

The political ecology of virtual water in southern Spain

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Abstract

What does virtual water conceal? Synthesizing political ecology with ecological economics the present work questions the understanding of the scientific concept of virtual water as part of an independent objective reality, rather than as a construction supported by pre-existing ideas. The discourse promoting both the concept of VW and the methodologies used to estimate VW flows is structured according to some underlying ideas that are framed within market logic and the rationality of international trade. Consequently, it produces a representation of water as a factor of production that does not challenge the hegemonic construction of water scarcity in nature, and proposes a water management system the main purpose of which is maximising efficiency in the use of the resource. Revealing the ideas underlying virtual water concept we aspire to show how critical approach of EE can be complemented by PE theories. Starting from an epistemological reflection, its

specific objective focuses on contrasting this reflection with the reality of water in the horticultural sector of Almería (southern Spain), with the purpose of bringing to light the aspects made invisible through the use of the VW indicator in a concrete case study.

Keywords: Political ecology, virtual water, market logic, water scarcity, efficiency

1. Introduction

Virtual water (Allan, 1993) is an indicator that reflects the hidden water flows of social metabolism (Martínez Alier, 2005). But what does virtual water hide? The present work questions the understanding of the scientific concept of virtual water (VW) as part of an independent objective reality, rather than as a construction supported by pre-existing ideas (Goldman et al., 2011). The discourse promoting both the concept of VW and the methodologies used to estimate VW flows is structured according to some underlying ideas that are framed within market logic and the rationality of international trade. Consequently, it produces a representation of water as a factor of production that does not challenge the hegemonic construction of water scarcity in nature, and proposes a water management system the main purpose of which is maximising efficiency in the use of the resource.

From an Ecological Economics (EE) perspective, this biophysical indicator may be used to make visible the ecological distribution conflicts generated by an economy's social metabolism (Martínez Alier et al., 2010). We argue that VW approach make visible the "material origin" of the conflicts caused by water metabolism while obscuring the root of these conflicts adopting uncritically the market mechanism as the solution to the problem of water management. Recent studies suggest to delve into the synergies between the EE and the Political Ecology (PE) perspectives (Martínez Alier et al., 2010; Otero et al., 2011; Kallis et al., 2013) pointing out the need on the politicisation of environmental knowledge. Building on these studies we aspire to show how critical approach of EE can be complemented by PE theories.

There has been a proliferation of works estimating VW flows and the concept has been widely accepted and spread across the scientific community, transcending the academic sphere and becoming a relevant tool in decision-making processes undertaken by governments and firms. The impact on society of the discourse

promoting this concept is, therefore, worth analysing. Great efforts have been made to develop and implement methodologies capable of estimating VW flows, but little attention has been paid to the ideas underlying this concept.

From this approach, the question arises as to which ideas underlie the concept. This study aims to put into dialogue Ecological Economics and Political Ecology perspectives to illuminate the contradictions found in the virtual water approach by unravelling controversial concepts such as scarcity and efficiency. Starting from an epistemological reflection, its specific objective focuses on contrasting this reflection with the reality of water in the horticultural sector of Almería (Spain), with the purpose of bringing to light the aspects made invisible through the use of the VW indicator in a concrete case study.

The selection of Almería for this case study was based on two reasons. One is that Almería (located in the southeast of Andalusia, Spain), despite being one of the driest areas in Europe, is also the most productive agricultural region in the continent (Downward & Taylor, 2005). This high productivity level has, nevertheless, very high environmental and social costs, since it has led to the overexploitation of the aquifers in the area, among other relevant impacts. A critical analysis of the context reveals that the overexploitation has taken place as a consequence of the power relations developed around the concepts of water scarcity and water efficiency in the area and of the short-sighted vision of the markets. Some studies on the VW flows of this Spanish province made to date (Madrid, 2004; Chapagain & Orr, 2008; Allan, 2010) show that Almería is exporting great amounts of water in the form of agricultural products and is, because of that, overexploiting its aquifers. However, conclusion drawn from other VW flows analysis in the area explain away this intensive use of water by alluding to the high level of efficiency achieved and to the high monetary return obtained from it. These conclusions are based on the idea that the water footprint (WF) of Almería's horticultural sector is very small (Tolón et al., 2013). Thus, we find different conclusions based on the analysis of the same indicator in the same area. Why this happens? We argue that the metaphor of VW flows disembodied of all institutional and political processes that both coexist with them and affect them, is altering how we understand ecosystems, shifting us from complex systems thinking toward simple flow analysis.

The second reason behind the selection of Almería for this case study is the authors' academic and empirical knowledge of this province, derived from their participation in the Cooperative Research on Environmental Problems in Europe (CREPE)¹ Project. Our empirical evidence for the analysis relies on both primary and secondary data sources. Firstly, the fieldwork conducted consisted of 15 in-depth interviews with key stakeholders involved in the case study. Secondly, a deep review of secondary information regarding the context of Almería. Thirdly, direct observation was carried out in 2009 during the interviews. For further information see Beltrán et al. (2010) and Ripoll et al. (2011). The results are presented in a narrative form from the point of view defined by this theoretical approach.

The article is structured as follows. Following this introduction, the spreading of the concept of VW and of the main estimation methodologies is examined. In the third section, the theoretical framework of the research, which explores the relations between Ecological Economics and Political Ecology, is presented. The fourth section includes the analysis of the ideas underlying the concept, while the fifth one contrasts these ideas with the case study of Almería. Finally, the main conclusions drawn from the research are presented.

Conclusions

Norgaard (2013) argues that ecosystem services started as a humble metaphor addressing the understanding of our relation with nature to become a “complexity blinder” because through this metaphor the complexity has been reduced and simplified to inform markets. Following this idea, we argue that VW metaphor disembodied of all institutional and political processes that both coexist with them and affect them, is similarly distorting how we understand socio-ecosystems, shifting us from complex systems thinking toward simple flow analysis. This research has made evident that VW, despite being a potent biophysical indicator that sheds light on the water flows involved in production processes, does not challenge the market logic and the neoclassical (ir)rationality of international trade. It thus conceals the fact that terms as “water scarcity” and “water efficiency” are socially built and the impacts these ideas may have in the configuration of the socio-ecosystem. The lack

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of discussion about the process required to establish these scientific facts when it comes to studying the production and circulation of this knowledge is also made evident. Moreover, by examining how VW concept has been widely accepted and spread across the scientific community arises the question: why VW approach has been welcome so warmly in the water management community? Gialis & Mavroudeas (2014, 61) claim that “VW approach uncritically deifies the market mechanism, erroneously treats water as a sui generis commodity substance, and blindly adopts the problematic international trade theory of comparative advantage”. We argue that this compliance with the hegemonic market logic that VW approach offers has fostered the perfect marriage between academics, administration and companies, enabling to this knowledge “wins”.

The dialogue between Ecological Economics and Political Ecology shows why the methodological work of ecological economists will be politically ineffective and even contradictory if they adopt uncritically virtual water approach. These estimations make visible the “material origin” of the conflicts caused by water metabolism however, at the same time, obscure the root of these conflicts adopting market strategies as solution, neglecting how issues of labor, power, and unequal exchange affect water resources. Following Kallis et al., (2013, 99) “although the metodological work of ecological economists offer opportunities for social struggles and for changing the course of institutional change (...) ecological economists' normative stance in favor of plural values and institutions will be naïve and politically ineffective if they do not recognize the social processes and dynamics that make this normative proposal so hard to implement”. Hence, the Ecological Economics approach is reinforced by the guidelines of Political Ecology, and this combined perspective offers an alternative to conventional approaches and avoids the simplistic separation between science and politics (Forsyth, 2003).

Finally, VW flow estimations confirm that Almería is exporting great amounts of water in the form of agricultural products, thus explaining the material origin of the environmental impact caused by the water metabolism of the horticultural sector in this province. But these estimations neither question the origin of the conflict nor the institutional and power geometries that originate those flows thus simplifying the complex practice of understanding socio-ecosystems. Furthermore, VW approach is a way through which the ideas of scarcity and efficiency are discursively employed in mobilizing interventions in the hydrosocial cycle. To avoid the compensations that

would be necessary to pay to the irrigators for implementing control measures while responding to the demands of the irrigation sector, desalination in Almería is a public water policy that focuses on increasing water supply in a less socially conflictive way than water transfers (Swyngedouw, 2013).

As proved by Chapagain & Orr (2008, 2009) and Vaham et al. (2013), the quantitative study of VW flows is a helpful tool to raise awareness among consumers about their responsibility in water consumption. However, more studies are required to analyse the discourse promoted by these methodologies and its impact on society. In this sense, the effects of the prescriptive discourse on the various geographical scales of analysis and on the different social actors involved in the conflict open new lines of research, as does the examination of the representation of water (mainly as a factor of production) constructed by these methodologies.

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