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From dichotomy to duality: Addressing interdisciplinary epistemological barriers to inclusive knowledge governance in global environmental assessments

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ABSTRACT

This paper provides an account of how epistemological differences between the natural and physical sciences and social sciences may be a barrier to multiscale and inclusive forms of knowledge governance in global environmental assessments (GEAs). It proposes the concept of geographies of knowledge, to designate both the universalising drive of a positivist epistemology and the localism of relativist and constructivist epistemologies. The paper attempts to determine whether these conflicting geographies of knowledge have been barriers to greater integration of non-scientific knowledge systems – such as Indigenous and Local Knowledge (ILK) – by looking at the cases of three GEAs: the Intergovernmental Panel on Climate Change (IPCC), the Millennium Ecosystem Assessment (MA) and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). The paper concludes that innovations in knowledge governance which seek to give more weight to non-scientific knowledge systems should more explicitly acknowledge and address interdisciplinary epistemological differences.

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1. Introduction

It is well established that ‘in the industrial West, science and politics have long collaborated to produce dominant understandings of nature’ (Jasanoff, 2010: p. 7). Many scholars have attempted to show how this has been the case with the ‘black-boxing’ of the ‘global’ dimension of environmental change (e.g. Turnhout et al., 2016). They argue that the scale of environmental change has been coproduced and coconstructed by both policy-makers and the scientific community. In epistemological terms, this universalistic framing stems in part from positivist tendencies in the natural and physical sciences, leading to the reconceptualisation of environmental change as analytically global. This is reflected in the drive of international politico-scientific knowledge institutions (Beck, 2014), such as the Intergovernmental Panel on Climate Change (IPCC), to produce ‘global kinds of knowledge’ (Hulme, 2010).

For relativists and constructivists, the scale of environmental change, knowledge production and political decision-making are social constructions. Scholars – principally in the fields of Science and Technology Studies and critical social science – have argued that the unitary and self-perpetuating positivist dimension of scientific knowledge ignores the plurality and heterogeneity of worldviews, and hence the chiefly local dimension of knowledge (Hulme, 2010; Martello and Jasanoff, 2004). Some scholars, who share this view, have proposed forms of knowledge governance

(e.g. transdisciplinarity) for scientific assessments that aim at localising analytical (and political) scales through the integration and empowerment of local, non-scientific knowledge systems, often categorised as Indigenous and Local Knowledge (ILK). By knowledge governance I mean the formal and informal mechanisms that deal with the selection, coverage, regulation, and integration of various forms of knowledge.

This push for greater integration of indigenous and traditional knowledge in scientific assessments has also been backed by decades of successful political campaigning and alliances between global indigenous social movements and (international) civil society organisations such as the World Rainforest Movement (Brosius, 2006). Although these movements were originally largely reactionary to cases of destruction and dispossession of livelihoods and important ecosystem services by governments and extractive industries, they have broadened over time to include issues of intellectual property rights and the preservation of traditional knowledge (Brosius, 2006).

As a result, various efforts have been made to incorporate indigenous knowledge in scientific assessments, albeit to a varying degree. Tengo et al. (2014) make a useful distinction between integration, synergies, and coproduction of knowledge. Integration of knowledge necessary involves a certain degree of scientific validation of non-scientific knowledge systems. Whilst synergising knowledge – which presupposes intrinsic validity of different knowledge systems – can be achieved through emphasising

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complementarities of parallel knowledge claims. Finally, coproduction involves the active partaking of diverse knowledge systems at all stages of knowledge generation. I contend that these different approaches can be plotted on a spectrum from weak to strong knowledge integration.

In support of greater knowledge integration scholars have persuasively demonstrated how scientific assessments can benefit from the social sciences to contextualise and reveal the political components of divergent knowledge claims (e.g. Beck, 2014). They have also shown that integrating ILKs in policy-relevant science may give direction to policy and legitimise decision-making (i.e. through democratising science) (e.g. Miller, 2007). To date, however, there has been too little questioning as to whether underlying epistemological differences – between natural and physical scientists and those who defend the value of ILKs – are potential barriers to greater knowledge integration in scientific assessments. Given broad acceptance of the need for more inclusive and locally-sensitive environmental science and policy and given the drive for scientific consensus in much environmental policy-making, this is an important question that needs addressing.

This paper offers a view on the problem, by examining three global environmental assessments (GEAs): the Intergovernmental Panel on Climate Change (IPCC), the Millennium Ecosystem Assessment (MA) and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). GEAs are worthy of attention for several reasons: i) the international science on Global Environmental Change (GEC) has often taken the form of global scientific assessments; ii) 'scientific assessment bodies are now established as a significant part of global environmental governance and exercise a remarkable amount of epistemic and political authority' (Beck, 2014: p. 81); and iii) due to the synthesising role of globally-driven scientific assessments, and their highly political dimension, collaboration between multiple actors and multiple knowledge systems has often been advocated and pushed for (Lebel, 2006).

The paper does not, however, deal with the politics of integration, nor does it discuss, in depth, the various epistemological compatibilities of scientific and non-scientific knowledge systems (cf. Agrawal, 1995). Moreover, whilst I recognise the fundamental role of agency in prompting conflict in transdisciplinary research, there is already extensive literature on how 'ontological politics', power asymmetries, ideological differences, and methodological discrepancies may hinder effective knowledge integration (cf. Klenk and Meehan, 2015, for a review of transdisciplinary research in climate change adaptation). The paper exclusively focuses on the impact of contrasting disciplinary epistemologies on the integration of Indigenous and Local Knowledges (ILKs) in global environmental assessments (GEAs).

I begin with a short discussion on positivism – its presence in the natural and physical sciences – and relativism. I argue that one way of framing epistemological differences is through a geographical mapping of knowledge, so as to designate both the universalistic aspirations of many of the physical and natural sciences and the predominately local outlook of (traditionally) relativist and constructivist social scientific disciplines. I then move onto a short discussion on the use of indigenous knowledge and Traditional Ecological Knowledge (TEK) in research. I then turn to the individual cases of the IPCC, the MA and the IPBES, followed by a comparative analysis (cf. 5.4). I conclude that in instances where the integration of local, non-scientific forms of knowledge, such as ILKs, challenges the hegemony of scientific knowledge, fundamental epistemological differences may become dichotomous and thus arduous to reconcile. However, innovations in knowledge governance that do not seek to be counter-hegemonic may encourage a dualistic view of different geographies of

knowledge, thus creating space for productive discussion and collaboration.

2. Positivism in the natural and physical sciences

Positivism (or logical positivism) is the name given to the philosophy of science that combines faith in modern mathematical logic and tools and an empiricist epistemology (Rosenberg, 2000). By the 19th century, some thinkers, like the French philosopher Auguste Comte, believed that the experimental method and the cumulativeness of scientific knowledge would eventually lead to the unity of the disciplines and thereby the unity of knowledge. Comte called this stage of civilisation the 'positive stage' (Laudan, 1996). By cumulativeness of scientific knowledge, we mean that a theory (T1) that has been verified through experiment or systematic experience can provide the basis for a theory (T2), and so on (Laudan, 1990). A more cautious interpretation of cumulativeness remains to a large extent, to this day, a foundational principle of the experimental and law-seeking sciences.

Although there are variations of positivism, it may be reduced to its seminal assumptions: i) scientific knowledge is cumulative; ii) it is analytically superior to other forms of knowledge; and iii) it can describe events and phenomena, unvarying in space and time (in its extreme form) (Bhaskar, 1981). It can therefore be said that the unitary ambition of positivism and its supposed ability to overcome spatiotemporal disparities amount to a specific geography of knowledge: universalism. Even in its most moderate form, positivism stipulates that all knowledge that is 'scientifically' produced should be compatible and that the compatibility of knowledge enables practitioners to make reasonably accurate generalisations about the natural world that transcend contextual constraints.

3. Relativism, constructivism and the critique of universalism

Dissatisfaction with positivist-type social science (e.g. rational choice theory) led many anthropologists, sociologists and political scientists – amongst others – to develop a preference for relativist (and constructivist) accounts of reality. Epistemological relativism can be defined by its denial of the universality and timelessness of truth statements, and scepticism with regards to science's capacity to transcend individual viewpoints (Forsyth, 2003). Hence relativism, unlike positivism, emphasises the importance of the 'place' where knowledge is produced. In the relativist's view, all these contextual and personal elements contribute to the way in which we cognitively make sense of the world. For relativists all knowledge 'sits in place': it is spatiotemporally bound, and thus cannot be universalised (Escobar, 2001). This includes scientific knowledge that 'begins at one level as a deeply local activity' (Martello and Jasanoff, 2004: p. 19).

Constructivism, building on basic relativist assumptions, maintains that 'truth' is produced by a dialectical relationship between agency and structure. For constructivists, a person's 'truth' is the product of the interplay between her subjective experience and her socio-cultural and physical environment. Hence, for constructivists, it is the all-powerful cognitive authority of a scientific consensus that determines what counts as a scientific fact or not (Demeritt, 2001). More important to us, however, is the constructivist critique of what Miller (2009) calls 'unitary globalism'. Constructivists believe that homogenous universal knowledge is 'a creative product of human imagination, disciplined by techniques, skills, tools, schools of thought, institutions and practices for producing knowledge' (Miller, 2009: p. 156). For these scholars 'the local and the global are scales, processes, or even levels of analysis, but certainly not places or locations' (Escobar,

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