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Studying Resource-Dependent Communities Through a Social-Ecological Lens? Examining Complementarity with Existing Research Traditions in Canada

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\section*{ABSTRACT}
This article explores the suitability of Ostrom and colleagues’ social-ecological systems framework (SESF) for the study of resource-dependent communities in Canada. Through a broad literature about resource-dependent communities in Canada, three main approaches are identified, named staples research, rural development, and sustainability studies. Each of these research traditions is analyzed with regards to a common set of criteria – focus, scale, methods, treatment of institutions, and treatment of environmental dimensions. Research in each category is compared and contrasted with the SESF approach, to identify areas of overlap and divergence. Results indicate that the SESF is unlikely to provide additional benefit in terms of in-depth of social analysis, however, it does provide a unique contribution in terms of its coupled approach to conceiving social and ecological systems and its ability to operationalize these relationships through structured variables.

\section*{INTRODUCTION}
Social-ecological systems (SES) have become leading analytic frameworks for studying the relationships between communities and the environment. SES is a broad term, which encompasses approaches with different conceptual underpinnings, vocabularies, and areas of application (see Binder et al. 2013 for a detailed review). One well-known approach, the subject of this article, is known as the social-ecological systems framework (SESF). It seeks to support interdisciplinary diagnostics and comparisons of natural resource dilemmas. The SESF treats social-ecological systems as complex, coupled, and interactive systems, described by variables covering social, institutional, and biophysical attributes (Ostrom 2007, 2009; McGinnis and Ostrom 2014). While the proposed framework has generated considerable theoretical debate, there is also increasing interest in...
applying and testing the SESF through empirical research. Thus far, empirical work focuses mainly on environmental governance (Fleischman et al. 2010; Blanco 2011; Leslie et al. 2015), however, the range of topics is widening, including soundscapes (Dumyahn and Pijanowski 2011), community resilience (Ommer 2007; Kelly et al. 2015) and sustainable cities (Ramaswami et al. 2012).

In this article, we seek to explore the applicability of the SESF towards the study of community well-being in resource-dependent communities through a comparison with existing approaches. We adopt Hayter’s (2008) definition of industry-resource-town, described as: “towns whose economic base is dominated by the extraction and primary processing of (non-agricultural) natural resources, non-renewable, or renewable” (291). Despite the dominance of this economic model in industrialized contexts, such as North America, Australia, and Russia, there are relatively few studies, which specifically adopt an SESF approach to the study of resource-dependent communities. This may be related to the origins of Ostrom’s work, which focused on the local governance of common property resources (Ostrom 1990). However, given the qualities of resource-dependent communities, including their historical and contemporary reliance on natural resources, the presence of governance institutions at multiple scales and the desire to address a host of sustainability challenges, we hypothesize that the SESF holds interesting potential as a lens through which to better understand resource-dependent communities and their relationships to surrounding environments.

Extractivist activities and their relationship to community well-being has been the focus of long-standing research internationally, with strong representation from countries such as Canada, the United States, Australia, and Scandinavia (Machlis, Force, and Balice 1990; Lansbury and Breakspear 1995; Lane and Rickson 1997; Kusel 2001; Dale 2002; Langton and Mazel 2008). From the outset, the issue of community well-being, described initially as “community stability” was a central consideration, due to the observation that resource-dependent communities suffered from a number of structural weaknesses related to their remote location and economic exposure to fluctuating markets (Robinson 1962; Lucas and Tepperman 1971; Bradbury 1978; Bradbury and St-Martin 1983). With the introduction of sustainability discourses in the 1990s, the literature expanded and diversified. This included the introduction of new concepts such as resilience (Varghese et al. 2009; Magis 2010), community capacity (Kusel 2001, Kelly and Bliss 2009), and community capitals (Flora and Flora 2004), which share a dynamic and adaptive view of communities. Meanwhile, scholars in the political economy also deepened the analysis of macroeconomic and policy conditions affecting resource-dependent regions (Wilson 2004; Howlett and Brownsey 2007; Hutton 2007).

In this article, we explore the intersection between this research and a social-ecological systems approach. What are the differences and similarities? To what extent does the social-ecological systems framework, with its orientation towards an integrated view of socio-cultural and ecological systems propose a novel way of looking at resource-dependent communities? As a step towards answering these questions, we undertake a literature review focused on research on resource-dependent communities, as the foundation for a broader discussion of SESF and its potential contribution. As such, the literature review serves a dual purpose; it provides a retrospective on research contributions in the field of resource-dependent communities, while also
exploring the complementarity of a relatively new and emerging approach to studying sustainability issues in these places. The literature review focuses exclusively on Canada, due to its long-standing tradition of resource extraction across multiple sectors (mining, forestry, oil, and gas) and the presence of a solid literature on resource-dependent communities, which spans numerous disciplines.

We begin the article by describing our research methodology, including how research materials were selected, analyzed, and grouped. This is followed by a descriptive overview of the social-ecological systems framework based on a number of recent articles by key contributors. This is followed by the literature review itself, divided according to three inductively-derived categories, including “staples research”, “rural development”, and “sustainability studies”. We conclude with a discussion of the potential of the SESF for furthering collective knowledge of resource-dependent communities.

Methods

The literature review on resource-dependent communities is based on 45 sources. The objective of the literature review was not to be exhaustive, but rather to include a sufficient number of articles to capture the broad trends within the literature, including theoretical orientations, methods, and findings. To achieve this, we adopted an inductive process, which allowed us to generate analytic categories and theoretical propositions throughout the research process. From the outset, we sought to compare research articles across five aspects, which were deemed relevant for the comparison with the social-ecological systems framework (SESF). These aspects, which were recorded in a large spreadsheet, include: focus of the research; spatial scale (the unit of analysis); methodology (type of data and how it was collected); treatment of environmental dimensions (if and how they were considered); and the role of institutions (how were institutions and actors defined and operationalized).

The literature review covers the period 1990–2017. We limited our search to articles, which specifically treated resource-dependent communities or regions in Canada. As mentioned, we defined resource-dependence as those communities whose economies depend on extractivist industries such as forestry, mining, and energy sectors. To identify articles, we used two approaches. First, we used the search engines Scopus, Science Direct, and Google Scholar, focusing on combinations of keywords like “community”, “dependency”, and “natural resources”, “Canada”. To broaden the search, we eventually added keywords like “sustainability”, “staples”, and “indicators”. Second, using a type of snowball approach, we looked at the bibliographies of the articles we reviewed, in order to identify other relevant sources through the nature of the titles. Given our interest in community well-being and resource-dependence specifically, we excluded articles, which treated environmental governance without a community focus. We also excluded articles addressing communities in other types of relationships with natural resources, such as tourism activities or subsistence activities. We also restricted our literature review to peer-reviewed academic articles, books, and book chapters, excluding policy reports. We chose to exclude policy reports as the quality of these are harder to verify, due to the absence of a peer-review process. Our first search revealed 50 relevant sources. We continually refined our list of articles, discarding some and adding others.
according to the relevancy of the topic. The main criterion for inclusion/exclusion was the presence of the pairing of resource-dependent community and issues related specifically to community well-being.

Based on similarities in research objective and theoretical approach, we divided the articles into three broad categories. Having a strong familiarity with this literature also helped us to make these distinctions. The categories are named: (1) staples research, (2) rural development, and (3) sustainability studies. The staples research builds on work by political economist Innis and Mackintosh analyzing the influence of resource export dependency for regional development in Canada (Howlett et al. 1999). Rural development is a broad category covering work focused on the socio-economic and cultural qualities of resource-dependent communities. Finally, sustainability studies includes work, which seeks to operationalize the notion of community well-being through the vocabulary of sustainability and related concepts. We acknowledge that these are rough groupings, without completely distinct boundaries. Parallel to the literature review, we also reviewed the literature on the social-ecological systems framework. The goal was to present an overview of the approach, including conceptual and operational aspects, as well as critics. Our research team conducted a previous literature review of empirical material related to SESF, which helped inform this section (Teitelbaum et al. 2016). The SESF is presented in the following section.

**Introducing the Social-ecological Systems Framework**

The social-ecological systems framework (SESF) is proposed as a framework to help scholars working on the sustainability of social-ecological systems to build a mode of analysis which views them as a complex, nested system operating at multiple scales (McGinnis and Ostrom 2014). It builds on Ostrom et al.’s previous work examining institutional conditions favoring the collective management of common-pool resources (Ostrom 1990). Based on new institutional economics, the epistemological foundations posit methodological individualism for the study of community-based resource management systems, meaning collective action deduced from the shared behavior of individuals (Noga 2011). Ostrom defines institutions as "configurations of rules that shape human interactions, including formal and informal rules" (Ostrom and Basurto 2011, 318). There is, therefore, particular attention paid to the role of actors, local norms, and processes of rule-making and enforcement, whether formally or informally sanctioned (Crawford and Ostrom 1995; Ostrom 2005).

Ostrom views social-ecological systems as inherently dynamic and subject to a range of shocks and disturbances. An important focus, therefore, is adaptation and the ways in which system components interact and adapt themselves to change, in complex and non-linear ways (Anderies, Janssen, and Ostrom 2004). Institutional resilience speaks to the degree to which actors are capable of adapting and innovating institutional arrangements in response to changing circumstances. However, the SESF, like Ostrom’s previous work, seeks to go beyond analysis at a socio-political level. By integrating both biophysical and socio-cultural factors, the SESF seeks to analyze interactions between institutions and resource systems at multiple scales to assess forms of governance (Ostrom 2005, Ostrom 2007, McGinnis and Ostrom 2014).
Described, as an ontology rather than a theory, the SESF proposes a “basic vocabulary of concepts and terms that may be used to construct the kinds of causal explanations expected of a theory.” (McGinnis and Ostrom 2014, 30). At the first tier, are a series of four core subsystems that interact with each other under the pressure of external social, economic, and political settings and related ecosystems at different scales – these are conceptualized as influential factors, which are outside the system (Ostrom 2007). These four subsystems are: (1) the resource system, described as the broader territorial unit, (2) resource units, described as the resources being generated by the system; (3) actors, described as the individuals or representatives of collective entities; and (4) the governance system, described as the rules and procedures, which structure interactions. Each of these four subsystems can be broken down into a series of second and third-tier variables, and so on. For example, the variable governance system can be broken down into sub-variables such as non-government organizations, property-rights systems, and network structure. For example, in a recent article, Bissonnette et al. (2018) used the SESF to compare several community forests in North America by focusing on their governance systems (first-level variable). Authors selected a subset of second-level variables (e.g. rule-making organizations, rules-in-use) and third-level variables (e.g. public organizations, community-based organizations, collective-choice rules, constitutional-choice rules) to describe the governance systems of each community forest considered in their study (Bissonnette et al. 2018). This allowed similarities and differences to be identified between cases and inferences to be made concerning good governance practices.

There is an increasing number of empirical studies, which seek to apply the SESF to the study of different resource dilemmas (Blanco 2011; Basurto, Gelcich, and Ostrom 2013; Kelly et al. 2015). Liu et al. (2007) describe some of the common elements of these studies: a focus on ecological and human variables and variables that link these together; interdisciplinary teams; the adoption of tools and techniques from social and ecological sciences; and longitudinal focus, which allows for the elucidation of temporal dynamics. The studies draw on data from both social and natural sciences, including interviews, land use information, ecological data, policy analysis, but reflect a stronger reliance on interpretive than statistical methods (Thiel, Adamseged, and Baake 2015).

This literature has been recognized as promising, insofar as it is building a body of work, which adopts a common language and classification system, thereby enhancing opportunities for comparability across cases, regions, and nations. Indeed, the SESF was designed to overcome the dilemma posed in the study of community-based natural resource management by the necessity of producing context-sensitive analysis while avoiding the analytical trap of idiographic case studies (Basurto and Ostrom 2009). However, according to Thiel, Adamseged, and Baake (2015), this remains elusive: “the principal challenge for the SESF: generalizing cases specific findings for the purposes of theory development while not ending up with theories that are ignorant of context specificity.” (154).

Thiel, Adamseged, and Baake (2015) raise other challenges as well. One is the tendency for the SESF to be used as a descriptive or interpretive method, rather than an explanatory or diagnostic tool. Also problematic is when researchers attribute explanatory power to the variables of the framework, without necessarily having sufficiently demonstrated causality in relationships between variables. Several studies note a lack of
transparency in the construction of variables, because researchers provide insufficient information regarding the selection of variables, their definition, and forms of measurement, making it difficult to analyze the appropriateness of the chosen variable to the phenomenon being studied (Thiel, Adamseged, and Baake 2015; Teitelbaum et al. 2016). For Basurto, Gelcich, and Ostrom (2013, 1374), “careful assessment of the meaning of the variables depicted, and understanding of the local context to which the analysis applies, is irreplaceable”.

Authors also acknowledge that the SESF tends to neglect important explanatory variables, which are at the core of critical theory in social sciences, such as power and discourses. As such, Fabinyi, Evans, and Foale (2014) note that the SESF bears “remarkable similarities with earlier forms of ecological anthropology”, for three reasons: “an excessive focus on how humans adapt to their environments”, variables that would be lacking nuances to attend to social and cultural diversity, and limited capacity to pay attention to the manifestation of values and power. Along the same lines, Epstein et al. (2014) argue that the SESF largely looks at power through the relationship between institutions and sustainability, which poses numerous challenges to operationalize notions of power attuned to intra-community power imbalances and historically embedded discursive realities that can both limit and expand the realm of possibility for specific groups.

**Literature Review: Approaches to Studying Resource-Dependent Communities in Canada**

**Staples Research**

Staples theory is a classic theory in Canada founded by political economists Innis (1894–1952) and Mackintosh (1895–1970), which views Canada’s culture, history, and political economy as shaped by the exploitation of “staples”, defined as “a raw, or unfinished bulk commodity product, which is sold to export markets”, such as fur, fish, wood, metals, or fossil fuels (Howlett and Brownsey 2007, 2). Staples became the axis upon which to undertake analyses of the trajectory of resource-led development in Canada, including core-periphery relationships, class structure, and economic development patterns. Innis and others described patterns of path dependency for resource communities, based on a lack of economic diversification, reliance on industrialized areas for markets and supplies, and volatile market conditions. The notion of the “staples trap” was proposed to describe these patterns of regional dependency (Barnes, Hayter, and Hay 2001).

Contemporary political economists have taken up staples theory as a lens through which we can study resource dependence in the Canadian context. They have sought to theorize transformations in the staples economy, focusing on factors such as globalization, neoliberalism, resource depletion, industrial restructuring, and the presence of new policy regimes and social movements. Indeed, one of the unique features of the staples literature is its attention to the interplay between macroeconomic conditions, political regimes at national and regional levels and local dynamics. A good example is the work of economic geographers, Hayter and Barnes (Barnes and Hayter 1994; Hayter and Barnes 1997; Hayter 2003), which characterizes the transition within British Columbia’s coastal forest industry as a change from Fordist to post-Fordist production models,
which, coupled with new social policy concerns, resulted in significant industrial restructure in the form of technological change, mill closures, and layoffs. The authors examine individual responses of communities through case studies, which highlight differences based on geography, social capacity, and market conditions.

An important contribution is a work by Hutton (1994, 2007), which proposes an evolution of the staples economy from a “mature” or “advanced” staples economy, characterized by increasing pressure on resource stocks, to a “post-staples state”. Under the latter, resource degradation is combined with capital/technological investments (labor reductions), global market pressures, and new social forces such as environmentalism, leading to the eventual destabilization and decline of resource economies and the rise of post-industrial activities. Hutton’s work spurred several studies examining specific resource sectors against this thesis. Many of these studies describe a type of hybrid between mature and post-staples attributes, due to the enduring presence of economic dependency, combined with new social and political forces such as environmentalism and indigenous rights.

Clancy (2007), for example, describes the offshore oil industry, which while presenting qualities of a classic staples industry, has also been strongly influenced by a regulatory environment characterized by metropolitan policy influence and post-material values, including concerns surrounding workplace health, safety, and environmental security. Similarly, Brownsey (2007) drawing on a historical analysis of the oil and gas sector (1867-present), observes the gradual imposition of stronger forms of environmental and social regulation, which creates stratification within the industry due to prohibitive costs for smaller producers. Carroll, Stephenson, and Shaw (2011), in a historical analysis of the shale gas sector, describe political challenges to the industry, in the form of pressure from environmental and indigenous groups as well as concerns related to climate change. Rayner and Howlett (2007) examining the Canadian aquaculture sector, describe an “uneven” transition to a post-staples economy, due to the presence of a technologically-intensive industry combined with a policy regime, which has not sufficiently adapted to changing market conditions and social concerns associated with this industry. Thus, these and other studies speak to a disconnect between macroeconomic conditions, social values, and socio-political processes. Fournis and Fortin (2015) attribute this to an institutional architecture lacking legitimacy due to its failure to consider discordant voices and its inability to consider locally-situated dynamics. Indeed, the authors contend that natural resources have been largely dis-appropriated from local communities by the political-corporatist regime, which perpetuates colonial models and discourages endogenous development strategies.

Complementary to these sectorally-based studies are a lesser number of studies, which adopt different scales of analysis and epistemological standpoints. Several studies provide a community-centric perspective on the history of resource development and the enduring influence of global economic forces (local-global relations), including restructuring processes, labor rationalization and the shift towards neoliberal governance practices (Barnes, Hayter, and Hay 2001; Halseth et al. 2014). In a different vein, Thorpe and Sandberg (2007) pose a critique of the dominant narrative within staples research, based on the exclusion of alternative voices and visions related to the forest, such as indigenous people and women.
Comparisons with a social-ecological systems approach reveal some marked differences. Staples research is, first and foremost, a critical scholarship, which aims to tackle the causes and consequences of resource dependence at a broad scale, through analysis of specific geographies and sectors over time. Communities are mostly treated as imbricated in broader resource economies, indeed within “a set of global relations that determine its fate” and are not usually the primary unit of analysis (Barnes, Hayter, and Hay 2001, 2132). By contrast, the SESF views communities and/or locally situated groups as a primary component, imbricated in an ecological and territorially-defined system. This is also reflected in the way that institutions are conceptualized. For the SESF, the institutional analysis is oriented towards local norms, social organization, and set of rules that emerge and are negotiated at a local level. Macroeconomic and political influences are conceptualized as contextual factors. For staples, these macroeconomic forces are at the heart of the institutional analysis. Through a focus on formal processes such as regulatory frameworks, investment patterns, and labor markets, formal institutions are seen to determine resource and power distributions amongst actors (Halseth and Ryser 2017).

Methodologically, the staples literature draws mostly on analysis of secondary sources, including academic work and policy. Only a few studies reviewed here made use of primary data collection and interpretive methods. Interestingly, very few studies provide explicit information about the methodology applied to gather information. This approach focuses almost exclusively on capturing socio-economic variables while maintaining a strong normative focus, derived from the central objective of understanding how capital accumulation proceeds, and how benefits and costs are distributed (Wellstead 2007). By contrast, the SESF proposes a structured approach to data collection and puts considerable emphasis on the need for detailed and transparent methodologies, which are not imbued with normative goals (Basurto, Gelcich, and Ostrom 2013).

Having said that, there are also similarities between the two approaches, such as a shared commitment to documenting the socio-economic configurations that emerge as the result of resource dependence, how these evolve over time, and how they respond to shocks, both external and internal. The notion of a system is not foreign to staples research, however, unlike the social-ecological systems framework, it is defined largely by political and economic relationships. “For Innis, space and time are made inside larger but geographically and historically specific social and economic systems defined by institutions, technology, and a given physical environment” (Barnes, Hayter, and Hay 2001, 2131).

The treatment of environmental dimensions also reveals some similarities. The staples approach views the natural environment as a key component of the resource economy, to an extent as it represents the natural capital to support development. However, in the staples articles, we reviewed references to natural resources were mostly limited to very general statements about resource supply and the risks of natural resource depletion. In the case of the SESF, the view of the natural environment is also anthropocentric, to an extent it is conceptualized as a resource for human use, however, it is treated more explicitly through the identification of a series sub-systems and variables with an effort to characterize changes in the natural environment over time and in relation to social systems.
Rural Development

We use the term rural development to describe a category of studies, based on the social sciences, which speak directly to the qualities of resource-dependent communities and their place within the rural landscape, including issues of community development. Work in the rural development tradition has been instrumental in describing the characteristics of resource-dependent communities. Randall and Ironside (1996) seek to confront classic generalizations concerning the qualities of single-industry resource towns. Based on a statistical analysis of 220 resource-dependent communities, the authors find heightened heterogeneity in economic structure (full-time versus part-time) across different resource sectors and persistently low rates of participation by women. Other work, such as a study by Picot and Heath (1992) focus on differences based on community size, demonstrating that smaller communities in Atlantic Canada are more strongly affected by shifts in the natural resource economy in terms of real earnings and patterns of out-migration. Through an econometric analysis, Leake, Adamowicz, and Boxall (2006) examine forest dependence and its relationship to economic well-being, revealing a positive and significant relationship between forest-dependence and unemployment and poverty incidence. Similar results were found by Stedman, Parkins, and Beckley (2005), however, with inter-provincial variation. Halseth (1999) examines migration patterns through a study of three resource-dependent communities in British Columbia, revealing that economic factors (job opportunities, affordability) represents the most important factor for both out-migration and in-migration and that most incoming households relocate from other small towns rather than urban centers. Connections with work in the staples tradition is evident here, as authors provide empirically-based portraits evoking patterns of uneven development related to corporate industries and markets.

Other work adopts an ethnographic or interpretive approaches to capture viewpoints and discourses associated with community well-being. Bullock (2013) provides a case study of the Northeast Superior Region in Ontario, including regional struggles to appropriate forestry governance and development. Bullock (2013) identifies several narratives, including a “conventional diagnostic” frame, which reduces economic issues to “a narrow set of problematic and pricing conditions” and a “local control” frame, which recasts local people as resource owners and stewards seeking to implement a more locally-centered and adapted approach to natural resource governance and development. Larsen (2004) looks at collective space identities in three resource-dependent communities in British Columbia, demonstrating how residents politicize the idea of place as a strategy to counteract powerlessness and perceived intervention from external influences such as corporate interests and government.

Jean (2006) draws on interviews to qualify visions of local development in a regional forest economy, describing these as burdened by a legacy of corporate intervention and the presence of a utilitarian vision of natural resources, which reflects little concern for environmental concerns and long-term sustainability.

Gender is a central theme in the rural development literature. Some studies present statistical accounts of women’s labor force participation (Randall and Ironside 1996; Egan and Klausen 1998; Halseth 1999). Others present a qualitative account of women’s experiences working and residing in resource-dependent communities, signaling...
problems related to discrimination in the workplace, barriers to participation in political life and social isolation (Gill 1990; Halseth and Lo 1999). However, some studies show a different and improved perspective (Gill 1990b; McLeod and Hovorka 2008). A survey by McLeod and Hovorka (2008), for example, in a mining town in Alberta, revealed positive viewpoints regarding employment opportunities for women, experiences in the workplace, and participation in personal and civic life. Indeed, the differences and complexities of women’s experiences in resource-dependent communities are being revealed. Reed (2003), drawing on narrative approaches, describes a for women in resource-dependent communities – which “lies in women’s shared experiences of and opposition to their marginality from the industry and local forestry paradox culture while simultaneously reinforcing it through both discourse and practice” (375).

There is also an interest in community development within this literature, which is reflected through the applications of concepts such as community economic development (CED) and social planning. This research is solutions-oriented, offering policy lessons and best practices. Markey et al. (2008), for example, uses participatory research methods and a place-based perspective to call for renewed governmental support (capacity-building, investments in infrastructure) in the wake of the neoliberal period of policy-making in British Columbia. Other work examines the impacts of “mega-projects”, highlighting the importance of adequate government planning and corporate social responsibility initiatives such as impact-benefit agreements (Ritter 2001; Storey and Hamilton 2003; Markey, Halseth, and Manson 2010; Storey 2010). Other work examines the phenomena of “fly-in/fly-out arrangements.” Storey (2010), comparing Canada and Australia, documents a number of issues for nearby communities, including leakage of benefits to larger centers, and an additional burden of service and infrastructure provision for transient workers. Gill (1990), focusing on a recently built coal mining town in British Columbia, examines the results of the town’s planning process, a holistic effort in environmental design, which included measures for enhancing social interaction and sense of community through indicators such as participation in community affairs and satisfaction with quality of life and friendships in the community. Similarly, in Quebec, there exists a research stream, called “territorial development” which promotes a territorially-based approach to local development, based on renewed democratic processes and a multifunctional approach to developing natural resources (Jean 2006; Gagnon et al. 2006). Governance is an important theme in this literature as researchers seek to depict the dynamics and local processes through which relationships to local territories are constructed and structured (Chiasson and Leclerc 2013).

The rural development literature, while diverse, reflects a community-centered approach, which is not readily apparent in the staples literature, but which is also shared by the social-ecological systems framework. Both SESF and rural development approaches have an interest in understanding the social processes by which local actors come together to effect change. While both are attentive to external influences, such as government policy and market conditions, these are secondary influences, which serve to shape conditions within communities. This is reflected in the variables described in the social subsystems of the SESF, such as leadership, norms, and mental models, also central considerations in rural development work. Both share a common understanding of institutions as well, insofar as they both focus attention on social norms and the role
of local organizations in shaping endogenous development processes, while also considering outside institutions as either enablers or constraints to successful development.

However, given the diversity of epistemological standpoints and methodologies represented in the rural development category, and the almost singular focus on social analysis, we hypothesize that work in his category potentially goes further than SESF in the depth of analyses of socio-political dynamics and processes in resource-dependent communities. For example, the studies on gender, development discourse, and political appropriation of place reviewed here, are particularly attentive to issues of power and inequality, which are not as easily captured within broad social-ecological system studies due to their relatively minor place within the framework (Epstein et al. 2014).

Conversely, however, the rural development literature is less attuned to the nature of human-environment relationships, often excluding these all together, or describing them from a social constructivist perspective. While the rural development sometimes alludes to the importance of territorially-anchored or place-based analyses, the articles reviewed here did not go so far as to incorporate detailed description or analysis of environmental conditions. Indeed, most studies were focused exclusively on the description of social systems.

**Sustainability Studies**

Although this category could arguably be a subset of the “rural development category”, we chose to make it a separate category, due to its more integrative approach to treating communities in relation to the environment. We limit this category to studies, which specifically use the vocabulary of sustainability and associated terminology (community resilience, community capacity) in the study of resource-dependent communities.

During the late 1990s and early 2000s, researchers at the socio-economic research network of the Canadian Forest Service as well as university-based researchers pioneered a new line of investigation, which addressed resource-dependence (mostly forest-dependence) through the lens of sustainability. This work reflects an applied perspective, insofar as it seeks to operationalize and measure progress towards the goal of sustainable community development. Working in collaboration with groups such as the Canadian Models Forests and the Sustainable Forest Management Network (SFMN), this research is particularly innovative in elaborating “criteria and indicator” approaches (Parkins, Stedman, and Varghese 2001; Beckley et al. 2002; Stedman et al. 2005) with the stated goal of establishing “baseline data that can be incorporated into decision support systems and to use the data as a basis for future comparison across time and between regions” (Beckley, Parkins, and Stedman 2002, 627).

While this work is based on descriptive statistics, it also incorporates qualitative methods, in a form which allows for comparison. One approach is to combine “objective indicators” (also called profile indicators), such as statistics on income, poverty, employment, human capital, and population mobility, with “subjective indicators” (also called process indicators), capturing contextually-bound dimensions such as social networks, leadership, and perceptions of well-being (den Otter and Beckley 2002; Parkins, Stedman, and Varghese 2001; Teitelbaum et al. 2003). According to the authors, the latter brings an enhanced ability to explain the social dynamics, which
enable communities to work collectively and adapt to change. Particular attention is given to operationalizing the notion of place attachment or “sense of place” as an indicator of community sustainability (Stedman 1999; Beckley et al. 2007). Other studies focus exclusively on establishing local level indicators for monitoring and evaluation purposes, often using bottom-up processes (Parkins, Stedman, and Varghese 2001; Fraser et al. 2006). For example, a study by Parkins, Stedman, and Varghese (2001) reveals important differences in local indicators based on cultural factors highlighting the importance of avoiding one-size-fits-all approach but also the risk that local indicators reflect local preferences rather than sustainability issues per se.

To enhance the conceptualization and operationalization of sustainability, researchers have sought out different concepts such as community capital or community capacity, which speak to the collective assets and resources, which a community has in support of transformative change and adaptation (Nadeau, Shindler, and Kakoyannis 1999). Work by Parlee (2015) adopts a “capital framework”, including social, human, and natural capital, to investigate the impacts of oil sands development for indigenous communities in Alberta, revealing weakness in the human and financial capital, for example, governance processes, mismanagement of resource rents, and low-education levels. However, the study found stronger outcomes related to bonding and bridging forms of social capital, including connections to social movements. Markey’s book “Second Growth” (2005) also uses a capitals framework (human, social, economic, and ecological” to analyze success factors in forest-dependent regions in British Columbia. A study by Bouthillier et al. (2000) draws on the concepts of capacity and well-being to present a holistic portrait of four forest-dependent communities in Quebec. Through the description of sociopolitical dynamics and institutions and social relationships to the forest, the authors find strong social cohesion combined with a number of common challenges including low human capital, unemployment, and service decline in small municipalities. These concepts are interesting in that they specifically seek to address linkages with environments and natural resources as a component of community well-being.

The concept of resilience has also been adopted in studies of resource-dependent communities (Ommer 2007; Varghese et al. 2009; Lyon and Parkins 2013). Resilience, a concept inspired by ecology, focuses on the ability of a system, social or ecological, to adapt to change, despite the presence of perturbations and shocks (Gunderson and Holling 2002). It is a concept that is also common in the literature on social-ecological systems (Lyon and Parkins 2013). Social resilience speaks to the collective capacity of the community to deal with and reorganize in response to change. Work by Ommer (2007) adopts a resilience framework to study social-ecological health in relation to Canada coastal communities in relation to marine ecosystems. Drawing on the notions of restructuring, common to staples research, this work seeks to conceptualize interactivity between social and biophysical systems, including spatial and temporal dynamics through a focus on community health. Through historical analysis, community-based studies and health statistics, the extent of the social-ecological crisis is revealed, as well as the need for innovative governance solutions. Varghese et al. (2009) adopts the concept of resilience to investigate the social consequences of local ownership and control of forestry mills, focusing on social learning and distribution of benefits. Work by
Lyon and Parkins (2013) seeks to counteract the functionalist tendencies in the resilience literature. Using the theoretical lens of cultural morphogenesis, which focuses on the influence of cultural systems as a key determinant of collective behavior, the authors compare two communities facing mill closure and the role played by cultural attachment to the mill in influencing collective responses and strategies.

The convergences between sustainability studies and SESF are quite apparent. Not only do they apply some of the same vocabularies, they share a commitment to diagnosing sustainability dilemmas through the application of structured methodologies including comparable variables. Both reflect a preference towards empirical research grounded in a pragmatic approach. In the case of sustainability studies, this is largely concentrated on measures of social sustainability, which are also captured within the social subsystems of the SESF, named actors and governance. The literature revealed a few exceptions, such as work applying the capitals framework or social-ecological resilience. By comparison, the SESF offers an expansive and coherent framework, which includes biophysical components and seeks to attend to the interactions and feedbacks between various components of the system. In terms of interdisciplinary and social-ecological connectivity, the SESF presents some advantages.

**Discussion and Conclusions**

Tracing out the differences between these research traditions, including epistemological, theoretical, and methodological perspectives, and comparing them with the social-ecological systems framework reveals important differences but also strong complementarity. Each intellectual tradition brings a unique lens towards depicting the circumstances and qualities of resource-dependent communities in Canada, revealing a diverse assemblage of communities beset by important challenges, which can be traced to historical processes of development. The lessons captured by this literature have far-reaching implications not only for Canada but also other countries and regions living in relationships of economic dependence with industrial resource industries.

We sum up the general qualities of each category in Table 1 (keeping in mind that each category includes some outliers). In terms of their positionality, the SESF and staples research are furthest apart. Staples research is defined by its coherent theoretical approach, which focuses on the influence of structural conditions at a global level, which shape inequalities in resource-dependent regions. Through its analysis of political-economic regimes, including powerful actors and institutions, staples research poses an important social critique of Canada’s development model. This is very different from the SESF, which focuses primarily on social processes at the level of individuals, groups, and communities, albeit under the influence of external factors. For SESF, relationships to environmental conditions in territorially bounded systems is paramount, while for staples, the environment is sometimes overlooked or defined largely from an utilitarian or social perspective, as resources subject to pressures from the human use or as the subject of emerging social movements. The conception of institutions is also different, as staples focuses on formal actors and rules while SESF is attentive to the influence of social norms and collectively-defined institutions at the local level. Despite their differences, the two approaches are complementary, in that they both point to the
complexity of social and economic configurations that emerge in the context of resource-dependent communities, however, using different approaches, scales, and methods.

Work in the rural development category shares the SESF’s orientation towards description and analysis at a community level. Both traditions are interested in socio-political dynamics, insofar as they can facilitate processes of territorially-anchored development. However, in the case of rural development, its strength resides in its treatment of social dimensions of community well-being. The research reviewed here includes statistical work, documenting characteristics such as employment patterns, mobility, and poverty. It also includes interpretive work, which speaks to the different discourses, which exists in resource-based communities, questions of power, and the experiences of women and marginalized groups. Finally, the literature also speaks to issues of policy and social planning, calling for socially responsive and locally grounded approaches. The rural development literature is perhaps the most eclectic category, encompassing different methods and epistemological standpoints, however, it shares a commitment to in-depth empirical analysis. Indeed, its analytic focus, especially with regards to discursive and relational aspects of communities, likely surpasses what the SESF intends to do (Epstein et al. 2014). However, the SESF, through its problem-driven approach and its commitment to the application of a shared framework, has strong potential to bring a more integrative and consistent approach to understanding community dilemmas, connecting these with broader environmental dimensions.

Sustainability studies is closest to the SESF approach. Both share a concern with the long-term viability of communities and ecosystems, and the need for research to address the practical problems associated with resource use and exploitation. Although addressed less explicitly in this article due to the focus on community well-being, issues of resource governance are central to both literatures. The use of concepts such as resilience and forms of capital (social, natural, etc.) is also common to both research

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**Table 1. Broad findings related to SESF and each literature review category.**

<table>
<thead>
<tr>
<th>Research category</th>
<th>Focus</th>
<th>Scale</th>
<th>Methods</th>
<th>Treatment of institutions</th>
<th>Treatment of environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>SESF</td>
<td>Interdisciplinary diagnostics of sustainability dilemmas</td>
<td>Micro-meso</td>
<td>Mixed methods (interviews, land use information, ecological data, policy analysis)</td>
<td>Formal and informal. Focus on endogenous processes</td>
<td>Anthropocentric with explicit variables</td>
</tr>
<tr>
<td>Staples</td>
<td>Analysis of macro-structural forces shaping resource economies</td>
<td>Macro</td>
<td>Historical and policy analysis</td>
<td>Formal. Focus on exogenous processes</td>
<td>Anthropocentric without explicit variables</td>
</tr>
<tr>
<td>Rural development</td>
<td>Description and analysis of community processes and social dynamics</td>
<td>Micro-meso</td>
<td>Mixed methods in social science (statistics, interviews, surveys, ethnography)</td>
<td>Formal and informal. Focus on endogenous processes</td>
<td>Absent or anthropocentric without explicit variables</td>
</tr>
<tr>
<td>Sustainability studies</td>
<td>Analyzing progress towards the objectives of social sustainability</td>
<td>Micro-meso</td>
<td>Mixed methods in social science (statistics, interviews, surveys)</td>
<td>Formal and informal. Focus on endogenous processes</td>
<td>Absent or anthropocentric with explicit variables</td>
</tr>
</tbody>
</table>
approaches. While the sustainability studies literature is more strongly oriented towards the analysis of social dimensions of sustainability, we can, nonetheless, see an emerging interest towards the incorporation of environmental measures and concerns into the analysis. The methodological orientation of this work also shows similarities. Both favor structured methodologies, based on variables and indicators, which allow for empirically-based portraits of social and/or social-ecological systems. In the case of sustainability studies, this is not the only methodological approach applied. There are also studies, which draw on case studies using interpretive methods, however, these are sometimes translated into measurable indices, to enhance comparability.

Where the SESF distinguishes itself from existing approaches is through its objective to incorporate natural systems into a coherent analysis and to view social and ecological systems as coupled and interactive. The SES framework is unique in this regard, as it acknowledges the inherent complexity of natural systems and sets out broad parameters for the inclusion of environmental variables. This clearly contrasts with the existing research on resource-dependent communities in Canada, which either overlooks environmental connections and dynamics altogether, views them as a backdrop to social processes or treats them as a supply of natural capital in service of the community or the nation. The SESF does not represent a complete departure from this anthropocentric view of natural resources, however, it does provide a starting point for comparable efforts to address sustainability challenges through social-ecological analysis. While the operationalization of the SESF brings with it a host of challenges (Thiel, Adamseged, and Baake 2015), it provides an interesting opportunity to enhance work in this area through a more integrated and interdisciplinary approach, which draws attention to community-environment linkages and interactions. However, the globalized character of economic conditions in Canada’s resource-dependent communities presents particularities, which are relatively unexplored by work in the SESF tradition. It will be important to adequately theorize dimensions related to the external setting (social, economic, and political) in combination with the analysis of the internal social-ecological system. A useful next step would be to apply SESF to an empirical case study, in order to further clarify the extent of congruity.

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