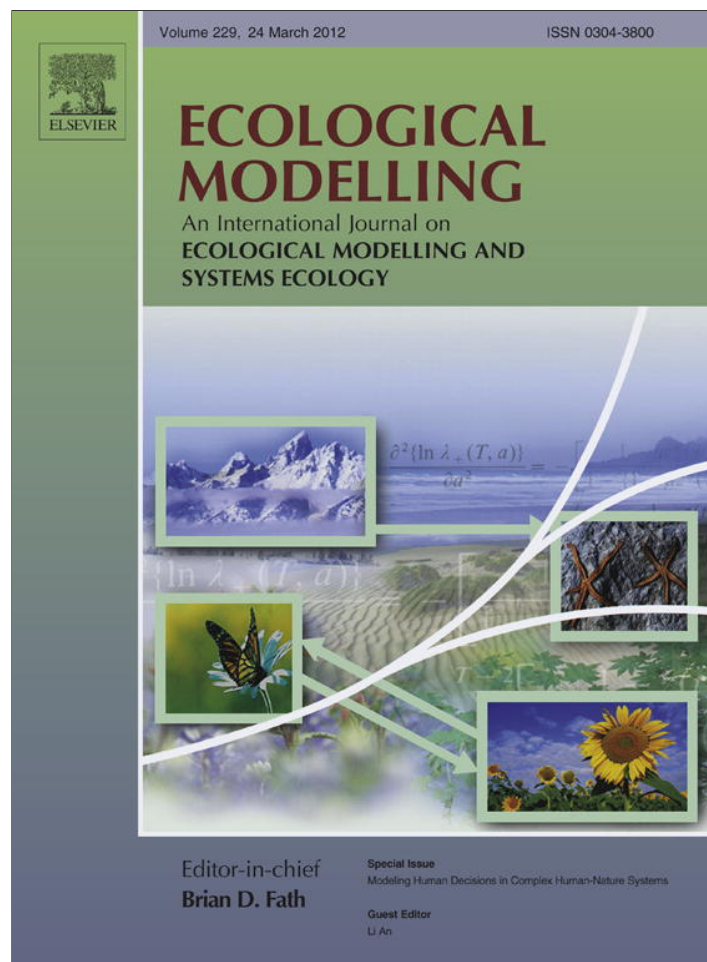


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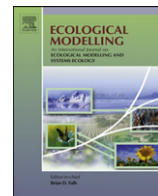
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Ecological Modelling

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

Figured worlds: Environmental complexity and affective ecologies in Fanjingshan, China

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ARTICLE INFO

Article history:

Available online 29 July 2011

Keywords:

Environmental complexity
Networks
Relations
Assemblages
Affects

ABSTRACT

This paper takes environmental complexity to task by offering a way to understand the heterogeneity of an ecosystem in terms of its components' *relations* rather than in terms of individuals (disaggregate) or wholes (aggregate). To do so, we use Escobar's notion of *redes* (networks) and Deleuze and Guattari's ideas about human/environment relations as they relate to understanding the practical, political and emotional complexities of change in Fanjingshan National Nature Reserve (FNNR), Guizhou Province, China. A critical issue in the reserve relates to the resource-use relations between local farmers and an endangered snub-nosed monkey species, *Rhinopithecus brelichi*. Deleuze and Guattari point to understanding complexity through affective ecologies, while Escobar's work is particularly useful in connecting local activism, ecotourism, and community networks in an attempt to contest globalized hegemonic discourses that do not necessarily support sustainability at the local level. The 21,000 farmers within FNNR have an intimate knowledge of their local environment that derives from day-to-day living and, for some farmers, from generations living in a particular area. The paper discusses some of the actions of local farmers that are variously connected to, and emotionally charged around, sustainability and the preservation of the snub-nosed monkey.

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1. Introduction

Jonathan Maskit (2009, p. 129) describes sustainability as “too many people using up too much stuff too quickly for it to regenerate itself.” Of course, there is a huge and growing body of academic and popular literature debating the efficacy of these kinds of simple statements. Julian Simon (1998), for example, makes an argument for growth economics by suggesting that scarcity is always only relative and, if allowed, the market will find substitutes. On the other hand, William Rees (2001) suggests that the unsustainability of current rates of economic growth is precisely because of disruption to basic ecological processes that are not easily substitutable. Arturo Escobar (2008, p. 9) takes this argument to the plight of indigenous peoples, noting that local practices “embedded in rituals, languages, and forms of classification of natural beings [humans, monkeys, trees] that might look strange to moderns” have a built in notion of local practices of sustainability that has become impractical owing to a variety of pressures, including global economics and state development initiatives. He points to this as one of the most difficult predicaments for conservation activists and advocates who are ever pushed for more rational ecological and environmental practices: “in doing so, they ... are moving away

from the long-standing, place-based notions and practices which ensured a reasonable level of sustainability until recent decades” (Escobar, 2008, p. 9).

With this paper we look at the complexities of the notion of sustainability as it affects the political, emotional and practical everyday lives of farmers in the Fanjingshan National Nature Reserve (FNNR) in Guizhou Province, China (Fig. 1). To do so, we evoke an alternative theory of development from Escobar and post-structural theories of human/nature relations from Gilles Deleuze and Felix Guattari as ways to understand the complexity and heterogeneity of ecosystems in terms of their components' *relations* rather than in terms of individuals (disaggregates) or wholes (aggregates). To the extent that everyday lives are affected by larger global processes and that those, too, can be understood by components' relations, we also speak to the ways that global economic development impacts local geographies. Sustainability at the local level is complexly woven with global economic restructuring and regional circuits of capital. Part of what we look at here relates to the complex relations between local practices amongst the 21,000 farmers in FNNR, and a recent upsurge in tourism and concomitant external representations of the area's economic potential.

Escobar (2008) argues that it is important for indigenous peoples to create ‘figured worlds’ in which local practices, culture, and identities are deployed effectively enough to create a visible (spontaneous, emotional and corporeal) space that contests external, hegemonic representations of that place. In his work in Columbia,

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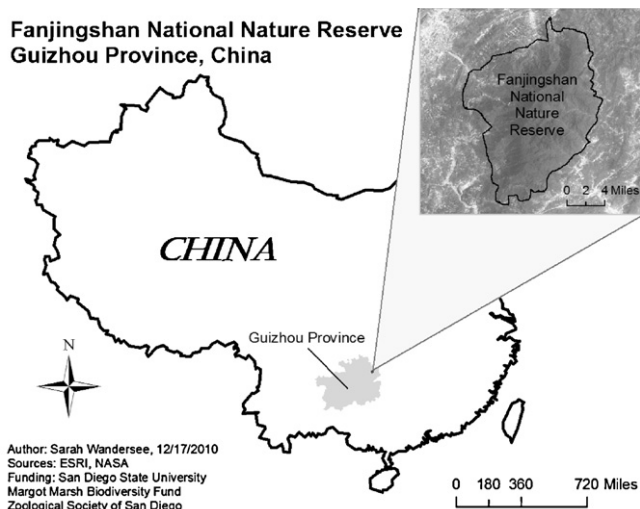


Fig. 1. FNNR, Guizhou Province.

Source: Sarah Wandersee.

Escobar focuses on the ways the local Black Community appropriated and conserved aspects of nature by, for example, coordinating various groups to negotiate with government agencies and stop the construction of an intended oil pipeline. Escobar's focus on social and activist movements at odds with the state and global capital is not paralleled overtly in FNNR where there is no institutionalized resistance to larger processes of development. Rather, the local area foments a nuanced set of relations between traditional cultures and farming practices and pushes from the state and global capital to create a particular kind of figured world. We look at some of the everyday behaviors of farmers who reside in the FNNR within the contexts of, culpability with, and contestation over, external representations of area that may focus more on eco-tourism or cultural heritage than traditional farming. We argue that representations, feelings, and behaviors are complexly woven together at a number of different levels and yet it is imperative that researchers and policy makers do not lose sight of the shifting local relations that bind those complexities in projects that push sustainability as a goal. An easy way to lose sight of complexity is with simplistic seemingly rational models that do not account for place-based relations within an ecosystem, or relations that transcend numerous scales of influence. In contrast, we propose a model based on affective ecologies that account for the complexities of local places and the ways that indigenous peoples, flora and fauna are affected by relations with each other, state governance and exogenous forces.

A critical issue in FNNR relates to the resource-use relations between local farmers and an endangered snub-nose monkey species, *Rhinopithecus brelichin* (Fig. 2) whose study and preservation is the *raison d'être* of the reserve, which was established in 1978. The farmers within FNNR have an intimate knowledge of their local environment, borne from their daily practices that date back, in some cases, many generations. They also are part of state-created education programs on preservation and sustainability, and some are beneficiaries of new eco-tourism projects that focus on the spectacular scenery, exotic Buddhist temples and, of course, the elusive snub-nose monkeys. We speculate on the ways the FNNR is an example of Escobar's (2008) concern for building on identity, territory, affect and autonomy where they may exist locally and how the creation of a figured world may help indigenous farmers contest external representations of local potential, even where institutionalized resistance is lacking.



Fig. 2. Guizhou snub-nosed golden monkey.

2. Local places, identities and assemblages

Tropes such as development, modernization, self-reliance and sustainability may speak to important changes and transformations, but contemporary development theorists who engage post-structuralist and feminist arguments note that they also speak to the external policies and practices of international institutions, NGOs and revolutionary governments whose bases are often predicated upon notions of enlightenment progress, linear development towards mass consumption and a male-dominated public-sphere (cf. Scott, 1995). The ensuing power struggle places rationality, efficiency and optimism at the forefront of a regime that may also characterize indigenous peoples' work as inferior, backward or invisible. In discourses of this kind, social struggles focus on productive activities that exclude equal gendered power relations and retain notions that, for example, the reproductive sphere (e.g., child-bearing and rearing, feeding workers, education) is subordinate to money-making activities and that natural processes should be manipulated for profit when possible. Alternatively, a focus on local values de-stabilizes the grand terms of enlightenment-based, universal development but, that said, it may also romanticize 'the local' and 'indigenous' to the extent that political power is lost at the local level. Escobar's post-structuralism moves development theories to a relational understanding of change and transformation that establishes local political will, with a focus on creating "locally situated, culturally constructed and socially organized" figured worlds as the sort of spaces "in which cultural politics are enacted that result in particular personal and collective identities" (Escobar, 2008, p. 218). The idea of figured worlds resonate with the kinds of communities advocated by economic geographers, Katherine and Julie Gibson-Graham (2006), as a basis of a postcapitalist politics where the economic capacities of reproductive activity are recognized, and specific geographies are released from an ontology of structure. As complexity theory recognizes, 'structures' do not necessarily predetermine the kinds of connections people and animals make. There is always the possibility of the happenstance, where new categories arise that lead to emergent worlds (Smith, 2007). In challenging the structures of western development theories, Gibson-Graham and Escobar are indebted to the work of Gilles Deleuze and, in particular, his collaborations with Felix Guattari. Deleuze and Guattari's (1987) notions of *deterritorialization* and *reterritorialization*, for example, offer a post-structural engagement where the former process deconstructs a particular assemblage (a region, an ecosystem, a habitat, a social group, an individual) and thus opens up new possibilities for existence, while the latter

reassembles this intensity to form new identities that are viable within the context within which it finds itself. From Deleuze and Guattari, new ideas of space and complexity emerge. Rather than positioning identity in a fixed, grounded, Cartesian grid, a Guattarian *space* evokes air, smoothness and openness while a Deleuzian *identity* focuses on differences and potentialities (Aitken, 2009, p. 12). With this way of thinking, note Gibson-Graham (1996, p. 82), the structure of identity is splintered into the not-knowing of multiplicity, heterogeneity, rupture and flight:

“The map is open and connectable in all its dimensions; it is detachable, reversible, adapted to any kind of mounting, reworked by an individual, group or social formation” (Deleuze and Guattari, 1987, p. 12).

From this perspective, the map/figured world of people–animal–place relations is reworked as open, malleable and infinitely accessible for individuals and groups to create the possibility of affective ecologies through what Escobar (2008, p. 32) calls mutually constitutive processes of localization.

2.1. Local spaces of development, affective ecologies and the bricolage of nature

What occurs in places like FNNR is an encounter between self-organizing ecosystems and indigenous people from below, on the one hand, and state structures comprising hierarchical institutions of various kinds, on the other hand. Escobar (2008, p. 32) elaborates a complex power-play between these two conflicting, yet mutually constitutive, processes of localization. First, the dominant forces of the state and capital attempt to “shift the production of locality in their favor,” thus ultimately creating “. . . a delocalizing effect with respect to places,” and, second, there are what Escobar refers to as subaltern forms of localization: “place-based strategies that rely on the attachment to territory and culture; and network strategies.” In the first instance capital and the state mobilizes a politics of scale that valorizes local endeavors (e.g., some eco-tourism programs are problematically foisted on indigenous peoples and are advertised globally as authentic, traditional experiences that do not hurt the environment). To the extent that these strategies do not originate from local places (they may come from the state or from the global capitalist enterprises) they inevitably induce a delocalizing effect in terms of an unfolding of social and ecological life. In the second instance are subaltern strategies, which follow the Deleuzian notion that “the oppressed, if given the chance . . . and on their way to solidarity through alliance politics . . . can speak and know their conditions” (Spivak, 1983, p. 25). Escobar’s alternative development strategy advocates a solidarity of community activism and grassroots organization, which is at odds with political practices in FNNR but, as we shall show in a moment, there are lessons to be learned from the coalescence of state-supported initiatives and local practices within this region that suggest mutually constitutive tensions and positive affective ecologies.

To the extent that affect is about how changes in one body (a nation, a habitat, a farmer, a monkey) result in transformations in other bodies, *affective ecologies* enable a nuanced understanding of complex relations with a focus on perpetual adjustments and motion. Affective ecologies approach classification, taxonomy and identity as always in motion or, to use Deleuze’s (1994, p. 40) words, as principles of *becoming*. Deleuzian scholar, Brian Massumi (2002, p. 15) extends this by arguing that “. . . affect offers a way of weaving together concepts of movement, tendency, and intensity in a way that takes us right back to the beginning: in what sense the body coincides with its own transitions and its transitions with its potential.” A focus on affect as process is quintessentially ecological. Arne Naesse (1989, p. 36) characterizes the methodology of the discipline of ecology as one suggested by the simple maxim “all things

hang together,” and similarly, Massumi (2002, p. 43) declares that “[a]ffect is the whole world, from the precise angle of its differential emergence” (Massumi, 2002, p. 43). Of course, by definition concepts like affect, movement, tendency and intensity are extremely difficult to tie down, but what is important is Deleuze’s insistence that they can be known, grasped and made intelligible. By so doing, Deleuze’s work provides researchers with a nexus that unequivocally interweaves affect and transformative thinking through an alternative conceptualization of ecological bodies in motion (Curti et al., forthcoming). For Deleuze and Guattari (1987, p. 316), motion provides a way to understand the ways territories are unhinged. As Ronald Bogue (2009, p. 44) points out, Deleuze and Guattari recognize that although various functions (sex, aggression) are organized within a territory, no single function causes the territory to come into existence. Various functions are organized or created as a collection of heterogeneous entities that fit together in an assemblage only because they move towards territorialization, and not the other way around. As we point out in a moment, Escobar’s notion of a figured world provides some stability to this motion, without sacrificing the nuances of affects.

The ontological basis for the kind of post-structural identity relations that Escobar sets out are best articulated as process through Deleuze’s (1993) notion of *folding*, wherein bodies have the capacity to unfold and enfold the spaces and discourses they encounter through the myriad of micro-behaviors that comprise everyday actions; and as pattern through Deleuze and Guattari’s (1987, p. 196) use of the term *bricolage*, wherein parts and items are put together in complicated ways, “not because they fulfill some ideal design but simply because that are possible.” Related to deterritorialization and reterritorialization as defined above, unfolding and enfolding suggest processes through which territories (habitats, ecosystems, regions) make new relations. From an ecological perspective, the notion of Nature as *bricoleur* assumes the interconnectedness of all things and, with relevance for what we are trying to do here, it highlights the complex relations of place attachment and other people’s and animals’ relations with space.

Place attachment within a world of bricolage is described by Deleuze and Guattari (1987) as a realm of “universal desiring production, in which ubiquitous desiring-machines are connected in circuits through which pass diverse flows and fluxes” (cited in Bogue, 2009, p. 44). These circuits may include what we normally think of as machines (tractors, irrigation systems or a monkey’s digestive system), but they may also connect assemblages of humans, fauna and flora and processes “. . . in makeshift, variable relations, and the flows may consist of matter, energy, information, sensations, thoughts, fantasies, and so on” (Bogue, 2009, p. 44). Desiring-production is not about optimization and efficiency, but about satisfactory and good-enough functioning that makes room for breakdowns, pauses, glitches and changes in motion.

To help us bring this discussion of ecological complexity back to Escobar’s focus on local activism, Simone Bignall (2010) notes important connections between apathy and activism and Deleuze and Guattari’s positive conceptualization of desire-production. For Bignall, desire-production provides an alternative understanding of motivation and selfhood made through the complex and piecemeal relations forged through folding. Importantly for what we are trying to do here, she argues that the individual or community has an immediate and active interest in the quality of its multifaceted relations with others. This helps elaborate Escobar’s work on institutionalized activism in Columbia to the FNNR, where activism finds another path, and “. . . can be read as practices aimed at creating and safeguarding the social conditions that foster the complex relational composition of selves and communities” (Bignall, 2010, p. 7). If identity politics, the crux of Escobar’s development theory, are constructed through what Deleuze calls a ‘folding of forces’, then they concern the ability of a body (a farmer, a monkey, a

park manager, a wild pig, a stack of bamboo) to act upon itself and to produce itself as a subject. This force enables a bending back of power – a self-governance – to emerge. In this way, Deleuze's folding of forces enables a subject to actively construct and shape its own bodily relations to the world and thereby create a figured world as something that is produced, reproduced and naturalized through everyday behaviors. Alternatively, the 'folding of bodies' concerns the body's material relations with space and a 'fold of the line outside the fold' forms when a body connects with creative potential, which Deleuze (1988, p. 104) calls the virtual: a very real but not yet actualized potential. This is the indeterminate space of change that may set the stage for the creation of a figured world but can also easily be co-opted in favor of external forces that have a very different idea of the potential of a local area.

2.2. Complex nature/human relations and local activism

Deleuze and Guattari's ideas embrace ecological principles because they describe change for human and non-human alike. Escobar's relational focus is tied specifically to activism and everyday behaviors of indigenous peoples. The kind of activism described by Bignall (2010, p. 13) derives from desire-production as a positive force that generates complex individuals and assemblages. Complex bodies are not affected wholly or entirely, but by a vast number of internal and external relations at any one time that impact upon and transform them in partial and selective ways. In *Difference and Repetition*, Deleuze (1994, pp. 70–91) describes the becoming of being as a process involving increasing activity through which a body enriches its affective capacities by increasing its powers of engagement and sociability in terms of a kind of non-linear 'progression'. Bignall (2010, p. 22) argues that this ontology "encourages one to think of oneself as a 'complex' self, with a direct interest in activism that aims to create enabling social conditions of diversity, equity, liberty and radical democracy since these are the conditions that permit open exchange and interaction in communities of practice." Communities of practice pre-sage figured worlds by establishing certain competencies and capacities for place-based, situated learning (Escobar, 2008, p. 218). Escobar argues that the creation of figured worlds for indigenous people provide a bases for challenging inequality and neo-liberal policies that may raise from forms of sustainability that are really about foisting on local areas practices that primarily benefit ideas of state governments and global capitalist institutions. As a complex self, Bignall (2010, p. 22) goes on to argue, "one has an unmediated interest in activism that seeks to safeguard the wider ecological conditions that protect other forms of (non-human) diversity as part of a broad existential milieu."

In understanding affective relations between components in an ecosystem it is important to understand the scales of change. While acknowledging that activism and changes in behaviors are often strategies to preserve basic elements of life-style and traditions, because changes seldom occur in the form of dramatic events, and because social change may be seen as something that is discursively imposed on people (Lie and Lund, 1995, pp. 7–8), it is important to understand that from Escobar's relational perspective the material contexts of life change over time, and that marginalized peoples can take advantage of these changes. For example, when a woman enters a new field of work, it necessarily implies "... changing relationships to fathers, brothers and husbands and may lead to new socio-cultural definitions of what belongs to the male and female spheres" (Lie and Lund, 1995, p. 11). Change dynamics are not easily understood by focusing on change in individuals and aggregates circumscribed within a predefined systems but, rather, by focusing on relational complexities. A directed and constructive Deleuzian pol-

itics is found in figured worlds, which cultivate understandings of the complex social benefits if diversity and equality as the material scaffolding of affective ecologies.

Recent decades have witnessed considerable interdisciplinary research and conservation efforts pointing to a fundamental question of how we can better understand the ecological complexities of humans, protected species, and the environment (e.g., Ehrlich and Wilson, 1991; Vitousek, 1994; Jeffers, 1997; Vitousek et al., 1997; Dirzo and Raven, 2003; Smith et al., 2003; Turner et al., 2003; O'Connor and Crowe, 2005). Much of this work pulls from a very specific form of complexity theory development that helps understand how organisms adapt to their environments. A complex adaptive system is contrasted with ordered and chaotic systems by the interactions between the system and the agents acting within it, according to certain prescribed rules. Escobar's ideas of complexity and dynamic relations are informed by Deleuze to the extent that rules and boundaries are flexible and individual components and systems no longer need precise definitions.

The idea of complex relations being unfolded and enfolded in a Deleuzian bricolage is picked up by Escobar (2008) when he argues for *redes* as networks or assemblages that open up the possible of transformative action in the face of blistering and relentless attacks by corporate and colonial capitalism. The Spanish *redes* is most closely related to the English term *network*, but Escobar (2008, p. 36) uses it to convey the more powerful Deleuzian idea of *assemblages* that constitute folding and dynamic relations at all scales. Deleuze's use of *assemblage* as a way to understand the complexity and heterogeneity of ecosystems in terms of its components' relations rather than in terms of individuals (disaggregate) or wholes (aggregate) has gained some considerable foothold of late in the social sciences. Manuel DeLanda (1997, 2002, 2006) articulates a theory of assemblage based on Deleuze's ideas. Arguing that it cuts across the nature-culture divide, he points out that unlike organic totalities, the parts of an assemblage do not form a seamless whole (DeLanda, 2006, p. 4). Because assemblages are wholes whose properties emerge from relations between parts, they can be used to model affective ecologies. The relationships between the assemblage and the components (also assemblages) that comprise the assemblage are complex and non-linear (DeLanda, 1997). This non-reductionist, non-linear perspective cannot be generalized or idealized, and only provides a glimpse or impression of material conditions at a particular moment. Escobar argues with the Spanish word *redes*, literally a network, is better translated as an assemblage. Nature and social change, he notes, "... are ineluctably produced in and through relations in a dynamic fashion ... Images of *redes* circulated widely ... in the 1990s [in the global south] ... represented graphically as drawings of a variety of traditional fishing nets, lacking strict pattern regularity, shaped by use and user, and always being repaired, *redes* referred to a host of entities, including amongst others social movement organizations, local radio networks, women's associations, and action plans" (Escobar, 2008, p. 26; Fig. 3).

Escobar alternative development advocates activism with two political strategies that focus on (i) attachment to place, and (ii) attachment to *redes* that empower social networks to enact a politics of scale from below. These latter strategies, engage "local movements with biodiversity networks, on the one hand, and with other place-based actors and struggles, on the other" (Escobar, 2008, p. 32). The idea of attachment is based on the ways that identities are constructed through everyday practices at many levels. Escobar points out that although daily tasks and activities create the micro-worlds to which we are most intimately tied, at another level it is possible to create more stable, albeit always changing, figured worlds where identity construction operates through an active and emotional engagement with the world: "There is a constant tacking between identity, local contentious practice, and historical

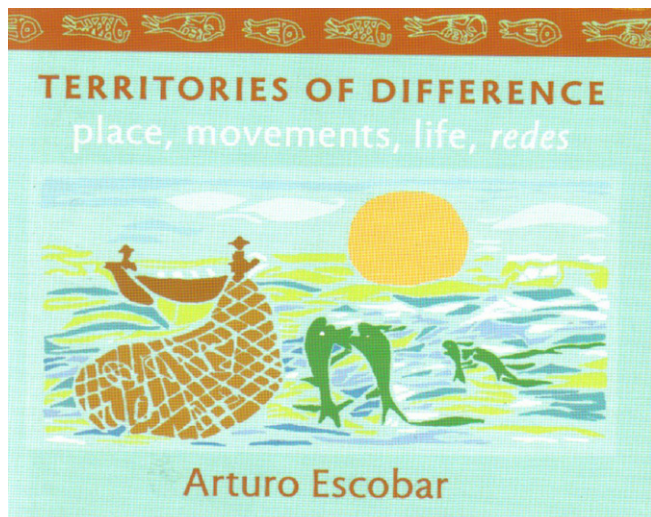


Fig. 3. Escobar (2008) points out that *redes* are sometimes referred to metaphorically as a traditional fishing nets.

struggles that confer upon identity construction a dynamic character” (Escobar, 2008, p. 203).

Escobar (2008, p. 65) argues that relational strategies for battling externally imposed structures “should take as a point of departure an understanding of resisting, returning, and re-placing that is contextual with respect to local practices, building on movements for identity, territory, and autonomy wherever they may exist.” By so doing, he provides a nuanced way of understanding complexity that always favors the growth of sustainability and management through local actors. Escobar’s empirical work follows the activism of PCN (Process of Black Communities of the Columbian Pacific) that arose spontaneously in the 1990s in response to an exogenous developmental model imposed by the Columbian state in concert with local incursions by global capitalist enterprises intent upon developing and extracting profit from the region’s natural resources. To the extent that there is no comparable local activism in FNNR, in the balance of this paper we focus on nascent development in the region and its effect on local practices amongst ethnic peoples.

In what follows we highlight complexities in the FNNR where there are variable social and bio-diverse relations between the endangered snub-nose monkey and indigenous farmers and their traditional agricultural practices; where tourist policies bounce back and forth between eco-sustainability and profitability, and where economic development and education interweave at times in ways that highlight delocalizing effects and at other times suggest the creation of a figured world for indigenous peoples.

3. Impressions of complexity and dynamism in Fanjingshan Reserve, China

The project from which the work in this paper is derived aims to establish a complex relational approach to 1) educate local indigenous people and FNNR staff, and 2) empower farmers, tourists and policy-makers in their conservation knowledge and awareness. The approximately 21,000 local residents who dwell within or near the reserve boundary mostly live a subsistence lifestyle. These residents are allowed to enter non-key-habitat forests and collect resources (e.g., fuelwood, herbs, mushrooms), and herd oxen (Aitken et al., 2011). Forests, particularly at higher elevations, serve as the shelter, cover, and food sources for golden monkeys.

3.1. Interviewing FNNR farmers and park rangers

Between May 25 and June 17, 2009, we interviewed a total of 69 households near the two major tourist trails within FNNR. Our survey was administered based on a stratified random sampling. From the lists of households provided by local administrative staff (e.g., police stations, management stations), we randomly took 5% of all the households from 54 villager groups that are close to the two existing tourist trails through the reserve. Villager groups are the most basic administrative unit in China, consisting from around 10 to over 100 households in our selected areas. If a certain household was not available for interview, we chose to survey the nearest one that was available. The interviewee for each selected household was the most knowledgeable person that was available at the time, e.g., the household head or his/her spouse (parents in some rare cases). The 69 households included 337 people. Amongst these 337 people, 170 were male and 167 female; 260 belonged to the Tujia ethnic group, 39 to the Miao group, and 36 to the Han group. Out of the surveyed people, 151 had an elementary school education only, 108 a middle school education, 15 a high school education, 12 a college education, and 51 had no formal educational training. The minimal, average, and maximum expenses of these surveyed households were 2000, 31,700, and 193,400 Yuan (we did not directly ask for income as such information is usually more sensitive and difficult to obtain). Prior to each interview, we explained the purposes of our interview, our protection of their privacy (e.g., only use for research, the confidentiality of our survey results), and obtained permission orally to continue our interviews. We also informally interviewed several Park Rangers and other FNNR officials.

As part of a larger study, the on-site interviews were performed to solicit local people’s attitudes and feelings towards local ecotourism programs and monkey conservation, along with their forest resource consumption, household income and expenditure, demographic features, knowledge about local environment and protected species, and attitudes towards emerging social issues (e.g., migration, childbearing). Our statistical analysis, including generalized linear models, revealed an almost unanimous support of monkey conservation/local tourism and a good awareness of protected species (see Aitken et al., 2011; Wandersee et al., submitted for publication). Local people’s perceived benefit from conservation, varying from household to household, can be explained by household expense and the amount of time spent collecting fuelwood. The perceived benefit from tourism is more likely found in households who spend less time collecting medicine herbs, and this is found especially in households of the Han ethnic group. The Han are the majority ethnic group in China as a whole, but represent a minority in the FNNR. Melissa Brown (2001), in discussing the disjuncture between official classification and local sensibilities amongst Tujia people, notes that while state officials classify ethnic groups based on common culture (including language), locals often classify themselves based on socio-political and gendered experiences (see also Schein, 2000). As we shall note in a moment, state sanctioned eco-tourism projects and a focus on local activism muddled the contexts of ethnicity in FNNR.

Local households primarily use fuelwood for cooking and heating in the winter. The surveys showed that the average fuelwood consumption per household amounts to 12,600 kg/year, and local farmers spend 233 days in fuelwood collection. The same surveys showed that local residents collect fuelwood year round, with greater harvesting rates from late Fall to early Spring. Other resource collectors enter the reserve in seasons when specific resources are most available. For example, bamboo shoots are collected in early Spring and giant bamboo stocks are harvested in late Spring to sell to construction projects located close to the growing tourist centers (Fig. 4).



Fig. 4. Two men paddle a bamboo raft from the interior of FNNR to market in late Spring.



Fig. 5. Lowland village landscape in the FNNR.

3.2. *The Ghizhou golden monkey assemblage*

To address questions of complexity and dynamism in FNNR from a relational perspective it is perhaps best to begin by engaging policy and practical complexities as they relate specifically to the Guizhou golden monkey and the farmers who occupy the reserve. The golden monkeys are endangered because of their small population size (around 700–800 monkeys; Yang et al., 2002, p. 94), high infant mortality (20%), and other life-history traits (e.g., 3 years of weaning, at least 3 years inter-birth interval). Living today in the increasingly higher reaches of the FNNR, this species may be threatened by a rapidly increasing human population within their single and last habitat, but this ecological concern is as yet not clear. That notwithstanding, as a national treasure of China and natural heritage of the entire world, the monkey is listed as “endangered” by the Chinese government and the International Union for Conservation of Nature.

In 1978 FNNR was designated specifically to protect the snub-nose monkeys and their habitat, but it also protects other species such as wild pigs. Conservation laws within the boundary of FNNR forbid hunting, poaching of killing monkeys. Out of this emerges an assemblage that provides pigs with more resources and less predation creating a problematic impact for farmers who experience the proliferation of pigs as a pest to their subsistence activities. Thus the snub-nose monkey ecological assemblage created by reserve legislation in 1978 has the unintended effect, in the first instance, of an increased pig population resulting in damage to farmers’ crops. In the second instance, it is not entirely clear how the creation of the FNNR has impacted the monkeys or how much resource use by farmers directly competes with monkey habitat. For example, some local farmers live in lowland valleys close to roadways and never enter monkey habitat (Fig. 5). In highland villages at certain times of the year farmers may venture into the golden monkey habitat in search of herbs (Fig. 6), but it is not clear if these herbs are also eaten by the monkeys. That said, human-induced habitat degradation may cause reserve managers to restrict human entry into certain areas of the reserve or at particular times, and restricted human entry may encourage monkeys to return. Interviews with park managers suggest that both loss of canopy forests and disruption by human visits are threatening the species. However, little is known about when, where, for what purposes, and how often local people enter habitat areas, and how golden monkeys may change their habitat use patterns as a result. Thus, as the farmers’ activities

flow and change in response to external and internal issues, the location and range of the golden monkeys change, but the relationship between human and monkey behaviors is by no means clear. None of the farmers we talked to in both highland and lowland villages during our fieldwork had ever seen a monkey in the wild, none had visited the FNNR clinic to see those in captivity (Fig. 2), and few had seen the stuffed monkeys at the new FNNR interpretive center (Fig. 7). Given the elusiveness of the snub-nosed monkeys for farmers and tourists alike, the stuffed monkeys on display at the interpretative center at the base of Fanjing Mountain suggest disturbing simulacra.

There are two main sight-seeing trails in the reserve through which tourists may come across a monkey troupe. Some expeditionary tourists avoid the designated sightseeing trails, entering core golden monkey habitat areas with aid from local residents as guides. Although this activity is not entirely legal, a guide who is aware of the activities of monkey troupes can significantly increase the chances of a sighting for tourists.



Fig. 6. Highland village landscape in the FNNR.



Fig. 7. Stuffed snub-nose monkey figures on display in the interpretative at the base of the Fanjingshan cable-car.

3.3. Eco-tourist assemblages

Eco-tourism and a new cable-car provide another interesting way to encounter the dynamic assemblages of FNNR (Fig. 8). The establishment of a cable-car service from the east entrance to a place near the mountain's top at Golden Peak (Fig. 9) in the Spring of 2009 substantially increased the number of tourists. Prior to the cable-car, access to the top of Fanjingshan was by long track and a formidable stairway, and normally comprised a two-day journey. To accommodate tourists a hotel was built near Golden Peak. The cable-car was justified in large part to foment and more eco-friendly form of tourism than the hotel, which is now demolished. As of 2009, over 40,000 Chinese tourists visit the Golden Peak annually, primarily between April and October with peaks in August and September. Given that the cable-car enables access to over 100 times the number of tourist previously afforded by the track and stairway, the extent to which these changes are eco-friendly is questionable.



Fig. 8. Fanjingshan cablecar.



Fig. 9. Golden Peak view platform at terminus of cablecar.

Fanjingshan's cultural heritage is based in large part on Buddhism and its ancient temples. The twin temples on Golden Peak are the largest draw for tourists and local farmers (Fig. 10). Several farmers mentioned to us that they made a yearly pilgrimage to the top of Golden Peak by trekking the path and climbing the stairs. The increased numbers of tourists to the Buddhist temples has resulted in changing work dynamics for many farmers in the area. In a process of deterritorialization and reterritorialization, those who were previously engaged in both farming and shop-keeping, for example, now find the latter much more profitable. Close to the base of the cable-car, we spoke with one young couple that has now all but given up farming their family plot while the wife maintains a shop catering to the tourists (Fig. 11). The husband has just bought an expensive new heavy-duty dump-truck to profit from the growing number of construction projects in the area. The parking attendant at the cable-car lot explained that his shop had to be bull-dozed to make way for the interpretive center and he is more than happy with his new job, which provides a stable income (Fig. 12). For him, the demise of his shop unfolded a particular precarious livelihood that was enfolded into something more stable.

3.4. Indigenous assemblages

Another part of the assemblages that encompasses eco-tourism and the economic up-turn in the area are the indigenous minorities. Some local Tujia farmers engage in a form of heritage tourism that is based on their ethnic status. Wearing traditional costumes and performing ritual dancing and singing, they engage in



Fig. 10. Buddhist temples atop the twin peaks of Golden Mountain.



Fig. 11. New shops close to the cable-car.



Fig. 14. Ethnic Miao farmer.



Fig. 12. Cable-car parking lot.

tourist-oriented activities that takes them away from less profitable farming (Fig. 13). Although the focus on their ethnicity is state-sponsored and dovetails with larger national programs that highlight Chinese minorities (cf. Brown, 2001), there is also clearly a communal pride amongst these farmers. The main motivation for this form of heritage tourism is profitability for the local village due to increasing numbers of tourists.

It is clear, however, that the effects of the tourist boom are highly localized within a mile or so of the interpretative center and the

cable-car's base or to villages located on or near paved roads. As our interviews took us into more remote highland areas in the reserve (Fig. 6), farmers were disgruntled with geographic disparities in terms of who profited from the economic up-turn when they suffered hunting and gathering restrictions and the brunt of the havoc caused by wild pigs. A farmer who is ethnic Miao and living just over a mile from the center of tourist activity at the base of the cable-car bemoaned the poverty of his family and the problem of state regulations on what he could do in the reserve (Fig. 14). A little further up the valley on a tortuously narrow dirt path is a Tujia village that has existed in this area for several centuries. Because of its inaccessibility, the village is less influenced by the local tourist boom but not, as we note in a moment, by other larger global processes (Fig. 15).

Many of the villages in the FNNR trace their beginnings to a distant past, and there is a sense of continuation and survival (sustainability?) that seems to transcend contemporary impositions and external factors. There is nonetheless an external representation of potential economic growth that is imposed upon the area based on possibilities in heritage- and eco-tourism. That beginning ventures in the area such as the cable-car to the top of Golden Peak are producing a staggering growth in tourists bodes well for these externally represented and funded projects (the cable-car project was bank-rolled, designed and implemented by a German company) to continue. The geographic disparities in who benefits from these projects and who suffers from the FNNR regulations suggest also a growing tension amongst local farmers.

The sense of place and community attachment evident amongst local villages lends itself to the implementation of education and



Fig. 13. Ethnic Tujia (an ethnic minority in China) performing a traditional dance in FNNR.



Fig. 15. Ethnic Tujia village.



Fig. 16. Locally built structure to help police river fishing.

grassroots projects, of which our work is a part. The success of state-sponsored education programs on conservation and the need to protect endangered species is clear from knowledge gleaned from village surveys. That these educational programs have indirect consequences is also evident. For example, a group of villagers living a significant distance from the cable-car were concerned about over-fishing in a local river. One of their main concerns was outsiders coming into their area using explosives and pesticides to stun and dull fish so that they could be picked up from the water's surface. The villagers came together and built a structure on the banks of the river (Fig. 16) that housed local education programs and provided shelter for a retired farmer who policed this stretch of the river and politely asked fishermen to use ecologically sound methods of obtaining fish. That this initiative began with local concern for depleting fish reserves and was implemented through grassroots activism and community labor bodes well for the success of locally inspired education and sustainability initiatives. That the scale of this initiative is dwarfed by external projects such as the cable-car and other tourism initiatives is of some concern for the sustainability of local lifestyles.

Another externally driven change that affects locally sustainability in the area relates to the massive urban migration that China is currently experiencing. We asked the headman of the ancient, off the beaten-path, Tujia village if, after centuries of passing the family farm down through the generations, he was looking forward to passing on the work to his two sons. He was shocked that we would ask such a question. Waving his hand around as if offering us the spectacular scenery of his valley he asked us if we could not see how poor they were. He wanted something better for his sons, and he was convinced that betterment for them would only come after they made the 15 hours long train journey to the city of Guangzhou (Fig. 17). Designated as an Economic and Technical Development Area, and one of China's new National Hi-Tech Industrial Development Zones, Guangzhou is a magnet for economic growth and, as a consequence, it attracts many young migrants from Guizhou Province. With a population of nearly 4 million, it is one of the biggest successes of Chinese current economic dynamism. Migration has the potential of developing young people's identities in new directions, enabling them to realize the expanding territory of opportunities while still preserving family values and connections (Punch, 2008). Park officials suggested to us that remittances from young people's migration to places like Guangzhou contribute substantially to the wealth of the remaining family members in FNNR. Park officials and farmers alike felt that the out-migration of young people did not negatively affect the overall sustainability of the region, and some suggested the precise opposite because it alleviated population pressure while



Fig. 17. Many young people in the FNNR want to move to Guangzhou.

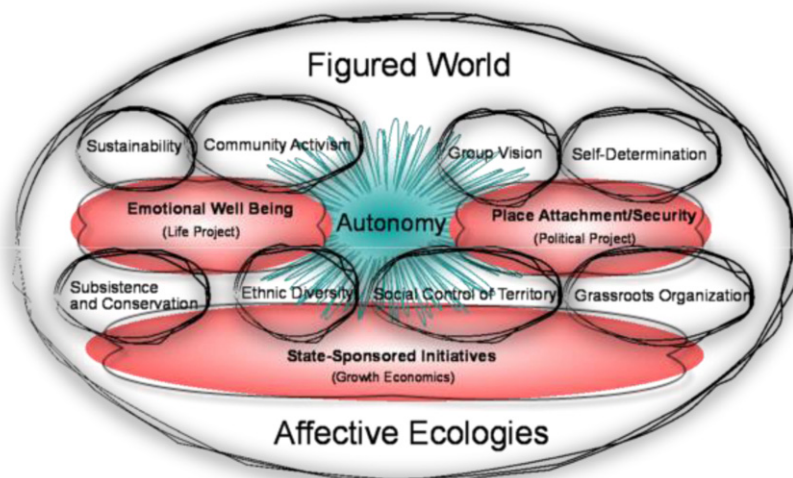
increased family incomes. In addition, an argument was made that families function as a team by sharing household duties while also withstanding periods of separation and these processes resulted in personal growth and the creation of foundations for future development in FNNR by, perhaps, creating an assemblage that meshes tradition with innovation.

4. Figured worlds and community activism

Escobar's views on identity, territory, and autonomy connect with dynamics in FNNR to create diverse affective ecological assemblages. What is less clear is how the complexities of affective ecologies coalesce his idea of a figured world into the place attachment, activism and emotional well-being that is part of the lives of indigenous farmers in FNNR (Table 1). The question of whether local practices and identities are deployed effectively enough to create a visible space that contests hegemonic representations of FNNR is not easy to answer. Interviews with farmers suggest strong feelings of emotional well-being that included endorsement of education, self-sufficiency, and the importance of family. Education came from family and community elders as well as state officials who shared traditional and new views on protecting species. These values are incorporated into evolving and complex relationships within a shifting society that suggests an appreciation of habitat loss and needs for preservation, and ways those may relate to the practicalities of resource use. State-sponsored initiatives in preservation, farming, eco-tourism and heritage are nonetheless huge in the area and have come to dominate the landscape around the Golden Peaks. On the other hand, Escobar's idea of *redes* as a traditional net that is constantly repaired and rearranged finds particular force with community activism in FNNR around problems such as wild pigs and fish poaching.

Table 1 brings together some of the ideas that fall out of our discussion of the emotionally charged ecological changes currently underway in the FNNR. Although it is a model that is roughly based upon Escobar's (2008, p. 148) work in Colombia, the lack of generalizability for this kind of ecological understanding does not enable direct transferability to FNNR. It nonetheless honors the specificity of the local contexts of indigenous farmers in the FNNR by suggesting the immense impact of the state-sponsored initiatives, which is true also for elsewhere in China. Ethnic coherence amongst the Tujia and Miao in FNNR, for example, is predicated upon state classifications (such as language) as well as more internal, place-based attachments and socio-economic connections. The lack of fixity (and infinite transferability) amongst parts of these assemblages is represented by inchoate lines around each item in the model. The model is centered around a sense of autonomy amongst the

Table 1
Some components (assemblages) of an indigenous peoples' figured world in FNNR.



indigenous farmers that is related to emotional well-being and security but also the largess and affects of state-sponsored initiatives. That the protection of snub-nose monkeys since 1978 resulted in an unforeseen proliferation of wild pigs highlights a particularly problematic and ongoing affect that diminishes the farmers' sense of autonomy. Although the grassroots organization of farmers to stop external fish poachers from using explosives and pesticides in a local river enhanced self-determination and hence autonomy, no such activism has arisen to address the issue of wild pigs.

The table is not intended to provide a comprehensive understanding of the complexity of indigenous practices in FNNR, but rather an impression of the ways assemblages might come together to create a relatively stable figured world that makes sense for the local people and points to ways forward. It speculates on the ways the FNNR example demonstrates Escobar's concern for building on identity, territory, and autonomy where they may exist locally. To the extent that there is more culpability and connection between indigenous peoples and state initiatives in FNNR than in Columbia, Escobar's model is modified to fit our local Chinese context. Although our work is in its infancy, it nonetheless seems clear that ethnic identity, short- and long-term migration patterns and changing educational opportunities are important for local attachment to places in FNNR. Informed by Deleuze's ideas of assemblages of relations made dynamic through folding, and Escobar's alternative development we focus on ecological complexities and a relational understanding of change and transformation that accounts for local contexts while also embracing less parochial changes. At this time, we are developing the theoretical and empirical bases of the project, but the work documented in this paper suggests some important insights. First, the success of heritage- and eco-tourism is locally uneven, with its main focus near the cable-car and in relatively accessible villages. The farmers who are impacted most by FNNR regulations on hunting and access are in more remote and marginalized areas. Mapped onto this are the impacts of grassroots activism petitioned by some of the local contexts of environmental education. And so, while acknowledging that changes in behaviors are often strategies to preserve basic elements of life style and traditions, we also note that the FNNR has seen an increase in national and global attention while continuing to embrace traditional ethnic cultural practices. Given that changes seldom occur in the form of dramatic events and that they almost

always move forward as an amalgamation of the old and the new, it is important to remember that from a relational perspective the material contexts of life change over time and that marginalized peoples can take advantage of these changes in unexpected ways.

References

- Aitken, S.C., 2009. *The Awkward Spaces of Fathering*. Ashgate Press, Farnham, England.
- Aitken, S.C., An, L., Wandersee, S., Yang, Y., 2011. Renegotiating local values: the case of Fanjingshan Reserve, China. In: Jones, M., Blake, P., Brun, C. (Eds.), *Festschrift for Ragnhild Lund*. Tapir Akademisk Forlag (title forthcoming).
- Biggall, S., 2010. Desire, apathy and activism. *Deleuze Studies* 4 (Suppl.), 7–27.
- Bogue, R., 2009. A thousand ecologies. In: Herzogenrath, B. (Ed.), *Deleuze/Guattari and Ecology*. Palgrave Macmillan, New York, pp. 42–56.
- Brown, M.J., 2001. Ethnic classification and culture: the case of the Tujia in Hubei, China. *Asian Ethnicity* 2 (1), 55–72.
- Curti, G., Aitken, S.C., Bosco, F.J., Goerisch, D.D. For not limiting emotional and affectual geographies. *Transactions of the Institute of British Geographers*, forthcoming.
- DeLanda, M., 1997. *A Thousand Years of Nonlinear History*. Swerve Editions, New York.
- DeLanda, M., 2002. *Intensive Science and Virtual Philosophy*. Continuum, New York.
- DeLanda, M., 2006. *A New Philosophy of Society: Assemblage Theory and Social Complexity*. Continuum, New York.
- Deleuze, G., 1988. *Spinoza: Practical Philosophy*. City Light Books, San Francisco.
- Deleuze, G., 1993. *The Fold: Leibniz and the baroque*. Translated by T. Conley. Minneapolis: University of Minnesota Press.
- Deleuze, G., 1994. *Difference and Repetition*. Columbia University Press, New York.
- Deleuze, G., Guattari, F., 1987. *A Thousand Plateaus: Capitalism and Schizophrenia*. University of Minnesota Press, Minneapolis.
- Dirzo, R., Raven, P.H., 2003. Global state of biodiversity and loss. *Annual Review of Environment and Resources* 28, 137–167.
- Ehrlich, P.R., Wilson, E.O., 1991. Biodiversity studies: science and policy. *Science* 253, 758–762.
- Escobar, A., 2008. *Territories of Difference: Place, Movements, Life, Redes*. Duke University Press, Durham, London.
- Gibson-Graham, J.K., 1996. *The End of Capitalism (As We Knew It)*. The University of Minnesota Press, Minneapolis.
- Gibson-Graham, J.K., 2006. *A Postcapitalist Politics*. The University of Minnesota Press, Minneapolis.
- Jeffers, J.N.R., 1997. Ecological consequences of biodiversity loss. *International Journal of Sustainable Development and World Ecology* 4 (2), 77–78.
- Lie, M., Lund, R., 1995. *Renegotiating Local Values: Working Women and Foreign Industry in Malaysia*. Crurzon Press, Richmond, Surrey.
- Maskit, J., 2009. Subjectivity, desire and the problem of consumption. In: Herzogenrath, B. (Ed.), *Deleuze/Guattari and Ecology*. Palgrave Macmillan, New York.
- Massumi, B., 2002. *Parables of the Virtual: Movement, Affect Sensation*. Duke University Press, Durham, NC.
- Naess, A., 1989. In: Rothenberg, D. (Ed., translator), *Ecology, Community and Lifestyle*. Cambridge University Press, Cambridge.
- O'Connor, N.E., Crowe, T.P., 2005. Biodiversity loss and ecosystem functioning: distinguishing between number and identity of species. *Ecology* 86 (7), 1783–1796.

- Punch, S., 2008. Negotiating migrant identities: young people in Bolivia and Argentina. In: Aitken, S., Ragnhild, R., Kjørholt, A.T. (Eds.), *Global Childhood: Globalization, Development and Young People*. Routledge, New York and London, pp. 95–112.
- Rees, W.E., 2001. Achieving sustainability: reform or transformation? In: Satterthwaite, D. (Ed.), *The Earthscan Reader in Sustainable Cities*. Earthscan Publications, London and Sterling, VA, pp. 22–52.
- Scott, C., 1995. *Gender and Development: Rethinking Modernization and Dependency Theory*. Lynne Rienner, Boulder, CO.
- Schein, L., 2000. *Minority Rules: The Miao and the Feminine in China's Cultural Politics*. Duke University Press, Durham and London.
- Simon, J.L., 1998. Scarcity or abundance? In: Crocker, D., Linden, T. (Eds.), *The Business of Consumption: Environmental Ethics and the Global Economy*. Rowman & Littlefield, Lanham, MD, pp. 237–245.
- Smith, D., 2007. The conditions of the new. *Deleuze Studies* 1, 1–21.
- Smith, R.J., Muir, R.D.J., Walpole, M.J., Balmford, A., Leader-Williams, N., 2003. Governance and the loss of biodiversity. *Nature* 426 (6962), 67–70.
- Spivak, G.C., 1983. Can the subaltern speak? In: Nelson, C., Grossberg, L. (Eds.), *Marxism and the Interpretation of Culture*. MacMillan, London, pp. 24–28.
- Turner, B.L., Matson, P.A., McCarthy, J.J., Corell, R.W., Christensen, L., Eckley, N., et al., 2003. Illustrating the coupled human–environment system for vulnerability analysis: three case studies. *Proceedings of the National Academy of Sciences* 100 (14), 8080–8085.
- Vitousek, P.M., 1994. Beyond global warming: ecology and global change. *Ecology* 75 (7), 1861–1876.
- Vitousek, P.M., Mooney, H.A., Lubchenco, J., Melillo, J.M., 1997. Human domination of Earth's ecosystems. *Science* 277 (5325), 494–499.
- Wandersee, S., An, L., López-Carr, D., & Yang, Y. Perception and decisions in modeling coupled human and natural systems: a case study from Fanjingshan National Nature Reserve, China. *Ecological Modelling (Spec. Issue of Modeling Human Decisions)*, submitted for publication.
- Yang, Y., Lei, X., Yang, C., 2002. *Ecology of the Wild Guizhou Snub-nosed Monkey*. Guizhou Science and Technology Press, Guiyang, China.