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# The co-production of livelihoods and land use change: Case studies from South Africa and Ghana

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**Abstract**

Land use change and livelihood systems are often analyzed separately or with one "driving" the other. This "driver-feedback" relationship has been buttressed by approaches to social process that are often far too static. Actors are confronted with a bundle of choices that they must negotiate as they create pathways of change. These choices are always bound up in relations of power and the knowledges that are the conditions for and results of these relations. We suggest that land uses and livelihood are different manifestations of the social processes by which individuals and groups negotiate the everyday conditions that shape their lives. We propose a framework that extends current understandings of the relationship between land use change and livelihoods by treating social relations of power as the entry point into this complex relationship. We underpin our arguments with empirical examples from South Africa and Ghana that locate power/knowledge relations in the context of social change in both study areas.


*Keywords:* Land use; Livelihoods; Co-production; South Africa; Ghana; Drivers of change

## 1. Introduction

Studies of land use and examinations of livelihoods, while dealing with remarkably similar issues, often occupy separate literatures. The evolving literature on land use change details how and why humans have altered their environments and often seek to generate future land use scenarios. Livelihood studies tend to focus on the material ways in which people produce and reproduce their household economies. Both types of inquiry seek to understand the relationship between nature and society through different means, and different sets of data. For us, livelihoods and land use are different manifestations of power relationships that are both productive of and the results of the conditions monitored by these two literatures. We argue that a productive starting point for the analysis of these linked phenomena lies in uncovering the power/knowledges that beget the social relations of production manifest in livelihoods and land uses.

Within their respective spheres, these literatures have made important contributions to our understanding of human–environment interaction. For example, the land use and cover change literature has become quite refined at monitoring land use change, has identified primary drivers of land use change at various scales, and has developed sophisticated models, both to predict change and offer ranges of scenarios (see especially Schoorl and Veldcamp, 2001; Stephenne and Lambin, 2001; Verberg and Veldcamp, 2001; Parker et al., 2001). The methods of determining the precise scope and pace of change are well refined, and progress has been made toward understanding the aggregation of forces driving land use change, especially in regions such as the Amazon. On the other hand, the livelihoods literature (for example, Low, 1989; Carney, 1998; Ellis, 1998, 2000; Francis, 2000; Orr and Mwale, 2001) recognizes the impact of livelihoods choices on land use

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outcomes, and the constraints of existing land uses on such decisions. For example, the livelihoods literature acknowledges that diversification of livelihoods activities to manage risk and uncertainty is a major feature of most developing world livelihoods (Ellis, 2000). Generally speaking, as livelihoods diversify the reliance on natural resources shifts and becomes decreasingly reliant on solely agricultural activities (Bryceson, 1997, 2002a), which will, in turn, alter land use.

What concerns us is the persistence of an assumption, in both literatures, of a relationship between land use and livelihoods in which changes in one are seen as both necessary and sufficient for explaining observed changes in the other (usually constructed as changes in livelihoods driving land use change). While feedbacks may return to influence the driving side of this relationship in a given locality, in general these feedbacks are treated as having an influence on the driver that is neither necessary nor sufficient to explain changes in that driver.

This "driver-feedback" relationship has been buttressed by approaches to social process that are often far too static (notable exceptions to this trend include Bassett, 1998; Turner, 1999; Bebbington, 2000, 2001; Robbins, 2001, 2004). The current literature tends to recognize that changes in the local connection between land use and livelihoods are the product of a local social system insofar as that system mediates larger influences that transcend the local, such as climate change. However, such mediation takes place, for instance, through simplified gender constructions in which women and men occupy roles that often have little history and no local constitution. Without an understanding of that history and constitution we cannot examine the diverse ways in which different people in different places link livelihoods and land use. For example, an explanatory framework for the intensification of a particular crop in a hypothetical settlement might note that this crop is primarily planted by men in situations where there is decreasing rainfall and where women's labor is available because they do not have other sources of employment that might draw them out of the household labor pool. Such an approach asks and answers *when* such land use changes take place (after a decline in rainfall) and *why* (because women's labor is available and because this plant is somehow useful in a drier environment), but despite appearances does not actually address *how* decreasing rainfall and limited women's employment come to result in a particular land use outcome (e.g. how are women compelled/convinced to contribute their labor to men's crops?). Current approaches to explanation, such as that outlined in our hypothetical example above, run the risk of conflating disparate processes by only examining their outcomes.

While we feel that both the livelihoods and land use literatures have seen recent, compelling arguments about the processes of change, particularly in agrarian landscapes, but also more recently in urban political ecology, urban livelihoods and urban land use (see especially Bryceson, 1997, 2002a,b; Black and Sessay, 1997; Bebbington, 2001; Mather, 2002; Turner, 1999; Batterbury, 2001; Lambin et al., 2001; Meikle et al., 2001; Shackleton et al., 2001; Birch-Thomsen et al., 2001; Chimhowu, 2002; Geist and Lambin, 2002; Kinsey, 2002; Perz, 2002; Slater, 2002; Sunderlin and Pokam, 2002; Ellis, 2000), many efforts have insufficiently explored social processes as part of their explanations. Livelihoods are not only the circulation of various resources, commonly labeled as forms of "capital", but also the means by which social roles are constituted and power circulated. Land use is reflective of a power-laden ordering of the world, where the appropriate crops, labor, land area and intensity for a given context are not only agricultural/biophysical facts, but important forms of knowledge that rest upon and produce relations of power in local contexts. It is because livelihoods and land use are different manifestations of these social processes through which people negotiate the challenges facing their everyday lives that we must turn our attention to these processes if we are to advance our understanding of this relationship.

To better explain the social processes we see at the center of the relationship between land use and livelihoods, we put forward the idea that livelihood and land use changes are *co-produced*, where shifts in one are reflexive of shifts in the other. It is not our intent to determine the causal factor and the affected agent in any particular land use or livelihoods scenario. Instead, we seek to extend the explanatory capacity of a literature that tends to reduce processes of change to discrete causal agents for land use or livelihoods change. While this reductionism may be a necessary first step in order to appreciate the complexity of change and its driving forces, our framework treats livelihoods and land use as different manifestations of the social processes by which individuals and groups negotiate the everyday conditions that shape their lives. The choice of the term co-production to describe this understanding of the relationship is deliberate. While mutual constitution is a common shorthand for the way we see land use and livelihoods as conditions for and results of one another, we seek to combine this understanding of the production of meaning with an understanding of material modes of production in particular sites to show how intertwined processes of (livelihood and land use) change lead to outcomes in forms of new meaning/materiality. Let us not give the impression that we dichotomize livelihoods and land use either epistemologically or methodologically. We see the two as inextricably linked. We also do not intend to reduce the study of local social change to either land use or livelihoods, or a particular land use/livelihoods nexus. Multiple, overlapping, and intertwined social processes affect change; we only focus on two.

We begin by examining the treatment of the land use/livelihoods relationship in both literatures. This review highlights the shared focus of these literatures on drivers of change and the way this focus, which limits our conceptualization of the land use/livelihoods relationship, could be broadened. We follow this review with a discussion of what we call the co-production of land use and livelihoods in which we detail how we see both land use and livelihoods as

manifestations of local social relations laden with power. We then illustrate the pathways of change visible through our approach by using two case studies to illustrate how co-produced livelihood and land use change is manifest as economic, social, and biophysical outcomes. These case studies address the ways in which a focus on the social processes that link livelihoods and livelihoods changes to particular land uses allows us not only to better understand particular local cases of this relationship, but also to create a foundation for an approach to this relationship that might result in productive generalizations. We conclude the paper by appealing to the relevant research communities to continue to break down both inter- and intra- disciplinary boundaries so that we might continue to unravel the linkages between how people earn a living and what this means for their natural surroundings.

## 2. Land use change

In preparation for this paper, we conducted an extensive literature review using materials collected previously and through the identification of gaps in our literature collection using common research tools. The literature was selected in the broadest way possible, by including research that had the words "land use", "land use change", "land use and cover change" or "land cover change" in either the title or keyword. Surely, there are both omissions and commissions. For example, there is a large literature on the impacts of land use change on the global carbon cycle, but these have been excluded since the emphasis of that literature is not understanding land use change, but rather its effects. Further, we have not meant to include all possible "land" themes here. A broader conceptualization of the field that engages more anthropological/environmental management approaches incorporates topics such as land reform, land rights, land management and tenure, resettlement, and community perspectives on land would swell the sample to unmanageable proportions, nor would many of the authors in those fields characterize their work in the realm of "land use change", even if writ large. However, we feel the review is representative as it included technical, physical, and social science journals and books.

In reviewing the literature, we looked specifically for land use studies that engaged any "livelihood" concept. We found out of approximately 320 sources, 11% (35) specifically referenced any livelihood concept. We also identified several trends in the land use change literature through this review. First, the causes of land change are often attributed to aggregate forces broadly defined (Barbier et al., 1991; Vesterby and Heimlich, 1991; Bilsborrow and Okoth-Ogendo, 1992; Heilig, 1997; Lindblade et al., 1998; Neilsen and Zobisch, 2001; Daba, 2003; Thaim, 2003) since it is often necessary to discuss how local forces synthesize into regional forces.

Second, research on the causes of change has a tendency toward assessments of global or regional driving forces of change (for example, Sage, 1994; Heilig, 1997; Soule and DeHart, 1998; DeHart and Soule, 2000). One example of this tendency is the debate over the I = PAT explanatory framework, where three primary influences are identified at the global scale: population, level of affluence, and level of technology. There are notable exceptions. Geist and Lambin (2002) divide driving forces into "proximate causes" and "underlying driving forces". The former is concerned with "human or immediate actions at the local level…that originate from intended land use and directly affect dryland cover" whilst the latter are "fundamental social and biophysical processes such as human population dynamics or agricultural policies that underpin the proximate causes and either operate at the local level or reflect influences at the national or global level". Mediating factors are described as forces that "may shape or modify the interplay between these two broad groups of causative factors" (Geist and Lambin, 2002, p. 817). This very context sensitive approach is at the cutting edge in land use studies that seek to elucidate deeper meaning behind "driving forces" (see also Reid et al., 2000). What we take issue with here is the tendency in the literature to stop short—to identify driving forces and to model results based on those findings while seldom asking "why are these the driving forces of land use change and how are they socially constructed". For example, there remains in the land use literature a concern for why certain actions are considered drivers of change in some areas and not in others (for example, Meyer and Turner, 1994, pp. 6–7). We do not view the focus on drivers as a failing of the land use change literature, rather an area where fresh approaches might complement existing knowledge.

For us, the question of why some drivers apply in one context but not another is best addressed by rethinking the concept of driving forces. The idea of a driving force is to identify a process that is both necessary and sufficient to explain a particular phenomenon. What we see as both necessary and sufficient for understanding the relationship between land use change and livelihoods are the mutually constitutive processes of meaning/materiality that are negotiated through power relations and social processes. From this perspective, the forces identified thus far in the literature are outcomes or manifestations of these processes, not themselves the drivers. Thus the often cited need to "aggregate up" will yield little more than surficial comparisons between places—to aggregate up, we argue, one must start with social processes, not their manifestations (intensification, population growth, economic trends).

A third observation about the land use change literature is that it treats land use change as an outcome of other processes, underestimating its role as a condition for those processes at local and global scales. "Drivers" of change are often characterized as nebulous forces—economy, politics, environmental change—while the detailed ethnographic studies of change often focus on only one type of driver or one particular intersection of drivers, thereby limiting the generalizability of their findings (Meyer and Turner (1994) warned about this long ago). Again we see land use change

as the *outcome of other processes*, rather than a process in itself constituted by/constitutive of local, regional, and national power relations. By treating land use change as the outcome of some political, economic, or environmental driver, the land use literature has unintentionally obscured the story of how and why people interact with their environment in certain ways and why outcomes from the same action across space or scale can be so vastly different. This stops us short of providing explanations for *how* people make decisions (with notable exceptions see Turner, 1999).

A fourth observation on the current literature is that it tends towards studies of households and modeling outcomes.[1] Fewer studies engage detailed political relationships as drivers of land use change with many deferring to aggregate economic statistics, both as explanatory variables and inputs for models. The overwhelming emphasis on understanding and predicting household behavior using a systems approach recalls a cultural ecological approach to human–environment interactions. The clear trend in the literature toward modeling outcomes is in part a response to a real need in the global change community to provide policy-makers with change scenarios. We see this trend as necessary but potentially problematic because, under current conceptualizations of land use change, these models cannot capture the complexities of the forces that lead to observed changes. Thus, even the most complex modeling exercises are limited. We do not take issue with the idea of modeling itself, but with the type of data modelers use. With rare exceptions, the data considered a "driving force" are often the outcome of the very processes we seek to detail in this paper. Though models may be brilliantly constructed, tested, and verified, they still fail to account for many empirically observed changes because they start at the wrong scale of social process. By the time the modeller picks up on a "driving force" it is little more than a manifestation of a previous nature-society relationship/interaction. As a result, these models often lack the explanatory power to tell us why the original event (pattern) occurred in the first place. A heartening development is that of agent-based modeling where individual agent choices are used for modeling scenarios (see especially Parker et al., 2001 for a synthesis). We look forward to any explanatory frameworks that can help us further understand human decision-making behavior, especially if it helps us uncover underlying social processes. Our argument here is simple—analyses of the causes of land use change based on examinations of the social relations of power that are conditions for/results of the patterns observed in the landscape will allow for better understandings of land use change, whether model driven or not.

## 3. Livelihoods

To make clear the important overlap between the land use and livelihoods literature, we conducted a review of the livelihoods literature very similar to that conducted for the land use literature. We searched for peer-reviewed articles and books that contained the terms "livelihood", "livelihood systems" and "household economics". Again, we are sure there are omissions and commissions, but feel our sample is broadly representative of the current literature. Of the 209 references we identified as dealing in some way with livelihoods,[2] only 5% (12) addressed land use change in the context of livelihoods. We focused on land use *change* since we are interested in the processes of change, not land broadly conceptualized as an input to a livelihood system. As in the land use change literature, we found some overarching themes in the livelihoods literature. Livelihoods are, in this literature, generally understood to be "the capabilities, assets (stores, resources, claims and access) and activities required for a means of living" (Chambers and Conway, 1992, p. 7; see also Carney, 1998; Scoones, 1998; Ellis, 2000; Bryceson, 1999; Carney et al., 1999; Shackleton et al., 2001; Hulme and Shepherd, 2003) . As Ellis (2000, p. 7) notes, this definition of livelihoods moves past income toward a more holistic consideration of the manner in which a person obtains a living. In practice, this definition has resulted in a number of approaches to livelihoods that focus closely on access to various types of assets drawn upon by individuals to make a living. These approaches tend to categorize these assets as one of five types of capital: natural, physical, human, financial and social. Land comes under natural capital, "the natural resource base (land, water, trees) that yields products utilized by human populations for their survival," though an improved field might come under the heading of physical capital, which generally includes "assets brought into existence by economic production processes" (Ellis, 2000, p. 8).

This literature, in its concern for access to livelihoods assets, cannot address the use of natural or physical capital without a discussion of the social networks and relationships that enable access to those forms of capital. In a sense, then, livelihoods approaches consider issues of "the social" whenever discussing land access and land use. Further, in the sustainable livelihoods literature (for example, Mohamed and Dodson, 1998; Sneddon, 2000; Gilling et al., 2001; Attfield et al., 2004) various authors address the reciprocal influence of land use on livelihoods. In this approach, particular land uses intersect with economic and

[1] Full referencing of this trend is beyond the scope of this paper. As noted above the modeling oriented papers/books represented 40% of the literature sample, but for some notable examples see especially *Agriculture*, *Ecosystems*, and *Environment* (85) 2001 for a collection of essays (see also Parker et al., 2001; Seto and Kaufmann, 2003; Parker et al., 2003; Evans and Kelly, 2004; Koning et al., 1999).

[2] Interestingly, we were able to find only one article where an analysis of livelihoods was informed by an analysis so commonly undertaken in the land use change literature where landscape change detection is conducted and causation for observed changes is sought. The impact of livelihood activities in the actual physical landscape is an omission from that literature. We also know there are more than 209 articles and books referring in one way or another to "livelihoods". Our statistic is not perfect, but we feel it does represent a general trend.

environmental processes, global and local, to affect the natural capital, such as hydrology, soil quality and available arable land, of a particular place in a manner that constrains future livelihoods choices that require access to land as a central component. Thus, the livelihoods literature treats livelihoods diversification, social networks and relationships, and land use as closely linked.

However, the livelihoods literature, like the land use literature, treats the linkage between livelihoods, especially diversification, and land use change as one of cause and effect. This treatment occurs when livelihoods studies focus on the ways in which changes in livelihoods drive land use change. This focus is manifest in two ways. First, the livelihoods literature tends to treat land use change as either an input to household livelihoods or as an outcome of diversification, except in circumstances where exogenous forces such as climate change, economic shifts, or government policy intervene. Thus, livelihoods are often privileged in the livelihoods/land use nexus, with the latter serving as an opportunity for or restraint on the agency expressed through the former via "feedbacks" (for example of box diagrams that neatly capture this relationship, see Scoones, 1998, p. 4; Carney et al., 1999, pp. 7, 9,11; Ellis, 2000, pp. 30, 49). For example, the literature on diversification has isolated both broader social and economic forces and micro-social relations that cause diversification (for example, Bryceson, 1997, 1999, 2002a,b; Hussein and Nelson, 1998; Carswell, 2000; Francis, 2000; Batterbury, 2001; Ellis, 2000; Campbell et al., 2002; Slater, 2002; McCabe, 2003), but less often in the context of land use (Preston, 1989; Bernstein, 2005; Sanchez and Leakey, 1997; Agarwal, 1998; Campbell, 1999; Shackleton et al., 2001; McDonald and Brown, 2000; Bebbington, 2001; Chimhowu, 2002; Tinsley, 2003) and rarely in the context of a land use change analysis (McCusker, 2004, 2002).

Second, issues of society and power usually enter the discussion of the land use and livelihoods relationship in terms of access to physical and natural capital via networks of social capital (this is termed by Ellis (2000, p. 30) as "access modified by"). Here again we see an aspect of livelihoods, social capital, as having a shaping role in land use with less consideration of the ways in which land use might affect social capital, except in terms of land shortage or conflict over access to resources. Thus, as in the land use literature, a livelihoods approach to land use change tends to view these changes as *outcomes* or *modifications* of other processes with less consideration of the ways in which changes in land use might reshape these processes at a fundamental level. Once again we find a literature that addresses the relationship between livelihoods and land use by identifying drivers of land use change in various livelihoods strategies. As in the land use change literature, we argue that the explanations of this literature for livelihoods and land use outcomes could be improved by asking how certain diversifications lead to certain land use changes; that is, what relations of power and knowledge act as the bridge between a particular diversification strategy or exogenous stress and a particular land use change?

Though complex, the interconnections between land use and livelihoods do not present an insurmountable barrier to a systematic approach to this relationship, and therefore to a greater understanding of livelihoods and land use change in particular sites. We argue that through an engagement with contemporary human geography approaches to nature-society relations, we can develop a means of examining the co-emergence of land use and livelihoods in sites around the world that can overcome the explanatory limitations of earlier analytic approaches.

## 4. The co-production of livelihood and land use change

To develop a systematic understanding of the interrelationship between livelihoods and land use, we approach them not as separate objects of knowledge related to one another through abstract processes, but as different manifestations of the social processes by which individuals and groups come to understand the challenges facing their everyday lives, the various forms of capital available to them to negotiate these challenges, and the strategies by which they can conduct such a negotiation. All of these understandings are forms of knowledge that carry with them power. The central point of analysis must be to identify who has the capacity to decide whether particular shifts in economy, ecology or society are threats to one's livelihoods, for it is this identification that will govern the strategies by which these shifts are managed.

It is critical to note that we do not consider either land use or livelihoods to be the mere outcomes of the social processes described above. Both livelihoods and land use are central means by which problems are identified and strategies to manage those problems are defined (Fig. 1). While most livelihoods are in fact packages of activities that cover a range of income sources, not all livelihoods

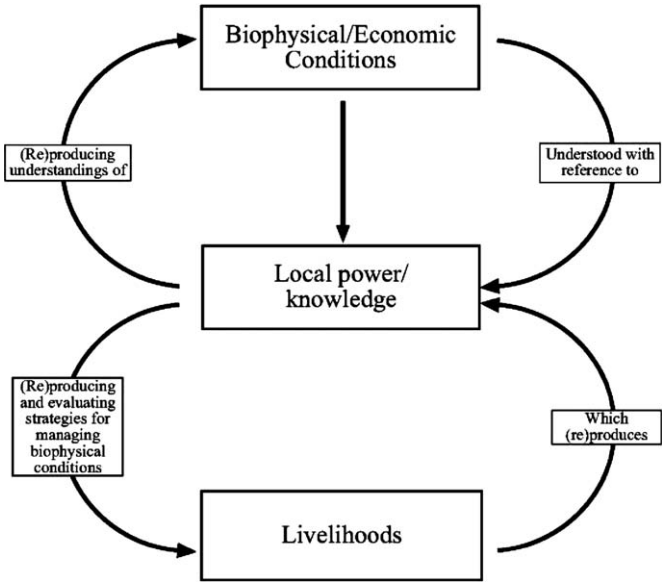


Fig. 1. Schematic of the co-production of livelihoods and land use (after Carr, 2005b).

packages are the same, even in the same place. Men and women commonly play different roles in the livelihoods of their households (for a review of the treatment of the household in development, including the relationship between households and livelihoods, see Carr, 2005a).[3] These different roles serve as means of marking gender within the household, and identifying the value of the different genders to the household. For example, if in a particular household women are limited to subsistence farming while men bring in large amounts of income from non-farm employment that cover most household expenses, this division of labor can serve to both give social and economic meaning to the categories woman and man, and at the same time give a value to those categories (where men are seen as more valuable than women to the larger household). In such a situation, a challenge arising to women's livelihoods activities is far less likely to be viewed as a threat requiring dramatic action than a similar threat to men's incomes.

Similarly, land use can serve as a means of marking social difference and identifying threats to income. A clear example of this phenomenon is seen in the work of Carney on contract rice farming in the Gambia (for example, Carney and Watts, 1990; Carney, 1996). This work illustrates how a large-scale rice production project initially intended to provide greater food production and profits to farmers in the Gambia through increased rice production also had the side effect of triggering a negotiation of roles within rice-cropping households. Before the project, rice cropping was seen as women's subsistence labor, and women controlled land appropriate to this form of labor because it was unsuitable for other, more profitable crops, such as groundnuts. The land worked by an individual therefore spoke to their gender and their status in society. After the introduction of technology that promoted rice cropping from marginal occupation to a primary means of income, however, rice became a valuable crop. Men began to take control of land appropriate to its production, relegating women to new, elevated lands unsuitable for rice production (and not terribly well suited to other forms of agriculture). We argue that land use in this area helped to identify and reinforce a gender division in which men were primary earners through the production of cash crops, while women were subsistence producers within the household. Therefore, land use had to be redefined not only because it was an important source of income for men, but also because such redefinition maintained the existing gender division that rested on particular forms of labor.

From our perspective, land use and livelihoods are not residues of the social process by which individuals and groups make a living, but active parts of that process. Existing forms of land use and existing livelihoods strategies are not merely material efforts to negotiate the day-to-day world, but also social statements about such things as gender roles and household politics (Carr, 2005b, in press). There is little space within the current conceptualization of drivers in either the land use or livelihoods literatures for this type of analysis.

## 5. Pathways of co-produced change

Co-production as outlines above emerged as the authors, using field data gathered in two separate studies, tried to make sense of the common themes in their research. In the following sections, we present the two case studies, and two different views of livelihoods/land use, that drove the idea of co-production. These studies share as their centering point a concern for identifying the social processes of which land use and livelihoods decisions are manifestations. As much of the data in these studies have been presented in the context of other research goals elsewhere (for South Africa, see McCusker, 2004; McCusker and Weiner, 2003; for Ghana see Carr, 2005a,b; Carr, in press), these case studies are not meant to be full analyses of particular livelihoods/land use connections, but instead are meant to illustrate the efficacy of approaching this relationship not as a direct link between livelihoods and land use, but as two different manifestations of the same process.

In the South Africa study, the class, race, and historical socio-economic injustices of the apartheid system temper co-production. While land is a part of household production to varying degrees, it is still central to most household reproductive systems. The land/livelihoods nexus in the Ghanaian case is strongly influenced by gender relations that take shape at the household level. In both case studies, both livelihoods decisions and land use changes are manifestations of social processes/power relations that serve as pathways through which change occurs. The following case studies provide some useful examples of how we have used such an approach to understand land/livelihood relations.

### 5.1. South Africa

Land and livelihoods are intricately connected in the rural South African landscape, where land is both a reality and an imaginary in everyday life. The often-violent dispossession of land in the twentieth century remains strongly embedded in the cultural memory of the rural north. Historically, land was the primary mechanism to garner income and sustain the household and while it plays a less central role in many livelihoods today, the contribution of land-based activities is still vital. Contemporary household incomes constructed in absence of land-based activities are

[3] The literature on the households and livelihoods in development is vast, and outside the scope of this paper. However, it is worth noting that a number of authors have directly addressed this issue (for example, Alderman et al., 1994; Aryeetey, 2004; Barrett et al., 2001; Bryceson and Howe, 1993; Carr, 2005a; Egyir, 1998; Ellis, 1998; Fafchamps, 1993; Fapohunda, 1988; Geisler, 1993; Goheen, 1988; Guyer, 1986; Haddad and Kanbur, 1990; Haller, 2000; Kalinda et al., 2000; Kotzé, 2003; Ocloo, 1997; Peters, 1995; Reardon, 1997; Ruerd and Van den Berg, 2001; Udry, 1996; Valdivia and Gilles, 2001; Varley, 1991), and that the characterizations of the household discussed in this paper are representative of studies that view households as non-co-operative entities.

vulnerable to economic shocks. Our visioning of land use and livelihoods as co-produced is nothing new in the context of these struggles. Rural blacks in the north were always quite cognizant of the fact that economic forces drove the wrenching away of their land—namely the need amongst white farmers and white businesses for black labor (Bundy, 1988). Thus, the façade of land alienation in the name of "land degradation" or "land improvement" fooled few in the black majority. It was clear to them that land dispossession was a precondition for their economic subjugation. The primary objective, Letsoalo (1987) demonstrates, was not simple land alienation rather:

> Only by understanding the evolving political economy can one decode what has happened to black landownership and the double-meaning of "land" (i.e. labour) reform in South Africa. Like all capitalist economies, South Africa's economy is dependent on the existence of a labour reservoir. The Black community could not perform this function as independent farmers (owning land) (p. 41).

In the context of this dispossession, black land/livelihood relations were transformed from largely agrarian production and subsistence to labor exchange and formal activities. Though blacks were forced out of agriculture into the cash economy, the sustainability of this economic shift required the transformation of their perceptions of *what* they could/should do to earn a living. In this project the apartheid state linked economic subjugation with political subjugation. Beginning in the 1950s formal steps to physically separate black from white in the notorious "Bantustan" system began, although the system of "native reserves" dates to the late 1800s. Being forced onto the most marginalized land in overcrowded conditions had the effect of reifying white or state claims that blacks were unproductive farmers, not only in the minds of state officials and proponents of apartheid, but also in the minds of blacks. For the Bantustans to be effective labor reserves, the population could not be self-sufficient either economically or psychologically. In effect, this "bantustanization" reinforced the reshaping of the land/livelihood relationship amongst blacks. Being forced on to the most marginalized land in overcrowded conditions had the effect of reifying white or state claims that blacks were unproductive farmers, not only in the minds of state officials and proponents of apartheid, but also in the minds of many blacks. For the Bantustans to be effective labor reserves, the population could not be self-sufficient either economically or psychologically. This was one of the more damaging and long-lasting effects of apartheid.

Today the forms of racialized knowledge produced by apartheid relations of power are still vividly evident when speaking to black smallhold farmers who often still seek "white" or "scientific" expertise. Granted, in the generations since dispossession many rural blacks have been completely deskilled in agrarian production, but for people who still maintain small plots of land to survive, the apartheid program was successful at convincing many that blacks were, if not incapable, at least less capable than whites of farming productively. While there was widespread resistance to this notion, its impact is clearly visible in the contemporary land/livelihood ethos in many areas of rural South Africa. Specifically, we can see the products of this power/knowledge in what appear to be contradictory notions about land and livelihoods. Discussed below, this power/knowledge is often manifest as a strong desire to farm but a lack of confidence/skills/labor to do so. Rather than treat these somewhat incongruous notions (desire to farm vs. lack of confidence) as disparate phenomenon or a manifestation of local irrationality, we view these contradictory notions as manifestations of the same social relations of power. By enabling a new perspective on the ongoing impact of apartheid on land/livelihoods interactions in South Africa, our approach is an important step in disentangling the apartheid mentality that continues to characterize these relations.

It is easy to lose the importance of this apartheid power/knowledge in the many local factors that shape the understanding of land and livelihoods in particular places. Complex negotiations often occur over land use that factors in a multiplicity of related objectives, from how well the land will sustain the household to the positionality in which a household might rest vis-à-vis other households with similar pieces of land. The understanding of material sustainability and household positionality is shaped by a complex set of social relations—or negotiations—that occur on a daily basis between households and various actors—the chief, the local council, the wealthy, and one's neighbors among others—to develop some level of economic and social stability. These negotiations, and the understandings of both household needs and the resources available to meet those needs, shape economic decision-making manifest in actions such as migration from outlying rural areas to towns to gain access to essential services, though leaving a plot of land also means leaving behind a form of security.

To demonstrate the co-production of livelihoods and land use change in South Africa through the remnants of apartheid power/knowledge, we draw on two case studies from the northern-most province of Limpopo (see Fig. 2). Both of these case studies rely on a detailed research methodology that included land use change detection using time series aerial photography and satellite images, quantitative interview schedules, qualitative group and community discussions, transect walks, community mapping and GIS, and videographic narratives. Field work was conducted in Limpopo in 1999–2000 and again in 2001–2004 using same-gender translators for interview schedules. A diverse typology of respondents was engaged in the course of this research, from chiefs and town councilors to the unemployed, young to old, and expert to local knowledge. The specific study sites included five Communal Property Associations ($n = 350$), an institution of South Africa's land reform program, and the rapidly growing small town of Mankweng ($n = 120$). The town could hardly be described

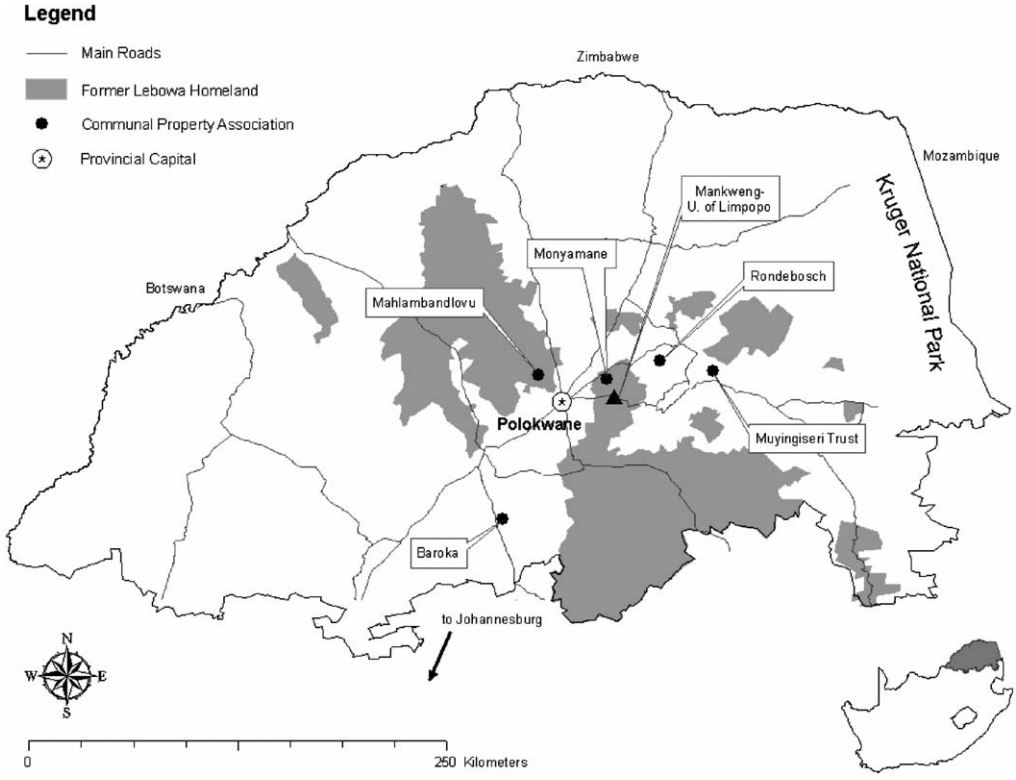


Fig. 2. Study sites in Limpopo, South Africa.

as an "urban" area, as it is more representative of the small trading center so common in rural areas of the country planned under the betterment scheme of the 1950s and 1960s.

As observed from satellite and aerial imagery, changes in land use on the land reform projects (CPAs) did not occur as anticipated (McCusker, 2004). Both project planners and members expected that the CPA farmland would employed for a variety of agricultural activities from row crop agriculture to intensive herding, however, this was not the case. Land was used less intensively and was largely under-productive. Given this finding, very specific questions were raised about why land was not being used to its fullest potential and the impacts of these patterns of land use on livelihoods.

Several contradictions in the findings fueled the emergence of the idea that land use and livelihood changes are co-produced. For instance, although most CPA members who participated in the study remarked that land-based activities, access, and assets contributed "very little" to their livelihoods, a similar majority (62%) replied that they actively farmed, raised animals, or undertook some other land-based livelihood activity. This apparent contradiction is a manifestation of local understandings of livelihoods and local capacities that can be traced back to apartheid power relations that enabled the expropriation of black lands in earlier eras. Specifically, this contradiction reflects the fact that while many of those included in this study must farm for a living, they assume that they are not earning all they could from this process or that other forms of non-farm labor are superior means of making a livelihood. Here we see the hangover of apartheid power/knowledge, which produced such knowledge of livelihoods to legitimize the political and economic subjugation of rural black citizens.

These assumptions play into, and enhance, contemporary relations of power that shape the materialization of this knowledge in the form of land use. The Communal Property Associations were less than successful on a number of grounds (McCusker, 2004). This lack of material enhancement often led to failing rates of participation. For example, the single most common reason for withdrawal from or lack of engagement with the associations was a lack of enhancement of member livelihoods—respondents argued that there were simply other livelihood activities that were more materially rewarding than participation in CPAs.

Apartheid power/knowledge never completely reshaped black ideas about land use and livelihoods, however. Today, despite these economic setbacks and feelings of inferiority, there are strong social imperatives (meanings) assigned to land-based activities, regardless of its perceived lack of profitability. Further questioning provoked responses such as: "I have just always farmed"; "We blacks can not fail to farm"; "Blacks who do not farm are lazy"; "Other people will take my land"; "I must keep busy so I farm"; "I can't get employment elsewhere"; and "the land is my life, Rands or not". New evidence is emerging that these "social imperatives" are not just cultural imaginaries, but also important livelihoods processes that are reemerging after years of

apartheid suppression. Shackleton et al. (2001) take to task the many studies that define livelihoods too narrowly and in doing so "ignore or undervalue the significant contribution that a range of 'subsistence-type' household activities and practices (such as the use of wild plant and animal resources, the use of non-meat goods and services from livestock, and home cropping) can make to the livelihood base. This is because such activities tend to be viewed as non-productive and insignificant or low-key" (Shackleton et al., 2001, p. 35; see also Twyman, 1998; Sierra and Stallings, 1998). The rationality of black farming systems is emerging, or more accurately, reemerging. Recognizing this rationality underneath the layers of apartheid power/knowledges is key to revitalizing rural South Africa and is often overlooked by critics looking for quick fixes to the stalled national land reform program (Bernstein, 2005).

The intricate relationship between livelihoods and land use was also manifest in the second case study—the town of Mankweng that surrounds the University of Limpopo. Here a dense residential structure replaced what had long been grassland and agricultural holdings starting in 1993/4. At first, this may seem contradictory to the development of rural livelihoods in the province—no new agricultural or grazing land was made available, the university did not hire large numbers of new employees, and the mining sector underwent dramatic restructuring leading to high levels of unemployment. However, respondents reported that access to electricity, water, and transportation was very important to them, *although they acknowledged that shifting residences to gain such access weakened their livelihood systems*. In this study site, respondents placed much more value on *residential* land than *agricultural* land. It must be noted that we employ a holistic definition of land use, not limiting it to agriculture. This valuing of land reflects the same power/knowledge as seen in the previous example, where agricultural livelihoods are devalued in favor of non-farm activities and land uses. At one level, in Mankweng, study participants value residential land near basic services. At another, though, we cannot explain their land uses through a simple assumption that residential land is superior to agricultural land—we must explain how this residential land came to be viewed in this manner. This is especially true given that those living on this land still rely on relatives in rural areas to provide foodstuffs in times of need, but vision their livelihoods as more secure as they exchange agricultural land for plots near the town. Given this, however, migrants to Mankweng still grasp fiercely to agricultural land imaginaries. An older female respondent noted that she would "never lose my sense of the land, as that would make me lose who I am". Thus we see in Mankweng, as in the previous example, an apparent contradiction in that the residents rely on agricultural activities for food and livelihood security, and yet devalue such activities in favor of semi-urban lifestyles that provide little material security. What we are describing is not a simple rural-to-urban migration, but the playing out of migration decision-making within a particular power/knowledge (see Carr, 2005 for an extended discussion of such migration decision-making).

The "hangover" of apartheid power/knowledge and its "leakages" (in the form of land imaginaries) shapes and is reproduced by post-apartheid local social relations. The powerful are no longer a white apartheid government, rather new actors have taken up the role of "the powerful" in different contexts. For example, the land use/livelihoods outcomes of the Mankweng example differ from that of the CPAs because of the ways in which this broad power/knowledge nexus intersects with the social structures particular to Mankweng. Superficially, Mankweng's rapid growth can be attributed, in part, to a contest between local chiefs and the local council for authority over land immediately surrounding the town. Local chiefs often encourage their subjects to settle on land to solidify their authority over it. The local council, seeking legitimacy, utilizes development money to provide basic services. Into this power contest enter households seeking to enhance their economic status through access to essential services such as water, electricity, and transportation. Respondents reported two of many possible scenarios as to exactly how this change was affected. Chiefs would either force or encourage their subjects seeking land into the contested area around Mankweng. When households sought new residential or agricultural land, Mankweng was presented as a highly prized location—central to all necessary services, including, ironically, local government offices. In other cases, chiefs would not reallocate land to new households in existing rural locations—only in Mankweng would land be allocated. At the same time, the local council was trying to affect its legitimacy by providing the same households with water and electricity. In this light then, it makes perfect sense for households to relocate to Mankweng. But we cannot treat chiefly control over land as a driver of this land use change, for this control is effective because it fits into the above-described power/knowledge within which residents make land use and migration decisions. For the time being, the convergence of apartheid power/knowledge and contemporary social relations allows many households to navigate these complex power relations to their immediate short term benefit. One troubling question, and that for future study, is the long term viability of such arrangements.

### 5.2. Ghana

Dominase and Ponkrum (Fig. 3) are two villages located in Ghana's Central Region. Over the past 40 years, the residents of these villages have experienced dramatic environmental and economic changes, ranging from ongoing environmental degradation related to earlier logging operations conducted to the north of the villages to the loss of (male-controlled) off-farm employment when this logging operation ended in the late 1960s (for a detailed discussion of the history of the research area, and its changing economic and environmental context, see Carr, 2002b, 2005b). While many of the residents of this area have migrated to

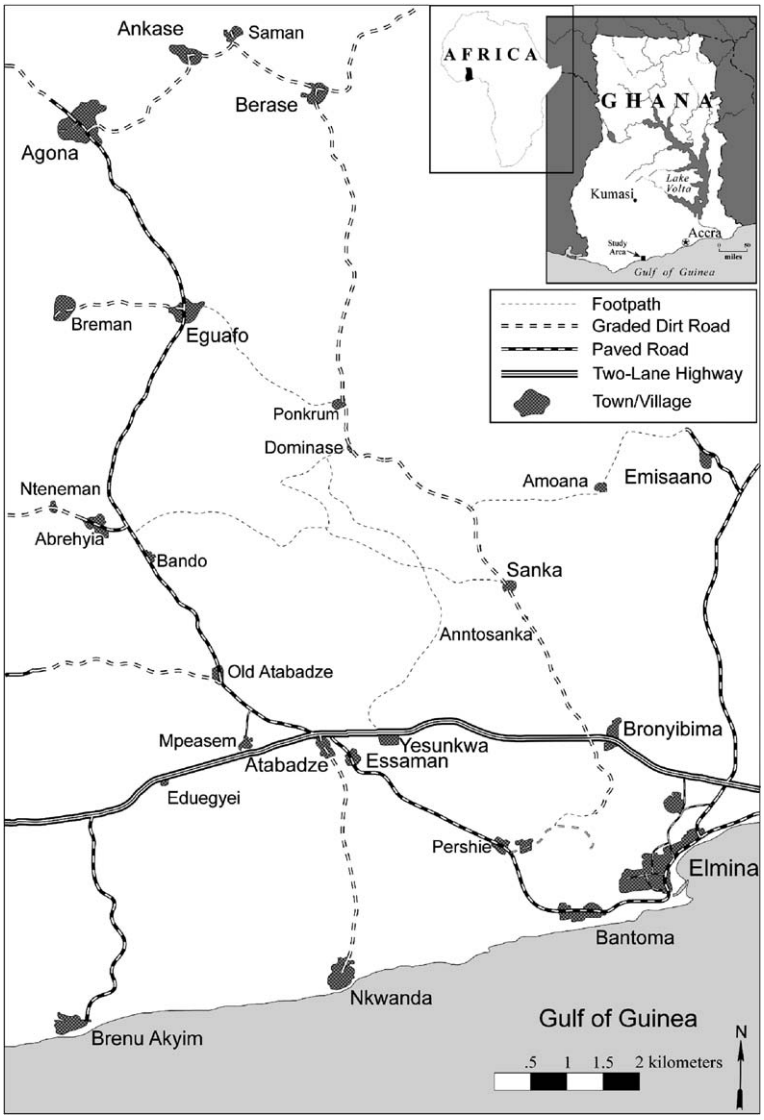


Fig. 3. Study sites in central region, Ghana (Carr, 2005b, p. 932).

new villages in response to these changes, others have reshaped their livelihood strategies to deal with the current conditions in the village. These strategies, which today manage a degrading local environment and an unstable local and national economy, are centered on agriculture, and therefore it is not surprising to see that in these villages shifts in livelihoods and shifts in land use are closely related. However, the link between livelihoods and land use in these villages is not one of a simple causal relationship. While livelihood changes may superficially drive land use change, existing land uses are critical means not only of obtaining subsistence, but also of defining gender roles within households, recognizing threats to local livelihoods, identifying solutions to those threats, and evaluating the efficacy of those solutions. In this sense, then, the relationship of livelihoods and land use is one where each constantly influences the other.

The data presented in this brief case study was gathered through interviews conducted during field seasons in 1997, 1998, 1999, 2000 and 2004. Sixty-seven residents of Dominase and Ponkrum (30 men and 37 women) took part in these semi-structured interviews, a sample of roughly half the adult population of the two villages.[4] The initial sampling strategy relied on a snowball methodology to engage as many residents of the area as possible in the research. As issues of gender became clearer before the 2000 field season, the sample was adjusted to represent men and women as equally as possible. In 2004 data was gathered on incomes, and an effort was made to gather information from households of varying economic status to capture the different strategies of the "rich" and "poor" in these villages. These interviews, while aimed at particular topics relevant to the larger goal of the project (which examined local strategies for managing economic and environmental change at the

[4] Some respondents were not available across all field seasons due to movement in and out of the village.

sociospatial margins of globalization), focused heavily on the agricultural livelihoods and related land uses upon which most residents rely.

Land use and livelihoods are both manifestations of the processes by which the residents of these villages understand and negotiate uncertainty. The residents of these villages have, over the past forty years, experienced dramatic shifts in both the local economy and the local ecology that have contributed to heightened uncertainty about everything from food supplies to the payment of children's school fees. To manage this uncertainty, households in these villages have developed diverse livelihood strategies. For the purposes of this article, we will focus on households where the male head earns less than $340[5] a year. These households usually employ a strategy that incorporates both household production for local markets and subsistence production (household reproduction) to balance risk between the local economy and environment. By examining this strategy, we can see how both land use and livelihoods decisions are in fact manifestations of a broad, yet analytically understandable process.

In households that explicitly rely on both productive and reproductive activities[6] to manage local economic and environmental uncertainty, men have a much greater market orientation in their agricultural activities than do women. This variable orientation is visible in both the fact that men tend to view a particular crop as more for sale at market then do women, and in the fact that men are more likely than women to plant crops like cocoa and palm that derive most of their value from market sale. These relative emphases, however, do not result in the sort of differentiation in agricultural incomes one might expect. In 2004 the average farm plot[7] of a man in this income cohort yielded a profit equal to $39.46, while the average woman's plot yielded $53.89. Because under the land tenure practices of the Akan (see Awusabo-Asare, 1990; Brydon, 1987; Egyir, 1998; Quisumbing et al., 1999; Quisumbing et al., 2001) men are responsible for the allocation of land to the various members of their households, they are able to compensate for their lower per-area productivity by farming, on average, three and a half times more land than their wives. The end result is a wide difference between the average man's ($213.11) and woman's ($64.67) agricultural income.

The skewed allocation of land in these villages is not simply reflective of differing men's and women's capacity to conduct farm labor; indeed, women's higher per-unit productivity suggests the opposite. Instead, it is through the allocation of land that the male head of family can ensure his economic relevance to the household. Women are not only more productive than men in output per unit of farmland, but also tend to bring in far more non-agricultural income than men. Only three of ten men in this lower-income cohort reported significant income beyond their agricultural income, all three collecting rents on farmland they or their clans controlled. These rents yielded an average of a mere $7.56 annually. Seven of ten women in this cohort reported significant income beyond their agricultural income. All seven obtained this income through activities such as petty trading and food selling, earning an average of $42.33. These other sources of income, which women exploit to a much greater degree than men, reduced the gap in agricultural incomes in these households and create a situation in which, in the average household, the male head earns $220.87 to his wife's $107.00.

The land uses associated with these "balanced" households are at least as bound up in the maintenance of men's economic superiority as they are in the provisioning of materials to the household. Thus, in a basic way, land use (and therefore any land use change) is a manifestation of the process by which men maintain control over their households. However, if we closely examine the livelihoods strategy underlying the diversification of agriculture by gender, we see that the livelihoods in this area are also manifestations of this same process.

The different, gendered agricultural strategies among this income cohort in Dominase/Ponkrum suggest a balanced strategy that is in fact an expression of competing power/knowledges that have negotiated an uneasy mutual economic space for managing the economic and environmental uncertainty that characterizes residents' lives. In focusing on market participation, men apparently try to maximize the economic gain of their households, providing a buffer against weak crop years by selling scarce crops at market for a higher price and then using the money to maintain the household. Women appear to be focused on household food supplies, for in farming for subsistence they ensure that the household will have adequate food even if larger economic forces prevent its members from obtaining employment or market participation that might otherwise contribute to the well being of the household. Yet such a balanced strategy can only come about if the disparate agricultural strategies of men and women, embodied in their autonomous farms, can be linked into a single income that is employed to meet the needs not of the farm owner, but of the larger household. There is no means by which to do this under traditional Akan land tenure. Under the version of Akan land tenure employed in these villages, once the male head of household allocates land to the other members of the household the person to whom that land is allocated has control over the crops planted on that farm and the proceeds of the harvest from that farm.

To overcome this barrier to control, men construct a "shared income" that joins men's and women's agricultural incomes (though rarely addressing incomes from other sources, such as off-farm employment or petty trading in

[5] Dollar equivalent for cedis, converted on 20 December 2004.

[6] Virtually all households in these villages rely on both productive and reproductive activities for their livelihoods, though most households heavily focus on either productive activities (while devaluing reproductive activities) or, as in the case of those in this sample, hold both types of activity in a balance within the household economy.

[7] Farm plots in this area are measured in pools, an area of 250 $m^2$. For the rest of this case study, the reader may assume that the farm plots being compared are of equal size.

the village) into a single fund under the control of the male head of household (Carr, 2002a; Carr, 2005a,b). Men do not take women's income from them directly. Instead, they withdraw their own income from the household, forcing women to spend their money on household needs such as school fees and food for children. Though women contest the idea of a shared income, referencing local land tenure rules to support their claims to their agricultural incomes, through the strategic withdrawal of their income, men are able to direct women's income in an indirect manner and thus create a household income over which they have control.

Women's contestation of this indirect appropriation has little material effect on the control of their incomes because of their understanding of the larger economic and environmental context in which they find themselves. In these households, economic and environmental changes are understood in terms of the strategies employed to manage them. This "balanced" approach to economic and environmental uncertainty, which incorporates both market—and subsistence-oriented strategies, requires co-ordination of otherwise autonomous incomes. Men provide this co-ordination through the creation of a shared income linking the disparate incomes of men and women.

Defining economic and environmental change as an issue to be dealt with through a mixture of market and subsistence approaches to agriculture, the local strategy for managing economic and environmental change rests on/produces a system of social differentiations that is both the condition for and the result of the various roles played by different members of the household. Because this system of differentiations rests at least in part on a gendered division between market and subsistence agricultural production, the understanding of economic/environmental change and its management in these households gives an instrumentality to these differentiations by creating a need to co-ordinate men's and women's incomes. Therefore, women's subsistence farming represents their understanding of both the economic and environmental uncertainty in the context in which they live, and the possible actions for managing that uncertainty. This understanding of economic and environmental conditions overrides the local land tenure system, for while women speak strongly for the control of their own incomes, they continue to plant for subsistence and have those incomes appropriated by the male head of household.

Therefore, the intensity and character of land use in and around Dominase and Ponkrum is a function of the circulation of power at the household level that cannot be thought separately from knowledge about the local economy and environment that shapes local options for managing uncertainty (such as land use changes) and the evaluation of those options once implemented. Further, the particular uses of agricultural land by men and women are both a product of, and produce, gendered roles in this context that are crucial for the identification and understanding of threats to the household. Land use and livelihoods in Dominase and Ponkrum are closely linked not in a causal relationship, but because they are different manifestations of the same social process. We cannot understand either without approaching this process first.

## 6. Conclusion

We have argued in this paper that current efforts to identify either the driving forces of land use change or livelihoods change run into difficulty because, to this point, they have focused on assessing and modeling the manifestations of the broad processes manifest in both livelihoods and land use. Households are confronted with a bundle of choices that they must negotiate as they create pathways of change in order to secure their production and reproduction. These choices are always bound up in relations of power and the knowledges that are the conditions for and results of these relations. In the South Africa case, national scale apartheid power/knowledge continues to shape local understandings of livelihoods options, intersecting with contemporary local power relations to produce decision-making contexts that result in shifting patterns of land use that seem at odds with household livelihoods goals. These patterns, which might seem illogical or inexplicable on the surface, are coherent manifestations of the intersection and interplay of these different power/knowledges. In the Ghanaian case, household-level understandings of how to negotiate economic and environmental change (understandings manifest in land use patterns, among other things) are the conditions for and results of relations of power within these households. One cannot understand changing land use patterns in this context without careful consideration of these power relations.

What we have outlined here is a rethinking of the point of entry through which we try to understand change in land use and livelihoods in a given context, not a dismantling of current understanding represented in our literature review. Rather than searching for cause/effect relationships, we point out that envisioning land use and livelihoods as co-produced has led us to a place where we *begin* to see how patterns in the landscape reflect not deeper "driving forces", but complex relations of meaning and materiality that manifest themselves in these patterns. It is through a tracing of these relations in various contexts that we might develop a systematic approach to the relationship between land use and livelihoods both context-sensitive and allows for comparison across contexts not through reference to broad processes like global change or global capitalism that have less explanatory power in particular cases, but through the microprocesses of power and knowledge that shape local understandings of these broad forces and processes.

In introducing the idea of co-production, we do not seek to support the notion that land use and livelihoods need to be or are dichotomized, indict either literature for failure to integrate with the other, or essentialize land use and/or livelihoods in the study of local social process and power

relations. Instead, we seek to challenge the assumptions that exist between these communities about how land use and livelihoods are related, and present an alternative construction of this relationship that might serve as a guide for future research and a touchstone for continued conversation.

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