

POLITICAL ECOLOGY & RESILIENCE

COMPETING INTERDISCIPLINARITIES?

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I. Introduction

Today, calls for interdisciplinary and trans-disciplinary research and teaching have become the norm (Kinzig 2001; Miller et al. 2008; Schoolman et al. 2012). University administrators, research funding agencies, and various multilateral organisations ceaselessly promote interdisciplinarity or ‘cross-disciplinary’ collaboration for solving pressing global problems related, for example, to health, the environment, or the delivery of advanced technology to poor regions of the world. The plea for interdisciplinarity is particularly loud in the disciplinary areas dealing with questions of the environment, where researchers routinely invoke the need to develop approaches that bring together the social and natural sciences.

However, amidst all the appeals for crossing boundaries and breaking barriers between disciplines, two simple questions often remain unasked: first, what is the nature of ‘disciplinary’ practice in knowledge areas that require simultaneous consideration of interactions between environment and society? Second, what are the processes that lead these inherently ‘inter-disciplinary’ fields to become new dogmas and erect boundaries that subsequently need transcending? The answers to these questions can be simple or complex, depending on the perspective used for explaining the histories and changing nature of knowledge production. A Kuhnian response would potentially centre on the increased specialisation that often occurs in disciplines under a given ‘normal’ paradigm over a period of time (Kuhn 1962), resulting in a situation where the overall ‘interdisciplinarity’ of the paradigm is compromised by the narrowed focus and problem-solving developed through specialisation. Alternatively, a Latourian response to the questions would centre on the methods by which the knowledge of each interdisciplinary discipline is ‘made’

in ways that give them power and legitimacy within and beyond academic environments (Latour 1987).

In this essay, we draw on both perspectives to analyse the evolution of *political ecology* and the *resilience* approach, two interdisciplinary fields that focus on nature-society relationships for understanding and tackling diverse environmental problems. Political ecology emerged during the 1980s from geography, anthropology, and development studies, driven by calls to jettison ideological and disciplinary turf battles and develop interdisciplinary approaches with a critical and integrative framework for addressing social and environmental change. Resilience emerged a decade or two later, principally out of ecology, with a keen agenda to solve environmental problems by understanding their interlinked social and ecological components using a systems approach. Both ‘interdisciplines’ are currently dominant in academic study of society-environment interactions, with sizeable communities of students and scholars drawn from a range of traditional disciplines, including geography, biology, anthropology, rural sociology, political economy, and natural resource management.

In what follows, we sketch the origins and outcomes of each approach and compare how they bring different disciplines together to address issues at the interface of nature and society. What does interdisciplinarity mean in this context – is it about combining multiple epistemologies and methods; or about defining new ‘socio-natural’ environments; or is it about bringing different ideological commitments to tackling environmental problems? We conclude with reflections on the extent to which these ‘interdisciplines’ of science-nature-society can thrive without creating new boundaries and disciplinary dogmas.

II. Political ecology

Political ecology is an approach to research on society-environment interactions that synthesizes political-economic and ecological explanations of environmental change. It often emphasizes a historical approach to studies of land degradation, natural resource exploitation, environmental management, forest and agricultural transformations. It is particularly concerned with questions of struggles over social control of natural resources and how these are shaped by ideologies, institutions, global economic forces, ideas of nature, and by the natural properties and ecology of the resources concerned. Building on a variety of antecedents in geography and anthropology, the label took hold in the late 1980s and blossomed in the 1990s (Blaikie and Brookfield 1987; Robbins 2004; Gautier and Benjaminsen 2012).

Both the inspiration for the approach and its rise in popularity were related to its transgression of epistemological or paradigmatic boundaries. In the 1970s and 1980s, Anglophone universities experienced a period of unprecedented intellectual ferment in the social sciences. Scholars in the discipline of geography, for instance, advocated a plethora of new “-isms” and “-ologies” – feminism, phenomenology, systems theory, structuralism, post-structuralism, structuration, and political economy to name a few – challenging the prevailing paradigms for studying place, space, and society-environment relations (similar arguments emerged in the discipline of anthropology and the field of development studies). By the 1980s and

1990s, these diverse perspectives had become ideological camps with their own sub-disciplinary theory and history. For students who were drawn to geography or development studies by a burning interest in the problems of the period – poverty and underdevelopment, land degradation, rainforest loss, world hunger, global environmental change – the ideological camps, their theoretical jostling and turf battles were confusing and paralysing. What they wanted was to bring these theoretical insights to critical analysis and action for solving these problems.

It was against this background that political ecology rapidly gained popularity in the 1990s. The approach offered a path leading beyond the divisive ideological battles of the previous decades. Rather than creating another new –ism or –ology, it sought connections between them that could generate new ways of solving contemporary problems at the interface of nature and society. In *Land Degradation and Society*, a book that appeared in 1987, Piers Blaikie and Harold Brookfield made these assertions explicit:

We set out initially to write this book from position papers which adopted respectively Marxist and behavioural approaches.... What happened instead was something unforeseen: large areas of agreement emerged... There is something to be said for declaring a truce on the more abstract structural differences in the interpretations of social change, however important these differences may be, if it allows cross-fertilization of approaches.

There are certainly fundamental contradictions between the 'human adaptation', neo-classical, and various Marxist approaches, to take these three only. However, they share the objectives of understanding and problem solving, and of bringing about change in the situation, albeit in different degrees and in different ways. While there are epistemological reasons why Marxists have not been too interested in decision-making models, there is nothing inherently revisionist in building them. Likewise....

There is an extraordinary schism between two self-perceived epistemological camps, the one which measures, creates its own data and uses others' in model building, and the other which calls itself 'critical' and eschews analysis of this sort as positivist, and the data as ideologically tainted and reductionist. Whilst this book amply shows that data do not simply exist but rather are constructed, it also argues strongly for technically better *and* more ideologically aware measurement of process, costs and benefits. Quantitative modelling of resources-in-use and land managers themselves need not be mindless number crunching. Nor need a central concern for the social meaning of degradation and for conscious ideological choice in explanation be dismissed as biased and not 'real' science. (Blaikie & Brookfield 1987, pp. 24-25)

We quote this discussion at length because it directly addresses the frustration with earlier ideological and disciplinary rivalries, and because it shows that the approach proposed by Blaikie and Brookfield was interdisciplinary in multiple ways. It was both about building bridges between *ideological* camps and between *disciplines*. Both authors were geographers, but with different epistemological perspectives. Blaikie brought a Marxist political economy perspective from his engagement as a scholar-practitioner in international development, while Brookfield brought behaviorist perspectives to the study of cultural ecology. Other contributors to *Land Degradation and Society* broadened the scope of political ecology to include other disciplines such as soil science, neo-classical economics, and sociology. Reviewers characterized the book as representing a new “ideological pluralism” and “multi-disciplinarity” (Chambers 1988, p. 144), and being “post-paradigmatic” (Pickles and Watts 1992, p. 303).

In their attempt to bring together the diverse ideological and disciplinary perspectives presented in the volume, Blaikie and Brookfield proposed a “regional political ecology” that, in a phrase quoted frequently since, “combines the concerns of ecology and a broadly defined political economy.” (p. 17). The focus on ecology and political economy emphasized the two key *disciplinary* and *ideological* gulfs that were being bridged. Their gambit worked – the book became an inspirational rallying point for a generation of scholars seeking a new approach to crucial problems related to environment-development issues.

Despite becoming a ‘classic’ foundational reference for this interdisciplinary approach, Blaikie and Brookfield’s *Land Degradation and Society* was only one view of political ecology. Brookfield (2004, p. 40) commented that the ideological “truce” between him and Piers Blaikie “ended once the book was published and we did not succeed in working together on a revised text”. Anthropologists approached political ecology from a different set of concerns arising from critiques of development and its effects on indigenous and peasant cultures in the non-western world (e.g., Escobar 1995). Their calls for a post-development era and critical understanding of power relations and politics of representation in fieldwork and textual interpretation opened the door to new social and cultural theories in political ecology. The approach became an amalgam of all that its self-professed practitioners did under that label (Robbins 2004). As individual researchers, practitioners, and schools have shaped political ecology according to their own priorities with varying degrees of adherence to ideological pluralism and interdisciplinarity, various tensions have emerged.

First, there is the tension arising from differing emphases on ecological science and positivistic methods of enquiry at one end of a spectrum, and social analyses of the construction and representations of nature, power relations and institutional practices at the other end. Works at the two ends of the spectrum often make a acknowledgement of the interdisciplinarity of political ecology but show little evidence of an integrative framework of socio-environmental analysis. For instance, there are remote sensing studies of land use change that invoke political ecology as their approach but rarely go beyond reference to a few political factors influencing the process. Similarly, there are studies of agrarian change that claim to use political-ecology frameworks, but ‘ecology’ is merely a backdrop to their analysis of social power relations and resource management institutions.

Second, despite addressing similar concerns regarding transformations at the nature-society interface, interactions between geographers and anthropologists have been fairly limited. The political ecology performed by anthropologists differs in both scale and scope compared with that performed by geographers. Until recently very few geographical political ecologists cited articles from or published in the *Journal of Political Ecology* that was initiated in 1994 by two anthropologists. And while Blaikie and Brookfield (1987) is the most commonly cited text by geographer political ecologists, anthropological political ecologists invoke different foundational references such as Wolf (1972). In essence, the researchers and practitioners from each of these disciplines perform ‘interdisciplinary’ political ecology for their respective disciplinary audiences.

Third, and more specifically, the political ecology practised by geographers has been drawn in different epistemological directions and theoretical perspectives. The most prominent of these is the post-structuralist turn, with emphasis on social constructionism and discourse analysis (Peet and Watts 1996; Castree and Braun 2001; Forsyth 2003), along with new versions of feminism (Rocheleau 2008), actor network theory (Robbins 2004; Birkenholtz 2012), human/non-human relations (Whatmore 2002), and science and technology studies (Forsyth 2003; Bouleau 2013). The diversification of the post-structuralist turn has, in turn, resulted in a reassertion of the importance of political economy and the material and ecological relations shaping productive forces and social movements (Peet et al. 2011). Others have moved in different directions to expand the scope of political ecology to encompass broader spatio-temporal scales (Rangan and Kull 2009) and or the material and ecological relations of applied conservation biology (Campbell 2007). This diversification may appear, on the one hand, as a positive spirit of expanding interdisciplinary exploration and richness within political ecology (Pickles and Watts 1992) or, as Blaikie (1999, p. 131) noted, “all things to all people”, and thus lacking clarity as either an approach or a distinctive interdisciplinary field. He suggested that political ecology had become an “*emblem* and discursive device through which diverse networks of scholars and other concerned groups may communicate”.

III. The resilience approach

In contrast to political ecology’s geographical and anthropological roots, the resilience approach has its origins in the field of ecology. Taking inspiration from general systems theory, C. S. Holling argued in 1973 that instead of being inherently stable or at equilibrium, ecosystems are in a perpetually transient state. He introduced “resilience” as a property of such a system, defining it as “the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist” (Holling 1973, p. 17).

The resilience concept took wings outside its strictly ecological modelling aspects in the 1990s, first through interest generated by meetings of the Beijer Institute of Ecological Economics, and then promoted through a tight group of scholars including Holling (Parker and Hackett 2012). The publication of Fikret Berkes and Carl Folke’s (1998) edited volume *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*, signalled a conscious attempt by the scholars to move the concept beyond ecology’s disciplinary boundaries and present it as an approach that integrated social and ecological systems. Bibliometric analyses demonstrate the meteoric rise of the resilience approach (Parker and Hackett 2012; Xu and Marinova 2013), with high citation rates for publications emanating from a central core of scholars (e.g. Gunderson and Holling 2002; Folke et al. 2002, 2010; Walker and Salt 2006; 2012; Young et al. 2006; Gunderson et al. 2009). Its practitioners attribute its attractive strengths to a genuine commitment to holistic approach that integrates diverse disciplines; a forward-looking orientation as shown in the central position of adaptive capacity in its analyses; and an acceptance of unpredictability and complexity (Cote and Nightingale 2012).

Berkes and Folke outlined the central claims of the resilience approach as follows (1998, excerpts pp. 1-4):

[p.1] “The volume seeks to integrate two streams of resource management thought that fundamentally differ from the classic utilitarian approach. The first is the use of systems approach and adaptive management, with their emphasis on linkages and feedback controls.... The second stream of thought is that improving the performance of natural resource systems requires an emphasis on institutions and property rights.... the importance of a *social science* of resource management has not generally been recognized.”

[p.4] “Only a few studies... have explicitly analysed linkages between social systems and ecological systems. The present volume addresses this issue of linkage through its objective to *relate* management practices based on ecological understanding, *to* the social mechanisms behind these practices, in a variety of geographical settings, cultures, and ecosystems.

“We hold the view that social and ecological systems are in fact linked, and that the delineation between social and natural systems is artificial and arbitrary. Such views, however, are not yet accepted in conventional ecology and social science. When we wish to emphasize the integrated concept of humans-in-nature, we use the terms *social-ecological system* and *social-ecological linkages*.”

The resilience approach claims – like political ecology – to cross disciplinary boundaries, to integrate treatment of social and ecological systems (Folke et al. 2002; Gunderson and Holling 2002). This is stated explicitly on the Resilience Alliance website¹ and in the statement of purpose of the Alliance’s journal, *Ecology and Society*.² Often, the message comes across in a way that suggests that linking the social and the ecological is a novel idea, though in a follow-up book, Berkes et al. (2003, p.13) mention a number of other antecedents and inspirations, including political ecology as well as environmental ethics, environmental history, ecological economics, common property, and traditional ecological knowledge.

The antecedents of the resilience approach give it its flavour. The ecological side is strongly based in systems theory and conservation biology (the flagship journal *Ecology and Society* used to be titled *Conservation Ecology*). The social side is largely based on a relatively specific understanding of ‘social’ as institutions and property rights based on a broadly ‘economic’ perspective inherited from common property theory, neoclassical and ecological economics (Cote and Nightingale 2012; Turner 2014). The goal is to get people to ‘see’ the systemic links between ecology and society (primarily as economy) and make the right institutional and management decisions. According to Gunderson and Holling (2002, p. 10), only a shift in mindset to this kind of systems thinking and worldview will allow people to understand and manage socio-ecological systems.

The systems concepts in the resilience approach have evolved (moving from adaptation to co-adaptation, or towards ‘transformability’ - Walker et al. 2004) through application to hundreds of case studies aimed at tackling ‘wicked’ socio-ecological problems. The pages of *Ecology and Society* are filled with articles

¹ http://www.resalliance.org/index.php/about_ra, accessed 1 Aug. 2013.

² <http://www.ecologyandsociety.org/about/policies.php#focus>, accessed 1 Aug. 2013.

touching on governance, participatory resource management, stakeholder perceptions, adaptation and vulnerability, planning. In that journal and elsewhere, self-appointed stewards of the resilience approach have exercised a strong editorial hand in shaping and refining these concepts. (e.g. Carpenter et al. 2001; Folke et al 2010). More recently a number of scholars have sought to address the under-theorization of the social system in resilience approaches (Brown 2014), and to bring resilience into discussion with existing literatures on cultural landscapes (Plieninger and Bieling 2012), and development theories of livelihood diversification and social capital formation (Goulden et al. 2013).

IV. Disciplines, or different interdisciplinary sieves?

In the previous sections, we described the interdisciplinary claims of political ecology and resilience and their respective evolutionary pathways. How do such competing ‘interdisciplines’ survive and grow in a world of ‘disciplines’? If we apply Kuhn’s description of how a paradigm shift takes place, then ‘interdisciplines’ need to go through a process of becoming ‘disciplined’ through increased specialization and normalisation of a limited range of research questions, methods, and practices of knowledge validation. If we add the insights of a Latourian approach to ‘science in the making’, it becomes necessary to understand the networks and institutions that are mobilised in order to establish the legitimacy of these ‘interdisciplines’ among those who wield power and authority. Below, we use Latour’s ideas to illustrate how political ecology and resilience mobilise networks and establish their legitimacy and authority as interdisciplines and then go on to propose a model of how these environment-society ‘interdisciplines’ (and potentially others) resist becoming fully disciplined.

To begin with, both political ecology and resilience clearly have their central dogmas and favourite citations. In political ecology, hardly an article passes without the obligatory cap-doffing citation of Blaikie and Brookfield’s edited volume, and those by subsequent writers of political ecology ‘text-books’ (like Peet and Watts 1996; Robbins 2004; Peet et al. 2011). Likewise, in resilience approaches, one or more of the Gunderson-Holling-Folke-Berkes articles will be cited without fail. Both interdisciplines have a core group of individuals that serve as inspirations, advocates, gatekeepers and adjudicators (for resolving differences within their approaches). The resilience approach however, has a more centralized and well-defined presence in the form of the ‘Resilience Alliance’ (founded in 1999), a tight group of prominent, well-networked senior researchers coordinating a flagship journal (the open access *Ecology and Society*), publishing a series of books all with a single imprint (Island Press – the leading American environmental publisher), and organizing resilience workshops, retreats, and conferences (Parker and Hackett 2012; Brown 2014). These practices are clearly the marks of ‘disciplining’, in all senses of the word – authors are disciplining themselves into certain forms of discussion, certain sets of ideas, building traditions, and keeping discussions internal despite overtures to the outside world. In Kuhnian terms, these practitioners are committed to making the resilience approach the ‘normal paradigm’ of social-environmental analysis and problem-solving.

Generally, once they are normalised, disciplines are often regarded as well-bounded realms and often referred to as silos or fortresses. But in the case of ‘interdisciplines’, such analogies would work against their claims to interdisciplinarity. We suggest that normalised interdisciplines can instead be thought of as ‘sieves’. Sieves separate materials that are mixed together – sand and gravel grain and chaff, and so on. The mesh of a sieve is a barrier of interlaced strands, and varies in the size and shape of its openings. It only lets through material that is finer than its gauge. Different interdisciplines function, metaphorically speaking, as sieves, in that they try to define the gauge, or qualities, of the mesh through which nature-society relationships are sifted (analysed and translated) to produce knowledge and inform action. To put it crudely, the finer the mesh, the more an interdiscipline will become ‘disciplined’ and appear coherent and uniform; the coarser the mesh, the less it will be disciplined, and will appear as a medley of methods and concerns around nature-society relationships. A finer mesh succeeds in establishing something akin to a new discipline with specific methods, associations, and journals. A coarser mesh may not establish a new discipline, but may function as a syncretic symbol for articulating diverse concerns associated with environment-society relationships. In the case of resilience and political ecology, we would suggest that the former tends towards a finer mesh and the latter to a coarser one.

While political ecology and resilience both seek to understand human-environment relationships with a view to improving social and environmental outcomes, their interdisciplinary sieves differ not just in terms of the gauge, or coarseness, of the mesh, but also in the material the sieve is made of – its ideology and epistemology. To begin with, the two approaches differ in ideological tenor (Cote and Nightingale 2012; Turner 2014). Political ecology tends towards a more ‘radical’ stance that challenges institutional and political status quo whereas resilience tends more towards a ‘reformist’ approach that works with existing institutional and power structures to guide policy and management. Political ecology, by and large, has an explicit commitment to issues of social and environmental justice; the resilience approach tends to emphasise environmental sustainability in economic and institutional terms. The former tends to be seen as a critical voice and is thus less visible in policy-making (Blaikie 2012); the latter uses the language of economics and governance and nearly always targets policy-making in terms of ‘systems’, ‘management’, ‘stakeholders’ and the like (Walker and Salt 2012).

Taking this further, when political ecologists adopt a critical approach to a socio-ecological issue, their attention is directed first and foremost to the social processes for explanations and levers of change: economic exploitation, institutional functioning, power relations, and ideological constraints. In contrast, the resilience approach emphasizes the lack of ‘resilience thinking’, which draws attention to the interlinked, complex, dynamic, co-evolving socio-ecological systems. Resilience promotes itself as a very normative and coherent systemic approach that truly reflects the workings of nature and thereby produces better solutions for managing environments and natural resources. For instance, in the preface to *Resilience Thinking* (Walker and Salt 2006, p. xi), Stanford University’s Walter Reid wrote, “In other words, we need to apply ‘resilience thinking’.... Unfortunately, resilience thinking is a concept that is virtually absent from academic and management institutions that dominate large-scale resource management practices today... One

notable exception is a group of ecologists and social scientists who began working on these issues more than fifteen years ago through a network they named the Resilience Alliance.” In other words, resilience thinking is presented as the ideology that needs to be espoused for adapting and managing socio-ecological systems.

From an epistemological perspective, although both approaches combine different analytical methods, political ecology leans towards the ideographic, resilience towards the nomothetic. The positionality of researchers vis-à-vis their subjects tends to matter more in political ecology than in resilience. Resilience tends to follow normal science conventions in assuming that its subject matter is independent of its observation and that, however complex and unpredictable, it can be understood and explained through qualitative or quantitative models. In contrast, political ecology often begins with the assumption that epistemology is unstable: it simultaneously considers empirical evidence of environmental change as well as showing how those pieces of evidence are socially constructed.

The underlying models in political ecology are ones of complex social interactions – power, discourse, exchange, institutions, and the production, construction, and exploitation of nature – which trace their roots to diverse thinkers (such as Humboldt, Marx, Weber, Sauer, Geertz, Wolf, Foucault...). In contrast, the underlying models in resilience are ecological systems and complex or adaptive systems theory (which build on, though the link is rarely acknowledged, the systems theories of Bertalanffy, Boulding, Rapoport...) and rational-choice based social science. It tends to treat socio-ecological systems as ontologies – things that can be known and studied – rather than focusing on systemic practice of knowing them (Ison 2010), though it has expanded, particularly through the role of Fikret Berkes one presumes, to incorporate ideas about multiple knowledge systems, particularly ‘indigenous knowledge’ or ‘traditional ecological knowledge’. The resilience approach relies heavily on abstract systemic analytical metaphors – boundaries, thresholds, emergent properties – and particularly on the idea of an adaptive cycle, represented in an iconic figure-eight loop of growth [r], conservation [K], release [Ω], and reorganization [α].

These epistemological differences reflect different roots, with resilience arising mostly out of natural and social *science* and political ecology drawing more on critical and interpretive social *theory*. For example, the list of inspirations listed by Gunderson and Holling (2002, p.22) demonstrates a certain kind of interdisciplinarity: “...our approach... draws on theories of adaptive change in biological and ecological systems, of self-organization in complex systems, of rational actor models in economics, and of cultural evolution.” In contrast, political ecology builds on common property theory, political economy, peasant studies, feminist development, post-colonialism and post-structuralism (Robbins 2004, p. 41).

So, returning to the sieve metaphor, the above examples show that the two approaches clearly differ in the *character* of the mesh through which the multitude of factors, ideas, evidence, and theories relevant to addressing nature-society interactions are sifted and selected for inclusion within each interdiscipline. . Political ecology’s mesh favours the passage of critical ideas; resilience’s mesh in

turn favours elements that fit into systems thinking. As far as the *size* of the mesh, as we suggested earlier, the latter approach is arguably a finer mesh, which facilitates the establishment of a tighter, more coherent ‘discipline’. Political ecology, in contrast, has a coarser mesh that favours a somewhat more diverse, syncretic approach.

V. Clash, debate, and cross-fertilization

The ideological and epistemological differences between political ecology and resilience have generated vigorous debate. The debate is largely one-sided, with social scientists launching critiques (Walker and Cooper 2011) but little response from resilience. Political ecologists typically accuse resilience for being technocratic and ‘apolitical’ (Beymer-Ferris et al. 2012; Cote and Nightingale 2012; Widgren 2012; Turner 2014). Michael Watts (2011, p. 87-88) attacks a UNEP, WRI, and World Bank document called *The Roots of Resilience* that applies, as he says, “Holling’s and related ideas to the global development community.” His rhetoric sets the tone:

“...what is on offer ... is a bland and bloodless shopping list of ‘conditions’ for adaptive governance including ‘policy will’, ‘coordination of stakeholders’, ‘science’, ‘common goals’ and ‘creativity’.Ecological resiliency is the calculative metric for a brave new world of turbulent capitalism and the global economic order, and a new ecology of rule..... To return to Foucault and his notion of an expanded sense of eco-security, resiliency is an apparatus of security that will determine the process of ‘letting die’. Africa, once again, is the testing ground for a vision of security and care in which life is nothing more than permanent readiness and flexible adaptiveness.”

In more measured critical tones, Trevor Birkenholtz (2012, p. 5) argues:

“Resiliency ... abstract[s] social-ecological systems from the political-economic relations in which they are embedded..... This is a rationalist view of institutions... that leads to a focus on social capital and its derivative ‘adaptive capacity building’, which can be indexed and then addressed in technical and managerial terms ... rather than leading to the questioning of the structure of resource allocation or issues of social justice, human security, and equity.”

These debates echo those of the late 1970s between critical social scientists and proponents of ‘systems theory’. Derek Gregory (1980), for instance, drew on the theories of Habermas and Giddens to critique the systems approach despite the fact that it was “supposed to provide a means of dealing with the interactions and interfacing between man and nature, and so to offer the prospect of healing the breach between human geography and physical geography” (p. 329). He argued that systems approaches revolve around an ideology of ‘control’, of being able to see, master, and reduce complex systems into manageable components, and that this obscures historical and geographical specificity and reproduces structures of domination.

Both political ecology and resilience have clearly become their own epistemic communities. Yet there appear to be some overtures and crossovers between the two interdisciplines. It should not be forgotten, for example, that Blaikie and Brookfield (1987, p. 10) sought inspiration from Holling’s idea of resilience, and that Berkes et al. (2003) describe political ecology as a type of socio-ecological system approach. Holling’s student Garry Peterson (2000) explicitly sought to build bridges between the approaches, applying systems concepts like resilience, adaptive

cycle, and scale to the dynamics of political power in the management of the Columbia River. Others such as Neil Adger and Arun Agrawal move comfortably across both approaches.

More recently, some scholars have attempted to reconcile resilience and political ecology. Betsy Beymer-Ferris and colleagues (2012) detail the specific challenges of a resilience approach to the sustainability of prawn farming and mangrove management in Tanzania. Using the language of resilience, they point to ‘slow-moving variables’ (like marginalisation and pauperisation of villagers) and ‘fast-moving variables’ (like deaths, protests, shifts in party preferences) that can cause ‘regime shifts’. They then provide a sympathetic critique of adaptive management approaches as promoted under resilience thinking, arguing that these approaches struggle to incorporate “the multiple and competing views and politics of desirable states of the social-ecological system” (p. 295). They show that people respond constantly to transformations in how resources are controlled and managed, just as the ecological situation continues evolving, and suggest that the ‘rigidity trap’ may not be appropriate. They go on to demonstrate that industrial prawn farming causes degradation and injustices, despite global certifications and national regulations ostensibly put in place as tools of adaptive management.

VII. Conclusion

The study of environment-society interactions is a terrain where silo-like disciplinary practice is likely to fall flat. The simultaneous consideration of interactions between environment and society requires inter-disciplinary knowledge production. Yet, as we have seen with political ecology and resilience, there are multiple ways of being interdisciplinary. Gaps between disciplines, or more accurately, between Marxist and behavioural ideological outlooks, inspired the insights and collaborations that led to political ecology, an approach that took on many more inspirations from post-structuralism, disturbance ecology, and more. Similarly, the need to link social and ecological systems led to resilience approaches’ calls for interdisciplinarity – an interdisciplinarity held together by recourse to systems theory and the kinds of ecological and social science that fit into that vision.

Interdisciplinarity seeks to facilitate the kinds boundary crossings that are crucial at the interface of nature and society, leading to new insights and knowledge, and to solving problems that are not contained within the boundaries. Yet there are inevitably pressures to ‘discipline’ the new ‘interdisciplines’. The new interdisciplinary paradigms may eventually become Kuhnian ‘normal’ disciplines, following a Latourian process of disciplining through the mobilisation of networks of scholars, institutions, publications, and conferences. The resulting outcome is multiple interdisciplinarity that use sieves of finer or coarser grain meshes within different ideological and epistemological frames to sift understandings of the complexities of environment-society interactions.

Should we be concerned that interdisciplinary ‘sieves’ may become new dogmas, or can we expect that they will maintain a spirit of renewal and boundary crossing? Work at the nature-society interface is enriched by multiple powerful

interdisciplinary analytical approaches that sometimes complement and sometimes compete with each other. While some scholars may attempt to build bridges and cross-fertilize between fields like political ecology and resilience, some fundamental differences in purpose, in epistemology, in explanatory tools, and in ideology will always persist or re-assert themselves. Despite the zealotry of some proponents of either approach, there will always be different ways of thinking, interpreting, and understanding the complexities of human-environment interactions

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