The Land Tenure Disconnect in the Developing World:
Cultural Geography and the ‘Evidence Landscape’

Abstract
Land tenure has proven to be one of the most perplexing issues in the developing world. The inability of formal and customary property rights systems to effectively connect in ways that provide for tenure security creates dilemmas not easily overcome. Land in the day-to-day manifestation of the disconnect involves problems relating to claims and disputes, which rest upon proving access and ownership rights. Such proof is at the heart of both the capital-poverty-property rights argument, as well as non-commodity, identity-based and service attachments to lands. This article argues that evidence proving (attesting to) rights to land is an important but overlooked domain of interaction for the disconnect, and where opportunity resides for a potential contribution to effective cooperation between formal and informal tenure regimes; and, that this evidence is embedded in the same landscapes that are and have been of interest to cultural geography. This ‘evidence landscape’ is examined in the context of its utility and connection to customary tenure and formal law, and how it plays a role in attending to the disconnect in three cases: Mozambique, East Timor and the Zuni in the U.S.

Keywords: land tenure, cultural geography, evidence, landscape.

Introduction
The pervasiveness of the ongoing incompatibility, or disconnect, between informal customary land tenure and formal state property rights regimes in the developing world continues to be a primary issue with large repercussions on development, conflict, resource degradation, and the role of property in the operationalization of capital. Particular attention is currently focused on the latter, the economic potential of the informal, undocumented land held by the rural poor in developing countries. Such property occupied but not formerly owned, is thought to amount to considerable capital--much larger than the total investment in, and foreign assistance to, the developing world over the past couple of decades (de Soto 2000). Much about this ‘capital-poverty-property rights argument’ revolves first around land and its potential for collateral, but more fundamentally around issues of law--given that those who occupy lands are unable to prove ownership in a way that lending and other civil institutions require (de Soto 2000). While the relevance of the designation or derivation of this proof, or evidence, in ownership, claiming, and disputing is significant, the issue has not yet received attention in the literature on the land tenure disconnect in the developing world.

Recognition by the academic and development community of the separation between customary and national land tenure systems and the problems that result, have led to numerous and expensive attempts to bring smallholders into national property rights systems, or link the two through provision of title as evidence or proof of possession of land (e.g. Migot-Adholla and Bruce 1994; Carter et al. 1994; Roth et al. 1994a; Roth et al. 1994b; Golan 1994). Many experiences however have revealed that giving title to small-scale agriculturalists often accomplishes neither (e.g. Bruce et al. 1994; Lemel 1988; Roth et al. 1994a; Golan 1994; Migot-Adholla et al. 1994; Bromley and Cernea 1989; Unruh 2002a). The problematic nature of titling efforts has led to calls for approaches that give official recognition, under national legal codes, to diverse, local, in-place
patterns of access to and control over resources (e.g. Quan 2000; Delville 2000; Bruce and Migot-Adholla 1994; Shipton 1994; Tanner and Monnerat 1995; Samatar 1994; Lane 1991; Swift 1991). As well, the popularity of Hernando de Soto's (2000) capital-poverty-property rights argument highlights the importance of changing formal law to facilitate what people are already doing on the ground. But it is here that the problem gets difficult, and the process has stalled. What is it that people are doing 'on the ground' that is translatable into evidence of ownership, claim, access, and occupation? Unless evidence or proof of claim is connected to local cultural reality and logic, in addition to being relevant to formal law, it will not have value within the customary land tenure system and will not likely deliver the hoped for outcome within the formal land tenure system. The fundamental evidence issue, is that evidence must be of ongoing value and utility in both customary and formal land tenure systems. The problem of such 'proving' is at the heart of both rights recognition and the capital-poverty-property rights arguments, as well as attachments and claims to land based on identity, religion; and various insurance and security (food, livelihood, personal) functions.

Evidence proving rights to land is an important domain of interaction for the disconnect, and where significant unrealized opportunity may reside for potential compatibility between formal and informal tenure regimes. However approaches to connecting systems of customary social and cultural reality to spatially explicit constructs that have utility as evidence and proof in a formal legal system remain overlooked, elusive, and undefined. While the nature and legal status of informal land rights is of fundamental importance, the topic of this article is instead how to operationalize this recognition within formal law. In other words how to connect customary rights to formal law, given that it will not be possible for formal law to incorporate the many different rights themselves, belonging as they do to different groups (many of which are based on lineage, ethnicity, etc.) and at the same time have a law that is equally open to all, i.e., a uniform enforceable code (e.g. de Soto 2000). Proving that customary communities, households, and individuals have some form of claim to land(s), exists as a prerequisite to acknowledging rights to those lands. Evidence attests to rights. This article makes the argument that cultural geography, currently in a very productive and dynamic phase, is now in a unique position to contribute significantly to this evidence problem, and hence to managing the disconnect between formal and customary tenure systems. In this regard it is the intent of this article to contribute to the growing literature dealing with geography's importance to international research and important problems (e.g. Warf et al. 2004; Zimmerer 1994; Zimmerer and Young 1990; Wood 2004; Blaike and Brookfield 1987; Turner et al. 1990). Following a discussion about why it is cultural geography that is best positioned to articulate and translate evidence, and the primary issues involved in adaptation and adjudication in tenure systems, the paper examines the nature of the evidence domain, and considers three examples of constructs of cultural geographic evidence.

**Cultural Geography and the 'Evidence Landscape'**

The discipline of geography offers much that is relevant to the evidence problem. Legal geography considers the "relation between the places and spaces of social life, and the enactment, interpretation and contestation of law, both formal and informal" (Blomley 2002, 435). Cultural ecology looks at the relationship between cultural groups and the natural environment, with a focus on the "adaptive processes by which human societies and cultures adjust through subsistence patterns to the specific parameters of their local habitat" (Watts 2002, 134). Political ecology emphasizes historically embedded processes that contribute to a set of socioeconomic relations
And human ecology examines the relationships between people and physical and social environments (McManus 2002). These subfields (and in particular political ecology) all intersect significantly with the topic of landscape-based evidence, and make the connection with a broader human geography which provides such evidence with important meaning and legitimacy. However cultural geography is of particular interest for examining specifically what is needed in terms of the production and treatment of landscape 'material' that can be used as evidence. Cultural geography’s focus on "the active role of human groups in transforming natural environments" (Cosgrove 2002, 134), is what provides for the actual evidence. From Sauer's work to the present it is the 'morphology of landscape' (Sauer 1963) that results from "the agency of culture as a force in shaping the visible features of the earth's surface in delimited areas" (Cosgrove 2002, 138) that is of utility. The various combinations of the components of this interaction can make arguments of varying strength regarding the attachment of people to landscapes. In particular the interplay between social and cultural-ecological components is significant. Community level testimony from neighbors, relatives, and the customary leadership regarding boundaries, land occupation, land and tree tenure, land use and inheritance and the history of these, will be much more valuable in a land claim than knowledge of only physical evidence, i.e., location of rivers and streams, fallen trees, depressions, termite hills, etc. This is because social evidence ties individuals to communities and specific groups, and cultural-ecological evidence corroborated by social evidence constitutes the connection between the physical signs of land occupation due to human presence, and the social aspects (inheritance of land, networks of lending land, land transaction, etc.). Such a combination is at the heart of the definition of land tenure, which Middleton (1988) describes as "a system of relations between people and groups expressed in terms of their mutual rights and obligations with regard to land."

It is this visible result of human social relations involving the landscape, that can become (translated into) evidence connected to social and cultural meaning—thereby amplifying the construction of an 'argument' for claim that has important linkages to other evidence. The 'argument' notion is important. All claims to land are part of a construction of an evidence-based 'argument for claim.' Even formal title, or long-term occupation, are only arguments based on evidence that can be, and often is, contested—as are tribal, ethnic, identity, religious and other group membership-based claims. The utility of landscape-based evidence is such that in many circumstances there is a purposeful human interaction with the landscape for the express purpose of creating evidence of claim, access, or ownership—planting of economic trees, location of graves, or clearing trees (e.g. Odgaard 2003; Unruh et al. forthcoming; Mathieu et al. 2003). Mathieu et al. (2003, 119) note that inscriptions on the landscape are “also acts of ‘formalisation’ which have a high degree of social visibility…. ” And in cases of transfer of land rights, such formalization “signifies a public claim, on the part of the buyer, and a public acceptance, by the traditional indigenous owner, of the permanent transfer of rights” (Mathieu et al. 2003, 119). Thus such evidence is not ‘information,’ or an ‘institution,’ but rather an ‘argument.’ Such an argument can be strong, weak, true, untrue, convincing or unconvincing, and corroborate or contribute (strongly or weakly) to other ‘arguments’ to make a larger argument.

In this regard, within cultural geography a consideration of landscapes as representations, which communicate many varied messages and readings (e.g. King 1996; Barnes and Duncan 1992; Schein 1993; Pred 1997) is valuable. Such representation, made possible by the appropriation, recomposition and particularization of the meaning of culturally specific landscape material
(Duncan 2000; Valentine 2001), is what can facilitate the translation of such material into meaningful evidence for claims to land. Meaningful in that, as Duncan (2000, 704) notes "people accept cultural ideas and social relations embedded in landscapes because landscapes are taken for granted as material facts of life." Likewise Odgaard (2003) highlights the importance of social relationships to land rights, and Berry (1997) observes that land rights are not only understood as rules and laws, but as a function of daily interaction. As well Cleaver (2003) highlights the importance of daily interactions to institutional formation, noting that without the “social embedding of new arrangements, bureaucratic institutions are unlikely to be effective” (Cleaver 2003, 15; also Maganga 2003; Van donge 1993). Moreover, there can be an intentional reinterpretation of the dominant or common readings of landscapes, creating new spatially based representations (Creswell 1996). In this context one view of the cultural turn in geography is relevant, whereby "meaning is actively constructed, negotiated and contested, always constituted through the shared discourses of human and non-human agents" (Crang 2002, 142). And Barnett (1998, 38) argues that “the cultural turn is probably best characterized by a heightened reflexivity toward the valuable role of language, meaning, and representations in the constitution of ‘reality’ and knowledge of reality.” Such interpretation and reinterpretation is also a fundamental aspect of Western formal legal conceptions of evidence (discussed below) (Dennis 1999). The important point here is that these renditions of cultural geography, together with their ‘fit’ with how formal evidence law works, and the role of such evidence within customary communities, is what best defines the operational composition of the ‘evidence landscape.’

Thus while debates critiquing cultural geography’s emphasis on the visible form (morphology) as opposed to process (Cosgrove 2000) are valuable, it is the connection of the visible, to cultural, social, economic, and political process that constitutes the value of cultural geographic evidence. That significant local meaning can be accessed through the morphological characteristics of the cultural landscape is of important operational utility. This is particularly the case because social relationships regarding land(s) are ongoing and binding, bringing a needed enforcement aspect into decisions regarding claims or conflict.

Evidence and Adaptation

Ongoing Adaptation
In a comprehensive book entitled "Searching for Land Tenure Security in Africa" (Bruce and Migot-Adholla 1994), eight research projects in seven countries together with a comprehensive literature review approached the 'disconnect' in African land tenure. Given the problems associated with attempting to replace customary tenure with formal tenure, the authors come to the conclusion that there must be movement away from the "replacement paradigm" toward an "adaptation paradigm" (Bruce and Migot-Adholla 1994, 261). Such an adaptation approach is evolutionary and implies a clear acknowledgement of the legal applicability and enforceability of important aspects of customary tenure, and in particular focuses on adjudication as a primary vehicle for adaptation between customary and formal tenure systems (Bruce et al. 1994). de Soto (2000) also draws on how American formal property law evolved over time to reflect informal processes of claim and disputing as the country was settled, as an important example with regard to successful incorporation of customary constructs into state law. The significance of the Bruce and Migot-Adholla (1994) adaptation argument, and de Soto's (2000) American pioneer example, is the importance not only of the recognition of customary ways by formal law, but the evolutionary transformation of customary law as well, in reaction to interaction with formal law. The utility of evidence in this adaptation is two-fold, 1) its role in legal adjudication, and 2) its role in making an
informal argument for claim in the absence of effective institutions for land rights.

The Role of Adjudication

Bruce et al. (1994) highlight that a certain amount is known about the process of adaptation and transformation in customary land tenure systems, including the primary importance of conflict resolution in the process (also Moore 1986; Rose 1992). They point out that there is a need to look at "how dispute settlement mechanisms can best be framed to facilitate the process of legal evolution" (Bruce et al. 1994, 262). And Sara Berry argues that instead of rewriting laws dealing with land, governments should focus on “the mediation of what, in changing and unstable economies, will continue to be conflicting interests of farmers and others with respect to rights in rural land” (Bruce et al. 1994, 262). McAuslan (1998, 544) also notes the central role of adjudication with regard to land laws in Africa, “[t]he successful implementation and general public acceptance of new land laws and new rights, obligations, ways of doing things and official powers will depend to no small extent on whether efficient, effective and equitable dispute settlement mechanisms are put into place.” And the World Bank (1989, 104) acknowledges that, “[j]udicial mechanisms for dealing with disputes between owners claiming traditional versus modern land rights are urgently required.”

Because some of the most common and problematic interactions between customary and formal tenure regimes exist within the domain of competition and disputing, this becomes an important arena for transformation (over time) of both customary and formal ways (Bruce et al. 1994; Moore 1986; Rose 1992). The role of adjudication brings considerable focus to the functioning of evidence as an important medium of interaction within adjudication—including extra legal and alternative forms of settlement. In this regard the most important question is, what aspects of customary interactions with lands are both connected to ongoing social relations about land, and acceptable as legal forms of evidence?

The Role of the ‘Informal Argument’ - Evidence or Institutions?

While the existence of effective institutions for adjudication is important, lack of formal institutions to utilize evidence does not prohibit evidence from being widely used to make an argument for claim to land(s). And in reality the reverse is often the case. Where effective, legitimate institutions are lacking, the emergence of certain forms of landscape-based evidence can be particularly robust, especially forms which connect with formal notions of claim such as ‘occupation.’ Purposefully planted trees deserve particular mention in an evidentiary context due to the very clear connections made between social relations and landscape. The literature regarding the tenure role of trees is significantly large (e.g. Raintree 1987; Meinzen-Dick et al. 2002; Otsuka et al. 2001; Rocheleau and Edmunds 1997; and Fortmann and Ridell 1985 is an annotated bibliography on the topic with 414 entries). Economic, marker, and service trees are notable for their pervasive role as legitimate evidence for claim within customary systems, and their strong connection with formal legal notions of long-term occupation or presence. That tree planting serves as powerful evidence for land claims is underscored by the restriction on tree planting by certain groups, such as women, tenants, and migrants; and the failure of agroforestry programs that do not take this tenure aspect of trees into account. This valuable role for customarily planted trees is because such trees make the right evidentiary connections between the physical, social, and cultural, and point to the utility of forms of evidence that do link these, as the Mozambique and Zuni cases below illustrate.
While planting economic trees can be one way to make an argument for claim (e.g. Otsuka et al. 2001; Meinzen-Dick et al. 2002), more pervasive, and of greater concern, is the use of clearing land in order to create evidence of occupation and hence claim. Use of this form of evidence (deforestation) is widespread in part because it is so effective. In one sense, the more lacking local to national institutions are for adequately treating evidence (claim, dispute resolution), the greater the need to make a strong visible argument for claim, and the more prevalent certain forms of landscape-based evidence can be, particularly ‘clearing to claim.’ Brazil's grand colonization schemes in the Amazon provide examples of clearing to claim, where in spite of the government having provided settlers with land titles, settlers themselves in some cases, clear much more land than they can cultivate in an effort to secure their claim (Fernside 1986; Postel 1988). Other examples of clearing land so as to create evidence (of occupation) where effective institutions are lacking can be found in the Philippines (Uitamo 1999), Uganda (Mulley and Unruh 2004; Aluma 1989), Cameroun (Delville 2003), Zambia (Unruh et al. forthcoming), and Sierra Leone (author’s fieldwork 2005).

Such clearing is one way adaptation can occur between formal and informal tenure systems, with regard to forms of evidence being employed that also fit with concepts contained in formal law (occupation). That such a feature of adaptation can result in land degradation reveals the nonpositive aspects of adaptation if it operates in a one-sided fashion. On the other hand, if formal law generally held other forms of landscape-based evidence to be as important, or more important than ‘clearing to claim’ would this reduce the need to pursue such an arduous form of evidence (clearing) when other forms would do?

Delville (2003) notes in several countries (Rwanda, Ivory Coast, Benin, Senegal) the derivation of evidence (pieces of paper) and procedures that attest to land transactions, in the absence of institutions and laws to handle such evidence (also Andre 2003). Yet such evidence has great utility as an informal argument, a way to make the case for the existence of rights (Deville 2003). In effect such pieces of paper participate in the translation of landscape evidence--boundary represented in pieces of paper, and witnesses whose signatures attest to boundary location. Meanwhile Lund (2002) observes that negotiation plays a key role in land claiming and adjudication and that a variety of actors are engaged, as “all sorts of tactical and strategic manoeuvres that affect the outcome in terms of changing, transforming or solidifying a land claim” (Lund 2002, 18) are pursued. Such maneuvers, strategies, and assertions, in attempting claim, or defense of claim without using institutions, are based on various forms of evidence attesting to the assertion, or supporting the strategy, whether this be continued use and occupation, a receipt of purchase, membership in lineage or other group, or testimony of authority figures, friends, or neighbors.

What tree planting, ‘clearing to claim,’ and the rendering of ‘pieces of paper’ have in common in a tenure context, is that they can come about due both to the absence of effective institutions regarding land, and the relationship between tenure security and evidence. The recognition of the role of informal legalities in the absence of institutions is not new. There is a significant body of literature that focuses on ‘law, culture, and society’ issues that deal with land claiming and dispute settlement without courts, order without law, law as social process, the ‘shadow of the law,’ and folk law (e.g., Nader 1997; Moore 1973 2000; Delville 2003; Ellickson 1991; Renteln and Dundes 1995). Thus the real utility of such evidence is that it creates an informal ‘legal environment’ of
claim based on what is commonly thought to be legitimate forms of evidence of claim.

Adaptation or Evolution?
While the adaptation paradigm highlights the evolutionary nature of change in both customary and formal tenure systems as these adapt to each other, this approach is significantly different than the ‘evolutionary theory of land rights’ (e.g., World Bank 1989; Demsetz 1967) which Platteau (1996) effectively critiques for sub-Saharan Africa. The evolutionary theory holds that population increase, and the resulting land scarcity, change in land values, increased uncertainty, and conflict, leads to a demand for (by the populace) and delivery of (by the state) more secure property rights via title. By using population increase and land scarcity to be its primary drivers, the theory assumes--apart from what Platteau (1996) articulates—that the evolution of customary property rights occurs in isolation from interaction with formal tenure systems—which is the central theme of the ‘adaptation paradigm.’ As well the theory is problematic for a continent as diverse as Africa, and its evolutionary trajectory operates in isolation from the effects of pervasive socio-economic convulsions which dramatically change population – land scenarios in parts of the developing world--famine, armed conflict (often over land), forced dislocation, and subtractions of people from the land - labor nexus via malaria and HIV/AIDS. As such, land scarcity is not the only, or even the prevailing way that land conflicts are generated in many locations. Platteau (1996, 38) notes, “there seems to be an emerging consensus that several key predictions depicted [in the theory] typically fail to materialize.” Of particular relevance is the low level of trust which many customary populations can have toward the state regarding a number of issues, but especially over land, often for historical reasons. So that however strong the response by the state for the provision of the necessary security via institutions and title, trust in these can frequently be low, and as a result so will their effectiveness (Platteau 1996). Moreover, the evolutionary theory assumes that customary landholders do not innovate or derive solutions to problems and are essentially powerless, which of course is not the case (Delville 2003). Thus while both the adaptation paradigm and the evolutionary theory involve change over time, the orientation of the two are distinct, and the connection to this article is the former.

The Evidence Domain

The ‘Legal Heritage’ of Land Laws
Legislation imported to colonies by European rulers have an enduring legacy in developing country land laws in particular, and play a primary role in the ongoing disconnect between formal and informal approaches to tenure (e.g. McAuslan 2000; de Moor and Rothermund 1994; Okoth-Ogendo 2000). Thus while almost all colonies have enjoyed at least several decades of independence, with regard to land laws most have retained the "legal heritage" (de Moor and Rothermund 1994, 1) left by colonial rulers (also McAuslan 2000; Okoth-Ogendo 2000; Joireman 2001). The following discussion regarding evidence law draws from this heritage (e.g. Dennis 1999; de Moor and Rothermund 1994; Stevens and Pearce 2000; Rectlinger 1996; Kollewijn 1994), and attempts to articulate some of the more important aspects of evidence law, and how these intersect with customary evidence.

The links between African formal legal reality and Western law is significant, and likely to get stronger. McAuslan (1998, 525) notes that, “[i]ssues related to land reform in Africa are particularly relevant at this time, for a number of reasons. In the first place, the twin emphases of donors, led by the World Bank, on ‘good
governance' and the market economy as the keys to social and economic regeneration in Africa are increasingly seen as necessitating a greater reliance on legal forms and a legal culture similar to those operating in Western, market-orientated economies; conscious moves to adapt legal and judicial systems to that end are thus increasingly part of aid programmes. Secondly, land reform, while never off the African reform agenda as advanced by the donor community, is itself increasingly presented as being a candidate for legal—that is, Western-type legal—solutions."

And in a wide ranging essay on the impact of European land law on current land laws in Africa, McAuslan (2003) articulates the technical legal phenomenon, by noting the role of what is known as the ‘reception clause,’ primarily in former British colonies. “Throughout colonial Anglophone Africa, the reception clause provided that, as from a specified date, the common law, the doctrines of equity and statutes of general application applying in England as on that specified date would apply in the particular country named in the reception clause” (McAuslan 2003, 60). While different reception dates attend to different countries, for the 17 countries to which this applies in Africa, all reception clauses have survived and were confirmed in all cases at independence. As well these reception clauses have continued to survive and be reconfirmed in every constitutional change in all 17 countries since independence (McAuslan 2003).

“In some respects indeed, the influence [of received law] has grown since independence; with the collapse in so many countries of a system of national law reports, judges rely on precedents from English and South African law reports which continue to be received in the law court libraries in lieu of anything else” (McAuslan 2003:61).

Of interest in this context is the notion of ‘adverse possession’ in which occupation of the land in question for a period of time (registered or unregistered) can lead to the acquisition of title. Proving adverse possession then relies on the necessary evidence attesting to the fact of occupation for the period of time in question (Stevens and Pearce 2000; Garner 2000).

Legitimacy in Adjudication
The notion of legitimacy, as a fundamental objective of Western evidence law (Dennis 1999) is particularly suited to the treatment of evidence in the context of the disconnect between formal and informal tenure systems. As Dennis (1999, 36) notes, regarding the overall intent of evidence law, “[i]f official adjudications are to succeed in gaining acceptance and respect as authoritative decisions, it is essential that they are, and are seen to be, legitimate.” This form of legitimacy in law, (termed ‘legitimacy of decision’), is different than factual certainty of decision, regarding true facts of a dispute (Dennis 1999). Legitimacy of decision seeks legitimacy from the parties concerned and society at large, regarding notions of integrity, acceptability, and moral authority (Dennis 1999). In civil matters particularly, “the aim of adjudication is to settle disputes within a framework of economic, social and political relations that attaches considerable value to self-determination” (Dennis 1999, 42). Thus in civil adjudication, such as cases involving land, "[p]rocedural fairness and equality of treatment for parties in the litigation process may assume greater importance” (Denis 1999, 42). This is because "the aims of the civil process have at least as much to do with the restoration of equilibrium and harmony (via the peaceful and acceptable settlements of disputes) between warring parties as with the implementation of state policy on matters of civil law" (Dennis 1999, 42). In this regard the parties concerned must be free to collect and present any evidence that they believe to be of probative value in order for the procedure and resulting decision to be regarded by the parties as legitimate (Dennis 1999).
Such legitimacy is not unrelated to formal admissibility of evidence. With the exception of where exclusionary rules prevail, relevance is the fundamental test of admissibility in Western evidence law (Dennis 1999; Emanuel 1996). While there are variations in definitions of relevance, they tend toward the understanding that “there must be a ‘probative relationship’ between the piece of evidence and the factual proposition to which the evidence is addressed. That is, the evidence must make the factual proposition more (or less) likely than it would be without the evidence” (Emanuel 1996, 12; also Dennis 1999). The purpose behind such a broad test of admissibility is, again, to provide opportunities for parties to an adjudication, to present their own evidence, thus promoting legitimacy of decision and procedure in the eyes of the claimants (Dennis 1999). Thus the ‘adversary system,’ as a method of formal adjudication in common law, whereby the opposing parties in a conflict are free to gather, interpret, and present evidence for their claim (Rectlinger 1996) seeks to engage this legitimacy.

McAlusan (2003) notes the specific connection between such legitimacy and the legal domain in Africa, observing that the “connection between land law and political stability was made an important basis for the system of indirect rule or rule through chiefs which characterized British colonial rule in Africa and was not entirely absent from other colonial systems” (McAlusan 2003, 70). And Cousins (1996, 49-50) notes a similarity to traditional African law:

“…the objective of traditional courts or tribunals in Africa was to reconcile the disputants and maintain peace, rather than to punish the wrongdoer…[such] approaches tend to be process-oriented, focused on the need and desires of the people, rather than the results. Values of respect, honesty, dignity and reciprocity are stressed.”

In his critique of ‘the evolutionary theory of property rights’ Platteau (1996) articulates at length the relevance of legitimacy as a primary problem between African reality and the theory. Such a legitimacy problem can manifest itself in various ways, ranging from inertia on the part of smallholders regarding state-related land activities, to violence (Platteau 1996). In particular “[i]f people do not consider the new system of (land) rights to be legitimate, and refuse the reshuffling which it implies, they may succeed in blocking the normal functioning of the legal system. This can be especially true in young nations with ‘soft’ states as in Sub-Saharan Africa” (Platteau 1996, 61).

**Customary Evidence, or Rights?**

A distinction between the utility of evidence, vs. rights, is important for five reasons. First, although formal recognition of customary tenure structure (laws, rights, tenurial patterns) is valuable (e.g. Deville 2000; Okoth-Ogendo 2000; Toulmin and Quan 2000), because of the large variation in customary tenure forms and formulations (ethnic, geographic, religious, etc.) within any one country, focusing on a few broad customary tenurial patterns (rights) connected to simple forms of evidence (e.g. group membership) will not adequately engage the disconnect. Second, this same variation also means that formal law will not be able to embrace (make legal) all of this variation in ways that are meaningful to the different customary structures, and still be operable as a formal, widely applied (and regularized) uniform system. And indeed the codification of customary law can in some cases capture and emphasize ethnic differences as (Maganga and Juma 1999) have shown for Tanzania. Maganga (2003, 60) notes “the activities of one group undermine those of another, and no one group is willing to adhere to the cultural practices of another.” Ethiopia as an example has over 70 separate languages with a larger number of distinct social units. Third, attempts at incorporating customary laws and other structural aspects of indigenous
tenure regimes into formal law, finds that much in customary tenure can be fluid, reflecting variation and change in a variety of social, political, and economic variables, including capricious decision-making by leadership (Roberts 1994; Unruh 2002a). This creates a very uncertain formal legal environment, which Elias (1994) sees as a fundamental problem in attempting to reduce customary laws to writing. The goals of formalized property laws are otherwise. Such laws are much less subject to change, hence their predictability, wide application, and value in operationalizing capital and other aspects of property associated with land as a commodity (Unruh 2002a). Fourth, some primary forms of rights, held as quite valuable by customary groups, are very difficult to incorporate into formal law. Rights to land based on tribe, ethnicity, lineage, opposition to a particular group, or position in a customary hierarchy, can have large meaning within customary tenure regimes, but can be of limited or no utility, and in fact work in contradiction to formal tenure systems which hold notions of wide applicability and equity in the context of individual rights, as central tenets. This is a significant problem in attempting to legalize rights attached to groups. Fifth, conflicting rights and laws, both between different sets of customary law, and between customary and formal laws is a large and difficult problem (Unsworth 1994).

These issues highlight the importance of understanding usable evidence coming from customary life, as existing within a domain of human interaction with the landscape. And from this interaction many possibilities can be drawn that attest to the veracity of the interaction (corroboration), and hence the existence of rights for such interaction to occur in the first place. And Western evidence law is compatible with this. Dennis (1999,12) describes the law of evidence as not "a tidy system of clearly defined rules" but rather "indisputably untidy and extremely complex," in which nearly everything that is relevant is admissible.

Illustrative Cases

Three examples in different circumstances illustrate the potential contribution of the evidence landscape to managing the disconnect between formal and customary tenure regimes: Mozambique, East Timor, and Zuni lands in the U.S.

Mozambique

Mozambique in the early 1990s was recovering from a 23-year civil war in which over 40 percent of the national population was dislocated. As approximately six million people were returning to occupy or seek new lands, the government realized the severity of the disconnect created by the prevailing land law and its emphasis on documented title for all landholders (Tanner 2002). Postwar land tenure in Mozambique engages a particularly difficult national issue, which is the problematic relationship between the many relatively large commercial interests, and the indigenous or smallholder sector. These two groups frequently claimed the same land, but under different regimes of authority, legitimacy, and proof.

The problem, more specifically, became one of defining what was regarded as legitimate evidence by whom. Such an evidentiary problem in a postwar context becomes particularly difficult because the prevalence of weapons can quickly lead to violence in land disputes. The research on the spatio-evidence problem (Unruh 1997) examined customary evidence according to its social and cultural-ecological character, and found that a shift in landscape-based evidence subsequent to the war had the effect of selecting for forms of customary evidence that were more compatible with the formal tenure system (regarding occupation), particularly agroforestry trees (Table 1). Such trees
became singularly important, because they were easily and strongly tied to social evidence (particularly historical social evidence), and because they complied with the widely known definition of occupation in formal law (Mozambique Land Law 1997; MPPB 1997; Norfolk and Liversage 2003; Pancas 2003; Kloeck-Jenson 1998). Forces associated with the war and the disconnect between customary, migrant (war displaced), and formal tenure acted to put even greater weight on older agroforestry trees compared to younger trees and other forms of evidence (Unruh 2002b). This suggests that even in situations where formal and informal institutions regarding property rights are most disrupted (subsequent to war), agroforestry trees as legitimate evidence can be or become strong, particularly relative to other forms of evidence.

The results of the research were incorporated into the Mozambican Land Commission’s deliberations on land policy reform for the country, including the admissibility of various customary forms of evidence attesting to occupation. In the new land law such forms of evidence are now not to be prejudiced by or inferior to rights received through a formal written title (Mozambique Land Law 1997; Negrao 1999; Norfolk and Liversage 2003). While other important rights (other than those pertaining to evidence) were also included in the revised law, such rights nonetheless rest on proving occupancy or other attachments to location.

The enhanced position of customary evidence in the new Mozambican law is linked to a debilitated set of land and property institutions subsequent to the war, including a weak court system (Norfolk and Liversage 2003; MNA 1999; Pancas 2003). This relationship between the greater role for customary evidence and weak formal institutions is important. From the government’s view, the intent of making evidence to rights in land and property clear and strong in the law, is to make a substantial contribution to the extra-legal resolution and avoidance of conflicts, particularly between small and largeholders (Garvey 1998; Norfolk and Liversage 2003; MNA 1999). While not thought to pre-empt all conflicts, such an arrangement means that investors (foreign and national) need to negotiate directly with in-place local communities. This occurs due to the empowered position of local communities via the rights attested to by evidence of occupation, and as a result the community participation requirement in determining what areas are really ‘open’ or not (de Wit 2002; Pancas 2003; USDS 2001; Kloeck-Jenson 1998; Tanner 2002; Hanlon 2002; Norfolk and Liversage 2003). This position is given strength because the current land policy states that occupation according to customary evidence constitutes one way in which the use right attributed by the state is acquired without the need for documents (Hanchinamani 2003). Such evidence and rights were not seen as new, and did not have to be authorized – the law recognized them and offered them full legal protection (article 12; Tanner 2002).

The Mozambique case looked at three sets of villages in the provinces of Nampula and Cabo Delgado totaling 544 households. The three sets comprised different proportions of war displaced (migrants), western Nampula 10%, Monapo 23%, and Montepuez 73%. The sampling strategy is described in Unruh (2002b). Table 1 illustrates that the different village sets prefer different types of evidence, with available evidence in this case categorized into social, cultural-ecological, and physical. Social evidence is oral or testimonial, and is provided or confirmed by members of a community. This type of evidence relates to historical occupation, and ties individuals, households, and land to local communities. Social evidence can corroborate physical, cultural-ecological, and other social evidence. Cultural-ecological evidence can be defined as the physical pieces of evidence that exist due to human activity on the landscape, such as agroforestry trees, current and old field boundaries, tombs, cemeteries, etc. This evidence best demonstrates occupation and use,
and can corroborate social evidence and other cultural-ecological evidence regarding human activities relevant to land. Cultural-ecological evidence however is problematic exclusively on its own, and to a significant degree needs corroborative social evidence for meaning. Physical evidence is comprised of naturally occurring terrain features. Such features are easily observable to anyone, demonstrate relative familiarity with an area, and usually corroborate no other category of evidence.

Table 1 illustrates that the western Nampula set favors social evidence more than the other two. And the Monapo set favors no evidence type over the other, having more of a balance between evidence categories. The Montepuez set favors physical evidence. The differences in evidence type for the three village sets reflects what evidence can be accessed given different situations following the war. The Montepuez set is perhaps most noteworthy. Because most inhabitants in this set are migrants from elsewhere due to the war, and thus do not possess the same community-land connection or community cohesion, as do households within the western Nampula or the Monapo village sets, availability of social and cultural-ecological evidence is less.

For the three village sets in the study, the presence of agroforestry trees is the single most important piece of evidence for defending or asserting rights to land, regardless of the average number of trees per smallholder (Table 2). While nearly all households consider trees as quite valuable evidence, many did not actually possess the evidence, and in Montepuez very few possess significant numbers of trees.

The Mozambique case illustrates several points. While institutions for dealing with evidence in disputes are important, their absence does not result in a reduced role for evidence. On the contrary, reduction in the presence, effectiveness, and legitimacy of institutions (formal and informal) in Mozambique meant significant reliance on certain forms of evidence most able to connect the social and cultural with the visible physical (Unruh 2002b). The utility of strong evidence in the absence of institutions has not gone unnoticed by the Mozambican government, who has made forms of customary evidence legal in formal law, with the intent of avoiding, or preempting as many conflicts as possible. And, the different circumstances experienced by the village sets can result in value placed on different forms of evidence. This highlights the fluid nature of the evidence domain, reflecting social circumstances and relations, and suggests that admissibility of such evidence in formal law be as unrestricted as possible.

**East Timor**

In East Timor the 1999 conflict resulted in the destruction of almost all documents relating to land and property, such that current use of titles and other documents as evidence of ownership and access is extremely difficult (Marquardt et al. 2002). Moreover most of the rural land held by customary communities was never titled (Marquardt et al. 2002). The current East Timorese government, in acknowledging the tenurial difficulties, is presently researching local rural and urban realities as well as national and international issues regarding lands, so as to inform the derivation of national property rights laws (Nixon 2004; USAID 2003; Marquardt et al. 2002). A priority in the effort is to minimize the disconnect between rural customary landholders and commercial and state interests. Local customary evidence figures prominently in this research, and includes significant landscape-based cultural geographic evidence (Table 3) (Nixon 2004; Unruh 2003).
What the East Timor case reveals, and is particularly relevant to chaotic postwar scenarios, is both an enhancement of evidence as a medium of interaction with a decrease in the presence of effective institutions, and the need to leave the evidence domain as unstructured as possible in formal law. Table 3 illustrates the general agreement regarding what constitutes legitimate evidence between those holding state administration positions at various levels, and members of two customary communities. Prior to the violent departure of the Indonesians and the accompanying social upheaval, the only formal state evidence of ownership was an Indonesian land title (Fitzpatrick 2002). The general agreement in evidence (Table 3) subsequent to the upheaval and with the lack of effective institutions in-place presents a potential opportunity for future East Timorese land law to utilize such compatibility in lawmaking. At the same time the variability in what the three samples regard as ‘very important’ to ‘very unimportant’ evidence suggests caution in the establishment of formal evidence rules or norms that bar admissibility based on factors other than relevancy; that value some forms of evidence over others for reasons apart from probative value; or that unduly constrain, apart from ethical concerns, the way evidence is collected, discovered, or researched (also Bailliet 2003). Significant efforts are underway in East Timor to mesh formal and customary tenure systems, with priority placed on evidence as a medium of interaction between the emerging systems (Unruh 2003).

The Zuni
In an example from the American Southwest, the Zuni Nation has successfully pursued three major court cases against the American government for damages to Zuni claimed lands and confiscation of lands in the course of western settlement (Hart 1995; Ferguson and Hart 1985). This was accomplished without title as evidence (Hart 1995). This example, while occurring in a developed country, is meant to illustrate the degree to which the evidence landscape can be used in land claims and dispute resolution between formal and informal tenure systems. Thus while in a number of ways the case and the evidence are not completely replicable in many developing country circumstances, the point is to demonstrate the large utility of the landscape to act as an archive of evidence, and as an example of how such evidence can be ‘rendered.’

In the Zuni case the evidence landscape used was largely historical, and began with researching evidence of physical landscape change connected to large-scale tree cutting and other land use by white settlers on Zuni claimed land, and the subsequent erosion and changes in fluvial geomorphology (Hart 1995). Evidence was collected using soil coring that revealed biophysical landscape changes connected in time to social processes of tree cutting, settlement, and the traditional land use activities of the Zuni. The effort linked historical physical geography with testimonial evidence from the Zuni, and expert testimony from the fields of anthropology, archaeology, ethnography, and history that attested to where, when, and how events took place on the landscape (Hart 1995). The amount of time spent collecting and correlating all of the evidence, including map production (Ferguson and Hart 1985) ultimately proved quite powerful, with the tribe in one case winning a $25 million settlement, in another land access, and the establishment of a $25 million trust in the third case (Hart 1995). In the Zuni example the broad question was the same, what spatially-based evidence is translatable from reality, and is of meaning in both Zuni (i.e., correlated with social evidence) and formal law contexts.

While there exists extensive field data relating to the evidence landscape of the Zuni case (Hart
Ferguson and Hart 1985), only a few types are mentioned here for illustration. Stauber (1995, 137) describes the “recapturing” of the landscape in the Zuni case using old US Government Surveys. This approach (which has a parallel in colonial occupation and administration of lands in the developing world) used General Land Office (GLO) surveys made between 1880 and 1912. Both the plat maps and the accompanying field notes comprise a large-scale historical geography providing particular information over a 36 square mile area at a single point in time. Approximately 2000 pages of GLO survey notes and maps were examined by the case, and data compilations were made along criteria determined to be evidentiarily relevant. These included both environmental criteria (landform characteristics, soil type and quality, vegetation species and condition including quantity and quality of timber species, quantities of minerals, water resource characteristics, drainage characteristics), and cultural criteria (soil and water control features, agriculture and agricultural features, grazing and grazing features, architecture, transportation networks, industrial operations, and ethnographic and historical information dealing with attitudes or activities of the time) (Stauber 1995). In addition, agricultural field polygons, peach orchards, buildings and corrals for the entire area of concern were extracted from the GLO plats and placed onto a single scaled map. This information was compared with air photos from the 1930s, 1950s and 1970s, together with field measurements and interviews with Zuni informants, archeological fieldwork, and historical record research, to compile a record of occupation and change over time (Stauber 1995). This approach allowed specific changes (‘damages’ in the court cases) to be located and calculated over time. Thus the combination of the GLO surveys, aerial photography, and Zuni testimony proved quite valuable in that they dealt with information regarding who was using the Zuni landscape, what resources were present, and the quantity and condition of those resources at the time of the survey. Zuni witnesses then compared this information with other current and historical data to calculate landscape change (Stauber 1995).

Zuni use of oral tradition as attached to landscape was also used in the litigation (Wiget 1995). Wiget’s (1995) work on how to treat oral tradition and attach it to landscape so that it has evidentiary value, has application beyond the Zuni case.

“The problem of how to substantiate claims that depend on testimonies from oral tradition is an especially serious one for traditional peoples for whom large spans of their history and large areas of their domain lack written documentation, and whose conceptions of history do not always conform to Western notions” (Wiget 1995, 173; also Eggan 1967). The analysis of oral tradition attached to landscape was looked at within the criteria of validity, reliability and consistency. In this context validity refers to “the degree of conformity between reports of the event and the event itself as recorded in other primary source material” (Hoffman 1984, 70) such that validity can be a measure of corroboration (Wiget 1995). Reliability is “the consistency with which an individual will tell the same story about the same events on the different occasions” (Hoffman 1984, 70), and as such reliability is an outcome of replicability (Wiget 1995). Consistency is defined as “the degree to which the form or content of one testimony conforms with other testimonies. It differs from reliability by being a measure of conformity between, rather than within, traditions” (Wiget 1995, 179). Consistency as attached to landscape deals with the description (from multiple persons) of customs or practices that involve the landscape. In the Zuni case this included: the method of plugging gullies by setting rows of cedar branches and brush weighted with rock in a trench across a watercourse; the use of native irrigation techniques, including small diversion dams and wooden shunts; dry farming techniques using a digging stick; the siltation of small dams due to overgrazing and erosion, and the replacement of good grazing
grasses by noxious weeds due to overgrazing (Wiget 1995).

Wiget (1995) also pursued the development of thematic coherence in Zuni testimonial evidence regarding the landscape, in which certain narratives are created and interpreted regarding events and causation. The loss of draft horses as part of the government’s destocking policy toward the Zuni, led to a dependence on machinery, which became too expensive and time consuming to use and as a result drove many Zunis out of farming, with repercussions for the landscape. As well, fencing led to overgrazing, which in turn led to erosion and then to siltation of many small dams. Fencing also prevented the free movement of stock, which made herding practices more difficult. Silted dams, changed watercourses, erosion, change in floodplain fields, and use of machinery decreased the extent and effectiveness of farming, with visible outcomes on the landscape (Wiget 1995). Thus for this approach to testimonial or ‘parol’ evidence, techniques of studying oral history and folklore are brought to bear on the rendering of evidence.

In addition, testimonial evidence was used to corroborate other forms of evidence. Wiget (1995) accomplished this by isolating the provision of testimonial evidence from other forms of evidence, until they could be corroborated later, so as not to influence the provision or recording of testimony. Part of the corroboration effort involved fieldwork subsequent to gathering testimonial evidence, which was conducted to verify the locations of a sample of land use sites involved in the testimonies (Ferguson 1995). Photography of these sites produced additional evidence, as did documentation and maps produced from the testimony of Zuni elders (O’neil 1995). In total 232 land use sites were documented, from which maps and boundary areas were derived attesting to forms of land use over time, much of which was corroborated with the biophysical analysis of landscape change. Additional approaches to accessing the evidence landscape in the case were also used. Geological corroboration of native traditions was used, based on Delagua’s (1958) work; landscape features relevant to folk tradition as facts of history was used based on Prendergast and Meighan’s (1959) work; and Boyden (1995) used the manifestation of religion on the landscape as evidence.

The Zuni case also illustrates the importance of the interpretation of landscape features into meaning used as, or in, evidence. An important argument in the US Government’s case was that extensive erosion was well underway prior to white occupation of the area. Evidence was provided from an array of historical documents (early explorers, Spanish era documents, and scientific sources), as evidence that the prevalence of arroyos (as indications of erosion) was widespread prior to white settlement (Monson 1995). In rebuttal the plaintiff presented as evidence the history of the word ‘arroyo’ as it changed meaning in Spanish and English over the course of four centuries (Monson 1995). Early accounts and use of arroyo indicated a stream, river, or other small volume of water. Later usages, particularly as the word entered English vernacular and English dictionaries, included the concept of ‘dry gully’ which, prior to 1888 did not exist in its definition (Monson 1995). The careful study of the meaning of arroyo helped contribute to the success of the Zuni claims (Monson 1995). The illustrative point here is that, translation of landscape features into evidence, connects importantly with meaning, and can lead to important differences in interpretation, and hence argument.

The Zuni case highlights three points. First, that the potential for the evidence landscape is quite large—larger than agroforestry trees and ‘clearing to claim.’ Second, that techniques for reading
the landscape and rendering evidence from the landscape can be developed. And third, that interpretations, and reinterpretations of the meaning of cultural geographic landscape features can play a significant role. This interpreting is an important part of both cultural geography, and the treatment of evidence as an argument in the Western legal tradition.

Conclusions

The larger repercussions from the ongoing disconnect between formal and informal land tenure in the developing world are well known. Less clear are approaches that can effectively manage this disconnect. Significant attention continues to be focused on the need to incorporate structural aspects of customary tenure (particularly rights) into formal law (e.g. Deville 2000; Platteau 2000). However the disconnect continues to operate in a situation of overall “structural chaos” (Moorehead 1979, 1), where a certain ‘management’ of the tenurial confusion that prevails needs to be considered, as opposed to attempting to bring order through formal law (for discussions of such management vs. order through formal law, see Piermay 1996; Mathieu et al. 1997; Moorehead 1997; Delville 2000).

The problem at this point in history for developing countries is larger and more problematic than just fashioning local notions of property into a set of uniform enforceable laws along the lines of the capital-poverty-property rights argument. It is now the added dilemma of attempting to connect in a meaningful way, in-place, formal, European-derived property laws (which will not be discarded given how they are favored by urban elites and the donor community), and customary laws and activities which are bound up in ongoing social relations about land, and which service important social needs that individualized title cannot replace (Unruh 2002a).

This article argues for a much more in-depth consideration of the role of landscape-based evidence to assist in managing the disconnect, as an overlooked domain of interaction between the formal and informal. Five ideas within this approach are most important. First, customary evidence is different from customary laws, rights, norms, hierarchies and other structural components of land tenure systems. Evidence, particularly that attached to the landscape, is the result of day-to-day interaction with the physical environment. And while this interaction can itself be the result of, or influenced by the more structural aspects of a tenure system, spatially-based evidence has considerable utility due to its cultural meaning, visible physical characteristics, and attachments to other forms of social and cultural evidence. Second, because spatially-based evidence is the result of social relations embedded in landscapes over time, the ‘evidence landscape’ is an archive of large potential for the collection and interpretation of relevant evidence; and recent work illustrates the possibilities for reading the landscape (e.g. Russell 1997; Spirn 1998). Third, the evidence domain optimally needs to exist as an unstructured field of interaction between formal and customary tenure systems, where all parties are able to collect, interpret, and present evidence that is relevant, without being constrained by rigid evidence rules or norms. This is important for security and legitimacy, and particularly so where social upheaval has occurred, and where large variation in land use histories; tenurial orders; and social, ethnic, religious, geographic, and economic groups are common. Fourth, the interpretation of landscape characteristics, provides much in the way of useful evidence material that is different than a problematic set of customary evidence based on ethnicity, personal relation, lineage, etc. And importantly, it is different evidence than that based on social relations defined by opposition to another group(s) (e.g. the Palestinian – Israeli land question). Fifth, the parallel between the functioning of the evidence
domain, the heritage of Western evidence law in the developing world, particularly Africa, and the subfield of cultural geography tied to landscape, provides an opportunity to engage a rich and useful tradition in human-landscape analysis. Bruce et al. (1994, 262) note: “[t]here is a need to review the experience of African countries as to how and on what terms recognition of indigenous land tenure rules is most effective, and how dispute settlement mechanisms can best be framed to facilitate the process of legal evolution.”

McAuslan (2003, 80) notes that “it is difficult not to believe that an approach that seeks to marry up the law recognized as legitimate by the populace at large—customary law derived from local concerns and needs—with state law—a law that can and should take account of the wider national and international interests—is indeed the most appropriate way forward for those involved with tenure reform.” The trick of course is how to operationalize this ‘marrying up.’ This article argues that the potential role of landscape-based evidence is significant, but underutilized, and that both cultural geography and policy reform efforts need to consider options regarding such evidence. One thought in any ‘marrying’ approach is, that it may be much more difficult to attempt to incorporate customary rights into formal law, than to get Western-based formal law to abide more by its own traditions involving treatment of evidence.

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Tables.

Table 1. Percent of village sets mentioning social, cultural-ecological, and physical evidence.

<table>
<thead>
<tr>
<th>Evidence List</th>
<th>W. Nampula</th>
<th>Monapo</th>
<th>Montepuez</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social Evidence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Village elders</td>
<td>13</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Local Leaders</td>
<td>25</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Local organization</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Testimony family</td>
<td>16</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>History of occupation</td>
<td>7</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Knowledge of community area</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Testimony neighbors</td>
<td>36</td>
<td>45</td>
<td>3</td>
</tr>
<tr>
<td>History of economic trees</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Cultural - Ecological Evidence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trails</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Cemeteries</td>
<td>3</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Location roads</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sacred areas</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Ruins, old village</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Economic trees</td>
<td>86</td>
<td>93</td>
<td>90</td>
</tr>
<tr>
<td>Tombs</td>
<td>15</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Field boundaries</td>
<td>3</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Location old crops</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Physical Evidence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local terrain differences</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Very large trees</td>
<td>11</td>
<td>5</td>
<td>48</td>
</tr>
<tr>
<td>Location mountains</td>
<td>4</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Termite hills</td>
<td>5</td>
<td>5</td>
<td>28</td>
</tr>
<tr>
<td>Rivers</td>
<td>8</td>
<td>11</td>
<td>28</td>
</tr>
<tr>
<td>Soil type</td>
<td>31</td>
<td>26</td>
<td>61</td>
</tr>
<tr>
<td>Near cotton land</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Boulders</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Location hills</td>
<td>0</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 2 Summary of variables regarding agroforestry trees as evidence.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Village sets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>W. Nampula</td>
</tr>
<tr>
<td>Agroforestry trees as important evidence (%)</td>
<td>86</td>
</tr>
<tr>
<td>Average number of trees per household</td>
<td>25</td>
</tr>
<tr>
<td>Possess trees (percent)</td>
<td>59</td>
</tr>
<tr>
<td>Trees provide a ‘guarantee’ of not losing land (%)</td>
<td>99</td>
</tr>
</tbody>
</table>

Source: Unruh (1997). Between village set average values are significantly different at the 0.05 level between all three village sets for “Average number of trees per household;” and for “Agroforestry trees as important evidence” for the w. Nampula and Monapo; and for “Possess trees” between Montepuez and the other two sites. Source, Unruh 1997.

Table 3. State administration and village rankings of evidence. Values are percent of samples categorizing evidence as very important, important, not important, and very unimportant.

<table>
<thead>
<tr>
<th>Form of Evidence</th>
<th>Key Persons Admin - n = 101</th>
<th>Emera village, n = 31 (conflict)</th>
<th>Manatuto village, n = 30 (less conflict)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trees planted on the land</td>
<td>Very Import</td>
<td>Import</td>
<td>Not Import</td>
</tr>
<tr>
<td>2. Terraces</td>
<td>51%</td>
<td>48%</td>
<td>4%</td>
</tr>
<tr>
<td>3. Irrigation systems</td>
<td>44%</td>
<td>51%</td>
<td>5%</td>
</tr>
<tr>
<td>4. Houses and buildings</td>
<td>33%</td>
<td>47%</td>
<td>18%</td>
</tr>
<tr>
<td>5. Clearing land from forest</td>
<td>20%</td>
<td>38%</td>
<td>40%</td>
</tr>
<tr>
<td>6. Fences</td>
<td>25%</td>
<td>57%</td>
<td>17%</td>
</tr>
<tr>
<td>7. Rock markers</td>
<td>33%</td>
<td>50%</td>
<td>15%</td>
</tr>
<tr>
<td>8. Paths</td>
<td>24%</td>
<td>37%</td>
<td>35%</td>
</tr>
<tr>
<td>9. Divisions around rice fields</td>
<td>23%</td>
<td>50%</td>
<td>26%</td>
</tr>
<tr>
<td>10. Oral accounts of Katuas, supporting traditional claims</td>
<td>48%</td>
<td>43%</td>
<td>8%</td>
</tr>
<tr>
<td>11. Oral accounts of other witnesses</td>
<td>39%</td>
<td>44%</td>
<td>16%</td>
</tr>
<tr>
<td>12. Inheritance claims</td>
<td>43%</td>
<td>49%</td>
<td>6%</td>
</tr>
<tr>
<td>13. Allocation by traditional leaders</td>
<td>30%</td>
<td>53%</td>
<td>15%</td>
</tr>
<tr>
<td>14. A formal certificate issued by a government department</td>
<td>42%</td>
<td>40%</td>
<td>14%</td>
</tr>
<tr>
<td>15. Long term use of previously uncultivated land</td>
<td>22%</td>
<td>38%</td>
<td>13%</td>
</tr>
<tr>
<td>16. Medium/short/term occupation</td>
<td>9%</td>
<td>30%</td>
<td>53%</td>
</tr>
<tr>
<td>17. An agricultural lease issued by a government department</td>
<td>18%</td>
<td>38%</td>
<td>42%</td>
</tr>
<tr>
<td>18. Indonesian letter of recommendation for land ownership</td>
<td>16%</td>
<td>37%</td>
<td>43%</td>
</tr>
<tr>
<td>19. Receipt of tax payment</td>
<td>20%</td>
<td>49%</td>
<td>29%</td>
</tr>
</tbody>
</table>