



Closing the governance gaps in the water-energy-food nexus: Insights from integrative governance



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ABSTRACT

The water-energy-food nexus has become a popular concept in environmental change research and policy debates. Proponents suggest that a nexus approach promotes policy coherence through identifying optimal policy mixes and governance arrangements across the water, energy and food sectors. Although the nexus literature identifies some barriers to achieving coherence it does not clearly explain why the barriers are present, what influences them, and how they can be acted upon. These gaps disconnect the nexus literature from the governance processes it ultimately seeks to influence. This paper examines how the integrative environmental governance literature can help to close these gaps. It extracts insights from seven streams of research literature and discusses their relevance for the nexus literature. We argue that connecting the nexus to decision-making processes requires: i) rethinking the boundaries of nexus analysis vis-à-vis other sectors and levels; ii) elaboration of shared principles that can guide decision-making towards policy coherence – or an appropriate form of fragmentation – in different contexts; iii) viewing policy coherence as a continuous process of changing values and perception rather than as an outcome.

1. Introduction

The literature on the water-energy-food nexus (or “nexus” for short) expresses great ambitions to achieve policy coherence and overcome the unintended consequences of uncoordinated policy between different sectors. The nexus concept is intuitively compelling, spawning conceptual frameworks (see e.g. Cairns and Krzywoszynska 2016; Leck et al., 2015), and analytical tools (Granit et al., 2013). However, analytical insight by itself does not produce effective and accountable policy and management. Based on a review of nexus literature we identified three governance gaps that merit further attention because, as we argue, they render the nexus concept disconnected from the decision-making and policy-making processes it ultimately seeks to influence. The nexus literature clearly accepts that governance matters, but it does not go into depth. In particular, it falls short on providing insights on i) conditions for cross-sector coordination and collaboration; ii) dynamics that influence the nexus beyond cross-sector interactions; and iii) political and cognitive factors as determinants of policy change (Weitz et al., 2017).

Starting from these three governance gaps, this paper puts the claims and ambitions of the nexus literature in a productive conversation with existing debates in governance theory. We argue that

governance theory can help to fill the gaps, taking into account the wider governance landscape, the processes that take place within it and how they influence the links between technical information and implementation (Cairney, 2016). Specifically, we turn to the integrative environmental governance (IEG) literature for insights.

To familiarize the reader with the nexus concept (which is characterized by several different perspectives) and how the gaps were identified, we devote the following section to a summary of the nexus literature and its governance gaps (for a full account see Weitz et al., 2017) before exploring how IEG can help to close them.

2. The nexus literature and its governance gaps

The “water-energy-food nexus” approach emerged in the late 2000s, as a way of framing cross-sector and cross-scale interactions in a context marked by growing concerns about the global economic and food security crisis (Allouche et al., 2014). Since then, the “nexus” has gained popularity both within academia and among policy-makers (Leck et al., 2015; Benson et al., 2015).

A review of nexus literature, and key debates that focused particularly on governance implications (i.e. both the role ascribed to governance and the governance issues implied by a nexus approach Weitz

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et al., 2017) supported the conclusion made by several authors that the nexus is conceptually inconclusive (Wichelns, 2017; Cairns and Krzywoszynska, 2016). Here we provide a summary of three overarching perspectives. They are neither mutually exclusive nor exhaustive but capture the broad debates in the nexus literature. On at least two points the nexus literature is consistent: the overarching governance problem is that policies are fragmented across the water, energy and food sectors, which lead to unintended consequences; and the goal is to achieve policy coherence by identifying synergies and trade-offs, optimizing policy options, and adapting governance arrangements. However, the literature contains different explanations as to why fragmented policies pose problems and does not elaborate on what exactly policy coherence entails or how it can be achieved (Weitz et al., 2017).

The first perspective on the nexus focuses on risk and security, and is based on the idea that failing to account for connections between nexus sectors could worsen resource scarcity and induce conflicts (see e.g. Hoff 2011; Bizikova et al., 2013; World Economic Forum Water Initiative, 2012; NIC, 2012; Shell International BV, 2013). For example, first-generation biofuel production can present risks to food security (Rulli et al., 2016). Proposed strategies for reducing nexus-related security risks include placing supply risks on the political agenda and improving data collection in order to clarify interactions and design incentives (Beisheim 2013; World Economic Forum Water Initiative, 2012; Gain et al., 2015, as well as isolating sectors from impacts from other sectors (NIC, 2012).

The second perspective is guided by economic rationality. Here the nexus is seen as a way to improve policy cost-effectiveness and resource-use efficiency, as well as to optimize allocation of resources across sectors (SIWI, 2014). It is further considered as enabling the creation of new business opportunities and (green) economic growth (Vlotman and Ballard 2014; World Economic Forum Water Initiative, 2012, for example by ensuring sustainable water use in energy and food supply chains (Zahner, 2014; Wales, 2014). From this perspective, policy coherence is undermined by the sectors' different institutional frameworks, divergent targets, lack of communication, and lack of clarity on rights and responsibilities across sectors (Pittock et al., 2013). Proposed governance responses are mainly coordinative, such as strengthened cross-sectoral cooperation, increased communication and inclusive demand management via dialogue platforms or other inter-agency mechanisms and economic instruments (SIWI, 2014; Ringler et al., 2013; Weitz et al., 2014; Beisheim 2013).

Within these two perspectives, governing the nexus remains a technical or administrative matter, where better coordination of information about cross-sector interactions can improve, or even optimize, system performance as measured against security or economic criteria. However, information alone does not necessarily lead to policy change and administrative processes are not necessarily objective (Kurian, 2017). The third perspective acknowledges this and counters the dominant technical-administrative take on nexus governance. It makes the case that addressing trade-offs and improving policy integration across sectors is a fundamentally political process requiring negotiation amongst different actors with distinct perceptions, interests and practices (Rees 2013; Allouche et al., 2014; Stein et al., 2014). This perspective is thus concerned with equity and social progress (Dupar and Oates 2012; Stringer et al., 2014) and highlights that technical solutions for improving coherence within the nexus may have unintended and negative impacts in other policy areas, such as poverty alleviation and education (Jobbins et al., 2015). With this perspective, key barriers to policy coherence include unequal distribution of power, voice, access to information, resources and capability amongst actors and institutions (Lele et al., 2013; Perrone and Hornberger 2014), as well as conflicting interests, both domestic and international (Perrone and Hornberger 2014; Beisheim et al., 2013). Some authors further argue that outcomes can be improved by looking at specific, local, cases of trade-offs and preferences, in addition to a focus on the national scale

(Söderbaum and Granit, 2014; Stein et al., 2014).

While space only allowed for a re-cap of the nexus literature review here, we have concluded from the review that the literature falls short on a number of issues (see Weitz et al., 2017 for further discussion). Fundamentally for the nexus concept, clarity is needed on overarching objectives and guiding principles: what is it to achieve and for what purpose? No monolithic ideology underlies the nexus and these fundamental questions remain unanswered. Preferences for different measures for handling nexus issues will vary according to different perspectives on the nexus and, if adopted, steer in different directions. That is, policy coherence might be achieved through different paths, resulting in different outcomes for different stakeholders. With regards to governance implications and how the nexus can connect with decision-making processes, the literature also leaves a lot to be desired; why are barriers to integrative governance of water, energy and food present? What influences them? And how can they be acted upon? First, although all three nexus perspectives argue that cross-sector coordination and collaboration is desirable (for distinct reasons), they do not explain what conditions would enable or hinder collaboration and coordination between sectors, institutions and actors. Second, the nexus literature provides little insight on how dynamics beyond the sectoral boundaries of water, energy and food, influence the nexus (with some exceptions, such as Beisheim, 2013, who discusses widening the scope of the nexus to planetary boundaries). The non-linearity and complexity of governance and decision-making therefore tends to be ignored. Finally, while some authors have called for more attention to the politics of the nexus (e.g. Stein et al., 2014), the nexus literature generally overlooks how trade-offs are negotiated, decisions taken in practice and the ideological assumptions behind policy options. As reflected by perspectives one and two, a technical and administrative view dominates both the literature and conceptions of policy coherence in practice; yet political and cognitive factors are essential for connecting technical nexus analyses to actual decision-making and policy processes. Thus, the three gaps identified and in focus for the remainder of this paper are: 1) conditions for cross-sector coordination and collaboration; 2) dynamics beyond cross-sector interactions, and; 3) political and cognitive factors as determinants of change.

3. Approach and methods

With the objective to connect the nexus governance gaps and relevant governance theory, a first methodological question is where to look – which governance debates and theoretical approaches appear relevant for deriving insights on the nexus? We turn to the concept of integrative environmental governance (IEG). Visseren-Hamakers (2015) coined IEG as an umbrella term for a whole body of concepts that have a shared focus on the relationships between governance instruments and/or governance systems in a context of increasingly complex and fragmented environmental governance (or society and policy more generally). The concepts and their theories focus on relationships and interdependencies between different organizations and different policies, as well as the existence of many different decision-making centers. IEG brings together debates on these issues that have taken place in both policy circles and academia, but often in isolation (Visseren-Hamakers, 2015). Given the overlap between IEG and the nexus governance gaps in terms of interdependencies in policy across sectors, the movement toward policy being shaped in a wider context than within administrative sectors, and the distribution of power in decision-making, IEG appeared a well-positioned pool of knowledge from which to derive insights about the three gaps. Following Visseren-Hamakers (2015) we have looked at seven specific IEG concepts, which are presented in Table 1:

The *nexus approach* is in fact included as an eighth concept by Visseren-Hamakers (2015), referred to as the latest contribution to the IEG literature. However, it remains a placeholder rather than a substantial contribution. Exploring the links between the nexus approach

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