC's *Fifth Assessment Report* (Nakashima *et al*., 2012), UNESCO is now collaborating with the United Nations' Framework Convention on Climate Change to identify tools for, and methods of, bringing indigenous and traditional knowledge, alongside science, into the response to climate change. Last but not least, a Task Force on Indigenous and Local Knowledge has been established to provide IPBES with appropriate 'approaches and procedures' for bringing indigenous and local knowledge into global and regional assessments of biodiversity and ecosystem services. UNESCO is assisting in that effort through its role as the technical support unit for the task force.

2. See: www.unesco.org/links, www.en.marovo.org and www.canoeisthepeople.org

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