



Contents lists available at ScienceDirect

Geoforum

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

Editorial

Political-industrial ecology: Integrative, complementary, and critical approaches

ARTICLE INFO

Article history:

Received 5 May 2016

Received in revised form 10 October 2016

Accepted 22 November 2016

Available online xxxxx

ABSTRACT

“Political-industrial ecology” has been proposed as an emerging subfield of nature-society geography. In mapping out the landscape of this subfield, this paper develops a typology of three approaches to connecting politics and industrial ecology: (1) Integrative research that incorporates social, political, policy, institutional, and/or spatial considerations into industrial ecology analyses (“politics in industrial ecology”); (2) Complementary research that couples findings or frameworks from industrial ecology with social and political research (“politics and industrial ecology”); and (3) Critical research that examines how values, norms, groups, political relations, or institutions shape the production, interpretation, and usage of industrial ecology knowledge (“politics of industrial ecology”). This broad framing of political-industrial ecology invites contributions from many social sciences, including political ecology, political geography, political economy, sociology, public policy, management, environmental history, and science and technology studies.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

In recent papers, [Newell and Cousins \(2015\)](#) and [Cousins and Newell \(2015\)](#) propose a new subfield of political-industrial ecology (PIE) that would integrate insights from political ecology and industrial ecology (IE). As they describe it:

“[I]n addition to quantifying stocks and flows, a political-industrial ecology refers to an analysis of the broader historical, political, social, technological and economic mechanisms shaping the relationships between a product, commodity or material process, its primary inputs and outputs, and the relevant social and ecological implications.”

[[Cousins and Newell, 2015](#), 41]

This approach emphasizes that the systems analyzed by IE (e.g., industrial ecosystems, urban metabolisms, and product lifecycles) are constructed and governed by social processes. Whereas IE tracks the flow of energy and materials through these systems, PIE delves into the political, social, geographical, and institutional factors that configure these systems, regulate resource flows, and mediate socio-ecological impacts. It promises to open up the ‘black box’ of industrial metabolisms and offers insights into their complex social, spatial, and scalar dynamics. Moreover, this approach can reveal how IE’s fundamental definitions of systems, flows, and impacts are socially constructed, reflecting particular sociospatial values and understandings. In multiple ways, PIE is an exciting research approach that will help to “disentangle the interwoven knots of *social process, material metabolism and spatial form*” ([Swyngedouw and Heynen, 2003](#), 906).

This special issue of *Geoforum* brings together several papers at this interdisciplinary interface. As an epilogue, my commentary adds a broader perspective. I explore a future research agenda and framework for PIE by describing three types of research: (1) *Integrative* research that incorporates social, political, institutional, or spatial factors into IE analyses; (2) *Complementary* social science research that ‘speaks to’ or ‘builds on’ IE frameworks, concepts, or findings; and (3) *Critical* research that examines how values, norms, groups, political relations, or institutions shape the production, interpretation, and use of IE knowledge. For each approach, I provide a brief description and a few illustrative examples. It is not an exhaustive literature review, but rather is intended to start a structured conversation about what constitutes this emerging subfield. In addition to providing a more refined framework for PIE, this typology makes space for contributions from additional social sciences and humanities (including not only political ecology, but also political geography, political economy, political sociology, environmental history, public policy, management, and science and technology studies).

The three approaches described here can constructively work together in practice. For example, a critical analysis that identifies analytical gaps or weaknesses in IE might motivate complementary or integrative research to address those gaps, or an integrative modeling effort might be followed up with a reflexive, critical assessment. The synergy between integrative, complementary, and critical research is a key interdisciplinary strength of PIE. At the same time, I think it is useful to parse out these approaches as distinct intellectual ‘projects’ to highlight the diverse ways that social scientists can contribute to this exciting, emerging subfield.

2. Three types of PIE research

2.1. Integrative research (“Politics *in* Industrial Ecology”)

Integrative approaches seek to incorporate social, political, spatial, institutional, market, or policy factors into IE. Broadly speaking, the goal of this type of research is to better account, either quantitatively or qualitatively, for the socio-political dynamics that shape supply chains and industrial ecosystems across time and space. To illustrate this approach, here are a few examples of integrative approaches for one prominent IE method: Life Cycle Assessment (LCA). LCA analyzes the environmental impact of a specific product by quantifying inputs and outputs of energy and materials throughout its “life cycle” (i.e., production, transport, use, and disposal). Integrative PIE approaches to LCA include:

- **Spatially-explicit life cycle assessment (LCA):** LCA studies typically ignore spatial dynamics (Reap et al., 2008). Combining LCA with Geoinformation Systems (GIS) is a key way that geographers can help develop more site-specific LCAs (Cousins and Newell, 2015; Dresen and Jandewerth, 2012; Newell and Vos, 2011). In addition, during the impact assessment and interpretation stages of an LCA, social scientists can contribute a better understanding of how impacts vary with local physical and human geography, whether based on quantitative data about local landscapes or qualitative data about social risks and stakeholder perceptions (Anex and Focht, 2002; Owens, 1997).
- **Scenario-based LCA:** Although most LCA analyses are retrospective, interest is growing in scenario-based prospective LCA (Miller and Keoleian, 2015; Wender et al., 2014; Mathiesen et al., 2009; Spielmann et al., 2005). Scenarios allow analysts to explore hypothetical questions such as: How might lifecycles, supply chains, or industrial ecosystems change in the future? How do socio-political feedbacks drive or constrain the system evolution? What might be the impact of a particular policy, social movement, or regime change? Several studies have used expert-based Formative Scenario Analysis (FSA) (Scholz and Tietje, 2002) for developing prospective LCA scenarios (e.g., Weiser et al., 2015; Spoerri et al., 2009). Other social scientific methods for developing politically-informed scenarios could include focus groups or visioning exercises with local stakeholders, expert elicitation, counterfactual analyses, political economic analyses, or market forecasts.
- **Consequential LCA (CLCA):** CLCA is a newer type of LCA that estimates marginal effects as supply chains change over time, including spillover effects beyond the scope of the traditional lifecycle (Curran et al., 2005; Guinée et al., 2011). Currently, most CLCA models focus on biofuels’ impact on agricultural commodity prices and global land use (see Broch et al., 2013 for a review), which is an example of a market-mediated spillover effect. The logic of CLCA could also be expanded to non-market mechanisms, including cultural, social, political, and regulatory dynamics (Zamagni et al., 2012). This is potentially rich terrain for integrative PIE, though it is new and controversial.

Integrative research projects can provide significant opportunities for conversation, coordination, and collaboration between social scientists and industrial ecologists. Not surprisingly, the social scientists who currently participate in integrative LCA research tend to be quantitative modelers, whether from economics or geography. However, these examples highlight the great potential for qualitative social scientists to contribute to integrative research as well.

2.2. Complementary research (“Politics *and* Industrial Ecology”)

Complementary research represents social, political, market, or policy research that “speaks to” or “builds on” the findings or frameworks of IE. Whereas integrative research requires a high degree of coordination and collaboration between social scientists and industrial ecologists, complementary studies may be produced more independently, even standing alone from IE analyses. This diverse category of research includes:

- **Social LCA (SLCA):** SLCA is a growing field of inquiry that assesses social impacts at each stage of the product lifecycle (for a recent review and perspective on SLCA from human geography, see: Hobson and Lynch, 2015). SLCA may be coordinated with LCAs and life cycle costing of the same product, forming an integrative Life Cycle Sustainability Assessment (Guinée et al., 2011; Kloeppfer, 2008). But they may also be stand-alone studies that use the lifecycle concept to structure a social impact analysis.
- **Socio-political context of IE projects, policies or programs:** IE is applied to many purposes, such as designing industrial products and processes, planning eco-industrial parks, managing supply chains or waste flows, and estimating land use change emissions for biofuel regulations. But practitioners often face challenges managing the social dimensions of these initiatives, whether due to a lack of grassroots legitimacy (Hewes and Lyons, 2008; Murphy, 2006), difficulties with finding and managing partnerships (Gibbs and Deutz, 2007; Mirata, 2004; Heeres et al., 2004), misunderstandings about social, organizational, or policy decision-making (Cohen, 2013; Vermeulen, 2006; Cohen-Rosenthal, 2000; Andrews, 2000), or poor “political embedding” (Salmi and Toppinen, 2007). IE scholars have repeatedly flagged these socio-political challenges as an important research agenda (Jiao and Boons, 2014; Korhonen et al., 2004; Hoffman, 2003). Social scientists can contribute to describing, theorizing, and addressing these social dynamics using diverse methods such as case studies, network analysis, ethnography, process-tracing, discourse analysis, and institutional analysis.
- **Communication with stakeholders:** The IE literature has long discussed how to communicate their insights – and attendant uncertainties – to policy stakeholders (Lifset, 2005; Plevin et al., 2014). This communication challenge takes on increasing urgency as LCA becomes more prevalent in regulatory discourse (McManus and Taylor, 2015). Social science can provide guidance on communicating IE, including how to make it more understandable to non-experts (Gavankar et al., 2015) or useful for non-governmental organizations (O’Rourke, 2005). Social research can also help IE practitioners better understand the informational needs of local stakeholders or policy-makers (Herrmann et al., 2014; French and Geldermann, 2005).

As these examples show, complementary research can provide an opportunity for social scientists to contribute to an interdisciplinary PIE research agenda without necessarily partnering with industrial ecologists. This provides a pathway into PIE with lower barriers to entry. At the same time, the audience (and thereby the publishing opportunities) for this type of research may largely remain within the IE literature in the near term. Senior scholars and journal editors can take a lead in broadening the reach of this research. For example, this issue of *Geoforum* is an important step towards expanding the audience within geography.

Download English Version:

<https://daneshyari.com/en/article/5073205>

Download Persian Version:

<https://daneshyari.com/article/5073205>

[Daneshyari.com](https://daneshyari.com)