Geoforum xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Geoforum

journal homepage: www.elsevier.com/locate/geoforum

Unfolding scientific expertise and security in the changing governance of Ecosystem Services

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ARTICLE INFO

Article history:
Received 30 May 2016
Received in revised form 31 January 2017
Accepted 1 February 2017
Available online xxxx

Keywords:
Expertise
Self-reflectivity
Bibliometric analysis
Ecosystem Services
IPBES
Securitization

ABSTRACT

Within the past few decades, the idea of global Ecosystem Services (ES) has moved center stage in environmental and sustainability debates. The academic and policy discourse behind Ecosystem Service protection appears to have changed from a more ecological focus on habitat restoration to a predominantly economic one revolving around human well-being. The aim of this paper is to unfold the coupling between scientific expertise and security in the changing governance of ES. We employ a 'securitization' lens to advance our understanding of the recent change in the governance of ecosystems, as we reflect on the role of scientific expertise at the boundary between science and security. Empirically, we analyze how scientific experts, as securitizing actors, frame the degradation and loss of ES as an existential threat to human security thereby justifying measures to reverse these trends. In order to trace how the voices of scientific experts shape policies to govern ES we apply bibliometric analysis and an opinion-based survey to first identify *who* produces the scientific knowledge published, and then follow *how* key scientific experts link to policy-making arenas and use security framings. Lastly, we discuss the implications of the shifting discourse surrounding ES, and we reflect on our own positionality and approach, as we string together our findings to contribute to the debate about environmental expertise and governance, and the authority of scientific knowledge.

1. Introduction: The link between Ecosystem Services, security, and expertise

Environmental crises often take center stage in political and academic debates on threats to our planet and human societies (e.g. IPCC, 2014; Latour, 2011; Steffen et al., 2015). It is therefore important to unfold the coupling between the environment, security, and the role of scientific experts in this. In this paper we specifically examine how scientific experts, through their security framing of environmental degradation, shape environmental governance in the case of Ecosystem Services (ES).

The academic and policy discourse on ES has changed from being predominantly eco-centric to being more anthropocentric and economic, although different discourses are present at the same time (Barnaud and Antona, 2014; Raymond et al., 2013; Sandbrook et al., 2013). Méral (2012) traces the origins of the ES concept and notes that since the mid-2000s there has been a growing trend to include the notion in political agendas, branching out in several directions, including the monetary valuation of ES, its introduction in agricultural and environmental policies, and payments for ecosystem services (PES).[1] Similarly, Coralie et al. (2015) describe the move from ecologically-driven approaches to an economic and market lexicon; and specifically show a change in concern from ecological restoration and habitat creation to more economic concerns from mid-2000s. In a critical tone, Spash (2015) notes what he calls a shift in conservation from the protection of Nature for non-instrumental and eco-centric reasons (e.g. duty of care, prevention from harm, and protection of non-humans) to an anthropocentric, instrumental and economic focus, where the role of Nature is exclusively that of value provision in

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[1] The terms 'ecosystem services' and 'environmental services' are often taken as interchangeable despite some differences between them, such as whether the 'services' can be seen as products of human activities or only as products of ecosystems (Barnaud and Antona, 2014).

http://dx.doi.org/10.1016/j.geoforum.2017.02.001
0016-7185/

the global economy supporting market governance (see also Lele et al., 2013). The advocates of this shift on the other hand argue that until we can show that nature is essential for economic growth and development the degradation of ecosystems will continue (Juniper, 2014). This also explains why 'much of the ES literature tacitly or explicitly accepts an economic valuation framework for assessing human well-being' (Lele et al., 2013, p. 351). Parallel to this, Roth and Dressler (2012) note a growing commitment to markets as a means of meeting conservation objectives and livelihood *security*; promoting the idea that social well-being, rural livelihoods and economic development must not be at odds with conserving valued species and ecological systems. De Freitas et al. (2015) emphasize that these developments are presented "as a welcome 'greening' of capitalism that will resolve *critically urgent environmental crises*" (p. 239–240, emphasis added). Other scholars even go so far as to compare this ecological crisis with war (Latour, 2011, p. 75; Spash, 2015) and several highlight the "*urgen[cy]* for societies to act towards mitigating the effects of multiple environmental and natural resource *crises* and prevent or minimize further *damages*" (Thiel et al., 2015, p. 81, emphasis added). Kremen (2005, p. 477) concludes that ecologists should campaign to convince society of the importance of ecosystem services since "nothing less than our human future is at stake". With these notions by scientists of "crisis", "urgency", "damage" and even the use of war terminology, the changing discourse around ES can be coupled to notions of security and expertise: core topics of the present paper.

Within traditional security studies, however, security was not about the protection of ES, it was about states and survival of the state, and security experts were those who understood state apparatuses and state relations (Buzan et al., 1998; Dalby, 2002; Halfon, 2015; Owen, 2010). Only newer articulations have shifted security expertise from its traditional state-centric realms to other areas, such as human development and environmental protection (Dalby, 2002; Halfon, 2015). Scholarly work has for instance focused on the securitization of broad environmental issues such as climate change (e.g. Trombetta, 2008) and biodiversity conservation through processes of 'green militarization' (e.g. Lunstrum, 2014; Massé and Lunstrum, 2016; Verweijen and Marijnen, 2016), revealing how security practices are transformed and risks of dispossession and displacement rise (Fairhead et al., 2012; Duffy, 2016; Neumann, 2004; Peluso and Vandergeest, 2011; Ybarra, 2012). Indeed, the threats that states are asked to mitigate on behalf of their citizens require the assessment of complex trajectories of social, technological and environmental change (Jasanoff, 2005). In that way, *scientific* experts can become *security* experts, since their inputs are an unavoidable part of any discussion on environmental or security politics (Dalby, 2002). Experts provide means to identify what is dangerous and what is not, for instance by deciding whether an alert status should be moved from green to yellow, or even red (Berling and Bueger, 2015). This occurs for instance when lead scientists define the boundaries of our planet "within which humanity can operate safely", stating that transgression of these boundaries may be "deleterious or even catastrophic" (Rockstrom et al., 2009, see also Milkoreit et al., 2015, and Castree, 2015). This also happens when prominent ES scholars propose essential principles to ensure "scientific integrity in environmental interventions", predicting that *without* these principles, social and ecological benefits may be "undermined" (Naeem et al., 2015). Likewise this happens when comprehensive scientific meta-assessments couple Ecosystem Services (ES) to human well-being, stating that the degradation of natural capital has substantial harmful effects on human livelihoods, security, health, and economy (Costanza et al., 1997; Kremen, 2005; MEA, 2005; Fig. 1) taking the planet "to the edge of a massive wave of species extinctions, further threatening our own wellbeing" (MEA, 2005, p.3). Avoiding environmental catastrophe as a result of human activity then requires and justifies "significant changes in policies, institutions, and practices that are not currently underway" (MEA, 2005, p. 1; see also Danley and Widmark, 2016). Today it seems like the security threat of ES degradation is widely accepted as a fact in the scientific community, like an implicit undercurrent we take for granted and no longer need to make explicit, or what Berling (2011) calls a scientific 'objectivation' closing down controversy, even if contemporary uses of terms like "environment" and "security" should arguably be continuously challenged (Dalby, 2002).

Experts and expertise have become indispensable to the politics of nations, and indeed to transnational and global politics. The weight of political legitimation rests increasingly on the shoulders of experts, and yet they occupy at best a shadowy place, in terms of how final policy decisions are made (Jasanoff, 2005). *Scientific* experts are, as already mentioned, increasingly involved in environmental security politics (Halfon, 2015), but their role and the sites of science-security encounters have gone largely unrecognized and are under-researched (Berling, 2011). There is a need to examine the individuals and social and professional groups, rooted in evolving national and transnational societies, who govern in global governance (Kauppi and Madsen, 2014), and specifically, there is a need to actively engage with the moves and practices of science towards practical (security) politics (Buger and Villumsen, 2007). Recent scholarship has increasingly focused on the (discursive) ways in which different involved (expert) actors (such as project consultants, government officials, NGOs, scholars, etc.) increasingly draw upon 'green economy' ideas and accompanying ecological crisis narratives to justify and further the "marketization" or "financialisation" of ES (Büscher, 2012, 2014; Fairhead et al., 2012; Robertson, 2012; Sullivan, 2013). However, to our knowledge, the explicit security framing that accompanies these processes in the context of ES governance has remained largely unexplored, as has the role of scientific experts (see however Lund, 2015, on the professionalization of participatory forestry and its un-democratic and social consequences; or Büscher, 2014 on the construction and 'epistemic circulation' of value in conservation and development projects). While adopting the language of value and economic impacts offers obvious advantages in advancing the argument that ES are currently undervalued (Costanza et al., 1997), it is important to acknowledge that 'ES does not spring from a simple narrative of marketization' (Dempsey and Robertson, 2012, p. 759). Knowledge around ecosystems services is composed of normative beliefs, cause-and-effect claims, agreed methodological standards and socially-necessary abstractions, as well as policy aspirations (Haas, 1992; Dunlop, 2014; Robertson, 2012). This makes it all-the-more important to scrutinize the multiple ways in which evidence and discourses inform policy-making, and the different discursive strategies that 'experts' might deploy to negotiate the knowledge-policy interface (Dunlop, 2014, p. 208; Robertson, 2012; Van Hecken et al., 2015b). In this paper, we respond to these calls by examining how scientific experts are linked to environmental governance and security with the case of ES, and we discuss the consequences for society and nature. In order to explore how interpretative frames and related interests unfold through the coupling between ES, security, and expertise, we identify key scientific experts in ES through the use of bibliometric analysis and an opinion-based survey, and we follow some of their voices as they impact on ES governance and interrogate their security framings.

While previous critical scholarship has already engaged with the socio-political consequences of a world reduced to a collection of quantifiable ecosystem services (Robertson, 2012; Dempsey and Robertson, 2012; Sullivan, 2013; McAfee, 1999), or have dealt with ways to govern emergencies and attend to security affects as geographers (Adey et al., 2015; Anderson, 2015), we examine

Please cite this article in press as: Pasgaard, M., et al. Unfolding scientific expertise and security in the changing governance of Ecosystem Services. Geoforum (2017), http://dx.doi.org/10.1016/j.geoforum.2017.02.001