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**LAND DISPUTE RESOLUTION IN MOZAMBIQUE:
INSTITUTIONS AND EVIDENCE
OF AGROFORESTRY TECHNOLOGY ADOPTION**

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ABSTRACT

Successful adoption of natural resource management technologies requires that important fundamentals of property rights be established. Because disputes over property rights occur universally, the ability to successfully defend one's rights to property exercises a central influence on the tenure security necessary for technology adoption. However, defending rights to property rests upon the possession of evidence that is readily available and widely regarded as legitimate. This paper presents work carried out in postwar Mozambique on the availability and legitimacy of evidence pertaining to land tenure dispute resolution. What is unusual about the Mozambique case is that the physical presence of a natural resource management technology—agroforestry trees in this case—also serves as one of the most widely available and legitimate forms of evidence in the postwar period. Such an arrangement reveals important aspects about the reverse relationship between property rights and technology adoption. While such an evidence role for a technology may at first appear to encourage further adoption of agroforestry, important influences on property rights in the postwar setting serve to discourage full adoption and jeopardize the long-term presence of existing agroforestry trees. It remains to be seen if recent legislative changes regarding property rights will successfully engage customary forms of evidence and encourage full adoption of agroforestry in Mozambique.

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Joh D. Unruh*

1. INTRODUCTION

Nonadoption of natural resource management (NRM) technologies frequently occurs in an environment lacking in functioning land tenure dispute resolution institutions viewed as legitimate and workable by the parties concerned. The frequency, severity, and perception of land conflict and the character of land dispute resolution institutions have a fundamental influence on the resource access arrangements and tenure security necessary for technology adoption. Because all societies experience land disputes, the formation or evolution of customs or rules pertaining to legitimate evidence of rights to property is important to tenure security and resource access. Such evidence is a fundamental part of institutions regarding property rights, with repercussions on disputes and their resolution. If forces serve to alter the availability and legitimacy of evidence, then the associated institutions will also be altered, with implications for constraints and opportunities regarding technology adoption. This can be the case especially when an aspect of NRM technology is also regarded as evidence. This paper considers postwar Mozambique as a case study, and explores the effect of two broad forces on the availability and legitimacy

of evidence regarding claims to property, and the relationship of this evidence to cashew agroforestry as an NRM technology (including adoption and maintenance).

The first influence considered stems from the disparate approaches to land tenure taken by customary versus formal tenure systems, whereby different groups attempting to access the same land may view and/or practice relationships to land very differently. This can result in evidence for a claim to land being regarded as legitimate within a tenure system but not legitimate between systems. Complicating this is Mozambique's recent history of armed conflict, which significantly altered the availability of evidence. One of the more important outcomes of these two forces acting in tandem is a comparative shift in the importance of certain forms of evidence that are both available after the war, and legitimate within and between tenure systems, including intact systems (still in place to varying degrees after the war) and disrupted systems (areas and populations constituting significant percentages of migrants). Such a shift can be especially pronounced for less powerful groups. The heightened or reduced value or utility of certain forms of evidence (and attendant institutions) has significant effect on both property rights and NRM technology adoption. The nature of such effects depends on the nature of the evidence, and its relationship to the technology in question.

With empirical research carried out in Mozambique, this analysis considers land tenure conflict resolution as a "legitimate evidence" and "available evidence" problem in

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its relationship to cashew agroforestry, where cashew trees have become highly valued forms of evidence. Important in this regard is how customary, migrant, and formal approaches to land tenure, together with the recent war, have shaped the relative legitimacy and availability of forms of evidence, and the resulting impacts on dispute resolution institutions and technology adoption.

2. BACKGROUND ON MOZAMBIQUE

THE WAR, RURAL RE-INTEGRATION, AND LAND TENURE

The recent 16-year civil war in Mozambique dislocated approximately six million people (primarily small-scale agriculturalists) from land resources to which they are now returning and reclaiming. This comprises the largest reintegration of refugees and displaced persons in the history of Africa (USCR 1993). Although the war officially ended in 1992, the lack of confidence of the general population about the actual end to the conflict delayed moves back into agriculture (USCR 1993). As a result, the UN expected to continue its resettlement activities in Mozambique until the year 2000 (Lauriciano 1995).

Resource tenure issues are increasingly coming to the fore as populations respond to what they perceive to be lasting peace, and make decisions about returning to areas of origin or migrating elsewhere and re-engaging in agriculture. Many demobilized and

of Indiana in Bloomington, Indiana.

dislocated smallholders have returned to find their lands occupied by others, resulting in significant numbers of land disputes (Willett 1995; Galli 1992). At the same time, rural households are expanding areas under cultivation with each successive season as farmers bring areas long under fallow due to the war back into cultivation (USAID 1996). Further complicating access to land are large-scale recovery efforts to rehabilitate whole agricultural sectors, such as cashew and livestock production. These efforts involve free or greatly subsidized saplings and animals (connected to the landscape in some fashion), which are frequently used to claim land.

All land belongs to the state in Mozambique, but with limited capacity to exercise authority over land, there is considerable ambiguity over exactly what rights individuals, communities, and the state have. Even if the national land tenure framework operated perfectly and the necessary enforcement capacity existed, this would not resolve the complicated land conflicts emerging in postwar Mozambique. The central issue is less the lack of a surveying service and an official agency of coordination and arbitration, than the legitimacy of existing services with the competence and accountability to solve land conflicts for different groups (Tanner and Monnerat 1995). While recent political change increasingly recognizes the legitimacy of local, customary authority structures, the land law in place at the end of the war did not recognize customary tenure systems and therefore denied community access rights to land not currently under cultivation. The Land Law also did not recognize customary decisions that resolve conflicts between smallholders, nor customary evidence in disputes with largeholders who utilize the formal

land tenure system. Thus lands incorporated in fallow systems, forest extraction, grazing, and land otherwise held by communities are recognized as vacant, and are vulnerable to occupation by commercial land interests able to obtain title, resulting in widespread land disputes (Tanner and Monnerat 1995).

One of the features of postwar land tenure in Mozambique is that agricultural reintegration for many small-scale producers has begun with an initial dependence on locations where the most fertile land, perennial water supplies, infrastructure, markets, relief services, and physical security are present together. Migration to such areas occurred throughout and after the war, with food-insecure migrants coming into conflict with long-term customary residents. However, large land interests are also most interested in property acquisition in these agronomically endowed, or “critical resource” areas. At least nine million hectares of land have been awarded through the formal land tenure system to concessions for farming, hunting, tourism, and mining activities. Practically all these concessions overlap with settlements of smallholders, who were not part of formal land allocation decisions (Moll 1996). These nine million hectares occupy the highest quality land of the 35 million hectares of arable land, including all the major river basins and land near infrastructure and towns (Moll 1996). This has generated further conflict between migrants, in-place communities, and concession holders, in an environment where property rights (including dispute resolution) institutions between these groups are problematic.

BACKGROUND ON CASHEW AGROFORESTRY IN MOZAMBIQUE

Since the introduction of cashew trees to Mozambique by the Portuguese during the colonial era, trees have been established along the entire length of Mozambique's coastline and for a distance of up to 200 km inland, covering approximately one-third of the surface area of the country (CCL 1994). In the early 1970s Mozambique was the world's largest producer of cashew nuts in shell, and cashew was the primary export commodity (CCL 1994). Cashew trees exist largely on smallholder land in Mozambique, in groves and intermixed in cropping patterns with cassava, cowpea, maize, and groundnuts (CCL 1994). Planting and maintaining new trees is a fundamental aspect of cashew agroforestry, as is removing older nonproducing trees to create space in closed canopy groves and tree/crop associations. The very large decline in cashew production is to a large extent due to tree senility resulting in low yields or the end of production in old age trees, with very little tree replacement (CCL 1994).

The war and the associated collapse of the rural economy have impacted cashew agroforestry significantly. Older trees were not removed, existing producing trees were not maintained (pruned, brush cut away from beneath trees and so on) and perhaps most importantly, new trees were not planted over large areas of the country as populations were dislocated, and transport, marketing, and processing of cashew were disrupted (Finnegan 1992; CCL 1994).

A recent national cashew tree population survey found very low numbers of trees less than 15 years old in all areas (CCL1994). Only 10–15 percent of the cashew tree

population are in younger age classes (0–5, 6–10 years), with 20–30 percent between 16 and 25 years old, and 60–70 percent over 25 years of age (CCL 1994). A significant percentage of the younger trees that do exist appear to be self-seeded from the large stock of neglected adult trees (CCL 1994), meaning that their spatial placement either within an annual crop association or in a cashew grove is not optimized for an agroforestry system. While some studies note that production begins to decline after age 20 (FAO 1987; MOS/SST 1989) there is some disagreement as to the actual range in cashew tree productivity (CCL 1994). Throughout the cashew zone in Mozambique, very few trees are completely removed, in contrast to Tanzania and Kenya where farmers actively remove unproductive trees for use as firewood (CCL 1994). Thus a primary problem in Mozambique is the adoption (or postwar re-adoption) of tree replacement strategies and techniques, and hence a renewed role of agroforestry in natural resource management.

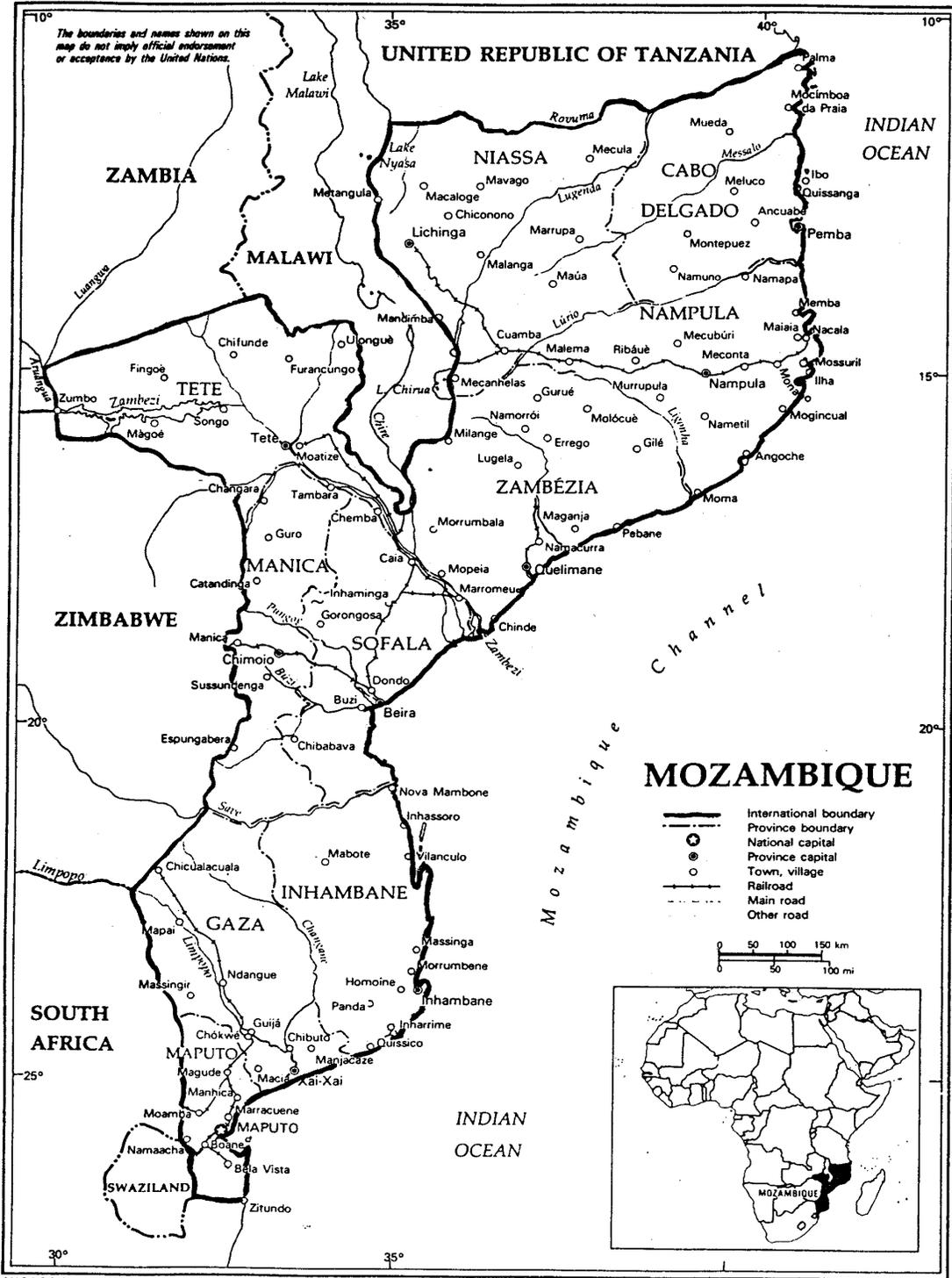
3. METHODOLOGY

In order to consider land conflict and how evidence operates for, and between smallholders, largeholders, and migrants, in 1996 social surveys were carried out (Unruh 1997) in two critical resource areas, and a control area in the northern part of the country. The idea was to compare the role of different forms of evidence (and customs and norms regarding evidence) in land dispute resolution.

The data for the study were gathered in the provinces of Nampula and Cabo Delgado in northern Mozambique (Figure 1). A social survey was carried out in 521

households in 21 villages, with villages distributed in three sets of seven villages each. Two of these sets were situated in agronomically endowed, or “critical resource” locations where fertile soils, perennial water, markets, infrastructure, and transport are fairly close together and thus are also locations most favored by large landholder interests. The third set of seven villages was dispersed within Nampula province in areas much less agronomically endowed, and not in critical resource areas. This third set acts as a control.

Figure 1—Study data in the provinces of Nampula and Cabo Delgado in Northern Mozambique



Villages for the control set were selected based on their location in less agronomically favored areas in Nampula province. Households within villages were selected according to a stratified random sampling, whereby all households of each village were divided according to their relationship with a large landholder interest (cotton producers in this area) and then randomly selected. Smallholder proximity to cotton production is the largest source of smallholder versus largeholder land conflict in Nampula and Cabo Delgado (Tanner 1996). For control villages, households were stratified according to their participation and nonparticipation in a CARE oil seeds project, and randomly selected. The decision to participate in the oil seeds project in a village was left to the household.¹ Although this choice, and the subsequent stratification, are not directly relevant to the present land tenure study, this subsample adequately represents households in noncritical resource areas.

4. CRITICAL RESOURCE AREAS AND THE CONTROL SET

Tables 1, 2, and 3 provide a look at some of the more relevant differences among the three sets of villages. Generally, those occupying the critical resource areas (especially Montepuez) are in a more constrained and difficult situation regarding land tenure. Migrants numbers are higher, land conflicts and loss due to conflicts are more

¹ This was part of a larger study dealing with land tenure and food security, as these related to largeholder cotton interests that operated in these areas.

problematic, agricultural investments (such as field bunding, fertilizer, and fences) are

lower, but

the number of years of education, surprisingly, is higher (Table 1). In general high values for tenure security are more frequent in the control set, while the critical resource sites have fewer respondents who are tenure secure (Table 2). Conflict resolution between smallholders using the customary tenure regime is regarded as more “unjust” in critical resource areas, as is land conflict resolution between smallholders and largeholders using the formal system (Table 3).

Table 1—Summary of selected variables for the control set and critical resource areas

Variables	Village sets ¹		
	Control set	Monapo	Montepuez
	<i>(percentage)</i>		
Share of migrants	10	23	73
Reports that smallholders lose land in the area	23	34	88
Perception that land conflicts are a problem	64	91	92
Perception that arrival of outsiders to obtain land is a problem for the community	16	39	66
	<i>(summed years for household)</i>		
Education	1.4	6.5	7.4
Average number of			
Land conflicts	0.21	0.53	0.49
Farm investments	5.5	5.2	2.4

Source: Unruh (1997).

1. Significant differences exist between village sets at the 0.05 level, with the exception of Monapo and Montepuez for “Perception of land conflicts as a problem”; and the control set and Montepuez for “Farm investments.”

Table 2—Tenure security for the three village sets

Tenure Security index	Control set	Monapo set	Montepuez set
Low: 8–15	10	27	50
Medium: 16–21	34	45	43
High: 22–30	56	28	7

Source: Unruh (1997).

- a. Data is presented as the percentage of respondents within each set that fall within low, medium, and high measures for the tenure security index.
- b. For land tenure security, an index was derived using 21 variables from the survey, including the general perception of land conflict (four variables); land loss and possibilities for losing land, including the role of title in land loss (eight variables); land lending (three variables); and investment in land (six variables). These variables were scaled, so that greater values indicate less presence and severity of land conflict, less land loss and preoccupation over land loss, more lending, and more investment. The values for the variables were added to give a scaled index for overall tenure security for each household. The index ranges from 8 to 30 with higher values indicating greater tenure security. Higher values are more frequent in the control, while the critical resource sites have fewer respondents that are tenure secure. Means for the tenure security index for the Montepuez (15.8) and Monapo (18.2) critical resource areas are significantly different from the control set (21.4) (and from each other) at the 0.05 level.

Table 3—Legitimacy of land dispute resolution for smallholders

Village set	Very just	Just	Unjust
Resolution between smallholders, using the customary system ¹			
Control	85	12	3
Monapo	59	38	3
Montepuez	29	53	17
Resolution between smallholders, using the statutory legal tenure system			
Control	52	43	4
Monapo	50	46	4
Montepuez	47	47	7
Resolution between smallholders and largeholders, using the statutory legal tenure system ¹			
Control	24	44	33
Monapo	14	31	55
Montepuez	13	17	71

Source: Unruh 1997.

Note: Data is expressed as a percentage of each village set’s sample.

1. Values between village sets are significantly different at the 0.05 level.

CASHEW AGROFORESTRY TREES AS EVIDENCE

Trees and Land Tenure

In the developing world, economically valuable trees are among the most common and valuable forms of customary evidence for claiming “ownership” of land (Raintree 1987; Fortmann and Riddell 1985 and the references cited in these works for Africa, Asia, and Latin America). Numerous studies have looked at the role of economic or otherwise valuable trees in land tenure (Fortmann and Bruce 1988; Raintree 1987; Cohen 1993; Fortmann and Ridell 1985 and the references cited therein). Tree planting’s role 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 into account this important custom regarding valuable trees. Trees, by their enduring nature, can be evidence that lands in fallow are still “owned.” This is important because land laws, including Mozambique’s, can stipulate that land is declared “abandoned” if uncultivated for more than a certain number of years, which is frequently much shorter than an adequate fallow period.

In Mozambique, cashew tree tenure plays a large role in property rights institutions for smallholders, including land conflict resolution. Forces associated with the war and the “disconnect” between customary, migrant, and formal tenure have acted to put even greater weight on older cashew trees compared to other forms of evidence. There are important relationships between this evidence role and the continued adoption

and maintenance of cashew agroforestry. The remainder of this section examines the relative importance of cashew trees as evidence; the subsequent two sections consider the two primary forces that shape the availability and legitimacy of cashew and other forms of evidence; and the final three sections look at cashew agroforestry's effect on property rights, factors important to the evolution of nonagroforestry evidence and institutions, and recent changes in the formal law to acknowledge forms of customary evidence.

Cashew Evidence in the Three Village Sets

For the three village sets in the study, the presence of cashew and other valuable 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. For the control, Monapo, and Montepuez samples, 86, 93, and 90 percent, respectively, indicated cashew trees as important evidence with respect to the occupation and "ownership" of land. These were the greatest percentages for any form of evidence (total of 30 forms) (Table 4). When asked whether having trees provided a "guarantee" against loss of land, the percentages were also quite high: 99, 99, and 94 percent for the control, Monapo, and Montepuez, respectively (Table 5). However the number of smallholders actually owning trees was much lower: 59, 69, and 16 percent of the control, Monapo, and Montepuez samples; and the average number of trees owned in the three samples was also low: 25, 39, and 3 for the control, Monapo, and Montepuez (Table 5). Thus 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. One way to interpret this is that it may indicate the degree to

which customs and norms that respect cashew trees as evidence are in place after the war, compared to other forms of evidence. The Montepuez village set is particularly noteworthy. While having the lowest percentage possessing trees and the lowest average number of trees per household, the percentage indicating this as important evidence is still quite high. Thus the Montepuez set illustrates that even in situations where institutions regarding property rights are most disrupted (Tables 1–3), the norms regarding agroforestry trees as legitimate evidence are nonetheless operative.

Thus, cashew agroforestry trees appear to provide strong evidence of claims to property, and legitimate evidence in dispute resolution. With property rights and tenure security strengthened by this evidence role of agroforestry trees, theoretically this would provide incentives to further invest in cashew agroforestry (adoption). However, as the following sections illustrate, several factors serve to complicate this investment significantly, with repercussions on property rights.

Table 4—Percentage of respondents mentioning social, cultural-ecological, and physical evidence, by village set

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

Source: Unruh (1997).

Table 5—Summary of variables regarding agroforestry trees as evidence

Variables	Village sets		
	Control set	Monapo	Montepuez
Average number of trees per household	25	39	3
		(percentage)	
Agroforestry trees as important evidence	86	93	90
Plan to plant trees	32	25	10
Possess trees	59	69	16
Trees provide a “guarantee” of not losing land	99	99	94

Source: Unruh (1997).

Note: Average values for villages are significantly different at the 0.05 level for all three village sets in the category “Average number of trees per household,” for the control set and Monapo in the category “Agroforestry trees as important evidence,” and for Montepuez and the other two sites for the categories “Planning to plant trees” and “Possess trees.”

5. THE WAR: DISLOCATION AND AGRICULTURAL DISRUPTION

The dislocations and disruptions attending the war have had significant impacts on the land tenure evidence “landscape” in two ways: 1) creating and maintaining an age-gap in agroforestry trees, and 2) making other forms of evidence less available and legitimate.

THE TREE AGE-GAP

Several interrelated forces connected to the war have operated, often in a mutually reinforcing way, to create and maintain a significant age-gap in cashew agroforestry trees. Perhaps most important was the direct effect of the dislocation of six million people on tree planting and the removal of older, nonproducing trees. Dislocatees (migrants) then

residing on others' land were prevented from planting by their hosts because it would be seen as a land claim. Likewise, removing trees from such land would be seen as challenging the owner's claims. For dislocatees cultivating land of no clear ownership, the temporary nature of their residence deterred tree planting. For communities not dislocated, the war and resulting food security problems meant that the agricultural time horizons of many small scale producers were reduced considerably, effectively precluding tree planting with its expectation of production only after several years on land needed for much quicker producing annual crops. At the same time older trees near the end of production were not removed, as they frequently still provided small amounts of cashew for food insecure agriculturalists.

The village set with the greatest percentage planning to plant cashew trees in the coming year was the control, the sample with the lowest number of migrants from elsewhere and the greatest tenure security (Tables 4,1,2). The other two village sets fit this pattern, that is, as the percentage of migrants increases, the percentage of those intending to plant cashew trees decreases, as does tenure security (Tables 1, 2, and 4). With migration higher in Montepuez and cashew trees fewest, this may suggest why tenure security is lowest and perception of unjust dispute resolution is highest.

The frequency and severity of land conflict also influences the cashew age-gap. Key informant interviews in the three village sets revealed that smallholders in areas where conflicts are a large problem (Monapo and Montepuez, Table 1) are especially reluctant to remove older trees due to their greater evidence value (as indications of long-

term occupation) over seedlings and saplings, which can be easily pulled up. An additional constraint to new tree planting is that as more smallholders lose land in the course of disputes (different from dislocation due to the war) they must then rent out or borrow land from other smallholders, again discouraging planting. In the overall context of cashew trees as evidence then, the tree age-gap has acted to shift emphasis (value) to older trees, primarily because this is what is most prevalent, and most meaningful as tree evidence. Migrants are most likely discouraged from removing trees as evidence, because the areas they occupy are relatively crowded, and include local community members. Thus, it would likely be known by whom the trees were cut, while the tree stump would attest to the fact that a tree once stood and had been cut. It would thus seem wiser for migrants to attempt borrowing or renting arrangements with local inhabitants, rather than attempt to overtly undermine their claims.

Availability of Nontree Evidence

The nature of dislocation during the war has meant that many agricultural areas were repeatedly occupied and abandoned at different times and by different groups. This has served to obscure, confuse and make less accessible or inaccessible many forms of evidence related to human occupation of the landscape. It also lessens social interaction regarding prewar arrangements of land ownership, loaning, renting, purchase, and so on. This is perhaps most notably the case where migrants currently comprise a significant proportion of the local population. The problematic postwar existence or availability of such forms of evidence not only has an influence on their legitimacy, but also on the comparative

importance and legitimacy of other forms of evidence (agroforestry) that remain in place, and so it provides a much clearer indication of the history of occupation.

In order to ascertain differences in evidence availability among the three village sets, forms of evidence were first categorized as social, cultural-ecological, or physical. Social evidence is oral or testimonial evidence provided or confirmed by others in the community. It demonstrates occupation, and serves to tie individuals and households to local communities. Social evidence also corroborates other social, as well as physical and cultural-ecological, evidence. Cultural-ecological evidence is 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, cemeteries, and so on. This evidence demonstrates occupation and corroborates social evidence and some other forms of cultural-ecological evidence. Physical evidence is defined as naturally occurring terrain features that are easily observed by anyone, and demonstrates familiarity with an area, but corroborates no other category of evidence.

These three categories of evidence vary considerably in their utility. In other words the interplay of social and cultural-ecological evidence will be much more meaningful than simply an individual's knowledge of where pieces of physical evidence (rivers, fallen trees, depressions, termite hills, and so on.) are located. Because knowledge of the location of naturally occurring terrain features is readily observed by anyone, it does not have the value of other evidence that lends itself to corroboration, and hence the building of an "argument." It is the combination of social evidence with

cultural-ecological evidence that is most valuable in constructing an argument for a claim to land in a dispute. This is because social evidence ties individuals to communities, 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, which are bound up in cultural-ecological evidence (inheritance of land, networks of lending land, land transaction, and so on.). Such social evidence 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.”

Table 4 compares the percentage of the village set samples favoring different forms of evidence within these three categories. What is most striking are the differences in social and physical evidence for the three village sets, but especially between the control set and Montepuez. Social evidence is largely lacking in the Montepuez set in favor of naturally occurring physical evidence, compared with the other two sets. This indicates the high preference for evidence that is available, even though such evidence is of reduced utility compared with other forms. Cultural-ecological evidence is essentially the same for the three sets, due to the large emphasis all sets place on agroforestry trees. However, there is a division within this evidence with regard to that evidence that ties individuals to community and land over the long-term (knowledge of and social attachment to tombs, cemeteries, sacred areas, village ruins, and so on) as opposed to shorter-term forms of cultural-ecological evidence (field boundaries, present crops, and

so on). Subtracting agroforestry trees from the list of cultural-ecological evidence, respondents in Montepuez were more likely than those in other sites to cite evidence that demonstrates shorter-term occupation of an area (Table 4). If the control villages are the most “intact” communities, then it makes sense that social evidence and long-term cultural-ecological evidence are most prevalent there.

Overall, the ability of smallholders in Montepuez to build a good argument as to a land claim is compromised due to the lack of social evidence that can corroborate the existence of other social or cultural-ecological evidence. This is most likely because the majority in the Montepuez sample are recent migrants (Table 1), and thus do not have the same community/land connection or community cohesion as households within the control or the Monapo village sets. Of the migrants in the Montepuez set, only three (out of 94) households indicated some form of social evidence. Thus reductions in the availability of social evidence for populations with significant numbers of migrants appear to result in a shift favoring forms of evidence that are available—physical evidence and some cultural-ecological evidence—with the relative permanence of older agroforestry trees emerging as one of the most important and durable pieces of evidence available.

6. DIFFERENT APPROACHES TO LAND TENURE

The interaction of disparate approaches to land tenure in Mozambique influences the legitimacy of forms of evidence in dispute resolution. While the previous section

looked at the influence of availability of evidence on shaping preferences for specific forms of evidence, the present section considers the influence of legitimacy of evidence on shaping evidence preferences across groups. In postwar Mozambique there are three different general approaches to land tenure: 1) customary, 2) statutory legal, and 3) migrant or “disrupted.” The latter approach is characterized by a comparative lack of social connections to community regarding land, and a higher value placed on naturally occurring physical forms of evidence in claims to land. Land disputes involving parties from the different tenure approaches can involve attempts to bring to bear forms of evidence that are regarded as legitimate and therefore respected (institutions) within a certain approach. But, if not respected by the opposing party (through enforcement or custom), then such forms of evidence are relatively unworkable. Violence aside, such a situation can then force the different parties, particularly the less powerful, to place increased value on evidence that is mutually legitimate.

For the customary (control) and largely migrant (Montepuez) groups in the study, there are only two forms of evidence for which both groups express a relatively high preference: soil type and agroforestry trees (Table 4), with soil type much less important for both communities compared with agroforestry trees. While similar data do not exist for largeholders (operating from the formal system), the land law in place at the end of the war acknowledged forms of smallholder evidence that demonstrates “occupation” (soil type does not), and explicitly disallowed social evidence. While crops and field boundaries are evidence of occupation, again, these have been severely disrupted during

the war so as to be problematic for smallholders to connect with for purposes of evidence in a dispute, and these are less preferred (Table 4). Agroforestry trees, on the other hand, especially the older trees (indicating long-term or previous occupation) are evidence of occupation in the formal land tenure system and can signify a more direct and permanent connection to land for smallholders. Thus, agroforestry trees are the only remaining evidence for which there exist customs and rules (formal and informal) that pertain to them as evidence, not only within, but also between groups operating from the three different tenure approaches. As disputes between these three groups become common in certain areas, agroforestry trees, as mutually acceptable and respected evidence for defending rights to land, will shape dispute resolution to put much greater weight on this evidence.

All else being equal then, the actual presence of such evidence should influence the outcomes of disputes (land lost or not). While not comparable in every way, Monapo and Montepuez seem to support this. Relatively, both sets experience the same measures for value of trees as evidence, conflict number, and perception of land conflict as a problem (Tables 1 and 5). However the Monapo set, with many more cashew trees, indicates a much lower percentage believing smallholders lose land (Table 1), and higher percentages believing conflict resolution between smallholders and largeholders is less of a problem than conflicts between smallholders (Table 3). That the Monapo sample expresses greater tenure security (Table 2) also makes sense. One might speculate that the much larger presence of cashew trees in the Monapo area (Table 5), together with a

greater presence of social evidence (not allowed in the Land Law, but in many cases connectable to trees) perhaps plays a substantial role in outcomes of land conflict.

Even in the presence of good evidence, conflicts are instigated for a variety of reasons, many stemming from poverty and instability in Mozambique, with migrants and largeholders alike seeking access to land in better areas with the hope of at least getting a crop from a piece of land before their claim is contested. While the incidence of conflict is perhaps not overly affected by the presence of cashew trees (Monapo has more cashew trees than Montepuez and less migrants, but also more conflicts), outcomes of disputes perhaps are resulting in greater tenure security. Comparisons between Monapo and Montepuez suggest that numbers of migrants and trees might not significantly affect incidence of conflict, but rather influence tenure security, investment in technology, and ideas regarding how “just” dispute resolution institutions are relying on whether legitimate evidence exists to address disputes.

7. THE TECHNOLOGY’S EFFECT ON PROPERTY RIGHTS INSTITUTIONS

There are two overall effects of cashew agroforestry on property rights in postwar Mozambique. First, the rules and customs regarding the link between agroforestry trees and land tenure have, in a postwar context, greatly facilitated (at no cost to the state) the coordination of defending and asserting rights to land, and hence land re-access and dispute resolution. This has helped to organize, nonviolently (and quite apart from intentionally implemented parts of the peace process) important aspects of property in a

way that might not have occurred had there been no (or very few) agroforestry trees present in the postwar period. Thus the technology, or an aspect of it (older existing trees), has and continues to play an important role in the organization of property rights in the period of recovery. The existence (and comparative importance) of respected customs and norms regarding the connection between agroforestry trees and land, in an otherwise chaotic postwar tenure environment, holds considerable potential as a starting point for the evolution or re-formation of additional institutions regarding property rights. Of significant potential here, especially over time, are forms of social evidence connectable to cashew trees, that is, corroborating testimony regarding lending, renting, and purchase of tree harvests, and times of planting and maintenance. Also of some potential are forms of cultural-ecological evidence attesting to short-term occupancy, such as field boundaries, location of crops, and so on, which could, over time, be used to derive social evidence regarding these.

The second effect of agroforestry trees as evidence on property rights has to do with the adoption and maintenance of cashew agroforestry as these intersect with the formidable tree age-gap. The failure to adopt, or re-adopt, tree replacement strategies due to the high value placed on older trees as evidence will eventually result in a decrease in this evidence as the older trees die out, with impacts on the overall technology (loss of agroforestry, as opposed to adoption) and property rights. With decreasing numbers of trees, their availability as forms of evidence would eventually reach a point where the set of customs and norms that pertain to trees as evidence would begin to disintegrate. Very

high value will continue to be placed on older trees unless other forms of evidence become available and legitimate, and institutions pertaining to these are able to evolve and deliver in terms of tenure security. The derivation of other forms of evidence, possessed by and legitimate to smallholders, and at the same time legitimate in the formal land tenure system and able to compliment agroforestry trees, would likely amplify the number and kind of meaningful forms of evidence and relieve some of the comparative importance of agroforestry trees; thus allowing the adoption (or re-adoption) of practices necessary for agroforestry as an NRM technology. For the control sample, even without customary social forms of evidence regarded as legal, there is a wider array of evidence available and legitimate (Table 4). This is also the set where the greatest planting goes on and where the smallest percent indicated that cashew trees are an important form of evidence (Table 5). Thus, while cashew trees are always expected to be an important form of evidence for the control (it is not significantly different from Montepuez in terms of importance) its comparative importance is less than for the other sets. This is due to the wide array of other available evidence as well as the proportionately smaller number of largeholders competing for land in the control area, thus enabling greater consensus on the legitimacy of customary evidence. For the three samples, the increasingly wide range of different forms of social and cultural-ecological evidence (from Montepuez to Monapo to the control set) parallels the percentage believing dispute resolution and tenure security between smallholders is more “just” (Tables 2 and 3).

In addition to the tenure relationship with tree replacement, there is a potentially significant market disruption effect on replacement strategies. With market and transport infrastructure considerably damaged during the war, the ability of commercial interests to purchase needed quantities of cashew over an adequately large area, and process, and transport shipments for export and urban consumption, has been much reduced. As a result, the economic incentive to smallholders to replace older trees in order to attain economically viable levels of production has likewise no doubt decreased. However, the relative importance of an economic incentive to replacement versus a tenure benefit to nonreplacement is difficult to determine. Presumably, if market and transport infrastructure were optimally in place in the post-war period, there would be some increase in replacement of trees. However with cashew trees—the primary form of existing evidence to land claim in many areas—it is perhaps unlikely that replacement would occur to the extent that such evidence is significantly jeopardized because the potential loss of land (and trees) would likely be a priority economic consideration over any incentive to increasing cashew production on land that may be lost. This may be especially important as cashew is usually the most common tree found on smallholder agricultural land in the country's cashew belt, and non-native economic tree species can have a stronger evidence value than native, naturally occurring trees. However over time, as other evidence becomes available and legitimate, the role of market incentives to tree replacement is likely to increase, provided the marketing infrastructure is recovering.

The two effects of cashew agroforestry on property rights (assisting in the organization of land re-access, and the potential disintegration of this same evidence and associated institutions along with the technology itself) perhaps highlight a broader point about the relationship between technology adoption and property rights. In Mozambique, the nature of this relationship is not a static, entirely predictable one, but rather is necessarily influenced by a wider sociopolitical context that can influence the trajectory of this relationship. As this context changes, so can the nature of the relationship.

8. FACTORS IMPORTANT TO THE EVOLUTION OF NONAGROFORESTRY EVIDENCE AND RELATED INSTITUTIONS

LEGITIMACY

The evolution of institutions that pertain to other forms of customary evidence (social, cultural-ecological) first faces a legitimacy problem with the formal tenure system. Customary evidence is largely not legitimate within the formal system, and the statutory system is less than legitimate to many smallholders, especially for dispute resolution. The incorporation of customary forms of evidence into the formal land tenure system (land law) is a fundamental step in making such evidence legitimate within the formal system, and the formal system legitimate to smallholders. This would act to increase the value of such evidence among smallholders, especially in the problematic conflicts with largeholders who operate from the formal tenure system. For dispute

resolution institutions to effectively operate between customary (including migrant) and formal tenure systems it must be realized that it is easier to modify national land legislation to accommodate evidence legitimate within the customary system, than it is to legislate out of existence customary norms and rules regarding land tenure (Bruce et al. 1994), in an attempt to replace the customary tenure system with the formal, so that everyone is “playing by the same rules.” This is not to suggest that the details of land tenure in all customary systems should be incorporated into formal law (an impossible task), but rather that the themes and tenets that embody these and make them operable, such as community membership, testimony, local leadership, history of occupation, present use, and use of in-place dispute resolution institutions for intra-community disputes, be recognized by statutory law.

On the other hand, continued conflicts with largeholders in which smallholders lose land because the formal system does not regard customary evidence as legal would increase the number of smallholders having to move off land, resulting in the loss of important social and cultural-ecological evidence wherever they end up as migrants, thereby acting to stagnate the evolution of evidence and their institutions. Adoption of agroforestry could then become more difficult as those dislocated from land will likely, if they continue to farm, be unable to plant trees on rented or borrowed land.

Legitimacy of the formal system from the smallholder viewpoint is also an issue. Smallholders residing in critical resource areas, with a much greater exposure to largeholders, believe that land dispute resolution between large and smallholders is more

unjust than do those in the control sample (bottom third of Table 3). That the primary problem in land dispute resolution involving the formal system is between small and largeholders, and not between smallholders, is supported by the differences in the response of “unjust” between utilization of the formal tenure system to resolve conflicts between smallholders, versus between smallholders and largeholders (Table 3). For Montepuez, 64 percent more of the sample believed the formal system was “unjust” when the dispute was between small and largeholders, as compared with use of the formal system for resolving disputes between smallholders. For Monapo, this difference was 51 percent, and for the control set, 29 percent. For dispute resolution between smallholders using the formal system, approximately half of the samples from both critical resource areas believed this to be “very just” which is comparable to the control. Thus, there exists both an opportunity and a problem regarding formal, legal land dispute resolution. The opportunity is that smallholders do believe the formal system has legitimacy, and this could be built upon. This would increase the legitimacy of the formal system for smallholders and incorporate the much needed “customs and controls” of communities in enforcement of decisions. The problem is that the same system (formal) is problematic when the dispute is between small and largeholders—acting to detract significantly from the opportunity.

AVAILABILITY

The evolution of institutions regarding customary forms of evidence also faces an availability problem. The war has disrupted much in the way of institutions regarding commonly accepted social and cultural-ecological evidence for smallholders, especially for those who are now migrants. To a large degree, this is because the availability of the evidence itself was disrupted. Time will be necessary to both increase the availability of evidence and re-make local institutions pertaining to this evidence. The re-formation of these will be variable over time and space, and in some areas will require considerable time. For areas with significant numbers of migrants (Montepuez), the question of availability of evidence will be more critical than for areas with fewer migrants (Monapo) or for established communities with very few migrants (control set). Making forms of customary evidence (especially social forms) legal in the formal tenure system will have less of an impact, or a much delayed impact on groups that do not have this evidence significantly available. In the Mozambique case, customary evidence regarded as legal will clearly be of greater assistance to communities such as the control areas and Monapo, as opposed to areas such as Montepuez, where forms of social evidence are much less available. However, to the degree that customary forms of evidence are made legal in the national tenure system, one could imagine that the time necessary for the evolution or re-evolution of institutions even in areas such as Montepuez would very likely be shortened.

COMMUNICATION

Inclusion of customary evidence in statutory legal codes, however, will have little meaning to small-scale agriculturalists if the parameters of the new statutory legal environment are not known at the local level, and if smallholders do not have the capacity to engage the new legal environment. Additional work (key informant interviews) in Mozambique indicated that while smallholders can perceive the statutory legal system to be unjust in dispute resolution with largeholders, they are unaware of the precise nature of the statutory legal framework regarding use and access of land resources, including dispute resolution. At the same time, largeholder and commercial interests are also often unaware of important aspects of the legal environment with regard to disputes and their resolution. District level officials are frequently unaware of current and new legal tenets, and there is extremely limited capacity on the part of the government to diffuse this information outside the provincial capitals. Even the capacity to “inform only” from the province to the district, and especially within the district is extremely weak and in many cases nonexistent. The incapacity of the district level to deal with basic land issues is an important impediment to smallholders’ ability to take advantage of any legal environment (current or changed). Thus, dissemination of information regarding legal tenets from the national capital through several layers of formal and informal land administration is a fundamental aspect of the evolution of effective institutions regarding legal forms of customary evidence. The two critical resource areas show a certain potential in this context. With significantly more education than the control site (Table 1), dissemination

of important aspects of the Land Law might be taken advantage of more quickly by this group, especially given the breakdown of important customary forms of evidence, community connection, and notions of how “just” the customary system is in dispute resolution between smallholders, compared with the formal system.

9. HAS THIS HAPPENED?

Responding to the land tenure issues of the postwar period, the Mozambican Interministerial Land Commission, backed by technical support, took the lead in formulating a revised national land policy and land law for Mozambique. Activities of the Land Commission over the previous five years included research on a number of important topics, local to national debates and discussions, workshops, and three national conferences on land issues, with discussions of land conflict resolution playing a prominent role in these. On July 31, 1997, after two weeks of parliamentary debate, the National Assembly approved a new Land Law.

The key changes regarding conflict resolution adopted as articles in the revised Law indicate

- Acceptance of nonwritten forms of customary evidence, such as oral testimony, to defend claims to land
- Explicit granting of land use rights to rural smallholders through occupation (without prejudice or inferiority compared with rights received by formal written title)

- Mandatory local community participation in the formal titling process
- Ability to register land in the name of the local community

Efforts are underway in Mozambique to encourage domestic and international NGOs to play a role in bringing about local understanding of the revised Land Law through communication of relevant aspects of the revision. This is done by a coordinated effort to engage in two primary activities. The first is to take on the much-needed role of communicating important aspects of the revised Law to the district levels. Second, NGOs, in their areas of activity, and with greater knowledge of both the formal legal structures and the smallholder communities they work with, are able to act as advocates to numerous communities, to “walk them through” dispute resolution with largeholders, while smallholders continue to learn about the new legal environment. These two aspects of national land policy reform in Mozambique (inclusion of customary evidence, and communication of the revised law to the provincial, district and local village levels) have the potential to encourage the evolution of land dispute resolution institutions associated with an amplifying menu of legitimate evidence.

Direct information on the impact of the revised Land Law is not available due to the recent nature of the changes. But what is expected is that smallholders, with an ability to present their own evidence that is customarily legitimate, yet legal within the formal system, will increasingly be able to participate in dispute resolution with largeholders, resulting in a greater ability to retain access to land. Making social forms of evidence legal may have the effect of encouraging smallholders to derive and value such

evidence where it does not now exist (Montepuez) or is weak (Monapo). This could eventually result in an expansion of the kinds of available evidence and associated institutions, like that which exists in the control community. Increasing tenure security in this way may then take some of the pressure off older agroforestry trees as the sole evidence that is available and respected by different groups. This in turn could result in the employment of the tree replacement strategies important to full adoption and maintenance of cashew agroforestry.

Incorporation of customary land tenure evidence into formal legislation creates a new framework for interaction between the customary and formal tenure systems. Largeholders will perhaps be more willing to “cut a deal” with communities over use of resources if it is widely known that customary evidence in a land dispute has formal legal standing. Overall, inclusion of customary evidence in formal legal codes is likely to have the effect of increasing community control over the resources on which they depend.

10. CONCLUSION

The nature of legitimate evidence in land dispute resolution plays a fundamental role in the land tenure security necessary for adoption of natural resource management technologies. In postwar Mozambique, forces associated with the conflict have served to alter the availability and legitimacy of evidence to put significant evidence value on cashew agroforestry trees. The widespread presence of cashew on smallholder land allows these trees to provide evidence of land ownership, and constitute legitimate evidence for dispute resolution. As a result, cashew agroforestry as an NRM technology

has strengthened property rights and heightened tenure security, a uniquely valuable service in the chaotic postwar period. With such value placed on agroforestry trees, further investment in cashew would seem the logical choice. However several forces serve to discourage investment in cashew planting.

- The high evidence value placed on agroforestry trees, together with a comparative lack of other evidence of equal value, means that older, nonproducing agroforestry trees are not removed to make space for planting cashew in tree-farm associations, or cashew groves.
- With close to half of the national population dislocated during the course of the war, the presence of migrants on land claimed by others is a common occurrence. Migrants are prevented from planting cashew due the role of tree planting in claiming land and because the duration of their tenure tends to be shorter.
- The war has created significant uncertainty over who owns what in Mozambique, increasing the probability of disputes and decreasing the incentives to invest further in cashew planting.
- The lack of connection between formal and customary land tenure systems has increased the likelihood of land disputes between smallholders and largeholders, particularly in critical resource areas. The resulting uncertainty is aggravated by power distributions that favor commercial and largeholder interests hence lending greater legitimacy to statutory law regarding administration of land. Smallholders therefore

can experience greater expectations of land loss, resulting in decreased incentives to invest in technologies such as cashew agroforestry.

Such a set of opposing forces regarding the role of cashew agroforestry trees as evidence for land claims reveals important aspects about the adoption of NRM technologies. With number of migrants highest and number of cashew trees lowest in Montepuez, this may explain lower measures of tenure security, and perceptions of unjust dispute resolution; however Monapo has a greater number of land conflicts than Montepuez despite a higher average number of cashew trees per person, fewer migrants, and greater tenure security. This may suggest that numbers of trees and migrants do not affect the incidence of conflict significantly, but they do affect tenure security, investment in technologies, and perceptions of the “justness” of dispute resolution institutions. Thus, incidence of conflicts may not necessarily significantly weaken tenure security, provided that forms of evidence widely perceived to be legitimate (such as cashew agroforestry trees) are available to resolve disputes.

With little alternative forms of evidence available that are as widely legitimate as cashew trees, there exists the risk that continued nonremoval of older trees coupled with little planting of new trees would result in fewer trees in the future. However, recent legislative revision by the Mozambican government has resulted in a formal land law that incorporates, to a significant degree, customary forms of evidence. This presents the possibility of “valuing” alternate forms of customary evidence in land dispute resolution, and widening the array of legitimate evidence available for smallholders. While too soon

to determine, this may have the effect of decreasing the near singular importance of cashew trees as evidence, and hence an important constraint to cashew tree replacement as an important aspect of full adoption of the agroforestry technology.

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